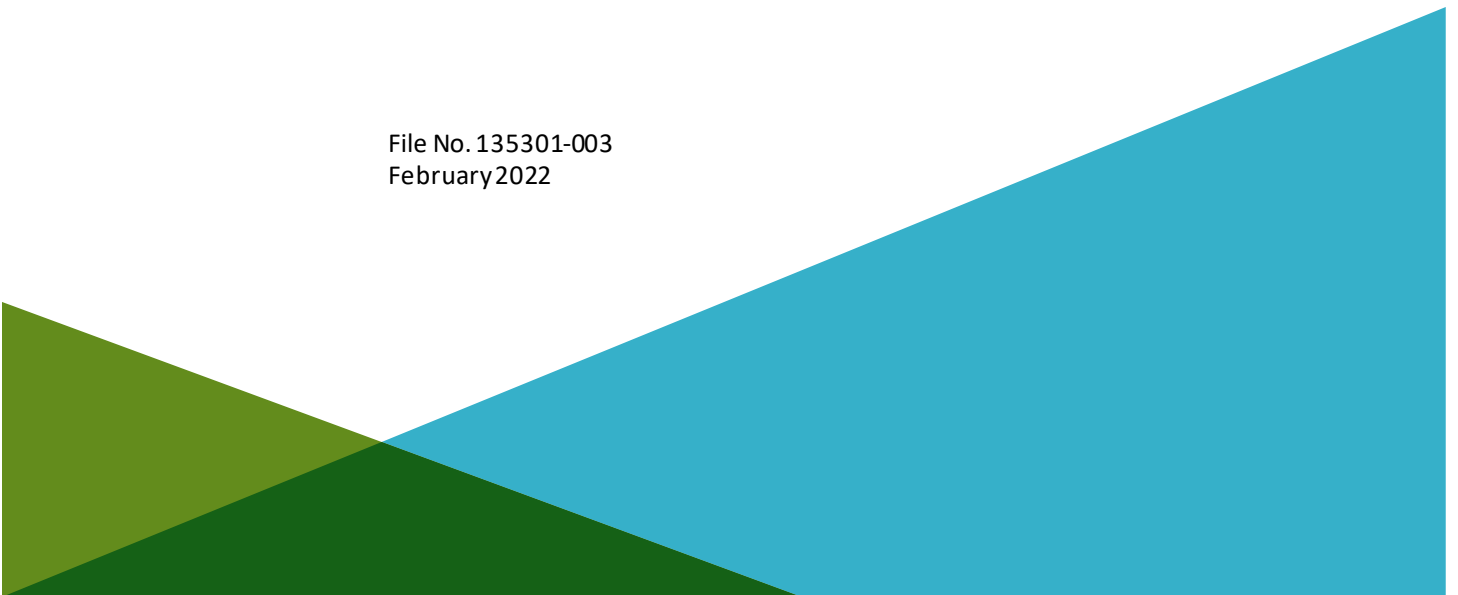


NPDES RGP APPLICATION FOR TEMPORARY CONSTRUCTION
DEWATERING
BUNKER HILL COMMUNITY COLLEGE
PROPOSED ACADEMIC STUDENT SUCCESS BUILDING
250 RUTHERFORD AVENUE
BOSTON, MASSACHUSETTS

by
Haley & Aldrich, Inc.
Boston, Massachusetts

for
Environmental Protection Agency (EPA) Region 1
Boston, Massachusetts

File No. 135301-003
February 2022





HALEY & ALDRICH, INC.
465 Medford St.
Suite 2200
Boston, MA 02129
617.886.7400

9 February 2022
File No. 135301-003

Environmental Protection Agency (EPA) Region 1
5 Post Office Square, Suite 100
Mail Code OEP06-4
Boston, Massachusetts 02109

Attention: Shauna Little

Subject: NPDES RGP Application for Temporary Construction Dewatering
Bunker Hill Community College
Proposed Academic Student Success Building
250 Rutherford Avenue
Boston, Massachusetts

Dear Shauna Little:

On behalf of our client, Bunker Hill Community College (BHCC), Haley & Aldrich, Inc. (Haley & Aldrich) is submitting this application to request authorization under the National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) for off-site discharge of temporary construction dewatering effluent during construction activities at the proposed BHCC Academic Student Success Building at 250 New Rutherford Ave (the site) in Boston Massachusetts as shown on Figure 1. A copy of the Notice of Intent (NOI) is included in Appendix A.

GENERAL SITE DESCRIPTION

The proposed 15,400 square-foot (sq ft) Academic Student Success Building will be constructed adjacent to existing Buildings B, C, and D on the BHCC campus as shown on Figure 2. The proposed building will be three stories with a slab-on-grade foundation. Proposed finished first floor slab elevations are planned to match existing, adjacent buildings at El. 24 (Boston City Base [BCB]).

Historical maps and Sanborn Fire Insurance Maps (Appendix B) indicate the BHCC campus was occupied by the Charlestown State Prison from 1805 to 1955. The prison was demolished between 1955 and 1964, and the BHCC campus buildings were constructed in 1973.

In December 2020, subsurface explorations were performed at the site. Concentrations of polycyclic aromatic hydrocarbons (PAHs) were detected in a soil sample collected in test boring HA20-6(OW) from a depth of 0 to 4 feet (ft; Figure 2) at concentrations above Massachusetts Contingency Plan (MCP; 310 CMR 40.0000) RCS-1 Reportable Concentrations. This exceedance constitutes a 120-day reporting condition pursuant to 310 CMR 40.0315(2). However, the presence of PAHs is likely attributable to ash, cinders, and coal observed in urban fill during drilling, and is therefore exempt from reporting in

accordance with 310 CMR 40.0317(9). Although the site is exempt from reporting under the MCP, it is our opinion that the presence of PAHs and urban fill at the site meets the definition of a site of known contamination under the RGP.

RECEIVING WATER INFORMATION

On 7 December 2021, Haley & Aldrich collected a receiving water sample from the Millers River under US Highway 1 as shown on Figure 3. The surface water sample was collected and submitted to Alpha Analytical, Inc. of Westborough, Massachusetts (Alpha) for chemical analysis of total metals, ammonia, and hardness. Field parameters, including pH and temperature, were collected from the surface water sample at the time of sampling. The results are summarized in Table I. Receiving water temperature is also noted on the effluent limitations input calculation page in Appendix C. The laboratory data report is provided in Appendix C.

The seven-day-ten-year flow (7Q10) of the receiving water was established using the U.S. Geological Survey (USGS) StreamStats program and confirmed by the Massachusetts Department of Environmental Protection (MassDEP) on 17 December 2021. The StreamStats report, Dilution Factor calculations, and MassDEP confirmation of the 7Q10 and Dilution Factor are included in Appendix C. The StreamStats Report, dilution factor calculations, and confirmation from MassDEP are included in Appendix D.

Copies of the "EnterData" and "FreshwaterResults" tabs from the excel file provided as an additional resource by the Environmental Protection Agency (EPA) are included in Appendix D and will be transmitted electronically with the NOI. The calculated effluent limitations are included for reference in Table I.

SOURCE WATER INFORMATION

To evaluate groundwater (source water) quality at the site, a groundwater samples was collected from observation well HA20-6(OW) on 21 October 2021. The well is located within a planned infiltration system adjacent to the building, as shown on Figure 2. Monitoring wells within the building footprint did not have a sufficient volume of water to collect a groundwater sample.

The groundwater samples were submitted to Alpha for chemical analysis of 2017 NPDES RGP parameters including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) including PAHs, total metals, total petroleum hydrocarbons (TPH), pesticides, polychlorinated biphenyls (PCBs), total suspended solids, chloride, total cyanide, total phenols, ammonia, and total residual chlorine. Field parameters, including pH and temperature, were collected at the time of groundwater sampling.

The source water quality data are summarized in Table I. Laboratory data reports are included in Appendix C.

Ethanol Discussion

The groundwater samples were not tested for ethanol because site history and the results of recent investigations and testing does not suggest that ethanol or petroleum products containing ethanol were used, stored, or released at the site.

DISCHARGE INFORMATION

Water from construction dewatering activities will be discharged into storm drains via temporary pipes located along the southern limits of the site. The storm drain locations and proposed discharge routes are shown on Figure 3. We anticipate effluent discharge rates to be about 50 gallons per minute (gpm) or less, with occasional peak flows of about 150 gpm during significant precipitation events. The temporary dewatering will be conducted with sump pumps placed in excavations.

DEWATERING TREATMENT SYSTEM INFORMATION

An effluent treatment system will be designed and implemented by site contractor(s) to meet the applicable 2017 RGP Discharge Effluent Criteria. Prior to discharge, collected water will be routed through a sedimentation tank and bag filters to remove suspended solids and undissolved chemical constituents. The proposed treatment system schematic is provided on Figure 4. Additional treatment may include granulated activated carbon (GAC), a chemical-aided settling agent, ion exchange, and/or pH adjustment.

TREATMENT CHEMICALS AND ADDITIVES INFORMATION

To meet the 2017 NPDES RGP Site-Specific Effluent Criteria, additional treatment including GAC, a chemically aided settling system, ion exchange, and/or pH adjustment may be added to the treatment system. Product information for potential treatment systems and additives, including Safety Data Sheets (SDSs), associated hazards, and manufacturer and proper system operation, are provided in Appendix E.

If required, pH adjustment will be conducted using sulfuric acid or sodium hydroxide that will be dosed to reduce or increase pH using a metered system. Potential product information, including chemical formula, SDS, Chemical Abstracts Service (CAS) registry number, manufacturer, and associated hazards, toxicological and ecological information, and manufacturer information, including dosing and metering, are provided in Appendix E.

The sulfuric acid or sodium hydroxide will be stored in 55-gallon drums with secondary containment systems in place; a summary of control measures for proper handling and spill prevention is provided in Appendix E. The addition of sulfuric acid or sodium hydroxide to control pH is a standard treatment for temporary construction dewatering: it is not expected to exceed applicable permit limitations and water quality standards or alter conditions in the receiving water. No additional testing is considered necessary for use of this product or to demonstrate that use of this product will not adversely affect the receiving water.

The pH will be automatically and continuously monitored, and additive added only as needed. The specific dosing will be based on the pH of the influent water, but at their maximum, the concentrations for sodium hydroxide or sulfuric acid would be 220 parts per million (ppm or milligrams per liter [mg/L]) based on the calculations provided below:

- Worst case scenario: pumping at 150 gpm and using 48 gallons of sodium hydroxide or sulfuric acid per day (based on a 2 gallon/hour metering rate)
- 150 gpm = 216,000 gallons/day
- Sodium Hydroxide or Sulfuric Acid use (one day) = 48 gallons/day
- 48 gallons/216,000 gallons = 2.22×10^{-4} gal
- 2.22×10^{-4} gal * 100% = 0.022%
- 1% = 10,000 ppm, therefore; 0.022% * 10,000 ppm = 220 ppm (mg/L)

The EC₅₀ for sodium hydroxide for fish is 340.7-469.2 mg/L (ppm), and the EC₅₀ for sulfuric acid for fish is 500 mg/L (ppm) as listed on the provided SDSs. Even at a worst-case scenario, the addition of sodium hydroxide or sulfuric acid is less than the EC₅₀.

If necessary, a chemical-aided settling system may be added to one or more of the treatment systems. The system would allow for the application of coagulant and non-ionic dry polymer. The product information for the proposed coagulant and dry polymer, including product name, manufacturer, purpose, and use, associated hazards and risks, reported aquatic toxicity (LC₅₀), and proper handling and storage measures, is included in the attached SDSs in Appendix H. The coagulant and dry polymer is considered a typical treatment for temporary construction dewatering; addition of these compounds is not expected to add pollutants in concentrations which exceed permit effluent limitations or applicable water quality standards or alter conditions in receiving water. No additional testing is considered to be necessary for use of these products or to demonstrate that use of these products will not adversely affect the receiving water.

The dosing concentration for both the coagulant and dry polymer typically ranges from 25 to 50 ppm. The actual dosing concentration is based on visual observations in the field and will be adjusted and calibrated by the operator during startup of the additional components to achieve the appropriate set-point for the system. Dosing is continuous at the set concentration while the system is running.

It is important to note that although the dosing concentration is 25 to 50 ppm, the detected concentration in the carryover (post-bag filter) is in the parts per trillion (ppt) range (about 6 orders of magnitude less than the dosing concentration). This is because nearly all the applied chemical becomes incorporated in the sludge and is removed from the waste stream as a solid from the weir tank and as part of typical system operations and maintenance.

DETERMINATION OF ENDANGERED SPECIES ACT ELIGIBILITY

According to the guidelines outlined in Appendix I of the 2017 NPDES RGP, a preliminary determination for the action area associated with this project was established using the U.S. Fish and Wildlife Service (FWS) Information, Planning, and Conservation (IPAC) online system; a copy of the determination is attached in Appendix F. Based on the results of the determination, the project and action area are

considered to meet FWS Criterion A because no listed species or critical habitat are present within the project action area. Additionally, a MassDEP Phase 1 Site Assessment Map is included in Appendix F, which confirms that no critical habitats are present at the site.

DOCUMENTATION OF NATIONAL HISTORIC PRESERVATION ACT REQUIREMENTS

Based on a review of the resources provided by the U.S. National Register of Historic Places and a review of the Massachusetts Cultural Resource Information System (MACRIS), no historic properties have been identified at the site, and discharge and discharge-related activities are not considered to affect historic properties. The discharge meets Criterion A. Documentation is included in Appendix G.

SUPPLEMENTAL INFORMATION

Permits for temporary construction dewatering will also be required from the Massachusetts Department of Transportation (MassDOT) and the Boston Water and Sewer Commission (BWSC). The MassDOT permit application will be submitted electronically and concurrently with this NOI. Once issued, a copy of the NPDES RGP Authorization will be provided to BWSC to support the dewatering permit application.

Owner and operation information are provided below for reference:

Owner:

Bunker Hill Community College
250 Rutherford Ave, Boston, MA 02129
Boston, Massachusetts 02129
Attn: Gary Bigelow


Operator:

Bond Building Construction
10 Cabot Road, Suite 300
Medford, Massachusetts 02155
Attn: Pam Bailey

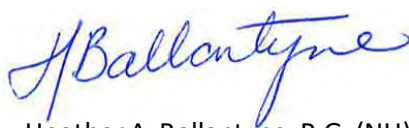
CLOSING

Thank you very much for your consideration. Please feel free to contact us should you wish to discuss the information contained herein or if you need additional information.

Sincerely yours,
HALEY & ALDRICH, INC.



Shay Gerald
Engineer



Heather A. Ballantyne, P.G. (NH), LSP
Senior Project Manager

Enclosures:

- Table I – Summary of Water Quality Data
- Figure 1 – Project Locus
- Figure 2 – Site and Subsurface Exploration Location Plan
- Figure 3 – Proposed Dewatering Discharge Route

Figure 4 –Proposed Treatment System Schematic
Appendix A – Notice of Intent (NOI)
Appendix B – Sanborn Maps
Appendix C - Laboratory Data Reports
Appendix D –Discharge Calculations
Appendix E –Treatment System Information
Appendix F – Endangered Species Act
Appendix G - National Historic Preservation Act Review

\\haleyaldrich.com\share\CF\Projects\135301\003 - RGP Application and Compliance\Dewatering\NPDES\NPDES NOI\Text\2022-0209-BHCC-NPDES RGP_F.docx

TABLES

TABLE I
SUMMARY OF WATER QUALITY DATA
 BHCC-NEW ACADEMIC BUILDING
 BOSTON, MASSACHUSETTS
 FILE NO. 135301

Location Name Sample Name Sample Date Lab Sample ID	Action Level				MCL Reportable Concentration RCGW-2 2014	HA20-6(OW) HA20-6(OW)-20211021 10/21/2021 L2157842-01	HA21-MR HA21-MR-20211207 12/07/2021 L2167180-01
	Massachusetts RGP Freshwater WQBEL 2017	Massachusetts RGP TQBEL 2017	2017 NPDES RGP Site-Specific Effluent Criteria				
Volatile Organic Compounds (ug/L)							
1,1,1-Trichloroethane	200	200		4000	ND (2)	-	
1,1,2-Trichloroethane	5	5		900	ND (1.5)	-	
1,1-Dichloroethane	70	70		2000	ND (1.5)	-	
1,1-Dichloroethene	3.2	3.2		80	ND (1)	-	
1,2-Dibromoethane (Ethylene Dibromide)	0.05	0.05		2	ND (0.01)	-	
1,2-Dichlorobenzene	600	600		2000	ND (5)	-	
1,2-Dichloroethane	5	5		5	ND (1.5)	-	
1,3-Dichlorobenzene	320	320		6000	ND (5)	-	
1,4-Dichlorobenzene	5	5		60	ND (5)	-	
Acetone	7970	7970		50000	ND (10)	-	
Benzene	5	5		1000	ND (1)	-	
Carbon tetrachloride	1.6	4.4		2	ND (1)	-	
cis-1,2-Dichloroethene	70	70		20	ND (1)	-	
Ethylbenzene	100	100		5000	ND (1)	-	
m,p-Xylenes	100	100		NA	ND (2)	-	
Methyl Tert Butyl Ether (MTBE)	20	70		5000	ND (10)	-	
Methylene chloride (Dichloromethane)	4.6	4.6		2000	ND (1)	-	
o-Xylene	100	100		NA	ND (1)	-	
Tert-Amyl Methyl Ether (TAME)	90	90		NA	ND (20)	-	
Tert-Butyl Alcohol (tert-Butanol)	120	120		NA	ND (100)	-	
Tetrachloroethene	3.3	5		50	ND (1)	-	
Toluene	100	100		40000	ND (1)	-	
Trichloroethene	5	5		5	ND (1)	-	
Vinyl chloride	2	2		2	ND (1)	-	
Xylene (total)	100	100		3000	ND (1)	-	
Volatile Organic Compounds SIM (ug/L)							
1,4-Dioxane	200	200		6000	ND (5)	-	
Semi-Volatile Organic Compounds (ug/L)							
bis(2-Ethylhexyl)phthalate	2.2	190		50000	ND (2.2)	-	
Butyl benzylphthalate	NA	190		10000	ND (5)	-	
Diethyl phthalate	NA	190		9000	ND (5)	-	
Dimethyl phthalate	NA	190		50000	ND (5)	-	
Di-n-butylphthalate	NA	190		5000	ND (5)	-	
Di-n-octyl phthalate	NA	190		100000	ND (5)	-	
Semi-Volatile Organic Compounds (SIM) (ug/L)							
Acenaphthene	100	100		6000	ND (0.1)	-	
Acenaphthylene	100	100		40	ND (0.1)	-	
Anthracene	100	100		30	ND (0.1)	-	
Benzo(a)anthracene	0.0038	1		1000	0.113	-	
Benzo(a)pyrene	0.0038	1		500	ND (0.1)	-	
Benzo(b)fluoranthene	0.0038	1		400	0.108	-	
Benzo(g,h,i)perylene	100	100		20	ND (0.1)	-	
Benzo(k)fluoranthene	0.0038	1		100	ND (0.1)	-	
Chrysene	0.0038	1		70	0.118	-	
Dibenz(a,h)anthracene	0.0038	1		40	ND (0.1)	-	
Fluoranthene	100	100		200	0.236	-	
Fluorene	100	100		40	ND (0.1)	-	
Indeno(1,2,3-cd)pyrene	0.0038	1		100	ND (0.1)	-	
Naphthalene	20	20		700	ND (0.1)	-	
Pentachlorophenol	1	1		200	ND (1)	-	
Phenanthrene	100	100		10000	0.143	-	
Pyrene	100	100		20	0.211	-	
Total Petroleum Hydrocarbons (ug/L)							
Petroleum hydrocarbons	5000	5000		5000	ND (4000)	-	
Inorganic Compounds (ug/L)							
Chromium VI (Hexavalent), Dissolved	11	323		300	ND (50)	-	
Antimony, Total	640	206		8000	5	ND (4)	
Arsenic, Total	10	104		900	ND (1)	ND (1)	
Cadmium, Total	0.25	10.2		4	ND (0.2)	ND (0.2)	
Chromium, Total	NA	NA		300	ND (1)	ND (1)	
Copper, Total	9	242		100000	1.29	8.14	
Hardness, Total	NA	NA		NA	506000	189000	
Iron, Total	1000	5000		NA	2060	2280	
Lead, Total	2.5	160		10	1.53	3.43	
Mercury, Total	0.77	0.739		20	ND (0.2)	ND (0.2)	
Nickel, Total	52	1450		200	ND (2)	2.62	
Selenium, Total	5	235.8		100	ND (5)	ND (5)	
Silver, Total	3.2	35.1		7	ND (0.4)	ND (0.4)	
Zinc, Total	120	420		900	11.22	49.35	
Other							
pH (lab), Total (pH units)	NA	NA		NA	-	7.3	
Salinity, Total (SU)	NA	NA		NA	-	ND (2)	
Ammonia, Total (ug/L)	NA	NA		NA	925	624	
Chloride, Total (ug/L)	NA	NA		NA	165000	-	
Chlorine, residual, Total (ug/L)	11	200		NA	ND (20)	-	
Chromium III (Trivalent), Total (ug/L)	74	323		600	ND (50)	-	
Cyanide, Total (ug/L)	5.2	178000		30	ND (5)	-	
Total Phenols (ug/L)	300	1080		NA	ND (30)	-	
Total Suspended Solids (TSS) (ug/L)	30000	30000		NA	14000	-	
Pesticides and PCBs (ug/L)							
Aroclor-1016 (PCB-1016)	6.40E-05	6.40E-05		5	ND (0.25)	-	
Aroclor-1221 (PCB-1221)	6.40E-05	6.40E-05		5	ND (0.25)	-	
Aroclor-1232 (PCB-1232)	6.40E-05	6.40E-05		5	ND (0.25)	-	
Aroclor-1242 (PCB-1242)	6.40E-05	6.40E-05		5	ND (0.25)	-	
Aroclor-1248 (PCB-1248)	6.40E-05	6.40E-05		5	ND (0.25)	-	
Aroclor-1254 (PCB-1254)	6.40E-05	6.40E-05		5	ND (0.25)	-	
Aroclor-1260 (PCB-1260)	6.40E-05	6.40E-05		5	ND (0.2)	-	

ABBREVIATIONS AND NOTES:

ug/L: micrograms per liter

-: Not Analyzed

bgs: below ground surface

NA: Not Applicable

ND (2.5): Not detected, number in parentheses is the laboratory reporting limit

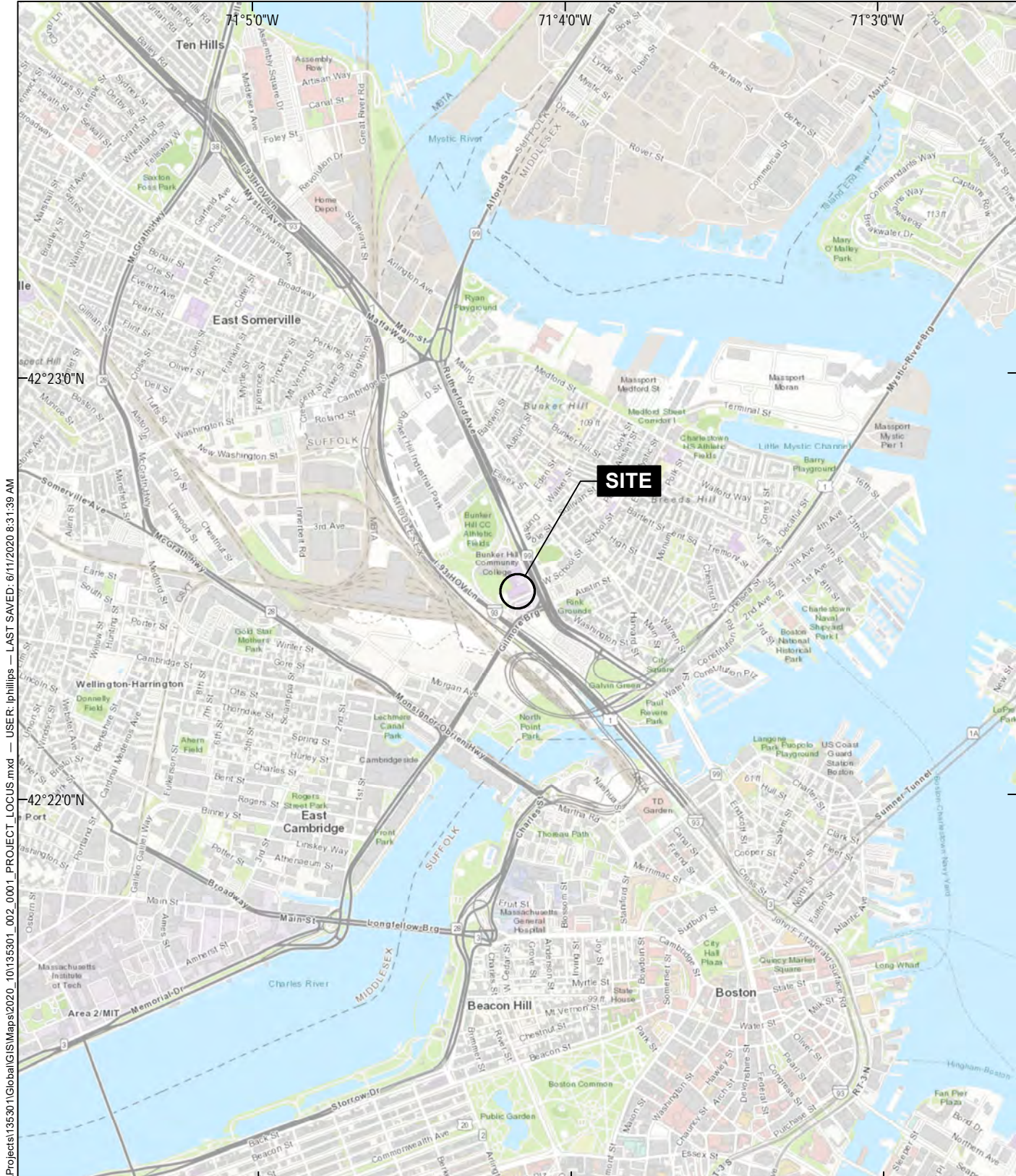
- Analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.

- For test methods used, see the laboratory data sheets.

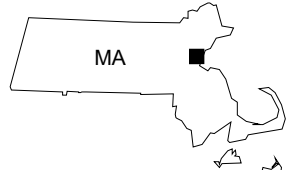
- Bold values indicate an exceedance of the RGP or RCGW-2 criteria.

- Groundwater samples analyzed for dissolved metals were filtered in the field with a 0.45 micrometer filter.

FIGURES



GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\135301\Global\GIS\Maps\2020_10\135301_PROJECT_LOCUS.mxd — USER: jphillips — LAST SAVED: 6/11/2020 8:31:39 AM



MAP SOURCE: ESRI
 SITE COORDINATES: 42°22'30"N, 71°04'10"W

**HALEY
 ALDRICH**

BUNKER HILL COMMUNITY COLLEGE
 ACADEMIC STUDENT SUCCESS BUILDING
 250 RUTHERFORD AVENUE
 BOSTON, MASSACHUSETTS

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
 FEBRUARY 2021








FIGURE 1

APPROXIMATE LOCATION OF PROPOSED GEOTHERMAL WELL FIELD

APPROXIMATE LOCATION OF PROPOSED INFILTRATION SYSTEM

MONITORING WELL SAMPLED FOR SOURCE WATER QUALITY

LEGEND

- HA20-TP-1**  DESIGNATION AND APPROXIMATE LOCATION OF TEST PIT EXCAVATED BY EARTHWORK INDUSTRIES, INC. ON 28 TO 29 JANUARY 2021 AND MONITORED BY HALEY & ALDRICH, INC.
- HA20-1**  DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS ON 8 TO 16 DECEMBER 2020 AND MONITORED BY HALEY & ALDRICH, INC.
- BBB-4**  DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING PERFORMED BY PROFESSIONAL SERVICE INDUSTRIES, INC. IN NOVEMBER 2006
- BB-5**  DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING PERFORMED BY WEBER ENGINEERING ASSOCIATES, LLC FROM APRIL TO MAY 2005
- B70-1**  DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING PERFORMED BY NEW ENGLAND TEST BORING CORPORATION IN JANUARY 1971
- B-808**  DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING PERFORMED BY RAYMOND CONCRETE PILE COMPANY IN MARCH 1970
- B-1**  DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING PERFORMED BY RAYMOND CONCRETE PILE COMPANY IN FEBRUARY 1967
- (OW)** INDICATES OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE

NOTES

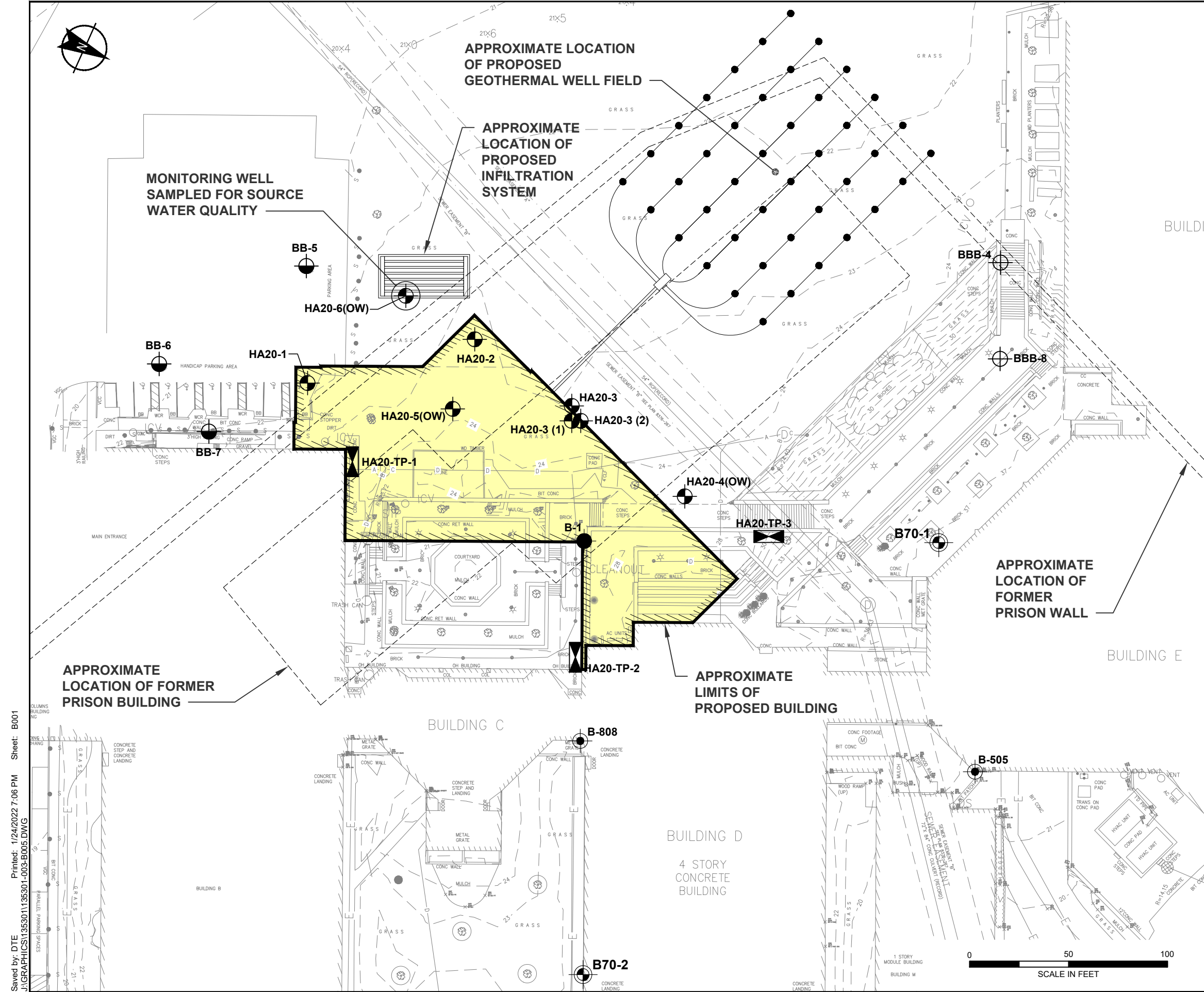
1. ELEVATIONS ARE IN FEET AND ARE REFERENCED IN BOSTON CITY BASE DATUM.
2. BASE PLAN TAKEN FROM ELECTRONIC FILE TITLED, "10691cut_sending.dwg", PROVIDED BY NITSCH ENGINEERING, INC. ON 18 DECEMBER 2020.
3. APPROXIMATE LIMITS OF FORMER PRISON WALLS/STRUCTURES OVERLAID FROM A PDF FILE TITLED, "BHC1901 - TEST WELL LOCATION - 20201223.PDF", PROVIDED BY NBBJ ON 8 APRIL 2021.
4. HA20-3 (1) AND HA20-3 (2) WERE TEST BORING ATTEMPTS, BUT WERE ABANDONED AFTER POTENTIAL GRANITE BLOCK OBSTRUCTIONS WERE ENCOUNTERED APPROXIMATELY 16 FEET BELOW GROUND SURFACE

HALEY ALDRICH BUNKER HILL COMMUNITY COLLEGE
ACADEMIC STUDENT SUCCESS BUILDING
BOSTON, MASSACHUSETTS

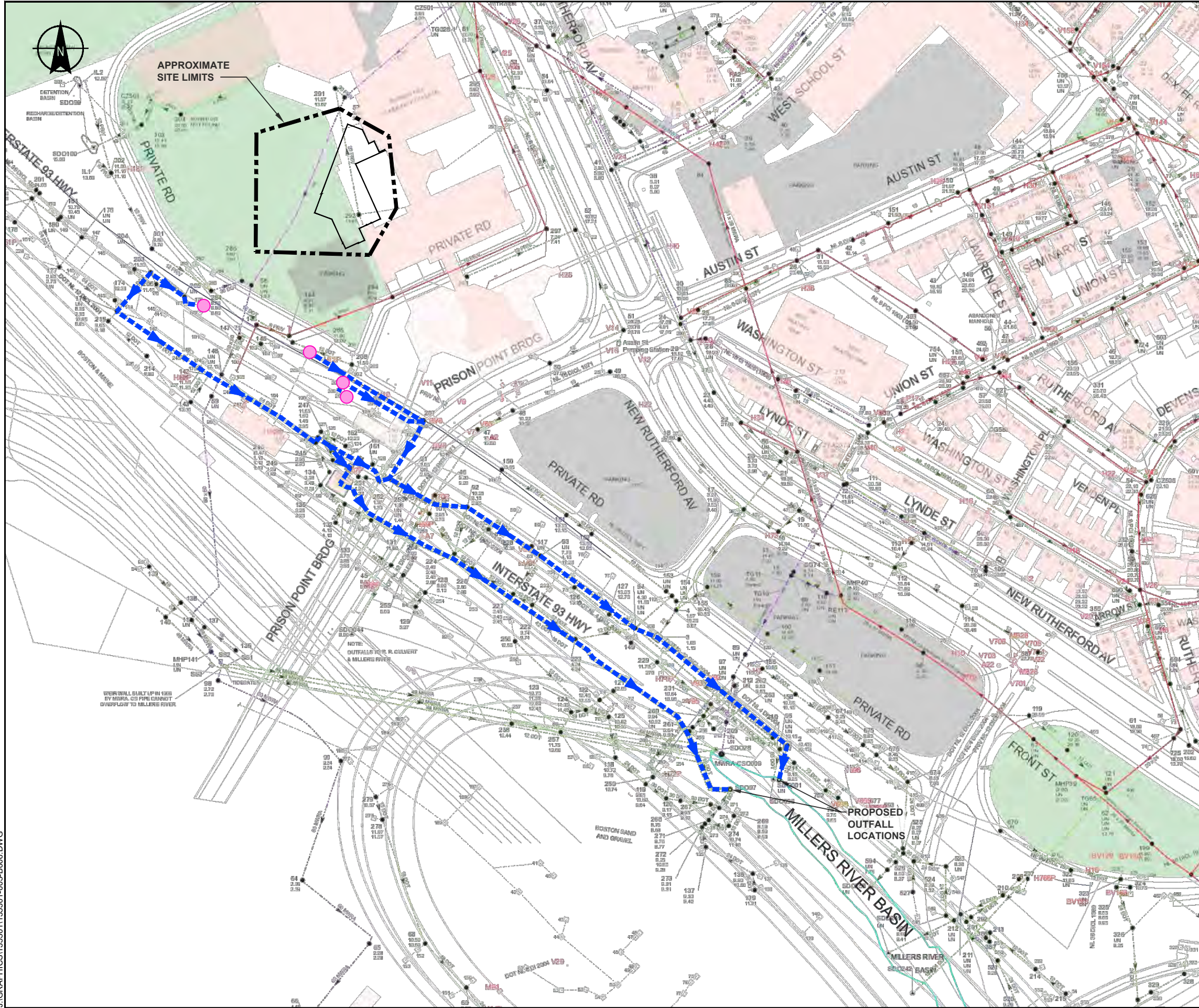
SITE AND SUBSURFACE EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
JANUARY 2022




FIGURE 2



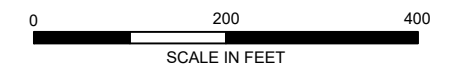
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 Sheet: B001
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LEGEND

-  PROPOSED DISCHARGE ROUTE
-  APPROXIMATE LIMITS OF WORK AREA
-  PROPOSED DISCHARGE LOCATION

- NOTES**
1. BASE PLAN TAKEN FROM A DRAWING PREPARED BY BOSTON WATER AND SEWER COMMISSION, PRINTED 4 NOVEMBER 2021.

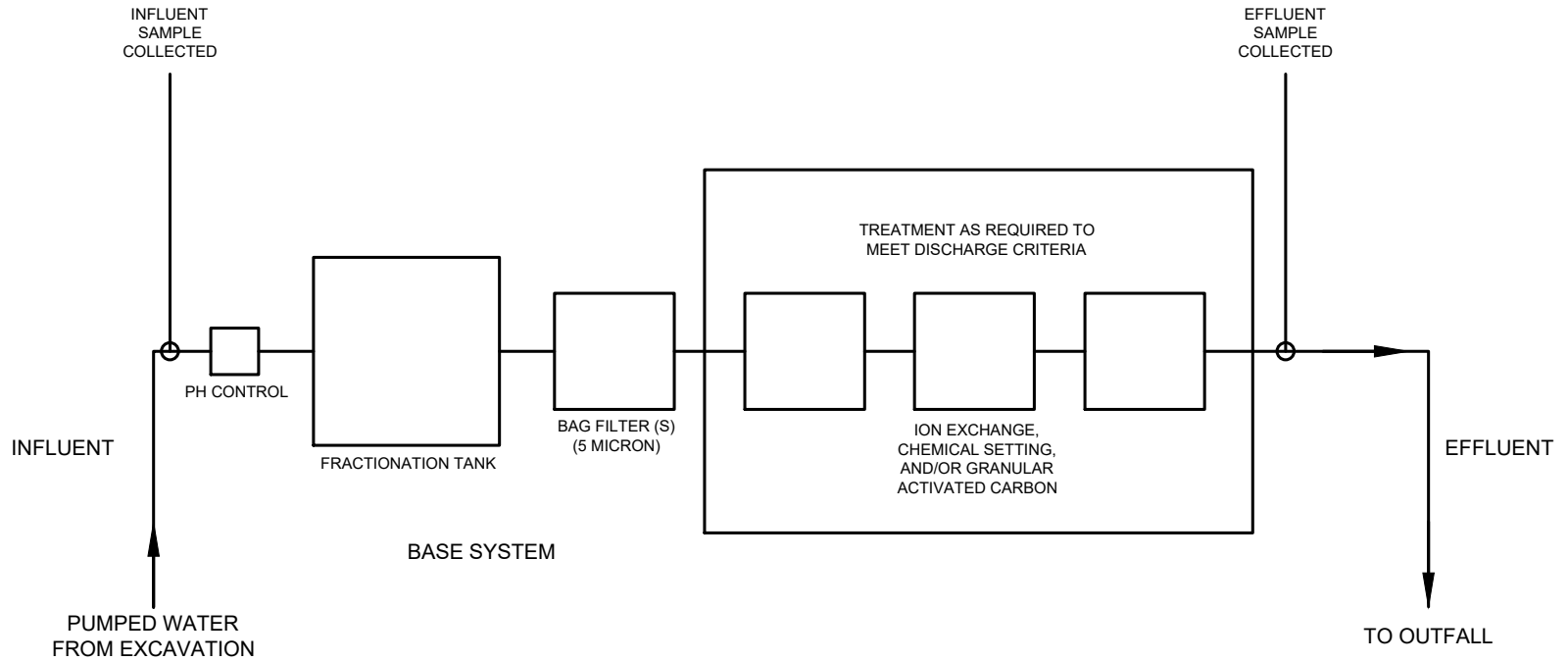


HALEY ALDRICH BUNKER HILL COMMUNITY COLLEGE
ACADEMIC STUDENT SUCCESS BUILDING
BOSTON, MASSACHUSETTS

**PROPOSED DEWATERING
DISCHARGE ROUTE**

SCALE: AS SHOWN
JANUARY 2022

FIGURE 3



LEGEND

→ DIRECTION OF FLOW

NOTE

1. DETAILS OF TREATMENT SYSTEM MAY VARY FROM SYSTEM INDICATED ABOVE. SPECIFIC MEANS AND METHODS OF TREATMENT TO BE SELECTED BY CONTRACTOR. WATER WILL BE TREATED TO MEET REQUIRED EFFLUENT STANDARDS.



BUNKER HILL COMMUNITY COLLEGE
 250 RUTHERFORD AVENUE
 BOSTON, MASSACHUSETTS

PROPOSED TREATMENT SYSTEM SCHEMATIC

SCALE: AS SHOWN
 JANUARY 2022

FIGURE 4

APPENDIX A
Notice of Intent (NOI)

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

A. General site information:

1. Name of site: BHCC-Academic Student Success Building	Site address: 250 Rutherford Avenue, Boston Massachusetts 02129		
	Street: Rutherford Avenue +		
	City: Boston	State: MA	Zip: 02129
2. Site owner Bunker Hill Community College Owner is (check one): <input type="checkbox"/> Federal <input type="checkbox"/> State/Tribal <input type="checkbox"/> Private <input type="checkbox"/> Other; if so, specify:	Contact Person: Gary Bigelow		
	Telephone: 617-936-1985	Email: gbigelow@bhcc.edu	
	Mailing address: 250 New Rutherford Ave, Boston, MA 02129		
	Street: 250 Rutherford Ave		
	City: Boston	State: MA	Zip: 02129
3. Site operator, if different than owner BOND Building Construction, Inc	Contact Person: Pam Bailey		
	Telephone: 617-394-6347	Email: pbailey@bond-building.com	
	Mailing address:		
	Street: 10 Cabot Road, Suite 300		
	City: Medford	State: MA	Zip: 02155
4. NPDES permit number assigned by EPA: Not Applicable NPDES permit is (check all that apply): <input checked="" type="checkbox"/> RGP <input type="checkbox"/> DGP <input type="checkbox"/> CGP <input type="checkbox"/> MSGP <input type="checkbox"/> Individual NPDES permit <input type="checkbox"/> Other; if so, specify:	5. Other regulatory program(s) that apply to the site (check all that apply):		
	<input type="checkbox"/> MA Chapter 21e; list RTN(s): <input type="checkbox"/> CERCLA <input type="checkbox"/> UIC Program <input type="checkbox"/> NH Groundwater Management Permit or Groundwater Release Detection Permit: <input type="checkbox"/> POTW Pretreatment <input type="checkbox"/> CWA Section 404		

B. Receiving water information:

1. Name of receiving water(s): Millers River	Waterbody identification of receiving water(s): MA72-31	Classification of receiving water(s): Class B
Receiving water is (check any that apply): <input type="checkbox"/> Outstanding Resource Water <input type="checkbox"/> Ocean Sanctuary <input type="checkbox"/> territorial sea <input type="checkbox"/> Wild and Scenic River		
2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Are sensitive receptors present near the site? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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. <small>Bottom Deposits, Debris, Habitat Assessment, Trash, Flocculant Masses, Metals, Oil and Grease, Petroleum Hydrocarbons, Polychlorinated Biphenyls (PCBs), Polycyclic Aromatic Hydrocarbons (PAHs) (Aquatic Ecosystems), Sum/Foam, Sedimentation/Siltation, Turbidity. No TMDL Available.</small>		
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.	19.2	
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	0	
6. Has the operator received confirmation from the appropriate State for the 7Q10 and dilution factor indicated? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, indicate date confirmation received: <u>12/17/2021</u>		
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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

C. Source water information:

1. Source water(s) is (check any that apply):			
<input checked="" type="checkbox"/> 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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 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): <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> The receiving water	<input type="checkbox"/> Potable water; if so, indicate municipality or origin:
		<input type="checkbox"/> A surface water other than the receiving water; if so, indicate waterbody:	<input type="checkbox"/> Other; if so, specify:

2. Source water contaminants: PAHs and Iron less than RCGW-2	
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): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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): <input type="checkbox"/> Yes <input type="checkbox"/> No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): <input checked="" type="checkbox"/> Existing discharge <input type="checkbox"/> New discharge <input type="checkbox"/> New source	
Outfall(s): SDO001 SDO97	Outfall location(s): (Latitude, Longitude) 42°22'14.2"N 71°03'55.7"W 42°22'13.5"N 71°03'56.8"W
Discharges enter the receiving water(s) via (check any that apply): <input checked="" type="checkbox"/> Direct discharge to the receiving water <input type="checkbox"/> Indirect discharge, if so, specify: Miller's River via MassDOT Storm drains <input checked="" type="checkbox"/> A private storm sewer system <input type="checkbox"/> 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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Has the operator has received permission from the owner to use such system for discharges? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No, if so, explain, with an estimated timeframe for obtaining permission: MassDOT applications are being submitted concurrently with this NOI Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Provide the expected start and end dates of discharge(s) (month/year): June 2022 to January 2023	
Indicate if the discharge is expected to occur over a duration of: <input type="checkbox"/> less than 12 months <input checked="" type="checkbox"/> 12 months or more <input type="checkbox"/> is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

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

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	4500NH- +	75	925	925	Report mg/L	---
Chloride		✓	1	44,300.0	5000	165000	165000	Report µg/l	---
Total Residual Chlorine	✓		1	4500CL-D	20	< 20	< 20	0.2 mg/L	NA
Total Suspended Solids		✓	1	2540D	5000	14000	14000	30 mg/L	---
Antimony		✓	1	3,200.8	4	5	5	206 µg/L	NA
Arsenic	✓		1	3,200.8	1	< 1	< 1	104 µg/L	NA
Cadmium	✓		1	3,200.8	0.2	< 0.2	< 0.2	10.2 µg/L	NA
Chromium III	✓		1	3,200.8	1	< 50	< 50	323 µg/L	NA
Chromium VI	✓		1	107,-	50	< 50 +	< 50	323 µg/L	NA
Copper		✓	1	3,200.8	1	1.29	1.29	242 µg/L	NA
Iron		✓	1	19,200.7	50	2060	2060	5,000 µg/L	1000 µg/L
Lead		✓	1	3,200.8	1	1.53	1.53	160 µg/L	NA
Mercury	✓		1	3,245.1	0.2	< 0.2	< 0.2	0.739 µg/L	NA
Nickel	✓		1	3,200.8	0.2	< 2	< 2	1,450 µg/L	NA
Selenium	✓		1	3,200.8	5	< 5	< 5	235.8 µg/L	NA
Silver	✓		1	3,200.8	0.4	< 0.4	< 0.4	35.1 µg/L	NA
Zinc		✓	1	3,200.8	10	11.22	11.22	420 µg/L	NA
Cyanide		✓	1	4500CN- +	5	< 5	< 5	178 mg/L	NA
B. Non-Halogenated VOCs									
Total BTEX			1				-	100 µg/L	---
Benzene	✓		1	128,624.1	1.0	< 1	< 1	5.0 µg/L	---
1,4 Dioxane	✓		1	128,624.1 +	5.0	< 5	< 5	200 µg/L	---
Acetone	✓		1	128,624.1	10	< 10	< 10	7.97 mg/L	---
Phenol	✓		1	4,420.1	30	< 30	< 30	1,080 µg/L	NA

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	128,624.1	1.0	< 1	< 1	4.4 µg/L	NA
1,2 Dichlorobenzene	✓		1	128,624.1	5.0	< 5	< 5	600 µg/L	---
1,3 Dichlorobenzene	✓		1	128,624.1	5.0	< 5	< 5	320 µg/L	---
1,4 Dichlorobenzene	✓		1	128,624.1	5.0	< 5	< 5	5.0 µg/L	---
Total dichlorobenzene			1				-	763 µg/L in NH	---
1,1 Dichloroethane	✓		1	128,624.1	1.5	< 1.5	< 1.5	70 µg/L	---
1,2 Dichloroethane	✓		1	128,624.1	1.5	< 1.5	< 1.5	5.0 µg/L	---
1,1 Dichloroethylene	✓		1	128,624.1	1.0	< 1	< 1	3.2 µg/L	---
Ethylene Dibromide	✓		1			< 0.01	0.01	0.05 µg/L	---
Methylene Chloride	✓		1	128,624.1	1.0	< 1	< 1	4.6 µg/L	---
1,1,1 Trichloroethane	✓		1	128,624.1	2.0	< 2	< 2	200 µg/L	---
1,1,2 Trichloroethane	✓		1	128,624.1	1.5	< 1.5	< 1.5	5.0 µg/L	---
Trichloroethylene	✓		1	128,624.1	1.0	< 1	< 1	5.0 µg/L	---
Tetrachloroethylene	✓		1	128,624.1	1.0	< 1	< 1	5.0 µg/L	NA
cis-1,2 Dichloroethylene	✓		1	128,624.1	1.0	< 1	< 1	70 µg/L	---
Vinyl Chloride	✓		1	128,624.1	1.0	< 1	< 1	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates			1				-	190 µg/L	NA
Diethylhexyl phthalate			1	129,625.1	5.0	< 5	< 5	101 µg/L	NA
Total Group I PAHs			1				-	1.0 µg/L	---
Benzo(a)anthracene		✓	1	129,625.1	0.100	0.113	0.113	As Total PAHs	NA
Benzo(a)pyrene	✓		1	129,625.1	0.100	< 0.1	< 0.1		NA
Benzo(b)fluoranthene		✓	1	129,625.1	0.100	0.108	0.108		NA
Benzo(k)fluoranthene	✓		1	129,625.1	0.100	< 0.1	< 0.1		NA
Chrysene	✓	✓	1			0.118	0.118		NA
Dibenzo(a,h)anthracene	✓		1	129,625.1	0.100	< 0.1	< 0.1		NA
Indeno(1,2,3-cd)pyrene	✓		1	129,625.1	0.100	< 0.1	< 0.1		NA

LIST OF COMPOUNDS DETECTED IN SOIL AT THE SITE

Volatile Organic Compounds

Acetone
Ethylbenzene
Naphthalene
Xylene (total)

Semi-Volatile Organic Compounds

Acenaphthene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Dibenz(a,h)anthracene
Dibenzofuran
Dimethyl phthalate
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene
Naphthalene
Phenanthrene
Pyrene

Total Petroleum Hydrocarbons

Petroleum hydrocarbons

Inorganic Compounds

Arsenic
Barium
Cadmium
Chromium
Lead
Mercury
Nickel
Vanadium
Zinc

E. Treatment system information

<p>1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)</p> <p><input type="checkbox"/> Adsorption/Absorption <input type="checkbox"/> Advanced Oxidation Processes <input type="checkbox"/> Air Stripping <input type="checkbox"/> Granulated Activated Carbon (“GAC”)/Liquid Phase Carbon Adsorption <input type="checkbox"/> Ion Exchange <input type="checkbox"/> Precipitation/Coagulation/Flocculation <input checked="" type="checkbox"/> Separation/Filtration <input type="checkbox"/> Other; if so, specify: Granular Activated Carbon (GAC), Coagulant, Ion Exchange and/or pH adjustment to meet necessary effluent limits.</p>	
<p>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, collected water will be routed through a sedimentation tank and bag filters to remove suspended solids and undissolved chemical constituents, as shown in Figure 4. Additional treatment may be include granular activated carbon (GAC) Coagulant, Ion Exchange and/or pH adjustment.</p> <p>Identify each major treatment component (check any that apply): <input checked="" type="checkbox"/> Fractionation tanks <input type="checkbox"/> Equalization tank <input type="checkbox"/> Oil/water separator <input type="checkbox"/> Mechanical filter <input type="checkbox"/> Media filter <input type="checkbox"/> Chemical feed tank <input type="checkbox"/> Air stripping unit <input checked="" type="checkbox"/> Bag filter <input checked="" type="checkbox"/> Other; if so, specify: Granular activated carbon (GAC), coagulant, Ion Exchange and/or pH adjustment mat be added to meet necessary effluent limits</p> <p>Indicate if either of the following will occur (check any that apply): <input type="checkbox"/> Chlorination <input type="checkbox"/> De-chlorination</p>	
<p>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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No, if so, provide justification:</p>	<p>150 gpm</p>
<p>Provide the proposed maximum effluent flow in gpm.</p>	<p>150 gpm</p>
<p>Provide the average effluent flow in gpm.</p>	<p>50 gpm</p>
<p>If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:</p>	<p>NA</p>
<p>4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	

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 or iron treatment conditioners (coagulant) 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:

Refer to attached Haley & Aldrich, Inc. Letter

- 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.
Refer to attached Haley & Aldrich, Inc. letter

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.

A BMPP meeting the requirements of this general permit will be implemented at the site.

BMPP certification statement:

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.

A MassDOT permit is being submitted concurrently with this NOI.

Check one: Yes No NA

Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): RGP DGP CGP MSGP Individual NPDES permit Other; if so, specify:

Check one: Yes No NA

Signature:


Pamela Bailey

Digitally signed by Pamela Bailey
DN: C=US, E=pbailey@bond-building.com, O="BOND
Building Construction, Inc.", CN=Pamela Bailey
Date: 2022.02.03 14:39:12-05'00'

Date: February 3, 2022

Print Name and Title: **Pamela Bailey, Senior Project Manager**

APPENDIX B
Sanborn Maps



250 Rutherford Avenue
250 Rutherford Avenue
Charlestown, MA 02129

Inquiry Number: 6281701.3

November 30, 2020

Certified Sanborn® Map Report



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

11/30/20

Site Name:

250 Rutherford Avenue
250 Rutherford Avenue
Charlestown, MA 02129
EDR Inquiry # 6281701.3

Client Name:

Haley & Aldrich, Inc.
465 Medford Street
Boston, MA 02129
Contact: Nathan Sherwood



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The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 6725-4EF8-99F3
PO # P135301-002
Project Bunker Hill Community College



Sanborn® Library search results

Certification #: 6725-4EF8-99F3

Maps Provided:

2002	1964
1998	1950
1996	1927
1995	1900
1994	1888
1993	
1990	
1989	

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- Library of Congress
- University Publications of America
- EDR Private Collection

The Sanborn Library LLC Since 1866™

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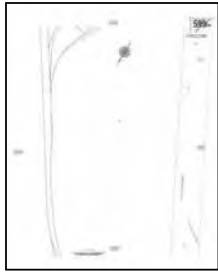
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Sanborn Sheet Key

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.



2002 Source Sheets



Volume 5W, Sheet 599c
2002

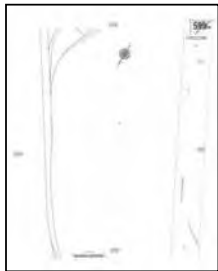


Volume 5W, Sheet 599d
2002



Volume 5W, Sheet 599e
2002

1998 Source Sheets



Volume 5W, Sheet 599c
1998

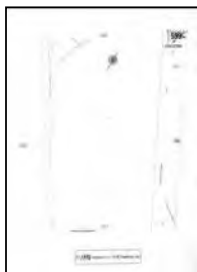


Volume 5W, Sheet 599d
1998



Volume 5W, Sheet 599e
1998

1996 Source Sheets



Volume 5W, Sheet 599c
1996



Volume 5W, Sheet 599d
1996



Volume 5W, Sheet 599e
1996

1995 Source Sheets



Volume 5W, Sheet 599c
1995



Volume 5W, Sheet 599d
1995



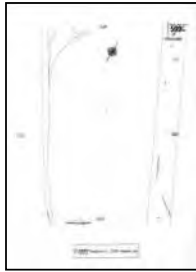
Volume 5W, Sheet 599e
1995

Sanborn Sheet Key

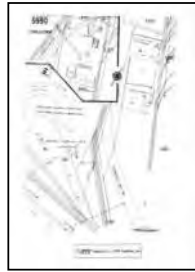
This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.



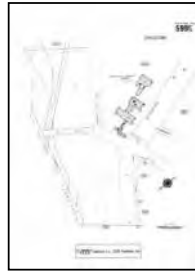
1994 Source Sheets



Volume 5W, Sheet 599c
1994

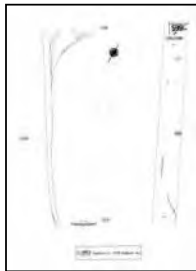


Volume 5W, Sheet 599d
1994

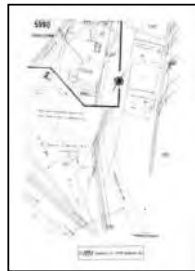


Volume 5W, Sheet 599e
1994

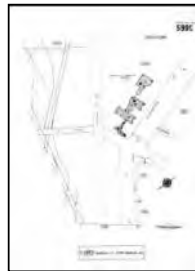
1993 Source Sheets



Volume 5W, Sheet 599c
1993

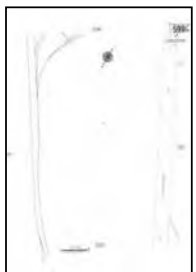


Volume 5W, Sheet 599d
1993



Volume 5W, Sheet 599e
1993

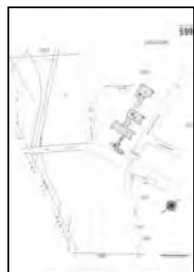
1990 Source Sheets



Volume 5W, Sheet 599c
1990

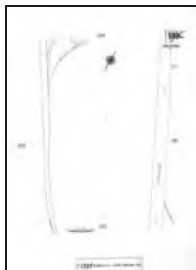


Volume 5W, Sheet 599d
1990

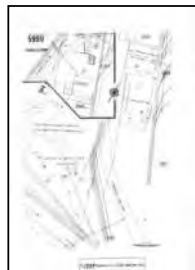


Volume 5W, Sheet 599e
1990

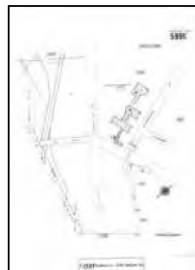
1989 Source Sheets



Volume 5W, Sheet 599c
1989



Volume 5W, Sheet 599d
1989



Volume 5W, Sheet 599e
1989

Sanborn Sheet Key

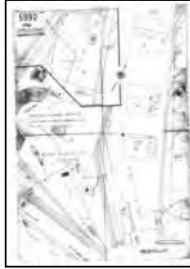
This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.



1964 Source Sheets



Volume 5W, Sheet 599c
1964



Volume 5W, Sheet 599d
1964

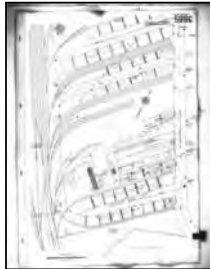


Volume 5W, Sheet 599e
1964

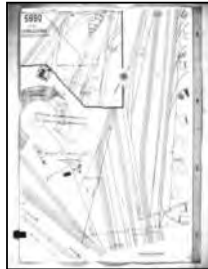
1950 Source Sheets



Volume 1, Sheet 73
1950



Volume 5, Sheet 599c
1950



Volume 5, Sheet 599d
1950



Volume 5, Sheet 599e
1950

1927 Source Sheets



Volume 5, Sheet 599e
1927

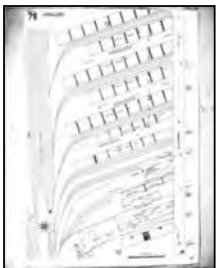


Volume 5, Sheet 599c
1927

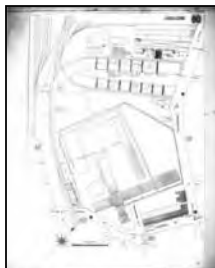


Volume 5, Sheet 599d
1927

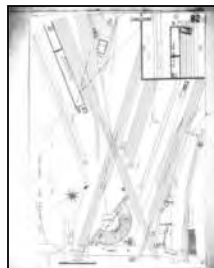
1900 Source Sheets



Volume 5, Sheet 79
1900



Volume 5, Sheet 80
1900



Volume 5, Sheet 82
1900



Volume 5, Sheet 99
1900

Sanborn Sheet Key

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.



1888 Source Sheets



Volume 5, Sheet 171
1888



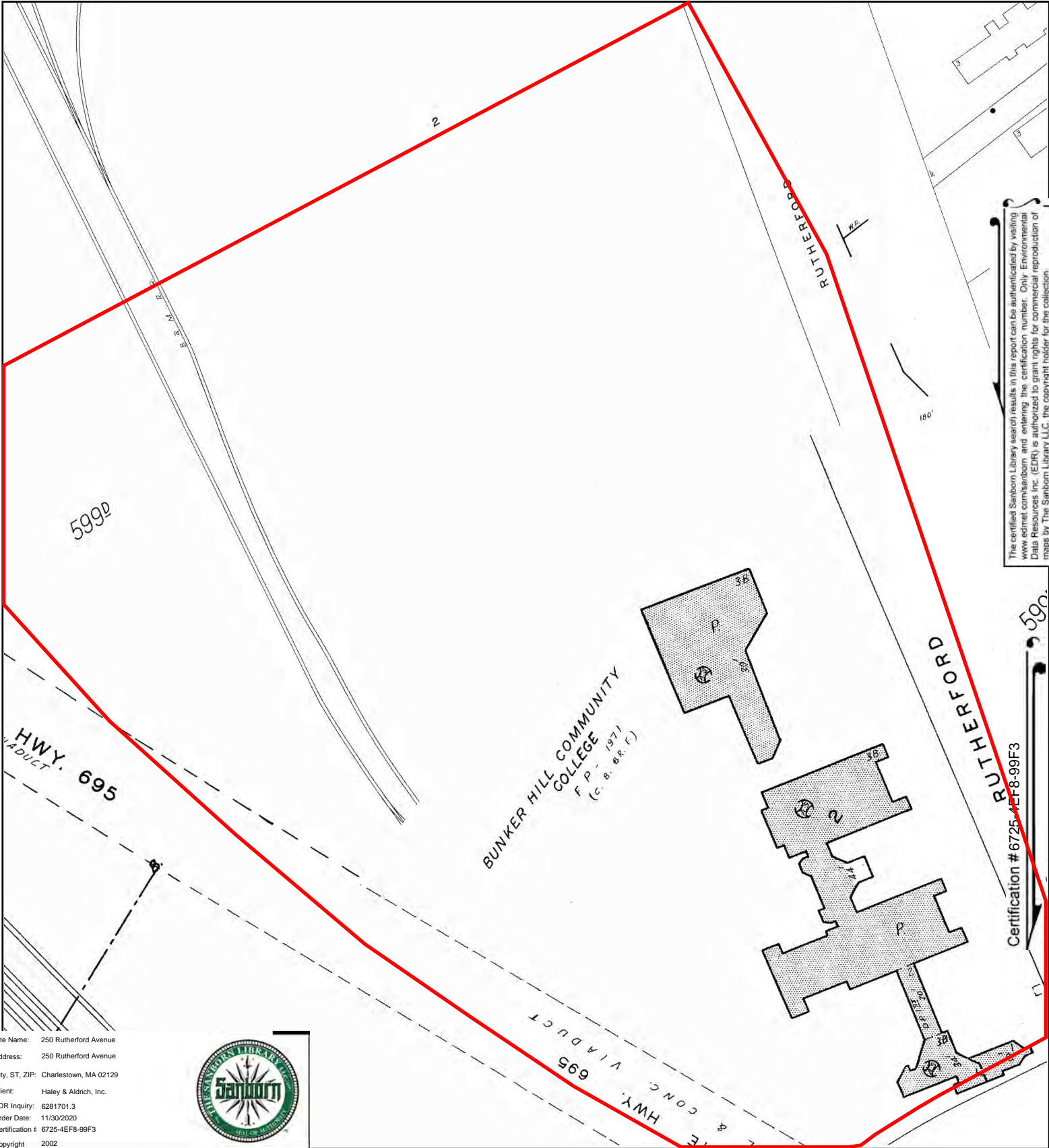
Volume 5, Sheet 170
1888



Volume 5, Sheet 171
1888



Volume 5, Sheet 178
1888

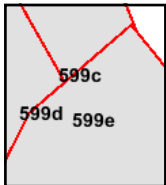
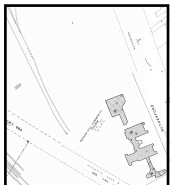
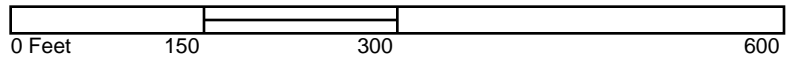


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 Client: Haley & Aldrich, Inc.
 EDR Inquiry: 6281701.3
 Order Date: 11/30/2020
 Certification #: 6725-4EF8-99F3
 Copyright: 2002

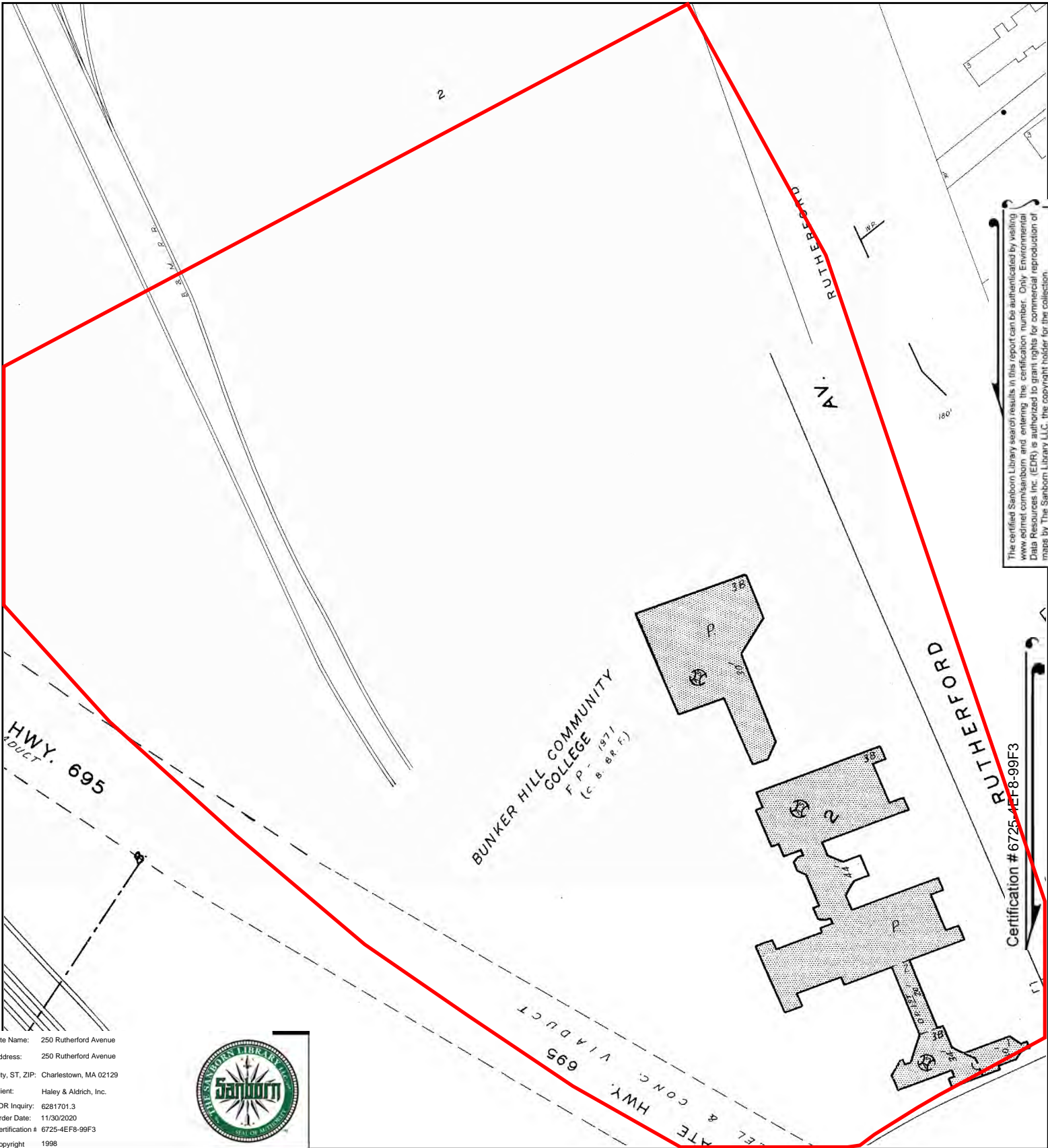


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Volume 5W, Sheet 599e
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 Volume 5W, Sheet 599c



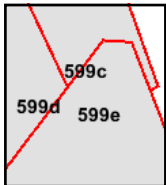
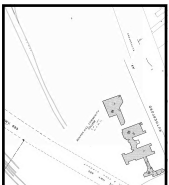


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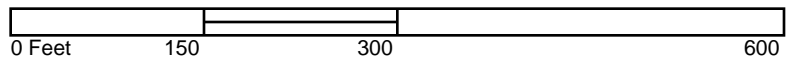
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 Copyright 1998

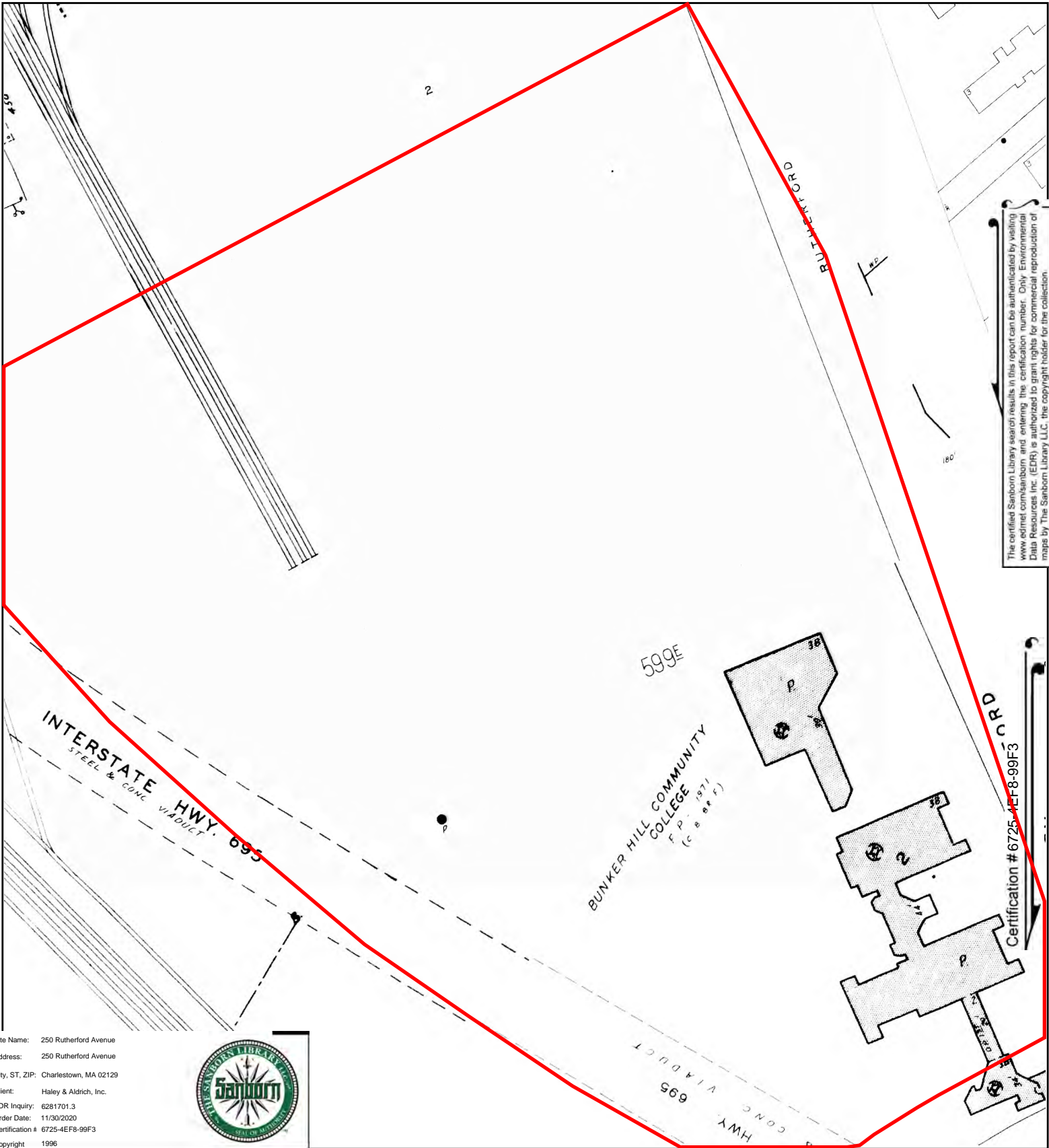


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Volume 5W, Sheet 599e
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 Volume 5W, Sheet 599c



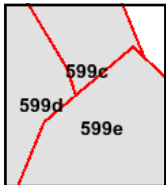
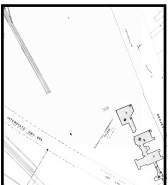
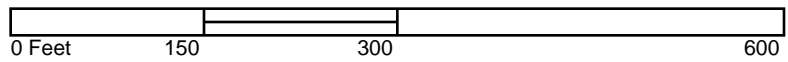


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 Copyright: 1996

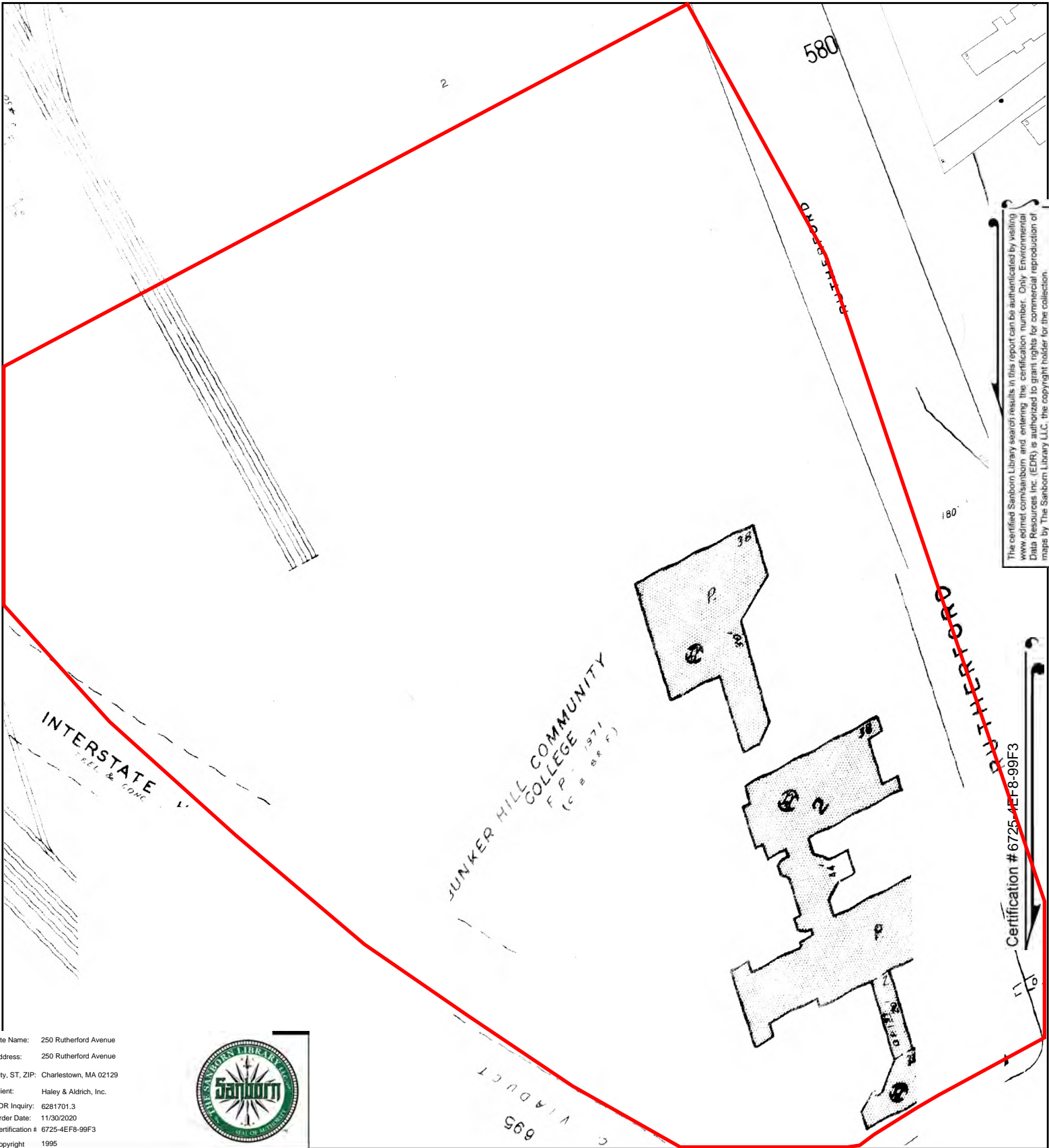


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Volume 5W, Sheet 599e
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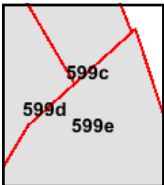
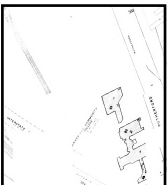
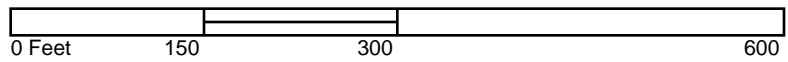
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 Copyright 1995

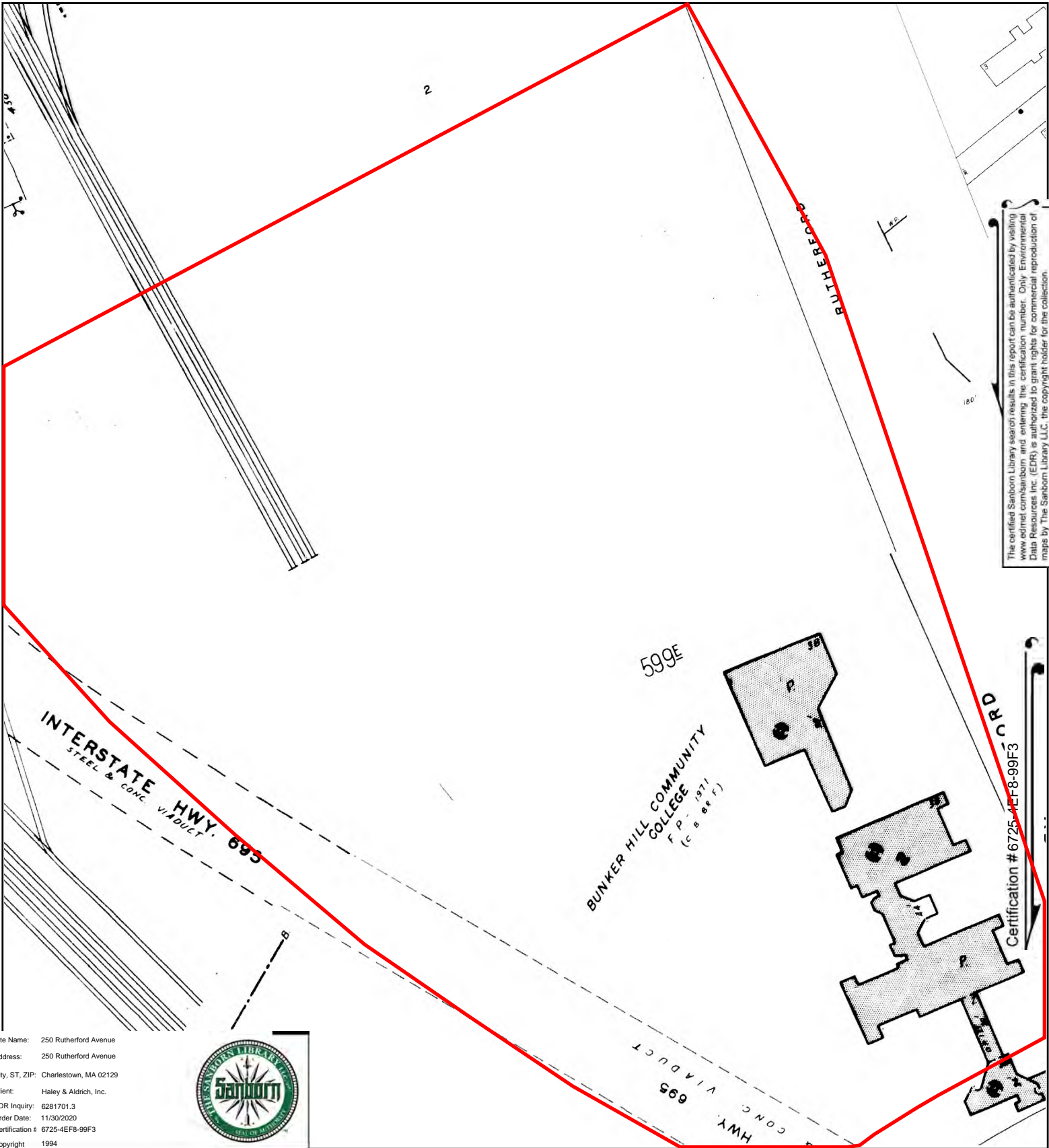


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Volume 5W, Sheet 599e
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 Volume 5W, Sheet 599c





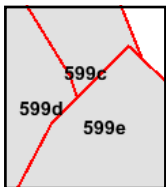
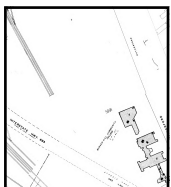
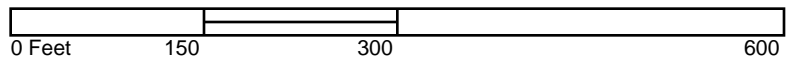
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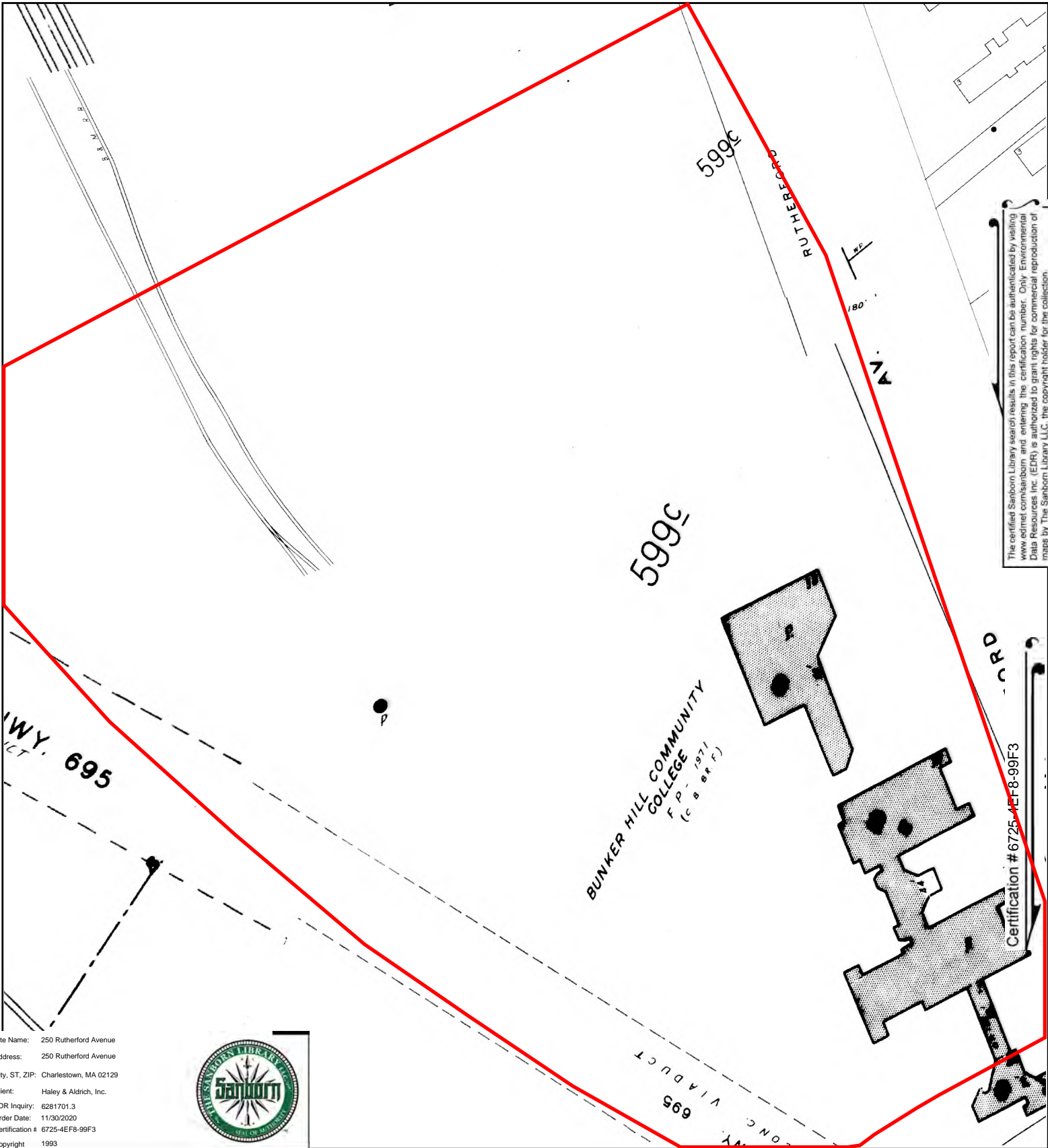


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Volume 5W, Sheet 599e
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 Volume 5W, Sheet 599c



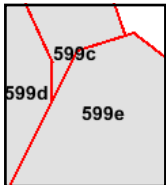
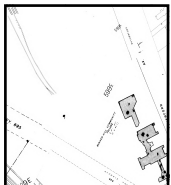
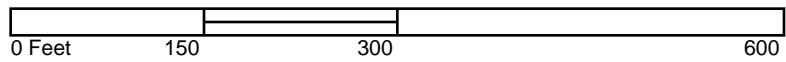


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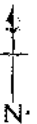
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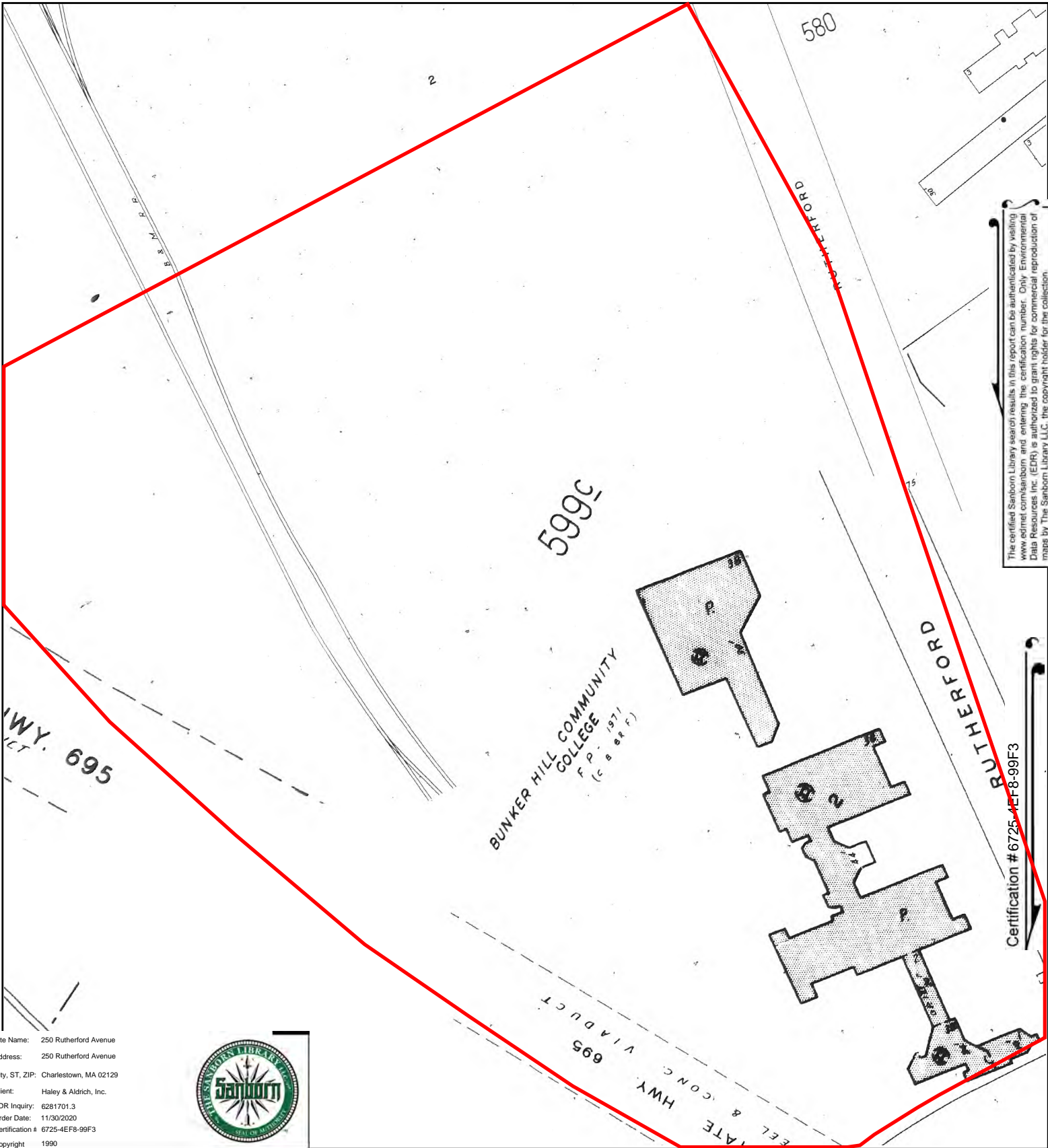


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Volume 5W, Sheet 599e
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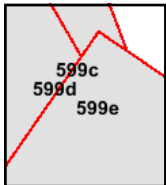
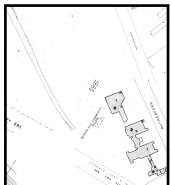
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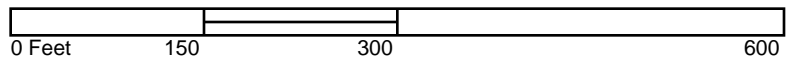
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 Order Date: 11/30/2020
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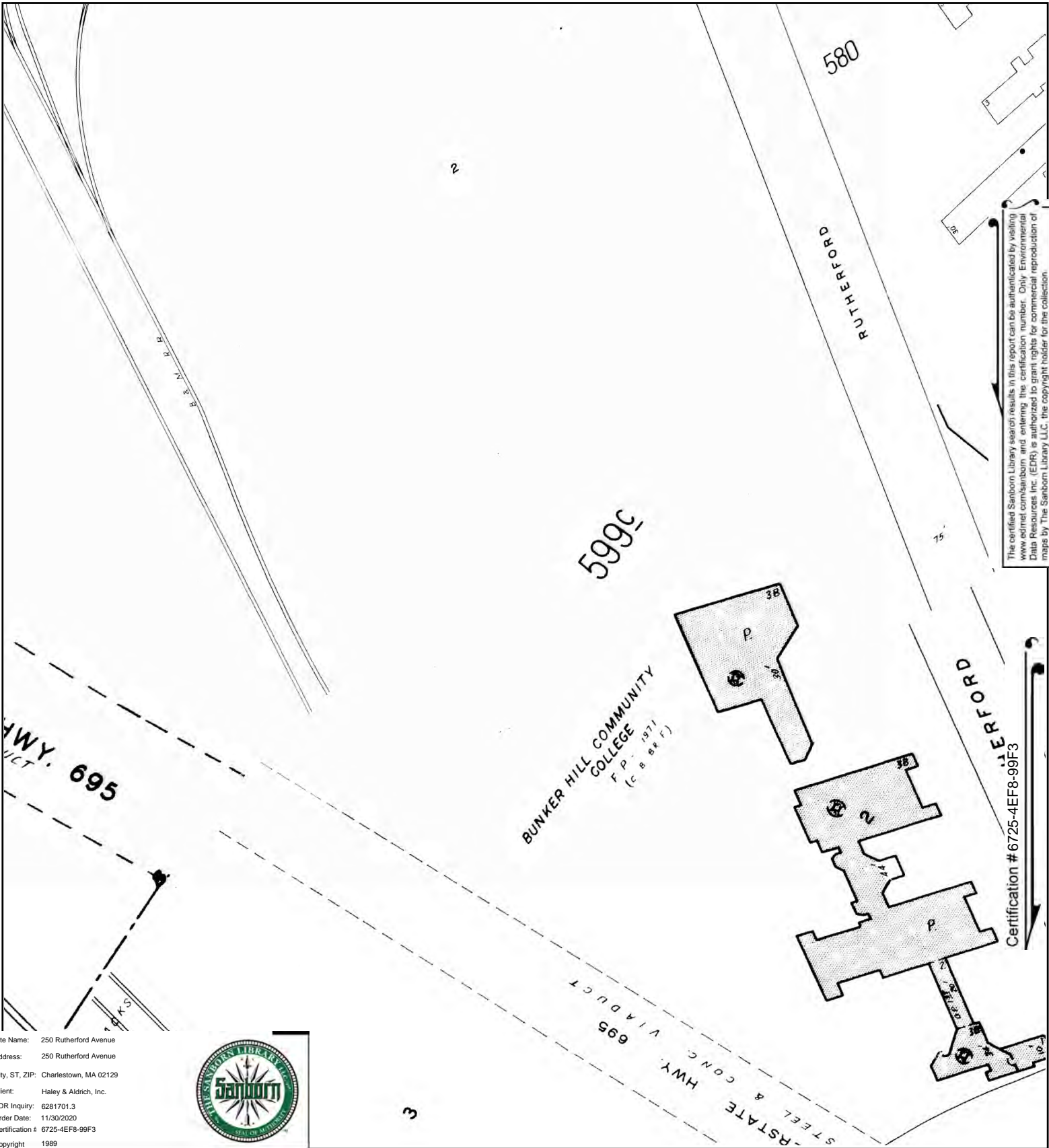


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Volume 5W, Sheet 599e
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 Volume 5W, Sheet 599c





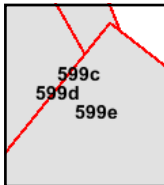
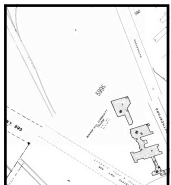
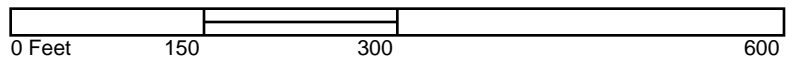
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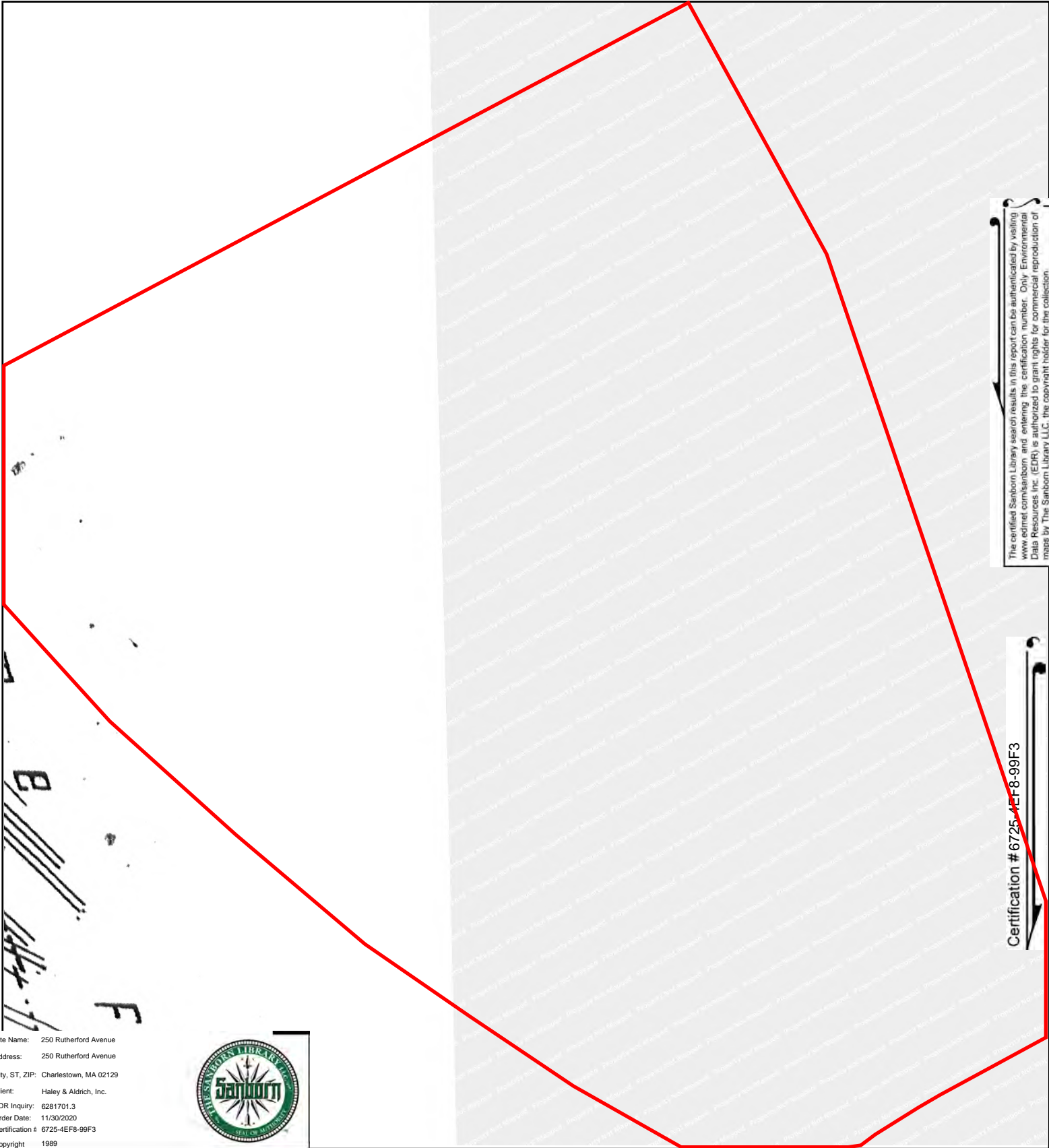


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Volume 5W, Sheet 599e
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 Volume 5W, Sheet 599c





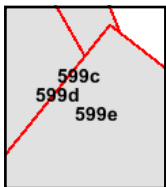
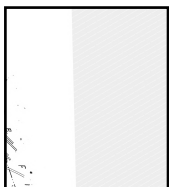
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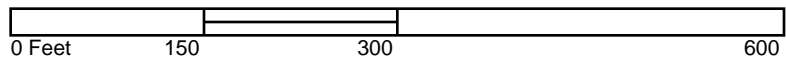
Site Name: 250 Rutherford Avenue
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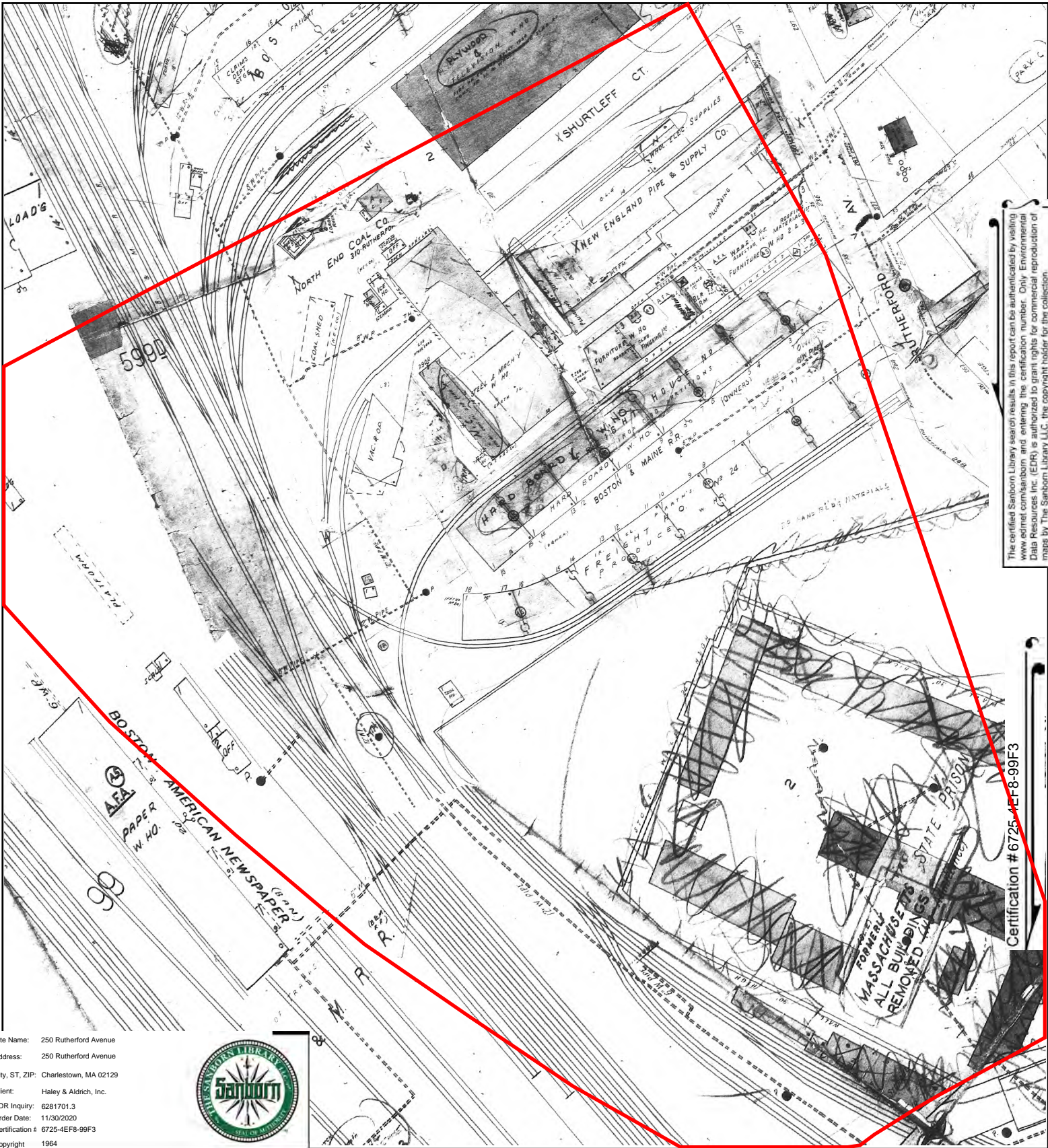


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Volume 5W, Sheet 599e
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 Volume 5W, Sheet 599c

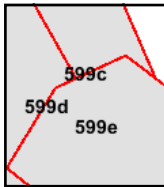
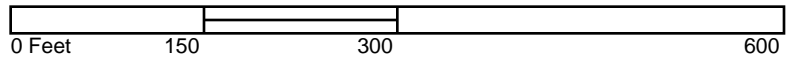




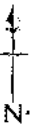
Site Name: 250 Rutherford Avenue
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 City, ST, ZIP: Charlestown, MA 02129
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 EDR Inquiry: 6281701.3
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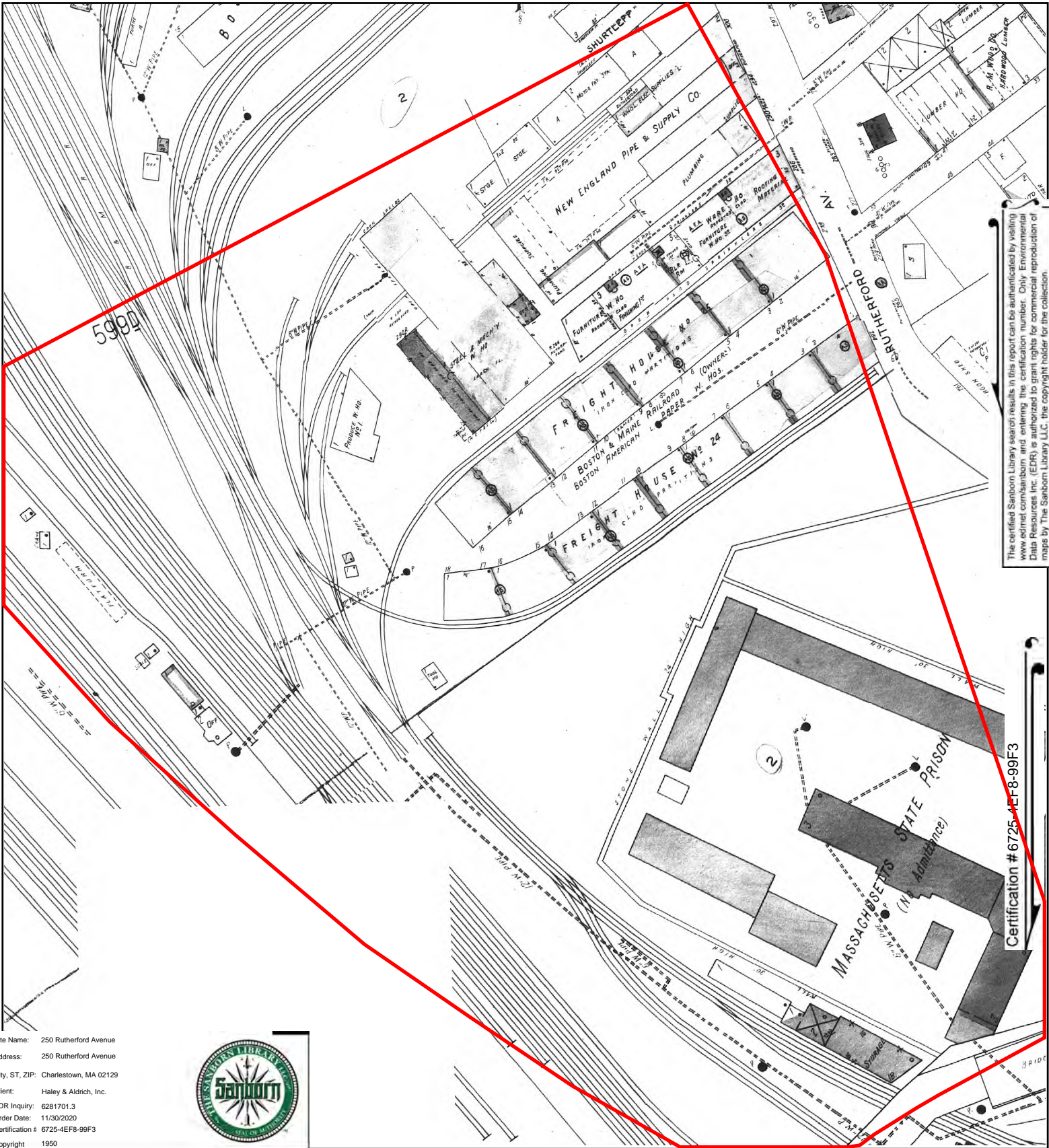


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Volume 5W, Sheet 599c
 Volume 5W, Sheet 599d
 Volume 5W, Sheet 599e





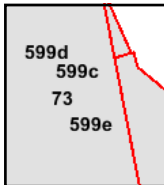
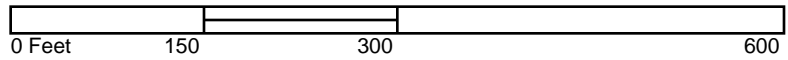
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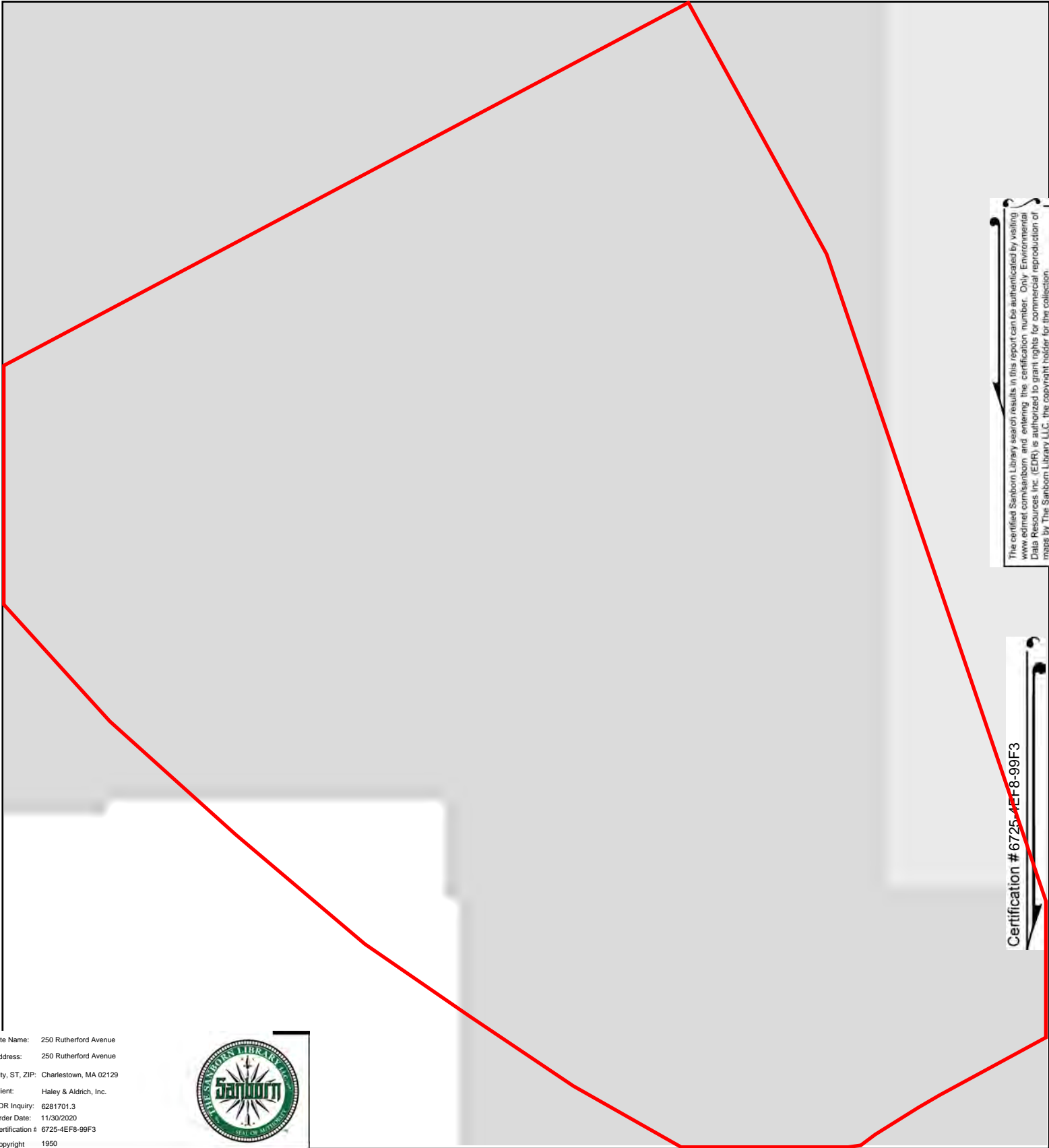


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Volume 5, Sheet 599e
 Volume 5, Sheet 599d
 Volume 5, Sheet 599c
 Volume 1, Sheet 73





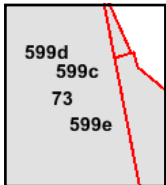
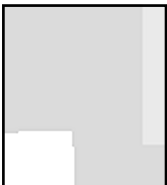
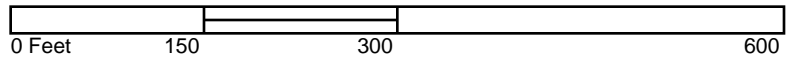
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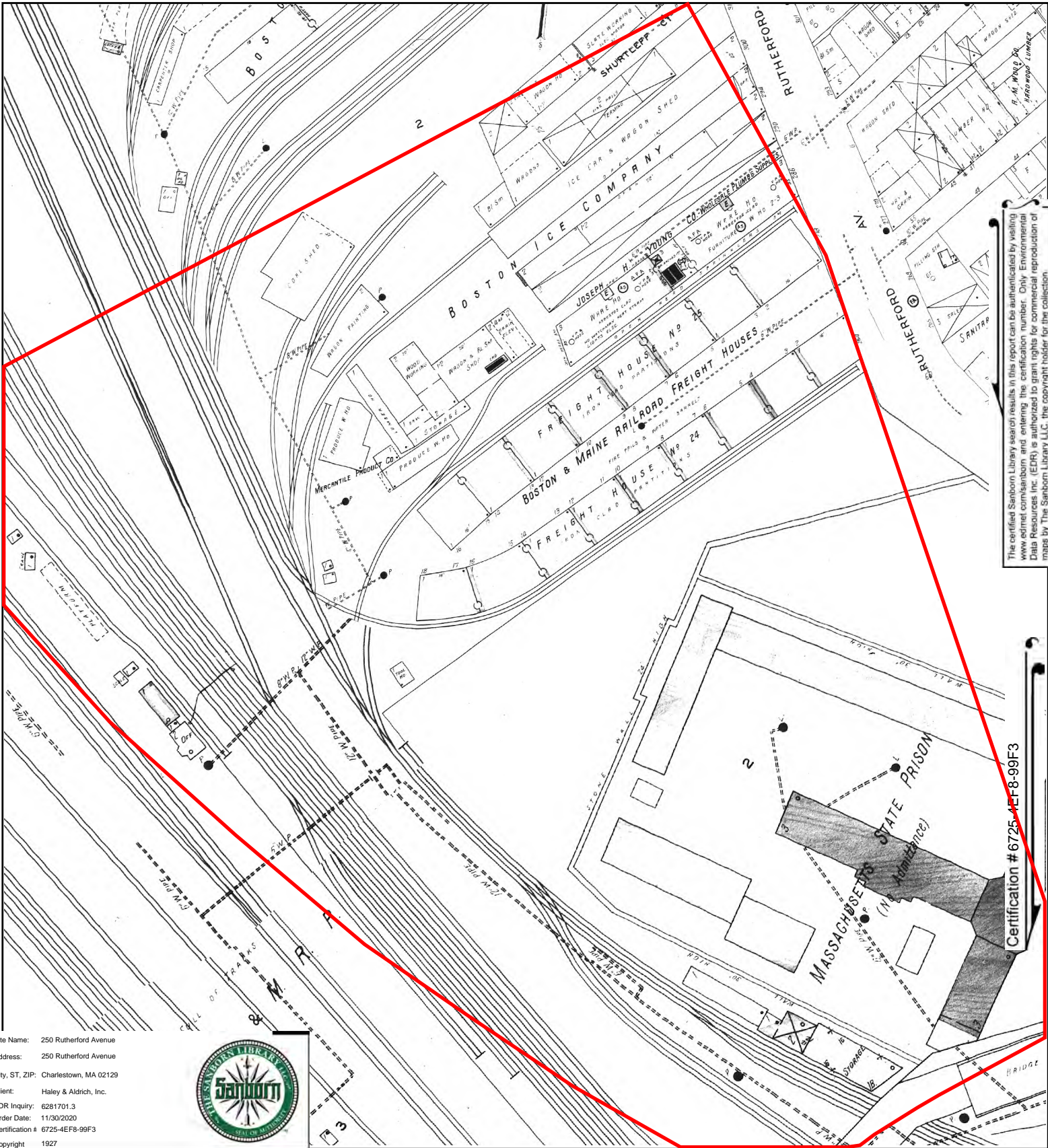


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 Volume 5, Sheet 599c
 Volume 1, Sheet 73





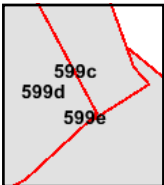
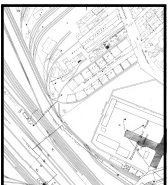
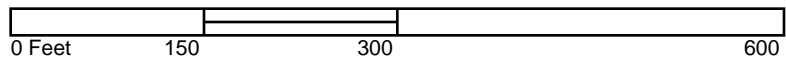
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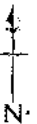
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 Address: 250 Rutherford Avenue
 City, ST, ZIP: Charlestown, MA 02129
 Client: Haley & Aldrich, Inc.
 EDR Inquiry: 6281701.3
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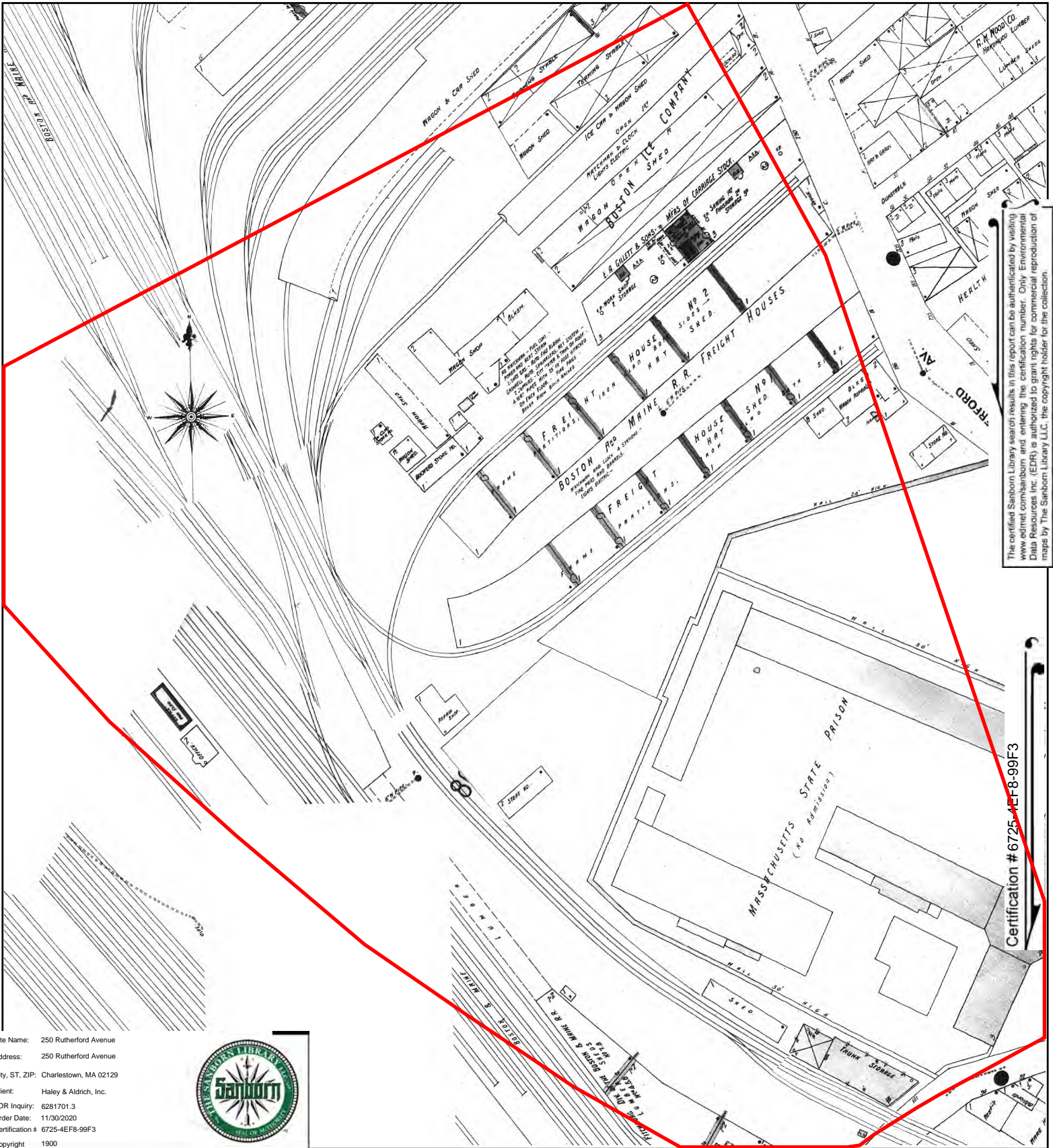


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Volume 5, Sheet 599d
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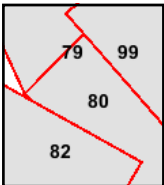
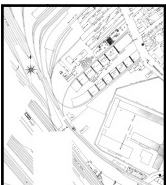
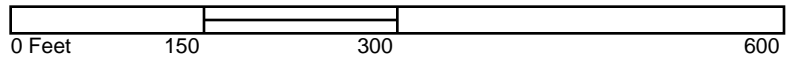
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 City, ST, ZIP: Charlestown, MA 02129
 Client: Haley & Aldrich, Inc.
 EDR Inquiry: 6281701.3
 Order Date: 11/30/2020
 Certification #: 6725-4EF8-99F3
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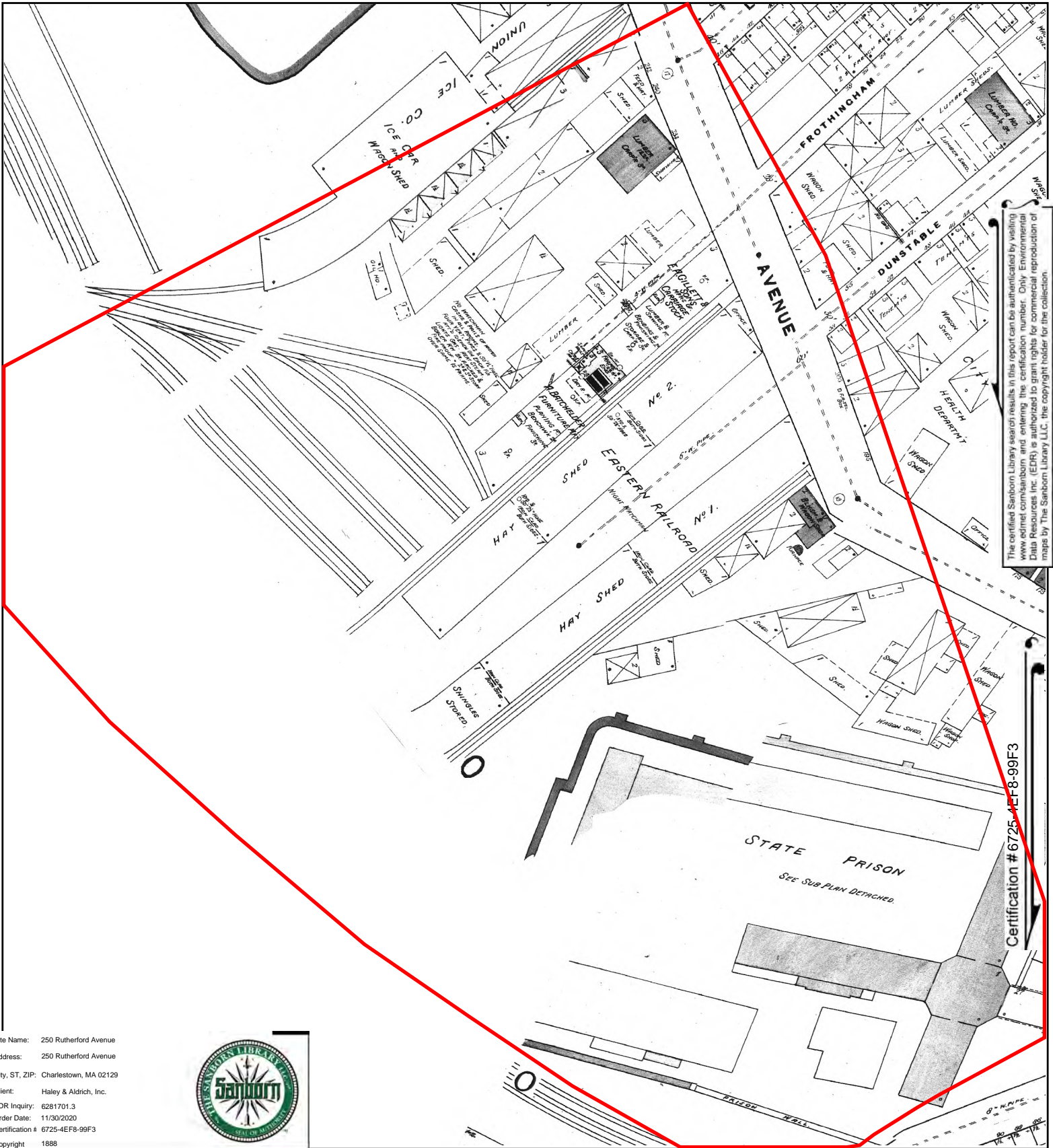


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Volume 5, Sheet 99
 Volume 5, Sheet 82
 Volume 5, Sheet 80
 Volume 5, Sheet 79





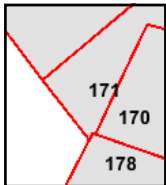
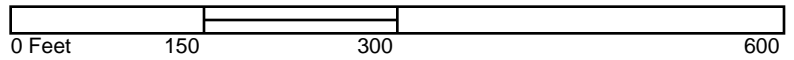
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Certification # 6725-4EF8-99F3

Site Name: 250 Rutherford Avenue
 Address: 250 Rutherford Avenue
 City, ST, ZIP: Charlestown, MA 02129
 Client: Haley & Aldrich, Inc.
 EDR Inquiry: 6281701.3
 Order Date: 11/30/2020
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Volume 5, Sheet 178
 Volume 5, Sheet 171
 Volume 5, Sheet 170
 Volume 5, Sheet 171



APPENDIX C

Laboratory Data Reports



ANALYTICAL REPORT

Lab Number:	L2157842
Client:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Charlestown, MA 02129-1400
ATTN:	Heather Ballantyne
Phone:	(617) 886-3061
Project Name:	BHCC-NEW ACADEMIC BUILDING
Project Number:	135301-003
Report Date:	11/02/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2157842-01	HA20-6(OW)	WATER	BHCC, CHARLSTOWN, MA	10/21/21 13:35	10/21/21

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Case Narrative (continued)

Report Submission

November 02, 2021: This final report includes the results of all requested analyses.

October 27, 2021: This is a preliminary report.

The analysis of Ethanol was subcontracted. A copy of the laboratory report is included as an addendum.

Please note: This data is only available in PDF format and is not available on Data Merger.

Hexavalent Chromium

L2157842-01: The sample has an elevated detection limit due to the dilution required by the sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Tiffani Morrissey - Tiffani Morrissey

Title: Technical Director/Representative

Date: 11/02/21

ORGANICS

VOLATILES

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

SAMPLE RESULTS

Lab ID: L2157842-01
 Client ID: HA20-6(OW)
 Sample Location: BHCC, CHARLSTOWN, MA

Date Collected: 10/21/21 13:35
 Date Received: 10/21/21
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 10/22/21 09:50
 Analyst: KJD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1
Trichloroethene	ND		ug/l	1.0	--	1
1,2-Dichlorobenzene	ND		ug/l	5.0	--	1
1,3-Dichlorobenzene	ND		ug/l	5.0	--	1
1,4-Dichlorobenzene	ND		ug/l	5.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Methyl tert butyl ether	ND		ug/l	10	--	1
Tert-Butyl Alcohol	ND		ug/l	100	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--	1

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

SAMPLE RESULTS

Lab ID: L2157842-01
 Client ID: HA20-6(OW)
 Sample Location: BHCC, CHARLSTOWN, MA

Date Collected: 10/21/21 13:35
 Date Received: 10/21/21
 Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
-----------	--------	-----------	-------	----	-----	-----------------

Volatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	107		60-140
Fluorobenzene	111		60-140
4-Bromofluorobenzene	96		60-140

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

SAMPLE RESULTS

Lab ID: L2157842-01
 Client ID: HA20-6(OW)
 Sample Location: BHCC, CHARLSTOWN, MA

Date Collected: 10/21/21 13:35
 Date Received: 10/21/21
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1-SIM
 Analytical Date: 10/22/21 20:41
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	109		60-140
4-Bromofluorobenzene	85		60-140

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

SAMPLE RESULTS

Lab ID: L2157842-01
 Client ID: HA20-6(OW)
 Sample Location: BHCC, CHARLSTOWN, MA

Date Collected: 10/21/21 13:35
 Date Received: 10/21/21
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 14,504.1
 Analytical Date: 10/26/21 15:05
 Analyst: AMM

Extraction Method: EPA 504.1
 Extraction Date: 10/26/21 12:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.010	--	1	A

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 10/22/21 04:59
Analyst: TAB

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1562462-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
Tetrachloroethene	ND		ug/l	1.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Vinyl chloride	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Methyl tert butyl ether	ND		ug/l	10	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 10/22/21 04:59
Analyst: TAB

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1562462-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	101		60-140
Fluorobenzene	111		60-140
4-Bromofluorobenzene	99		60-140

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1-SIM
 Analytical Date: 10/22/21 15:36
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1562666-4					
1,4-Dioxane	ND		ug/l	5.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	106		60-140
4-Bromofluorobenzene	89		60-140

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 10/26/21 13:25
Analyst: AMM

Extraction Method: EPA 504.1
Extraction Date: 10/26/21 12:15

Parameter	Result	Qualifier	Units	RL	MDL
Microextractables by GC - Westborough Lab for sample(s): 01 Batch: WG1563178-1					
1,2-Dibromoethane	ND		ug/l	0.010	-- A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	LCS	Qual	LCS	Qual	%Recovery	RPD	Qual	RPD
	%Recovery		%Recovery		Limits			Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1562462-3								
Methylene chloride	110		-		60-140	-		28
1,1-Dichloroethane	120		-		50-150	-		49
Carbon tetrachloride	130		-		70-130	-		41
1,1,2-Trichloroethane	100		-		70-130	-		45
Tetrachloroethene	105		-		70-130	-		39
1,2-Dichloroethane	125		-		70-130	-		49
1,1,1-Trichloroethane	125		-		70-130	-		36
Benzene	130		-		65-135	-		61
Toluene	120		-		70-130	-		41
Ethylbenzene	120		-		60-140	-		63
Vinyl chloride	105		-		5-195	-		66
1,1-Dichloroethene	110		-		50-150	-		32
cis-1,2-Dichloroethene	115		-		60-140	-		30
Trichloroethene	115		-		65-135	-		48
1,2-Dichlorobenzene	105		-		65-135	-		57
1,3-Dichlorobenzene	105		-		70-130	-		43
1,4-Dichlorobenzene	110		-		65-135	-		57
p/m-Xylene	110		-		60-140	-		30
o-xylene	110		-		60-140	-		30
Acetone	108		-		40-160	-		30
Methyl tert butyl ether	105		-		60-140	-		30
Tert-Butyl Alcohol	110		-		60-140	-		30
Tertiary-Amyl Methyl Ether	125		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
-----------	-------------------------	-------------	--------------------------	-------------	----------------------------	------------	-------------	----------------------

Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1562462-3

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
Pentafluorobenzene	103				60-140
Fluorobenzene	109				60-140
4-Bromofluorobenzene	97				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1562666-3								
1,4-Dioxane	112		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	106				60-140
4-Bromofluorobenzene	91				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Project Number: 135301-003

Lab Number: L2157842

Report Date: 11/02/21

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits	<i>Column</i>
Microextractables by GC - Westborough Lab Associated sample(s): 01 Batch: WG1563178-2									
1,2-Dibromoethane	96		-		80-120	-			A

Matrix Spike Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1563178-3 QC Sample: L2157447-02 Client ID: MS Sample													
1,2-Dibromoethane	ND	0.249	0.225	90		-	-		80-120	-		20	A
1,2-Dibromo-3-chloropropane	ND	0.249	0.200	80		-	-		80-120	-		20	A
1,2,3-Trichloropropane	ND	0.249	0.209	84		-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

SAMPLE RESULTS

Lab ID: L2157842-01
 Client ID: HA20-6(OW)
 Sample Location: BHCC, CHARLSTOWN, MA

Date Collected: 10/21/21 13:35
 Date Received: 10/21/21
 Field Prep: Refer to COC

Sample Depth:
 Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 10/25/21 10:50
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 10/24/21 04:50

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.20	--	1
Butyl benzyl phthalate	ND		ug/l	5.00	--	1
Di-n-butylphthalate	ND		ug/l	5.00	--	1
Di-n-octylphthalate	ND		ug/l	5.00	--	1
Diethyl phthalate	ND		ug/l	5.00	--	1
Dimethyl phthalate	ND		ug/l	5.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	83		42-122
2-Fluorobiphenyl	84		46-121
4-Terphenyl-d14	91		47-138

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

SAMPLE RESULTS

Lab ID: L2157842-01
 Client ID: HA20-6(OW)
 Sample Location: BHCC, CHARLSTOWN, MA

Date Collected: 10/21/21 13:35
 Date Received: 10/21/21
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1-SIM
 Analytical Date: 10/27/21 15:20
 Analyst: JJW

Extraction Method: EPA 625.1
 Extraction Date: 10/24/21 04:54

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.100	--	1
Fluoranthene	0.236		ug/l	0.100	--	1
Naphthalene	ND		ug/l	0.100	--	1
Benzo(a)anthracene	0.113		ug/l	0.100	--	1
Benzo(a)pyrene	ND		ug/l	0.100	--	1
Benzo(b)fluoranthene	0.108		ug/l	0.100	--	1
Benzo(k)fluoranthene	ND		ug/l	0.100	--	1
Chrysene	0.118		ug/l	0.100	--	1
Acenaphthylene	ND		ug/l	0.100	--	1
Anthracene	ND		ug/l	0.100	--	1
Benzo(ghi)perylene	ND		ug/l	0.100	--	1
Fluorene	ND		ug/l	0.100	--	1
Phenanthrene	0.143		ug/l	0.100	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.100	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.100	--	1
Pyrene	0.211		ug/l	0.100	--	1
Pentachlorophenol	ND		ug/l	1.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	60		25-87
Phenol-d6	47		16-65
Nitrobenzene-d5	91		42-122
2-Fluorobiphenyl	78		46-121
2,4,6-Tribromophenol	101		45-128
4-Terphenyl-d14	77		47-138

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 10/25/21 09:19
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 10/24/21 04:50

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1562387-1					
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.20	--
Butyl benzyl phthalate	ND		ug/l	5.00	--
Di-n-butylphthalate	ND		ug/l	5.00	--
Di-n-octylphthalate	ND		ug/l	5.00	--
Diethyl phthalate	ND		ug/l	5.00	--
Dimethyl phthalate	ND		ug/l	5.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	74		42-122
2-Fluorobiphenyl	74		46-121
4-Terphenyl-d14	80		47-138

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 129,625.1-SIM
Analytical Date: 10/24/21 21:45
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 10/24/21 04:54

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1562388-1					
Acenaphthene	ND		ug/l	0.100	--
Fluoranthene	ND		ug/l	0.100	--
Naphthalene	ND		ug/l	0.100	--
Benzo(a)anthracene	ND		ug/l	0.100	--
Benzo(a)pyrene	ND		ug/l	0.100	--
Benzo(b)fluoranthene	ND		ug/l	0.100	--
Benzo(k)fluoranthene	ND		ug/l	0.100	--
Chrysene	ND		ug/l	0.100	--
Acenaphthylene	ND		ug/l	0.100	--
Anthracene	ND		ug/l	0.100	--
Benzo(ghi)perylene	ND		ug/l	0.100	--
Fluorene	ND		ug/l	0.100	--
Phenanthrene	ND		ug/l	0.100	--
Dibenzo(a,h)anthracene	ND		ug/l	0.100	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.100	--
Pyrene	ND		ug/l	0.100	--
Pentachlorophenol	ND		ug/l	1.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	61		25-87
Phenol-d6	50		16-65
Nitrobenzene-d5	91		42-122
2-Fluorobiphenyl	76		46-121
2,4,6-Tribromophenol	91		45-128
4-Terphenyl-d14	77		47-138

Lab Control Sample Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1562387-2								
Bis(2-ethylhexyl)phthalate	110		-		29-137	-		82
Butyl benzyl phthalate	90		-		1-140	-		60
Di-n-butylphthalate	98		-		8-120	-		47
Di-n-octylphthalate	105		-		19-132	-		69
Diethyl phthalate	92		-		1-120	-		100
Dimethyl phthalate	96		-		1-120	-		183

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	85				42-122
2-Fluorobiphenyl	85				46-121
4-Terphenyl-d14	91				47-138



Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1562388-2								
Acenaphthene	80		-		60-132	-		30
Fluoranthene	93		-		43-121	-		30
Naphthalene	75		-		36-120	-		30
Benzo(a)anthracene	95		-		42-133	-		30
Benzo(a)pyrene	94		-		32-148	-		30
Benzo(b)fluoranthene	96		-		42-140	-		30
Benzo(k)fluoranthene	96		-		25-146	-		30
Chrysene	86		-		44-140	-		30
Acenaphthylene	83		-		54-126	-		30
Anthracene	87		-		43-120	-		30
Benzo(ghi)perylene	90		-		1-195	-		30
Fluorene	86		-		70-120	-		30
Phenanthrene	83		-		65-120	-		30
Dibenzo(a,h)anthracene	92		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	93		-		1-151	-		30
Pyrene	92		-		70-120	-		30
Pentachlorophenol	93		-		38-152	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
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Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1562388-2

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
2-Fluorophenol	58				25-87
Phenol-d6	47				16-65
Nitrobenzene-d5	84				42-122
2-Fluorobiphenyl	69				46-121
2,4,6-Tribromophenol	100				45-128
4-Terphenyl-d14	79				47-138

PCBS

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

SAMPLE RESULTS

Lab ID: L2157842-01
 Client ID: HA20-6(OW)
 Sample Location: BHCC, CHARLSTOWN, MA

Date Collected: 10/21/21 13:35
 Date Received: 10/21/21
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 127,608.3
 Analytical Date: 10/25/21 01:12
 Analyst: JM

Extraction Method: EPA 608.3
 Extraction Date: 10/24/21 00:38
 Cleanup Method: EPA 3665A
 Cleanup Date: 10/24/21
 Cleanup Method: EPA 3660B
 Cleanup Date: 10/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.250	--	1	A
Aroclor 1221	ND		ug/l	0.250	--	1	A
Aroclor 1232	ND		ug/l	0.250	--	1	A
Aroclor 1242	ND		ug/l	0.250	--	1	A
Aroclor 1248	ND		ug/l	0.250	--	1	A
Aroclor 1254	ND		ug/l	0.250	--	1	A
Aroclor 1260	ND		ug/l	0.200	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		37-123	B
Decachlorobiphenyl	63		38-114	B
2,4,5,6-Tetrachloro-m-xylene	70		37-123	A
Decachlorobiphenyl	76		38-114	A

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 127,608.3
Analytical Date: 10/25/21 00:07
Analyst: JM

Extraction Method: EPA 608.3
Extraction Date: 10/24/21 00:38
Cleanup Method: EPA 3665A
Cleanup Date: 10/24/21
Cleanup Method: EPA 3660B
Cleanup Date: 10/24/21

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1562367-1						
Aroclor 1016	ND		ug/l	0.250	--	A
Aroclor 1221	ND		ug/l	0.250	--	A
Aroclor 1232	ND		ug/l	0.250	--	A
Aroclor 1242	ND		ug/l	0.250	--	A
Aroclor 1248	ND		ug/l	0.250	--	A
Aroclor 1254	ND		ug/l	0.250	--	A
Aroclor 1260	ND		ug/l	0.200	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	64		37-123	B
Decachlorobiphenyl	71		38-114	B
2,4,5,6-Tetrachloro-m-xylene	67		37-123	A
Decachlorobiphenyl	86		38-114	A

Lab Control Sample Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 Batch: WG1562367-2									
Aroclor 1016	76		-		50-140	-		36	A
Aroclor 1260	81		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	55				37-123	B
Decachlorobiphenyl	70				38-114	B
2,4,5,6-Tetrachloro-m-xylene	59				37-123	A
Decachlorobiphenyl	85				38-114	A

METALS

Project Name: BHCC-NEW ACADEMIC BUILDING**Lab Number:** L2157842**Project Number:** 135301-003**Report Date:** 11/02/21**SAMPLE RESULTS**

Lab ID: L2157842-01

Date Collected: 10/21/21 13:35

Client ID: HA20-6(OW)

Date Received: 10/21/21

Sample Location: BHCC, CHARLSTOWN, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.00500		mg/l	0.00400	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Arsenic, Total	ND		mg/l	0.00100	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Cadmium, Total	ND		mg/l	0.00020	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Chromium, Total	ND		mg/l	0.00100	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Copper, Total	0.00129		mg/l	0.00100	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Iron, Total	2.06		mg/l	0.050	--	1	10/25/21 09:10	10/25/21 16:42	EPA 3005A	19,200.7	GD
Lead, Total	0.00153		mg/l	0.00100	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Mercury, Total	ND		mg/l	0.00020	--	1	10/25/21 13:50	10/25/21 21:07	EPA 245.1	3,245.1	AC
Nickel, Total	ND		mg/l	0.00200	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Selenium, Total	ND		mg/l	0.00500	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Silver, Total	ND		mg/l	0.00040	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Zinc, Total	0.01122		mg/l	0.01000	--	1	10/25/21 09:10	10/25/21 18:34	EPA 3005A	3,200.8	PS
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	506		mg/l	0.660	NA	1	10/25/21 09:10	10/25/21 16:42	EPA 3005A	19,200.7	GD
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.050	--	1		10/25/21 18:34	NA	107,-	



Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1562138-1									
Iron, Total	ND	mg/l	0.050	--	1	10/25/21 09:10	10/25/21 14:12	19,200.7	GD

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 01 Batch: WG1562138-1									
Hardness	ND	mg/l	0.660	NA	1	10/25/21 09:10	10/25/21 14:12	19,200.7	GD

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1562141-1									
Antimony, Total	ND	mg/l	0.00400	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Arsenic, Total	ND	mg/l	0.00100	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Cadmium, Total	ND	mg/l	0.00020	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Chromium, Total	ND	mg/l	0.00100	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Copper, Total	ND	mg/l	0.00100	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Lead, Total	ND	mg/l	0.00100	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Nickel, Total	ND	mg/l	0.00200	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Selenium, Total	ND	mg/l	0.00500	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Silver, Total	ND	mg/l	0.00040	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS
Zinc, Total	ND	mg/l	0.01000	--	1	10/25/21 09:10	10/25/21 15:50	3,200.8	PS

Prep Information

Digestion Method: EPA 3005A



Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1562144-1									
Mercury, Total	ND	mg/l	0.00020	--	1	10/25/21 13:50	10/25/21 19:25	3,245.1	AC

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1562138-2								
Iron, Total	104		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1562138-2								
Hardness	100		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1562141-2								
Antimony, Total	86		-		85-115	-		
Arsenic, Total	99		-		85-115	-		
Cadmium, Total	95		-		85-115	-		
Chromium, Total	98		-		85-115	-		
Copper, Total	96		-		85-115	-		
Lead, Total	90		-		85-115	-		
Nickel, Total	93		-		85-115	-		
Selenium, Total	99		-		85-115	-		
Silver, Total	98		-		85-115	-		
Zinc, Total	94		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1562144-2								
Mercury, Total	99		-		85-115	-		

Matrix Spike Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562138-3 QC Sample: L2157586-01 Client ID: MS Sample												
Iron, Total	ND	1	1.08	108	-	-	-	-	75-125	-	-	20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562138-3 QC Sample: L2157586-01 Client ID: MS Sample												
Hardness	85.8	66.2	150	97	-	-	-	-	75-125	-	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562138-7 QC Sample: L2157586-02 Client ID: MS Sample												
Iron, Total	0.157	1	1.20	104	-	-	-	-	75-125	-	-	20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562138-7 QC Sample: L2157586-02 Client ID: MS Sample												
Hardness	85.5	66.2	152	100	-	-	-	-	75-125	-	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562141-3 QC Sample: L2157586-01 Client ID: MS Sample												
Antimony, Total	ND	0.5	0.4833	97	-	-	-	-	70-130	-	-	20
Arsenic, Total	ND	0.12	0.1255	104	-	-	-	-	70-130	-	-	20
Cadmium, Total	0.00180	0.053	0.05407	99	-	-	-	-	70-130	-	-	20
Chromium, Total	ND	0.2	0.2039	102	-	-	-	-	70-130	-	-	20
Copper, Total	0.02494	0.25	0.2827	103	-	-	-	-	70-130	-	-	20
Lead, Total	ND	0.53	0.5192	98	-	-	-	-	70-130	-	-	20
Nickel, Total	0.04696	0.5	0.5232	95	-	-	-	-	70-130	-	-	20
Selenium, Total	ND	0.12	0.1288	107	-	-	-	-	70-130	-	-	20
Silver, Total	ND	0.05	0.05000	100	-	-	-	-	70-130	-	-	20
Zinc, Total	0.1487	0.5	0.6400	98	-	-	-	-	70-130	-	-	20

Matrix Spike Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562141-5 QC Sample: L2157586-02 Client ID: MS Sample									
Antimony, Total	ND	0.5	0.4672	93	-	-	70-130	-	20
Arsenic, Total	ND	0.12	0.1218	102	-	-	70-130	-	20
Cadmium, Total	0.00183	0.053	0.05525	101	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2049	102	-	-	70-130	-	20
Copper, Total	0.02469	0.25	0.2846	104	-	-	70-130	-	20
Lead, Total	ND	0.53	0.5254	99	-	-	70-130	-	20
Nickel, Total	0.04751	0.5	0.5374	98	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1250	104	-	-	70-130	-	20
Silver, Total	ND	0.05	0.05066	101	-	-	70-130	-	20
Zinc, Total	0.1462	0.5	0.6907	109	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562144-3 QC Sample: L2157853-01 Client ID: MS Sample									
Mercury, Total	0.00025	0.005	0.00503	96	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562144-5 QC Sample: L2157853-02 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.00483	97	-	-	70-130	-	20



Lab Duplicate Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562138-4 QC Sample: L2157586-01 Client ID: DUP Sample						
Iron, Total	ND	0.053	mg/l	NC		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562138-4 QC Sample: L2157586-01 Client ID: DUP Sample						
Hardness	85.8	85.6	mg/l	0		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562138-8 QC Sample: L2157586-02 Client ID: DUP Sample						
Iron, Total	0.157	0.164	mg/l	4		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562138-8 QC Sample: L2157586-02 Client ID: DUP Sample						
Hardness	85.5	84.9	mg/l	1		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562141-4 QC Sample: L2157586-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	ND	ND	mg/l	NC		20
Cadmium, Total	0.00180	0.00180	mg/l	0		20
Copper, Total	0.02494	0.02534	mg/l	2		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	0.04696	0.04712	mg/l	0		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.1487	0.1491	mg/l	0		20



Lab Duplicate Analysis
Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562141-6 QC Sample: L2157586-02 Client ID: DUP Sample					
Antimony, Total	ND	ND	mg/l	NC	20
Arsenic, Total	ND	ND	mg/l	NC	20
Cadmium, Total	0.00183	0.00179	mg/l	2	20
Copper, Total	0.02469	0.02498	mg/l	1	20
Lead, Total	ND	ND	mg/l	NC	20
Nickel, Total	0.04751	0.04680	mg/l	2	20
Selenium, Total	ND	ND	mg/l	NC	20
Silver, Total	ND	ND	mg/l	NC	20
Zinc, Total	0.1462	0.1478	mg/l	1	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562144-4 QC Sample: L2157853-01 Client ID: DUP Sample					
Mercury, Total	0.00025	0.00024	mg/l	4	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1562144-6 QC Sample: L2157853-02 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20



INORGANICS & MISCELLANEOUS

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

SAMPLE RESULTS

Lab ID: L2157842-01
Client ID: HA20-6(OW)
Sample Location: BHCC, CHARLSTOWN, MA

Date Collected: 10/21/21 13:35
Date Received: 10/21/21
Field Prep: Refer to COC

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	14.		mg/l	5.0	NA	1	-	10/26/21 15:00	121,2540D	AC
Cyanide, Total	ND		mg/l	0.005	--	1	10/25/21 12:00	10/25/21 17:09	121,4500CN-CE	JO
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/21/21 23:10	121,4500CL-D	AS
Nitrogen, Ammonia	0.925		mg/l	0.075	--	1	10/26/21 00:30	10/26/21 20:24	121,4500NH3-BH	AT
TPH, SGT-HEM	ND		mg/l	4.00	--	1	10/26/21 19:15	10/26/21 20:00	140,1664B	TL
Phenolics, Total	ND		mg/l	0.030	--	1	10/25/21 15:55	10/27/21 10:33	4,420.1	KP
Chromium, Hexavalent	ND		mg/l	0.050	--	5	10/22/21 04:56	10/22/21 05:04	1,7196A	V
Anions by Ion Chromatography - Westborough Lab										
Chloride	165.		mg/l	5.00	--	10	-	10/25/21 23:51	44,300.0	SH



Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1561740-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/21/21 23:10	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1561778-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	10/22/21 04:56	10/22/21 05:01	1,7196A	V
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1562584-1										
Cyanide, Total	ND		mg/l	0.005	--	1	10/25/21 12:00	10/25/21 16:50	121,4500CN-CE	JO
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1562844-1										
Phenolics, Total	ND		mg/l	0.030	--	1	10/25/21 15:55	10/27/21 10:29	4,420.1	KP
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1562944-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	10/26/21 00:30	10/26/21 20:10	121,4500NH3-BH	AT
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1562966-1										
Chloride	ND		mg/l	0.500	--	1	-	10/25/21 16:37	44,300.0	SH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1563341-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	10/26/21 15:00	121,2540D	AC
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1563360-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	10/26/21 19:15	10/26/21 20:00	140,1664B	TL

Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1561740-2								
Chlorine, Total Residual	104		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1561778-2								
Chromium, Hexavalent	110		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1562584-2								
Cyanide, Total	102		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1562844-2								
Phenolics, Total	101		-		70-130	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1562944-2								
Nitrogen, Ammonia	110		-		80-120	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG1562966-2								
Chloride	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1563341-2								
Solids, Total Suspended	107		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2157842

Project Number: 135301-003

Report Date: 11/02/21

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1563360-2					
TPH	86	-	64-132	-	34

Matrix Spike Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1561740-4 QC Sample: L2157842-01 Client ID: HA20-6(OW)												
Chlorine, Total Residual	ND	0.25	0.29	116	-	-	-	-	80-120	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1561778-4 QC Sample: L2157842-01 Client ID: HA20-6(OW)												
Chromium, Hexavalent	ND	0.5	0.512	102	-	-	-	-	85-115	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1562584-4 QC Sample: L2156470-01 Client ID: MS Sample												
Cyanide, Total	0.013	0.2	0.011	0	Q	-	-	-	90-110	-	-	30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1562844-4 QC Sample: L2157842-01 Client ID: HA20-6(OW)												
Phenolics, Total	ND	0.4	0.35	89	-	-	-	-	70-130	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1562944-4 QC Sample: L2157080-02 Client ID: MS Sample												
Nitrogen, Ammonia	1.06	4	4.62	89	-	-	-	-	80-120	-	-	20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1562966-3 QC Sample: L2157842-01 Client ID: HA20-6(OW)												
Chloride	165	40	201	90	-	-	-	-	90-110	-	-	18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1563360-4 QC Sample: L2153475-141 Client ID: MS Sample												
TPH	ND	20.8	17.0	82	-	-	-	-	64-132	-	-	34

Lab Duplicate Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1561740-3 QC Sample: L2157842-01 Client ID: HA20-6(OW)						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1561778-3 QC Sample: L2157842-01 Client ID: HA20-6(OW)						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1562584-3 QC Sample: L2156470-02 Client ID: DUP Sample						
Cyanide, Total	0.017	0.011	mg/l	42	Q	30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1562844-3 QC Sample: L2157842-01 Client ID: HA20-6(OW)						
Phenolics, Total	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1562944-3 QC Sample: L2157080-02 Client ID: DUP Sample						
Nitrogen, Ammonia	1.06	1.13	mg/l	6		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1562966-4 QC Sample: L2157842-01 Client ID: HA20-6(OW)						
Chloride	165	168	mg/l	2		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1563341-3 QC Sample: L2157372-02 Client ID: DUP Sample						
Solids, Total Suspended	480	510	mg/l	6		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1563360-3 QC Sample: L2153475-140 Client ID: DUP Sample						
TPH	ND	ND	mg/l	NC		34

Project Name: BHCC-NEW ACADEMIC BUILDING**Lab Number:** L2157842**Project Number:** 135301-003**Report Date:** 11/02/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
D	Absent
F	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2157842-01A	Vial Na2S2O3 preserved	D	NA		3.0	Y	Absent		624.1-SIM-RGP(7)
L2157842-01B	Vial Na2S2O3 preserved	D	NA		3.0	Y	Absent		624.1-SIM-RGP(7)
L2157842-01C	Vial Na2S2O3 preserved	D	NA		3.0	Y	Absent		624.1-SIM-RGP(7)
L2157842-01D	Vial Na2S2O3 preserved	D	NA		3.0	Y	Absent		624.1-RGP(7)
L2157842-01E	Vial Na2S2O3 preserved	D	NA		3.0	Y	Absent		624.1-RGP(7)
L2157842-01F	Vial Na2S2O3 preserved	D	NA		3.0	Y	Absent		624.1-RGP(7)
L2157842-01G	Vial Na2S2O3 preserved	D	NA		3.0	Y	Absent		504(14)
L2157842-01H	Vial Na2S2O3 preserved	D	NA		3.0	Y	Absent		504(14)
L2157842-01I	Vial unpreserved	D	NA		3.0	Y	Absent		SUB-ETHANOL(14)
L2157842-01J	Vial unpreserved	D	NA		3.0	Y	Absent		SUB-ETHANOL(14)
L2157842-01K	Vial unpreserved	D	NA		3.0	Y	Absent		SUB-ETHANOL(14)
L2157842-01L	Plastic 250ml HNO3 preserved	D	<2	<2	3.0	Y	Absent		HOLD-METAL-DISSOLVED(180)
L2157842-01M	Plastic 250ml HNO3 preserved	D	<2	<2	3.0	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),FE-UI(180),CU-2008T(180),HARDU(180),AG-2008T(180),HG-U(28),SE-2008T(180),AS-2008T(180),CR-2008T(180),SB-2008T(180),PB-2008T(180)
L2157842-01N	Plastic 250ml NaOH preserved	D	>12	>12	3.0	Y	Absent		TCN-4500(14)
L2157842-01O	Plastic 250ml NaOH preserved	D	>12	>12	3.0	Y	Absent		TCN-4500(14)
L2157842-01P	Plastic 500ml H2SO4 preserved	D	<2	<2	3.0	Y	Absent		NH3-4500(28)
L2157842-01Q	Plastic 950ml unpreserved	D	7	7	3.0	Y	Absent		HOLD-WETCHEM(),CL-300(28),HEXCR-7196(1),TRC-4500(1)
L2157842-01R	Plastic 950ml unpreserved	D	7	7	3.0	Y	Absent		TSS-2540(7)
L2157842-01S	Amber 950ml H2SO4 preserved	D	<2	<2	3.0	Y	Absent		TPHENOL-420(28)
L2157842-01T	Amber 1000ml Na2S2O3	F	7	7	2.1	Y	Absent		PCB-608.3(365)

Project Name: BHCC-NEW ACADEMIC BUILDING

Project Number: 135301-003

Serial_No:11022118:47

Lab Number: L2157842

Report Date: 11/02/21

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2157842-01U	Amber 1000ml Na2S2O3	F	7	7	2.1	Y	Absent		PCB-608.3(365)
L2157842-01V	Amber 1000ml Na2S2O3	F	7	7	2.1	Y	Absent		625.1-RGP(7)
L2157842-01W	Amber 1000ml Na2S2O3	F	7	7	2.1	Y	Absent		625.1-RGP(7)
L2157842-01X	Amber 1000ml Na2S2O3	F	7	7	2.1	Y	Absent		625.1-SIM-RGP(7)
L2157842-01Y	Amber 1000ml Na2S2O3	F	7	7	2.1	Y	Absent		625.1-SIM-RGP(7)
L2157842-01Z	Amber 1000ml HCl preserved	D	NA		3.0	Y	Absent		TPH-1664(28)
L2157842-01Z1	Amber 1000ml HCl preserved	D	NA		3.0	Y	Absent		TPH-1664(28)

Project Name: BHCC-NEW ACADEMIC BUILDING**Lab Number:** L2157842**Project Number:** 135301-003**Report Date:** 11/02/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2157842
Report Date: 11/02/21

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 4 Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. Revised March 1983.
- 14 Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. EPA/600/4-88/039, Revised July 1991.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 107 Alpha Analytical - In-house calculation method.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 127 Method 608.3: Organochlorine Pesticides and PCBs by GC/HSD, EPA 821-R-16-009, December 2016.
- 128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.
- 129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.
- 140 Method 1664, Revision B: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-10-001, February 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

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, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-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, **LCHAT 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, SM9222D.**

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, EPA 537.1.

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.

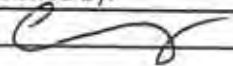
CHAIN OF CUSTODY Westborough, MA 01581 Manassett, MA 02548 8 Walkup Dr. 320 Forbes Blvd TEL: 508-898-9220 TEL: 508-522-9300 FAX: 508-898-9193 FAX: 508-822-3288		Service Centers Brewster, ME 04412 Portsmouth, NH 03801 Matwah, NJ 07430 Albany, NY 12205 Tonawanda, NY 14150 Holmes, PA 19043		Page 1 of 1		Date Rec'd In Lab 10/21/21		ALPHA Job # 2157842	
		Project Information Project Name: BHCC - New Academic Building Project Location: BHCC, Charlestown, MA Project # 135301-003 (Use Project name as Project #)		Deliverables <input checked="" type="checkbox"/> Email <input type="checkbox"/> Fax <input checked="" type="checkbox"/> EQUiS (1 File) <input type="checkbox"/> EQUiS (4 File) <input type="checkbox"/> Other:		Regulatory Requirements (Program/Criteria) <input checked="" type="checkbox"/> NPOES RPG Note: Select State from menu & identify criteria.		Billing Information <input checked="" type="checkbox"/> Same as Client Info PG #	
H&A Information H&A Client: DCAMM-BHCC H&A Address 455 Medford St Boston, MA 0212-1400 H&A Phone: 617-886-7400 H&A Fax: Standard <input checked="" type="checkbox"/> Due Date: H&A Email: hballantyne@haleyaldrich.com (only if pre approved) <input type="checkbox"/> # of Days:		Disposal Site Information Please identify below location of applicable disposal facilities. Disposal Facility: <input type="checkbox"/> NJ <input type="checkbox"/> NY <input type="checkbox"/> Other:							
These samples have been previously analyzed by Alpha <input type="checkbox"/> Other project specific requirements/comments: 3. HOLD PACN & ACN 12. Dissolved Metals ON HOLD (Field Filtered) Please sample per EPA Approved 2017 RGP Permit methods Please specify Metals or TAL:		ANALYSIS 1. TSS-2940 2. TRC-4900 3. TCN-4500 HOLD PACN & ACN 4. 504 5. 624.1/624.1 SIM for VOC and Dioxene 6. HEXCR-3500 & Trivalent Chromium 7. TPHENOL-420 8. 625.1 TCL (including Dithyomethylalate) 9. 625.1 TCL-SIM 10. CL-300 11. Total Metals - Ag, As, Cd, Cr, Cu, Ni, Pb, Se, Zn, Fe, Hg 12. Dissolved Metals - Ag, As, Ba, Cd, Cr, Cu, Ni, Pb, Se, Zn, Hg, Tl, Zr 13. Ammonia 14. Total Hardness 15. A2-ALCOHOL (Ethanol) 16. TPH-1864 17. PCB-508		Sample Filtration <input checked="" type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below)					
ALPHA Lab ID (Lab Use Only) Sample ID Collection Date Time Sample Matrix Sampler's Initials		1. TSS-2940 2. TRC-4900 3. TCN-4500 HOLD PACN & ACN 4. 504 5. 624.1/624.1 SIM for VOC and Dioxene 6. HEXCR-3500 & Trivalent Chromium 7. TPHENOL-420 8. 625.1 TCL (including Dithyomethylalate) 9. 625.1 TCL-SIM 10. CL-300 11. Total Metals - Ag, As, Cd, Cr, Cu, Ni, Pb, Se, Zn, Fe, Hg 12. Dissolved Metals - Ag, As, Ba, Cd, Cr, Cu, Ni, Pb, Se, Zn, Hg, Tl, Zr 13. Ammonia 14. Total Hardness 15. A2-ALCOHOL (Ethanol) 16. TPH-1864 17. PCB-508		Sample Specific Comments Temp - 15.9 pH - 6.51					
Preservative Code: A = None B = HCl C = HNO ₃ D = H ₂ SO ₄ E = NaOH F = MeOH G = NaHSO ₄ H = Na ₂ S ₂ O ₈ K/E = Zn Ac/NaOH O = Other		Container Code: P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube D = Other E = Encore D = BOD Bottle		Westboro: Certification No: MA935 Mansfield: Certification No: MA015 Container Type Preservative		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. Alpha Analytical's services under this Chain of Custody shall be performed in accordance with terms and conditions within Blanket Service Agreement# 2015-18-Alpha Analytical by and between Haley & Aldrich, Inc., its subsidiaries and affiliates and Alpha Analytical.			
Relinquished By: <i>Julia M...</i> Date/Time: 10/21/21 16:35 Received By: <i>W. ...</i> Date/Time: 10/21/21 16:45 <i>W. ...</i> Date/Time: 10/21/21 16:35		Document ID: 20455 Rev 1 (1/28/2016)							

 <p>ALPHA ANALYTICAL <i>World Class Chemistry</i></p>	<p>Subcontract Chain of Custody</p> <p>Tek Lab, Inc. 5445 Horsehoe Lake Road Collinsville, IL 62234-7425</p>	<div style="border: 1px solid black; padding: 5px;"> <p>Alpha Job Number L2157842</p> </div>
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Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019 Phone: 603.319.5010 Email: mgulli@alphalab.com	Project Location: MA Project Manager: Melissa Gulli <div style="background-color: #f0f0f0; padding: 2px;"> Turnaround & Deliverables Information </div> Due Date: Deliverables:	State/Federal Program: Regulatory Criteria:

Project Specific Requirements and/or Report Requirements	
Reference following Alpha Job Number on final report/deliverables: L2157842	Report to include Method Blank, LCS/LCSD:
Additional Comments: Send all results/reports to subreports@alphalab.com	

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
	HA20-6(OW)	10-21-21 13:35	WATER	Ethanol by EPA 1671 Revision A	

	Relinquished By:	Date/Time:	Received By:	Date/Time:
		10/25/21		
Form No: AL_subcoc				



November 02, 2021

Melissa Gulli
 Alpha Analytical
 145 Flanders Road
 Westborough, MA 01581
 TEL: (603) 319-5010
 FAX:



Illinois	100226
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: L2157842

WorkOrder: 21101525

Dear Melissa Gulli:

TEKLAB, INC received 1 sample on 10/26/2021 9:45:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth A. Hurley".

Elizabeth A. Hurley
 Project Manager
 (618)344-1004 ex 33
ehurley@teklabinc.com



Report Contents

<http://www.teklabinc.com/>

Client: Alpha Analytical

Work Order: 21101525

Client Project: L2157842

Report Date: 02-Nov-21

This reporting package includes the following:

Cover Letter	1
Report Contents	2
Definitions	3
Case Narrative	5
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Quality Control Results	8
Receiving Check List	9
Chain of Custody	Appended



Definitions

<http://www.teklabinc.com/>

Client: Alpha Analytical

Work Order: 21101525

Client Project: L2157842

Report Date: 02-Nov-21

Abbr Definition

* Analytes on report marked with an asterisk are not NELAP accredited

CCV Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.

CRQL A Client Requested Quantitation Limit is a reporting limit that varies according to customer request. The CRQL may not be less than the MDL.

DF Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilution factors.

DNI Did not ignite

DUP Laboratory duplicate is a replicate aliquot prepared under the same laboratory conditions and independently analyzed to obtain a measure of precision.

ICV Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.

IDPH IL Dept. of Public Health

LCS Laboratory control sample is a sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes and analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.

LCSD Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).

MBLK Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.

MDL "The method detection limit is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results."

MS Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).

MSD Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).

MW Molecular weight

NC Data is not acceptable for compliance purposes

ND Not Detected at the Reporting Limit

NELAP NELAP Accredited

PQL Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions.

RL The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.

RPD Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).

SPK The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.

Surr Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.

TIC Tentatively identified compound: Analytes tentatively identified in the sample by using a library search. Only results not in the calibration standard will be reported as tentatively identified compounds. Results for tentatively identified compounds that are not present in the calibration standard, but are assigned a specific chemical name based upon the library search, are calculated using total peak areas from reconstructed ion chromatograms and a response factor of one. The nearest Internal Standard is used for the calculation. The results of any TICs must be considered estimated, and are flagged with a "T". If the estimated result is above the calibration range it is flagged "ET"

TNTC Too numerous to count (> 200 CFU)



Definitions

<http://www.teklabinc.com/>

Client: Alpha Analytical

Work Order: 21101525

Client Project: L2157842

Report Date: 02-Nov-21

Qualifiers

- # - Unknown hydrocarbon
- C - RL shown is a Client Requested Quantitation Limit
- H - Holding times exceeded
- J - Analyte detected below quantitation limits
- ND - Not Detected at the Reporting Limit
- S - Spike Recovery outside recovery limits
- X - Value exceeds Maximum Contaminant Level
- B - Analyte detected in associated Method Blank
- E - Value above quantitation range
- I - Associated internal standard was outside method criteria
- M - Manual Integration used to determine area response
- R - RPD outside accepted recovery limits
- T - TIC(Tentatively identified compound)



Case Narrative

<http://www.teklabinc.com/>

Client: Alpha Analytical

Work Order: 21101525

Client Project: L2157842

Report Date: 02-Nov-21

Cooler Receipt Temp: 2.0 °C

Locations

Collinsville

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425

Phone (618) 344-1004

Fax (618) 344-1005

Email jhriley@teklabinc.com

Collinsville Air

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425

Phone (618) 344-1004

Fax (618) 344-1005

Email EHurley@teklabinc.com

Springfield

Address 3920 Pintail Dr
Springfield, IL 62711-9415

Phone (217) 698-1004

Fax (217) 698-1005

Email KKlostermann@teklabinc.com

Chicago

Address 1319 Butterfield Rd.
Downers Grove, IL 60515

Phone (630) 324-6855

Fax

Email arenner@teklabinc.com

Kansas City

Address 8421 Nieman Road
Lenexa, KS 66214

Phone (913) 541-1998

Fax (913) 541-1998

Email jhriley@teklabinc.com



Accreditations

<http://www.teklabinc.com/>

Client: Alpha Analytical

Work Order: 21101525

Client Project: L2157842

Report Date: 02-Nov-21

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2022	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2022	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2022	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2022	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2022	Collinsville
Arkansas	ADEQ	88-0966		3/14/2022	Collinsville
Illinois	IDPH	17584		5/31/2021	Collinsville
Kentucky	UST	0073		1/31/2022	Collinsville
Missouri	MDNR	00930		5/31/2021	Collinsville
Missouri	MDNR	930		1/31/2022	Collinsville



Laboratory Results

<http://www.teklabinc.com/>

Client: Alpha Analytical

Work Order: 21101525

Client Project: L2157842

Report Date: 02-Nov-21

Lab ID: 21101525-001

Client Sample ID: HA20-6(OW)

Matrix: AQUEOUS

Collection Date: 10/21/2021 13:35

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 1671A, PHARMACEUTICAL MANUFACTURING INDUSTRY NON-PURGEABLE VOLATILE ORGANICS								
Ethanol	*	20		ND	mg/L	1	11/02/2021 11:23	R302070



Quality Control Results

<http://www.teklabinc.com/>

Client: Alpha Analytical

Work Order: 21101525

Client Project: L2157842

Report Date: 02-Nov-21

EPA 600 1671A, PHARMACEUTICAL MANUFACTURING INDUSTRY NON-PURGEABLE VOLATILE OR

Batch R302070 **SampType: MBLK** Units mg/L

SampID: MBLK-110221

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Ethanol	*	20		ND						11/02/2021

Batch R302070 **SampType: LCS** Units mg/L

SampID: LCS-110221

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Ethanol	*	20		240	250.0	0	97.2	70	132	11/02/2021

Batch R302070 **SampType: MS** Units mg/L

SampID: 21101525-001AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Ethanol	*	20		230	250.0	0	91.1	70	132	11/02/2021

Batch R302070 **SampType: MSD** Units mg/L

RPD Limit: 30

SampID: 21101525-001AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Ethanol	*	20		260	250.0	0	103.7	227.8	12.91	11/02/2021



Receiving Check List

<http://www.teklabinc.com/>

Client: Alpha Analytical

Work Order: 21101525

Client Project: L2157842

Report Date: 02-Nov-21

Carrier: UPS

Received By: MLD

Completed by: *Mary E. Kemp*
On: 26-Oct-21
 Mary E. Kemp

Reviewed by: *Elizabeth A. Hurley*
On: 26-Oct-21
 Elizabeth A. Hurley

Pages to follow: Chain of custody

Extra pages included

- | | | | | |
|---|---|---|--|----------------------------------|
| Shipping container/cooler in good condition? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/> | Temp °C 2.0 |
| Type of thermal preservation? | None <input type="checkbox"/> | Ice <input checked="" type="checkbox"/> | Blue Ice <input type="checkbox"/> | Dry Ice <input type="checkbox"/> |
| Chain of custody present? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | | |
| Chain of custody signed when relinquished and received? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | | |
| Chain of custody agrees with sample labels? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | | |
| Samples in proper container/bottle? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | | |
| Sample containers intact? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | | |
| Sufficient sample volume for indicated test? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | | |
| All samples received within holding time? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | | |
| Reported field parameters measured: | Field <input type="checkbox"/> | Lab <input type="checkbox"/> | NA <input checked="" type="checkbox"/> | |
| Container/Temp Blank temperature in compliance? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | | |

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

- | | | | |
|---|---|-----------------------------|---|
| Water – at least one vial per sample has zero headspace? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | No VOA vials <input type="checkbox"/> |
| Water - TOX containers have zero headspace? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | No TOX containers <input checked="" type="checkbox"/> |
| Water - pH acceptable upon receipt? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | NA <input type="checkbox"/> |
| NPDES/CWA TCN interferences checked/treated in the field? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/> |

Any No responses must be detailed below or on the COC.

21101525



Subcontract Chain of Custody

Tek Lab, Inc.
5445 Horsehoe Lake Road
Collinsville, IL 62234-7425

Alpha Job Number
L2157842

Client Information	Project Information	Regulatory Requirements/Report Limits
Client: Alpha Analytical Labs Address: Eight Walkup Drive Westborough, MA 01581-1019	Project Location: MA Project Manager: Melissa Gulli	State/Federal Program: Regulatory Criteria:
Phone: 603.319.5010 Email: mgulli@alphalab.com	Turnaround & Deliverables Information Due Date: Deliverables:	

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L2157842

Report to include Method Blank, LCS/LCSD:

Additional Comments: Send all results/reports to subreports@alphalab.com

Lab ID	Client ID	Collection Date/Time	Sample Matrix	Analysis	Batch QC
21101525 -001	HA20-6(OW)	10-21-21 13:35	WATER	Ethanol by EPA 1671 Revision A 2.0°C LTS 3 DHS PR 10-26-21	

Form No: AL_subcoc	Relinquished By:	Date/Time:	Received By:	Date/Time:
		10/25/21	Melissa Gulli (UPS)	10/26/21 0945

PR 10-26-21



ANALYTICAL REPORT

Lab Number:	L2167180
Client:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Charlestown, MA 02129-1400
ATTN:	Heather Ballantyne
Phone:	(617) 886-3061
Project Name:	BHCC-NEW ACADEMIC BUILDING
Project Number:	135301-003
Report Date:	12/13/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2167180-01	HA21-MR	WATER	BHCC, CHARLESTOWN, MA	12/07/21 11:14	12/07/21

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Sebastian Corbin

Title: Technical Director/Representative

Date: 12/13/21

METALS

Project Name: BHCC-NEW ACADEMIC BUILDING**Lab Number:** L2167180**Project Number:** 135301-003**Report Date:** 12/13/21**SAMPLE RESULTS**

Lab ID: L2167180-01

Date Collected: 12/07/21 11:14

Client ID: HA21-MR

Date Received: 12/07/21

Sample Location: BHCC, CHARLESTOWN, MA

Field Prep: None

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Arsenic, Total	ND		mg/l	0.00100	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Cadmium, Total	ND		mg/l	0.00020	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Chromium, Total	ND		mg/l	0.00100	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Copper, Total	0.00814		mg/l	0.00100	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Iron, Total	2.28		mg/l	0.050	--	1	12/08/21 14:58	12/10/21 14:32	EPA 3005A	19,200.7	SV
Lead, Total	0.00343		mg/l	0.00100	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Mercury, Total	ND		mg/l	0.00020	--	1	12/08/21 15:06	12/09/21 11:47	EPA 245.1	3,245.1	AC
Nickel, Total	0.00262		mg/l	0.00200	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Selenium, Total	ND		mg/l	0.00500	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Silver, Total	ND		mg/l	0.00040	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Zinc, Total	0.04935		mg/l	0.01000	--	1	12/08/21 14:58	12/09/21 01:04	EPA 3005A	3,200.8	CD
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	189		mg/l	0.660	NA	1	12/08/21 14:58	12/10/21 14:32	EPA 3005A	19,200.7	SV



Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1580688-1									
Iron, Total	ND	mg/l	0.050	--	1	12/08/21 14:58	12/10/21 13:32	19,200.7	SV

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 01 Batch: WG1580688-1									
Hardness	ND	mg/l	0.660	NA	1	12/08/21 14:58	12/10/21 13:32	19,200.7	SV

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1580693-1									
Antimony, Total	ND	mg/l	0.00400	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Arsenic, Total	ND	mg/l	0.00100	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Cadmium, Total	ND	mg/l	0.00020	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Chromium, Total	ND	mg/l	0.00100	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Copper, Total	ND	mg/l	0.00100	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Lead, Total	ND	mg/l	0.00100	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Nickel, Total	ND	mg/l	0.00200	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Selenium, Total	ND	mg/l	0.00500	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Silver, Total	ND	mg/l	0.00040	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD
Zinc, Total	ND	mg/l	0.01000	--	1	12/08/21 14:58	12/09/21 00:12	3,200.8	CD

Prep Information

Digestion Method: EPA 3005A



Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2167180

Project Number: 135301-003

Report Date: 12/13/21

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1580696-1									
Mercury, Total	ND	mg/l	0.00020	--	1	12/08/21 15:06	12/09/21 10:37	3,245.1	AC

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1580688-2								
Iron, Total	98		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1580688-2								
Hardness	101		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1580693-2								
Antimony, Total	86		-		85-115	-		
Arsenic, Total	95		-		85-115	-		
Cadmium, Total	97		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	94		-		85-115	-		
Nickel, Total	96		-		85-115	-		
Selenium, Total	98		-		85-115	-		
Silver, Total	97		-		85-115	-		
Zinc, Total	94		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1580696-2								
Mercury, Total	91		-		85-115	-		



Matrix Spike Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580688-3 QC Sample: L2167174-01 Client ID: MS Sample												
Iron, Total	16.9	1	17.7	80	-	-	-	-	75-125	-	-	20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580688-3 QC Sample: L2167174-01 Client ID: MS Sample												
Hardness	575	66.2	634	89	-	-	-	-	75-125	-	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580688-7 QC Sample: L2167174-02 Client ID: MS Sample												
Iron, Total	0.186	1	1.16	97	-	-	-	-	75-125	-	-	20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580688-7 QC Sample: L2167174-02 Client ID: MS Sample												
Hardness	644	66.2	710	100	-	-	-	-	75-125	-	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580693-3 QC Sample: L2167174-01 Client ID: MS Sample												
Antimony, Total	ND	0.5	0.3964	79	-	-	-	-	70-130	-	-	20
Arsenic, Total	0.00122	0.12	0.1128	93	-	-	-	-	70-130	-	-	20
Cadmium, Total	ND	0.053	0.05056	95	-	-	-	-	70-130	-	-	20
Chromium, Total	0.02004	0.2	0.2033	92	-	-	-	-	70-130	-	-	20
Copper, Total	0.01869	0.25	0.2400	88	-	-	-	-	70-130	-	-	20
Lead, Total	0.01043	0.53	0.5019	93	-	-	-	-	70-130	-	-	20
Nickel, Total	0.01803	0.5	0.4578	88	-	-	-	-	70-130	-	-	20
Selenium, Total	ND	0.12	0.1118	93	-	-	-	-	70-130	-	-	20
Silver, Total	ND	0.05	0.04714	94	-	-	-	-	70-130	-	-	20
Zinc, Total	0.04812	0.5	0.4946	89	-	-	-	-	70-130	-	-	20

Matrix Spike Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580693-5 QC Sample: L2167174-02 Client ID: MS Sample									
Antimony, Total	ND	0.5	0.4820	96	-	-	70-130	-	20
Arsenic, Total	0.00102	0.12	0.1181	98	-	-	70-130	-	20
Cadmium, Total	ND	0.053	0.05058	95	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.1813	91	-	-	70-130	-	20
Copper, Total	0.00548	0.25	0.2298	90	-	-	70-130	-	20
Lead, Total	ND	0.53	0.4876	92	-	-	70-130	-	20
Nickel, Total	0.00757	0.5	0.4483	88	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1062	88	-	-	70-130	-	20
Silver, Total	ND	0.05	0.04634	93	-	-	70-130	-	20
Zinc, Total	0.01680	0.5	0.4609	89	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580696-3 QC Sample: L2167182-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.00460	92	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580696-5 QC Sample: L2167182-02 Client ID: MS Sample									
Mercury, Total	0.00034	0.005	0.00490	91	-	-	70-130	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Project Number: 135301-003

Lab Number: L2167180

Report Date: 12/13/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580688-4 QC Sample: L2167174-01 Client ID: DUP Sample						
Iron, Total	16.9	17.0	mg/l	1		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580688-8 QC Sample: L2167174-02 Client ID: DUP Sample						
Iron, Total	0.186	0.180	mg/l	3		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580693-4 QC Sample: L2167174-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.00122	0.00166	mg/l	31	Q	20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.02004	0.02300	mg/l	14		20
Copper, Total	0.01869	0.01964	mg/l	5		20
Lead, Total	0.01043	0.01093	mg/l	5		20
Nickel, Total	0.01803	0.01946	mg/l	8		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.04812	0.05282	mg/l	9		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580693-4 QC Sample: L2167174-01 Client ID: DUP Sample						
Selenium, Total	ND	ND	mg/l	NC		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Project Number: 135301-003

Lab Number: L2167180

Report Date: 12/13/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580693-6 QC Sample: L2167174-02 Client ID: DUP Sample					
Antimony, Total	ND	ND	mg/l	NC	20
Cadmium, Total	ND	ND	mg/l	NC	20
Chromium, Total	ND	ND	mg/l	NC	20
Copper, Total	0.00548	0.00525	mg/l	4	20
Lead, Total	ND	ND	mg/l	NC	20
Nickel, Total	0.00757	0.00733	mg/l	3	20
Silver, Total	ND	ND	mg/l	NC	20
Zinc, Total	0.01680	0.01664	mg/l	1	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580693-6 QC Sample: L2167174-02 Client ID: DUP Sample					
Arsenic, Total	0.00102	0.00113	mg/l	10	20
Selenium, Total	ND	ND	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580696-4 QC Sample: L2167182-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1580696-6 QC Sample: L2167182-02 Client ID: DUP Sample					
Mercury, Total	0.00034	0.00042	mg/l	20	20

INORGANICS & MISCELLANEOUS

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

SAMPLE RESULTS

Lab ID: L2167180-01
Client ID: HA21-MR
Sample Location: BHCC, CHARLESTOWN, MA

Date Collected: 12/07/21 11:14
Date Received: 12/07/21
Field Prep: None

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
SALINITY	ND		SU	2.0	--	1	-	12/08/21 18:32	121,2520B	AS
pH (H)	7.3		SU	-	NA	1	-	12/08/21 04:14	121,4500H+-B	KA
Nitrogen, Ammonia	0.624		mg/l	0.075	--	1	12/09/21 15:40	12/10/21 19:40	121,4500NH3-BH	AT



Project Name: BHCC-NEW ACADEMIC BUILDING

Lab Number: L2167180

Project Number: 135301-003

Report Date: 12/13/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1581160-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/09/21 15:40	12/10/21 19:27	121,4500NH3-BH	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Project Number: 135301-003

Lab Number: L2167180

Report Date: 12/13/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1580449-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1580859-1								
SALINITY	101		-			-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1581160-2								
Nitrogen, Ammonia	94		-		80-120	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1581160-4 QC Sample: L2167174-02 Client ID: MS Sample												
Nitrogen, Ammonia	4.26	4	8.03	94	-	-	-	-	80-120	-	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: BHCC-NEW ACADEMIC BUILDING

Project Number: 135301-003

Lab Number: L2167180

Report Date: 12/13/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1580449-2 QC Sample: L2166929-01 Client ID: DUP Sample						
pH	7.2	7.1	SU	1		5
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1580859-2 QC Sample: L2167180-01 Client ID: HA21-MR						
SALINITY	ND	ND	SU	NC		
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1581160-3 QC Sample: L2167174-02 Client ID: DUP Sample						
Nitrogen, Ammonia	4.26	4.38	mg/l	3		20

Project Name: BHCC-NEW ACADEMIC BUILDING**Lab Number:** L2167180**Project Number:** 135301-003**Report Date:** 12/13/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

E Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2167180-01A	Plastic 120ml unpreserved split	E	7	7	4.1	Y	Absent		-
L2167180-01B	Plastic 250ml HNO3 preserved	E	<2	<2	4.1	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),FE-UI(180),HARDU(180),CU-2008T(180),AS-2008T(180),SE-2008T(180),AG-2008T(180),HG-U(28),SB-2008T(180),CR-2008T(180),PB-2008T(180)
L2167180-01C	Plastic 500ml unpreserved	E	7	7	4.1	Y	Absent		SALINITY(28),PH-4500(.01)
L2167180-01D	Plastic 500ml H2SO4 preserved	E	<2	<2	4.1	Y	Absent		NH3-4500(28)
L2167180-01X	Plastic 120ml HNO3 preserved Filtrates	E	NA		4.1	Y	Absent		HOLD-METAL-DISSOLVED(180)

Project Name: BHCC-NEW ACADEMIC BUILDING**Lab Number:** L2167180**Project Number:** 135301-003**Report Date:** 12/13/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: BHCC-NEW ACADEMIC BUILDING
Project Number: 135301-003

Lab Number: L2167180
Report Date: 12/13/21

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

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, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-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, **LCHAT 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, SM9222D.**

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, EPA 537.1.

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.

 Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9229 FAX: 508-898-9183	CHAIN OF CUSTODY Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-8500 FAX: 508-822-3288	Service Centers Brewer, ME 04412 Portsmouth, NH 03801 Newark, NJ 07102 Albany, NY 12206 Tonawanda, NY 14150 Holmes, PA 19043	Page 1 of 1	Date Rec'd In Lab 12/7/21	ALPHA Job # 62167180										
		Project Information Project Name: BHCC- New Academic Building Project Location: BHCC, Charlestown, MA Project #: 135301-003 (Use Project name as Project #) <input type="checkbox"/>		Deliverables <input checked="" type="checkbox"/> Email <input type="checkbox"/> <input type="checkbox"/> EQUIS () FIM <input checked="" type="checkbox"/> <input type="checkbox"/> Other:		Billing Information Same as Client Info PO #									
H&A Information H&A Client: DCAMM-BHCC H&A Address: 465 Medford St Boston, MA 0212-1400 H&A Phone: 617-886-7400 H&A Fax: H&A Email: hballantyne@haleyaldrich.com , scorrald@haleyaldrich.com , atherinecoul@haleyaldrich.com		Project Manager: H Ballantyne ALPHAQuote #: Turn-Around Time Standard <input checked="" type="checkbox"/> Due Date: (only if pre approved) <input type="checkbox"/> # of Days:		Regulatory Requirements (Program/Criteria) MA Note: Select State from menu & identify criteria.		Disposal Site Information Please identify below location of applicable disposal facilities. Disposal Facility: <input type="checkbox"/> NJ <input type="checkbox"/> NY Other:									
Other project specific requirements/comments: 12 Dissolved Metals ON HOLD (Field Filtered) Samples submitted for 2017 NPDES RGP application; please follow approved testing methods and minimum detection levels as required by EPA. Please specify Metals or TAL:		ANALYSIS 1. Salinity 3. Total Metals - Ag, As, Cd, Cr, Cu, Ni, Pb, Sb, Se, Zn, Fe, Hg 4. Dissolved Metals - Ag, As, Be, Cd, Cr, Cu, Ni, Pb, Sb, Se, TLZ 5. Ammonia 6. Hardness 7. pH		Sample Filtration <input checked="" type="checkbox"/> Done <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do (Please Specify below) Sample Specific Comments											
ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	1. Salinity	3. Total Metals	4. Dissolved Metals	5. Ammonia	6. Hardness	7. pH	Sample Filtration	Preservation	Sample Specific Comments	
67180-01	HA21-MB	12/7	11:14	SW	SG	X	X	X	X	X	X	<input checked="" type="checkbox"/> Done	<input type="checkbox"/> Lab to do	Temp -50.4 pH - 7.4 3	
Preservative Code: A = None B = HCl C = HNO ₃ D = H ₂ SO ₄ E = NaOH F = MeOH G = NaHSO ₄ H = Na ₂ S ₂ O ₃ K/E = Zn Ac/NaOH O = Other		Container Code: P = Plastic A = Amber Glass V = Vial G = Glass B = Bacteria Cup C = Cube O = Other E = Encore D = BOO Bottle		Westboro: Certification No: MA935 Mansfield: Certification No: MAD15		Container Type Preservative		Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. Alpha Analytical's services under this Chain of Custody shall be performed in accordance with terms and conditions within Blanket Service Agreement# 2015-18-Alpha Analytical by and between Haley & Aldrich, Inc., its subsidiaries and affiliates and Alpha Analytical							
Relinquished By: Shay Gera		Date/Time: 12/7 12:04		Received By: M. R. G. S. R.		12/7/21/16:30									
Relinquished By: M. R. G. S. R.		Date/Time: 12/7 12:04		Received By: M. R. G. S. R.		12/7/21/16:30									
Relinquished By: Regina S. S. R.		Date/Time: 12/7 12:43		Received By: M. R. G. S. R.		12/7/21/17:43									

APPENDIX D

Discharge Calculations

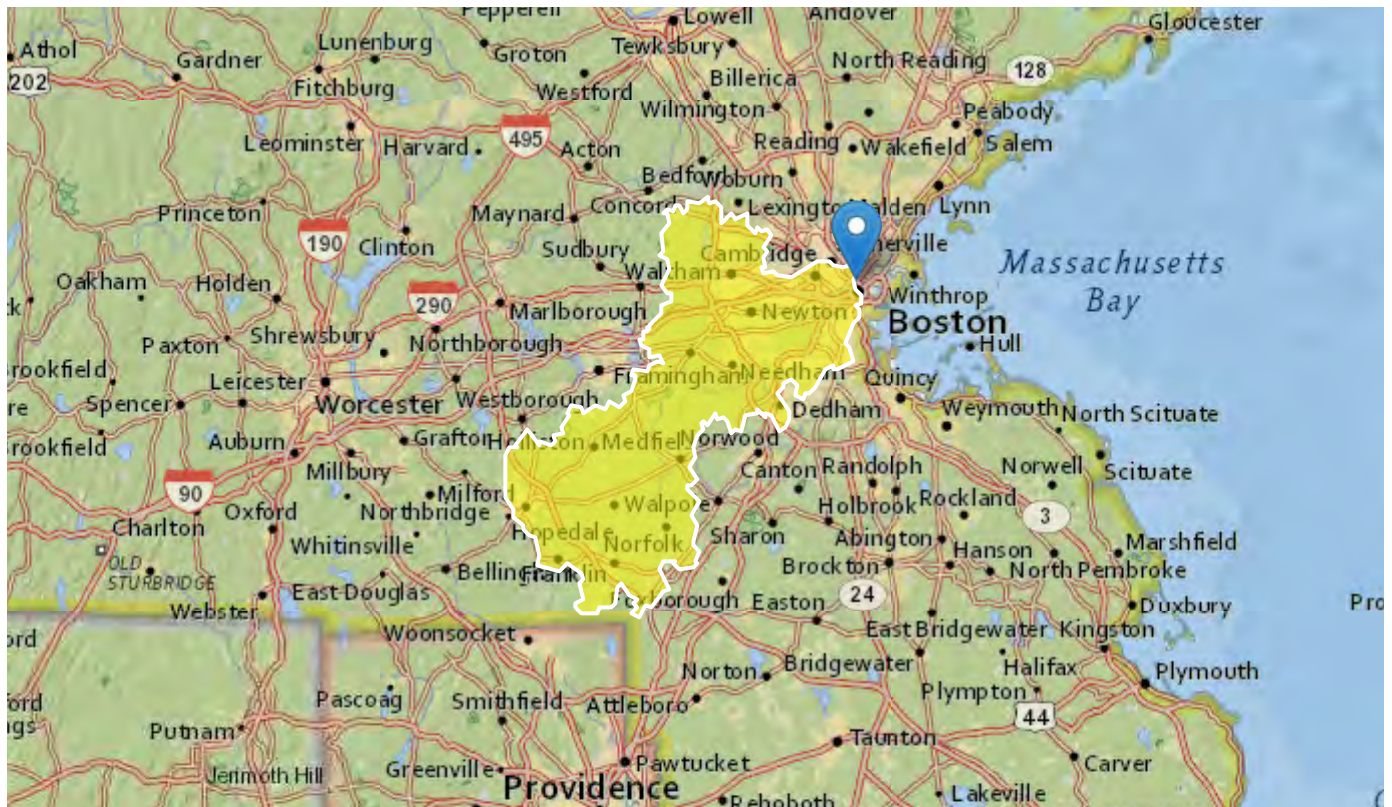
StreamStats Report

Region ID: MA

Workspace ID: MA20211210164040368000

Clicked Point (Latitude, Longitude): 42.36933, -71.06418

Time: 2021-12-10 11:41:05 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	313	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	2.314	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.25	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
ELEV	Mean Basin Elevation	189	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	12.2	percent

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	313	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	2.314	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.25	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

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

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	58.3	ft ³ /s
7 Day 10 Year Low Flow	29.7	ft ³ /s

Low-Flow Statistics Citations

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

Peak-Flow Statistics Parameters [Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	313	square miles	0.16	512
ELEV	Mean Basin Elevation	189	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	12.2	percent	0	32.3

Peak-Flow Statistics Flow Report [Peak Statewide 2016 5156]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	Plu	ASEp
50-percent AEP flood	3350	ft ³ /s	1710	6560	42.3
20-percent AEP flood	5230	ft ³ /s	2630	10400	43.4
10-percent AEP flood	6640	ft ³ /s	3270	13500	44.7
4-percent AEP flood	8640	ft ³ /s	4110	18200	47.1
2-percent AEP flood	10300	ft ³ /s	4750	22300	49.4
1-percent AEP flood	11900	ft ³ /s	5320	26600	51.8
0.5-percent AEP flood	13800	ft ³ /s	5990	31800	54.1
0.2-percent AEP flood	16300	ft ³ /s	6750	39300	57.6

Peak-Flow Statistics Citations

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

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Application Version: 4.6.2

StreamStats Services Version: 1.2.22

NSS Services Version: 2.1.2

HALEY & ALDRICH, INC.		CALCULATIONS	FILE NO.	135301-003	
CLIENT	DCAMM-BHCC		SHEET	1	of 1
PROJECT	BHCC-New Academic Building		DATE	9-Dec-21	
SUBJECT	Dilution Factor Calculations		COMPUTED BY	SMG	
PURPOSE: Calculate Dilution Factor (DF) for project based on 7 Day 10 Year (7Q10) Low Flow values.					
APPROACH: Calculate DF based on EPA formula $(Q_s + Q_D)/Q_D$, where Q_s is 7Q10 in million gallons per day (MGD) and Q_D is discharge flow in MGD.					
ASSUMPTIONS: 1. 7Q10 is 29.7 cfs (from StreamStats 4.0) 2. A conversion of 7.48 is used to convert cubic feet to gallons 3. A discharge flowrate of 150 gpm is assumed					
CALCULATIONS:					
<i>7Q10 Low Flow Value (Q_s)</i>					
$Q_s =$	$\frac{29.7 \text{ ft}^3}{\text{sec}}$	X	$\frac{7.48 \text{ gallons}}{\text{ft}^3}$	X	$\frac{86,400 \text{ sec}}{\text{day}}$
				X	$\frac{1 \text{ MG}}{1,000,000 \text{ gallons}}$
$Q_s =$	19.2 MGD				
<i>Discharge Flowrate (Q_D)</i>					
$Q_D =$	$\frac{150 \text{ gallons}}{\text{min}}$	X	$\frac{1,440 \text{ min}}{\text{day}}$	X	$\frac{1 \text{ MG}}{1,000,000 \text{ gallons}}$
$Q_D =$	0.216 MGD				
<i>Dilution Factor (DF)</i>					
$DF =$	$\frac{Q_s + Q_D}{Q_D}$	=	$\frac{19.2 \text{ MGD} + 0.216 \text{ MGD}}{0.216 \text{ MGD}}$	=	89.9
CONCLUSION The dilution factor for this project is calculated to be 89.9 based on the provided 7Q10 low flow value and discharge flowrate.					

Enter number values in green boxes below

Enter values in the units specified

↓	
19.2	Q _R = Enter upstream flow in MGD
0.216	Q _P = Enter discharge flow in MGD
0	Downstream 7Q10

Enter a dilution factor, if other than zero

↓	
0	

Enter values in the units specified

↓	
506	C _d = Enter influent hardness in mg/L CaCO₃
189	C _s = Enter receiving water hardness in mg/L CaCO₃

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

↓	
7.3	pH in Standard Units
10.22	Temperature in °C
0.624	Ammonia in mg/L
189	Hardness in mg/L CaCO₃
0	Salinity in ppt
0	Antimony in µg/L
0	Arsenic in µg/L
0	Cadmium in µg/L
0	Chromium III in µg/L
0	Chromium VI in µg/L
8.14	Copper in µg/L
2280	Iron in µg/L
3.43	Lead in µg/L
0	Mercury in µg/L
2.62	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
49.35	Zinc in µg/L

Enter **influent** concentrations in the units specified

↓	
0	TRC in µg/L
925	Ammonia in mg/L
0	Antimony in µg/L
0	Arsenic in µg/L
0	Cadmium in µg/L
0	Chromium III in µg/L
0	Chromium VI in µg/L
1.29	Copper in µg/L
2060	Iron in µg/L
1.53	Lead in µg/L
0	Mercury in µg/L
0	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
11.22	Zinc in µg/L
0	Cyanide in µg/L
0	Phenol in µg/L
0	Carbon Tetrachloride in µg/L
0	Tetrachloroethylene in µg/L
0	Total Phthalates in µg/L
0	Diethylhexylphthalate in µg/L
0	Benzo(a)anthracene in µg/L
0.113	Benzo(a)pyrene in µg/L
0.108	Benzo(b)fluoranthene in µg/L
0	Benzo(k)fluoranthene in µg/L
0.118	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	89.9					
	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
A. Inorganics						
Ammonia	Report	mg/L	---			
Chloride	Report	µg/L	---			
Total Residual Chlorine	0.2	mg/L	989	µg/L	---	µg/L
Total Suspended Solids	30	mg/L	---			
Antimony	206	µg/L	57529	µg/L		
Arsenic	104	µg/L	899	µg/L		
Cadmium	10.2	µg/L	39.5230	µg/L		
Chromium III	323	µg/L	13246.7	µg/L		
Chromium VI	323	µg/L	1027.8	µg/L		
Copper	242	µg/L	744.1	µg/L		
Iron	5000	µg/L	1000	µg/L		
Lead	160	µg/L	353.54	µg/L		
Mercury	0.739	µg/L	81.43	µg/L		
Nickel	1450	µg/L	7928.2	µg/L		
Selenium	235.8	µg/L	449.4	µg/L		
Silver	35.1	µg/L	1049.6	µg/L		
Zinc	420	µg/L	14375.0	µg/L		
Cyanide	178	mg/L	467.4	µg/L	---	µg/L
B. Non-Halogenated VOCs						
Total BTEX	100	µg/L	---			
Benzene	5.0	µg/L	---			
1,4 Dioxane	200	µg/L	---			
Acetone	7970	µg/L	---			
Phenol	1,080	µg/L	26967	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	4.4	µg/L	143.8	µg/L		
1,2 Dichlorobenzene	600	µg/L	---			
1,3 Dichlorobenzene	320	µg/L	---			
1,4 Dichlorobenzene	5.0	µg/L	---			
Total dichlorobenzene	---	µg/L	---			
1,1 Dichloroethane	70	µg/L	---			
1,2 Dichloroethane	5.0	µg/L	---			
1,1 Dichloroethylene	3.2	µg/L	---			
Ethylene Dibromide	0.05	µg/L	---			
Methylene Chloride	4.6	µg/L	---			
1,1,1 Trichloroethane	200	µg/L	---			
1,1,2 Trichloroethane	5.0	µg/L	---			
Trichloroethylene	5.0	µg/L	---			
Tetrachloroethylene	5.0	µg/L	296.6	µg/L		
cis-1,2 Dichloroethylene	70	µg/L	---			
Vinyl Chloride	2.0	µg/L	---			
D. Non-Halogenated SVOCs						
Total Phthalates	190	µg/L	---	µg/L		
Diethylhexyl phthalate	101	µg/L	197.8	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	1.0	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	0.3416	µg/L	---	µg/L
Benzo(a)pyrene	1.0	µg/L	0.3416	µg/L	---	µg/L
Benzo(b)fluoranthene	1.0	µg/L	0.3416	µg/L	---	µg/L
Benzo(k)fluoranthene	1.0	µg/L	0.3416	µg/L	---	µg/L
Chrysene	1.0	µg/L	0.3416	µg/L	---	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	0.3416	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	0.3416	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	1798	µg/L		
tert-Butyl Alcohol	120	µg/L	---			
tert-Amyl Methyl Ether	90	µg/L	---			

Gerald, Shay

From: Gerald, Shay
Sent: Friday, December 17, 2021 8:09 AM
To: Ruan, Xiaodan (DEP)
Cc: Ballantyne, Heather; Sherwood, Nathan
Subject: RE: 7Q10 + Dilution Factor for NPDES NOI - BHCC- New Academia Building Project

Good Morning Xiaodan,
I just wanted to confirm that we should assume a dilution factor of zero (0) for the application?

Thank you,
Shay Gerald

From: Ruan, Xiaodan (DEP) <xiaodan.ruan@state.ma.us>
Sent: Wednesday, December 15, 2021 2:59 PM
To: Gerald, Shay <SGerald@haleyaldrich.com>
Cc: Ballantyne, Heather <HBallantyne@haleyaldrich.com>; Sherwood, Nathan <NSherwood@haleyaldrich.com>; Vakalopoulos, Catherine (DEP) <catherine.vakalopoulos@state.ma.us>
Subject: RE: 7Q10 + Dilution Factor for NPDES NOI - BHCC- New Academia Building Project

CAUTION: External Email

Hi Shay,

The direct receiving water Millers River is stormwater dominant, and since 7Q10 looks at low flow conditions, we can't calculate a dilution factor. We have not granted dilution for discharges to the Millers River in the past, so there is no dilution allowed for the proposed discharge from the project at 50 New Rutherford Ave, Boston, 02129.

Here is water quality information in assisting you in filling out the NOI:

Waterbody and ID: Unnamed tributary (locally known as Millers River, MA72-31) within Charles River Watershed
Classification: B
Outstanding Resource Water?: no
State's most recent Integrated List is located here: <https://www.epa.gov/sites/production/files/2020-01/documents/2016-ma-303d-list-report.pdf>, search for "MA72-31" to see the causes of impairments.
TMDLs: There is no TMDL for this segment

Also, if this is not a *current* MCP site, then in addition to submitting the NOI to EPA, you need to apply with MassDEP and submit a \$500 fee (unless fee exempt, e.g., municipality). As you might already know that MassDEP has started using ePLACE, an online application submittal process where you will set up a user ID and be able to submit NOIs for various projects and pay by credit card. The instructions are located on this page: <https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent>. Technical assistant information for using the ePLACE is available on the ePLACE application webpage.

Please let me know if you have any questions.

Thanks,
Xiaodan

Xiaodan Ruan
Environmental Engineer
Massachusetts Department of Environmental Protection
One Winter Street, Boston, MA 02108
(857)-256-4172
xiaodan.ruan@mass.gov

From: Vakalopoulos, Catherine (DEP) <catherine.vakalopoulos@mass.gov>
Sent: Wednesday, December 15, 2021 12:03 PM
To: Ruan, Xiaodan (DEP) <xiaodan.ruan@mass.gov>
Cc: SGerald@haleyaldrich.com; Ballantyne, Heather <HBallantyne@haleyaldrich.com>; NSherwood@haleyaldrich.com
Subject: Fw: 7Q10 + Dilution Factor for NPDES NOI - BHCC- New Academia Building Project

Hi Xiaodan,
Are you able to work on this?
Cathy

Cathy Vakalopoulos
Massachusetts Department of Environmental Protection
1 Winter St., Boston, MA 02108, 617-348-4026
Please consider the environment before printing this e-mail

From: Gerald, Shay <SGerald@haleyaldrich.com>
Sent: Wednesday, December 15, 2021 10:28 AM
To: Vakalopoulos, Catherine (DEP) <catherine.vakalopoulos@mass.gov>
Cc: Ballantyne, Heather <HBallantyne@haleyaldrich.com>; Sherwood, Nathan <NSherwood@haleyaldrich.com>
Subject: 7Q10 + Dilution Factor for NPDES NOI - BHCC- New Academia Building Project

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Hi Cathy,

As required in Appendix V of the 2017 NPDES RGP, I have attached to this email our StreamStats report detailing the 7 Day 10 Year (7Q10) low flow value for our project (listed below) along with the dilution factor calculations for your review and confirmation.

Project:
BHCC - New Academia Building
50 New Rutherford Ave
Boston, 02129

Discharge:
Millers River via stormwater system outfall. See attached discharge route.
Design System Flow: 150 gallons per minute (0.216 MGD)
7 Day 10 Year Low Flow value (from attached StreamStats Report) = 29.7 cfs or 19.2 MGD

Dilution Factor (from attached calculations) = 89.9

Can you please confirm if these values are appropriate for use for our project?

Thank you,
Shay

Shay Gerald
Engineer

Haley & Aldrich, Inc.
465 Medford St | Suite 2200
Boston, MA 02129-1400

Office: (617) 886-7522
Mobile: (857) 248-7708

APPENDIX E

Treatment System Information

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.



Be Right™

Controller Comparison



Features	Previous Models		sc200™ Controller	Benefits
	sc100™ Controller	GLI53 Controller		
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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Simplifies analog sensor connections Works with analog and digital sensors
Analog Inputs	N/A	N/A	1 Analog Input Signal Analog 4-20mA Card	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Unprecedented combination of sensor breadth and digital communication options

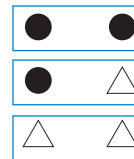
Choose from Hach's Broad Range of Digital and Analog Sensors

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	△

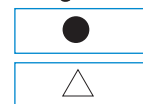
● = Digital △ = Analog

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*

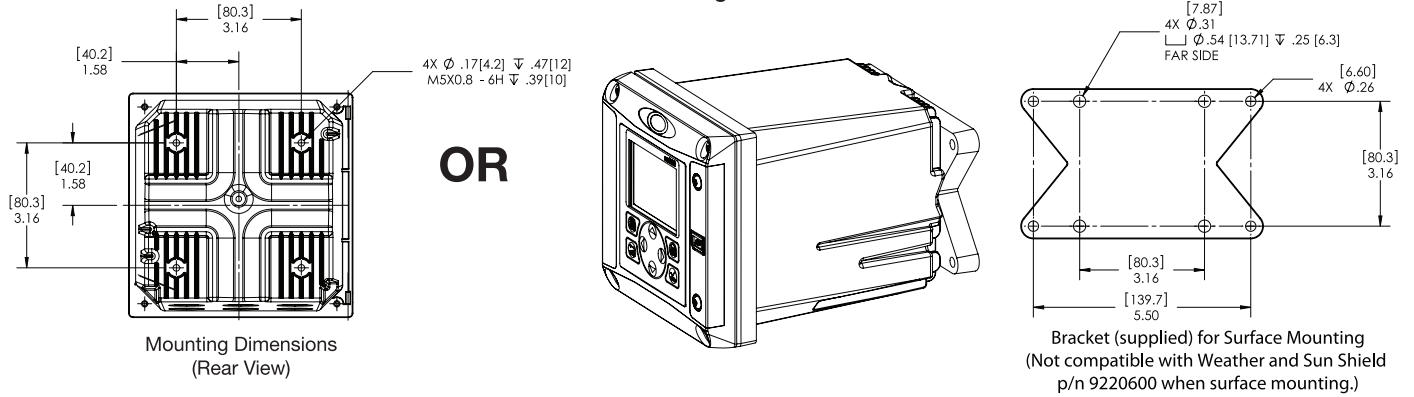
Dimensions (H x W x D)	5.7 in x 5.7 in x 7.1 in (144 mm x 144 mm x 181 mm)
Display	Graphic dot matrix LCD with LED backlighting, transreflective
Display Size	1.9 x 2.7 in. (48 mm x 68 mm)
Display Resolution	240 x 160 pixels
Weight	3.75 lbs. (1.70 kg)
Power Requirements (Voltage)	100 - 240 V AC, 24 V 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

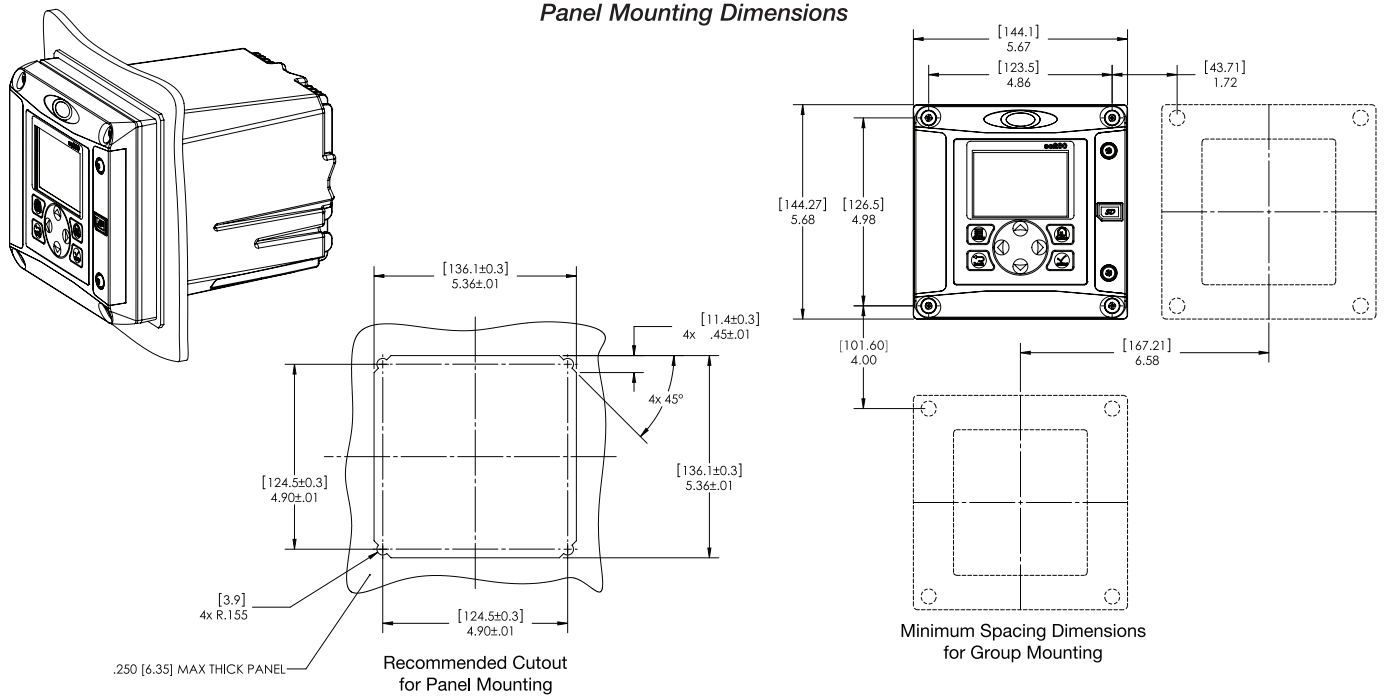
*Subject to change without notice.

Dimensions

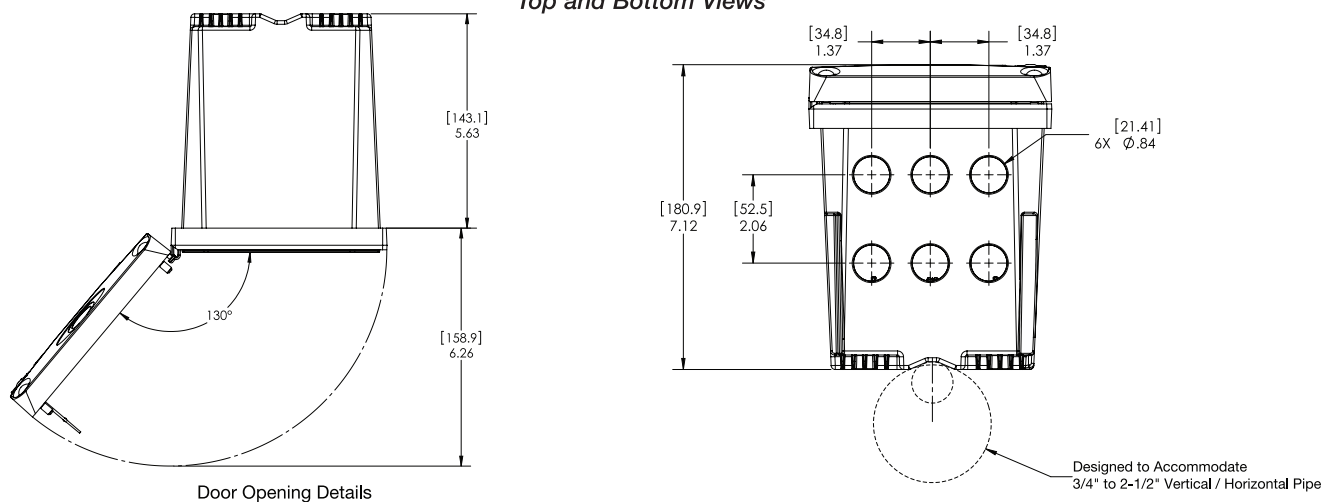
Surface Mounting Dimensions



Panel Mounting Dimensions



Top and Bottom Views



Ordering Information

sc200 for Hach Digital and Analog Sensors

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

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

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

sc200 for Ultrapure Sensors

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

Sensor and Communication Modules

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

Accessories

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



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 Outside United States: 970-669-3050 tel 970-461-3939 fax int@hach.com
hach.com

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In the interest of improving and updating its equipment,

Hach Company reserves the right to alter specifications to equipment at any time.



Be Right™

3/4-inch Combination pH and ORP Sensor Kits

pH/ORP



Use the Digital Gateway to make any Hach analog combination pH or ORP sensor compatible with the Hach sc1000 Controller.



Digital combination pH and ORP sensors are available in convertible, insertion, and sanitary mounting styles. Choose from rugged dome electrodes or "easy-to-clean" flat glass electrodes.

Features and Benefits

Low Price—High Performance

These combination sensors are designed for specialty applications for immersion or in-line mounting. The reference cell features a double-junction design for extended service life, and a built-in solution ground. The body is molded from chemically-resistant Ryton® or PVDF, and the reference junction is coaxial porous PTFE. All sensors are rated 0 to 105°C up to 100 psig, and have integral 4.5 m (15 ft.) cables with tinned leads. The PC-series (for pH) and RC-series (for ORP) combination sensors are ideal for measuring mild and aggressive media.

Special Electrode Configurations

Sensors with rugged dome electrodes, "easy-to-clean" flat glass electrodes, and even HF (hydrofluoric acid) resistant glass electrodes are available for a wide variety of process solutions.

Temperature Compensation Element Option

The PC-series combination pH sensors are available with or without a Pt 1000 ohm RTD temperature element. The RC-series combination ORP sensors are supplied without a temperature element.

Versatile Mounting Styles

Sensors are available in three mounting styles—convertible, insertion, and sanitary. Please turn to page 3 for more information.

Full-Featured "Plug and Play" Hach sc Digital Controllers

There are no complicated wiring or set up procedures with any Hach sc controller. Just plug in any combination of Hach digital sensors and it's ready to use—it's "plug and play."

One or multiple sensors—The sc controller family allows you to receive data from up to eight Hach digital sensors in any combination using a single controller.

Communications—Multiple alarm/control schemes are available using the relays and PID control outputs. Available communications include analog 4-20 mA, digital MODBUS® (RS485 and RS232) or Profibus DP protocols. (Other digital protocols are available. Contact your Hach representative for details.)

Data logger—A built-in data logger collects measurement data, calibration, verification points, and alarm history.

DW = drinking water WW = wastewater municipal PW = pure water / power
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

DW

WW

PW

IW

Specifications*

Most pH applications fall in the 2.5-12.5 pH range. General purpose pH glass electrodes perform well in this range. Some industrial applications require accurate measurements and control at pH values below 2 or above 12. Consult Hach Technical Support for details on these applications.

Combination pH Sensors

Measuring Range

0 to 14 pH

Accuracy

Less than 0.1 pH under reference conditions

Temperature Range

0 to 105°C (32 to 221°F)

Flow Rate

0 to 2 m/s (0 to 6.6 ft./s); non-abrasive

Pressure Range

0 to 6.9 bar at 100°C (0 to 100 psig at 212°F)

Signal Transmission Distance

100 m (328 ft.) when used with the Hach Digital Gateway and a Hach sc Digital Controller.

1000 m (3280 ft.) when used with the Hach Digital Gateway, Termination Box, and a Hach sc Digital Controller.

Sensor Cable

Integral coaxial cable (plus two conductors for temperature compensator option); 4.5 m (15 ft.) long

Wetted Materials

Convertible style: Ryton® body (glass filled)

Insertion style: PVDF body (Kynar®)

Sanitary style: 316 stainless steel sleeved PVDF body

Common materials for all sensor styles include PTFE double junction, glass process electrode, and Viton® O-rings

Warranty

90 days

Combination ORP Sensors

Measuring Range

-2000 to +2000 millivolts

Accuracy

Limited to calibration solution accuracy (\pm 20 mV)

Temperature Range

0 to 105°C (32 to 221°F)

Flow Rate

0 to 2 m/s (0 to 6.6 ft./s); non-abrasive

Pressure Range

0 to 6.9 bar at 100°C (0 to 100 psig at 212°F)

Signal Transmission Distance

100 m (328 ft.) when used with the Hach Digital Gateway and a Hach sc Digital Controller.

1000 m (3280 ft.) when used with the Hach Digital Gateway, Termination Box, and a Hach sc Digital Controller.

Sensor Cable

Integral coaxial cable; 4.5 m (15 ft.) long; terminated with stripped and tinned wires

Wetted Materials

Convertible style: Ryton® body (glass filled)

Insertion style: PVDF body (Kynar®)

Common materials for all sensor styles include PTFE double junction, glass with platinum process electrode, and Viton® O-rings

Warranty

90 days

*Specifications subject to change without notice.

Ryton® is a registered trademark of Phillips 66 Co.; Viton® is a registered trademark of E.I. DuPont de Nemours + Co.; Kynar® is a registered trademark of Pennwalt Corp.

Engineering Specifications

- The pH sensor shall be available in convertible, insertion or sanitary styles. The ORP sensor shall be available in only convertible or insertion styles.
- The convertible style sensor shall have a Ryton® body. The insertion style sensor shall have a PVDF body. The sanitary style sensor shall have a 316 stainless steel sleeved PVDF body. Common materials for all sensor styles shall include a PTFE double junction, and Viton® O-rings. The pH sensor shall have a glass pH electrode. The ORP sensor shall have a platinum ORP electrode.
- The convertible style pH sensor shall be available with or without a built-in Pt 1000 ohm RTD temperature element. Insertion and sanitary style pH sensors shall have a built-in Pt 1000 ohm RTD temperature element. Convertible and insertion style ORP sensors shall not have a built-in temperature element.
- The sensor shall communicate via MODBUS® RS-485 to a Hach sc Digital Controller.
- The sensor shall be Hach Company Model PC sc or PC-series for pH measurement or Model PC sc or RC-series for ORP measurement.

Dimensions

Convertible Style Sensor

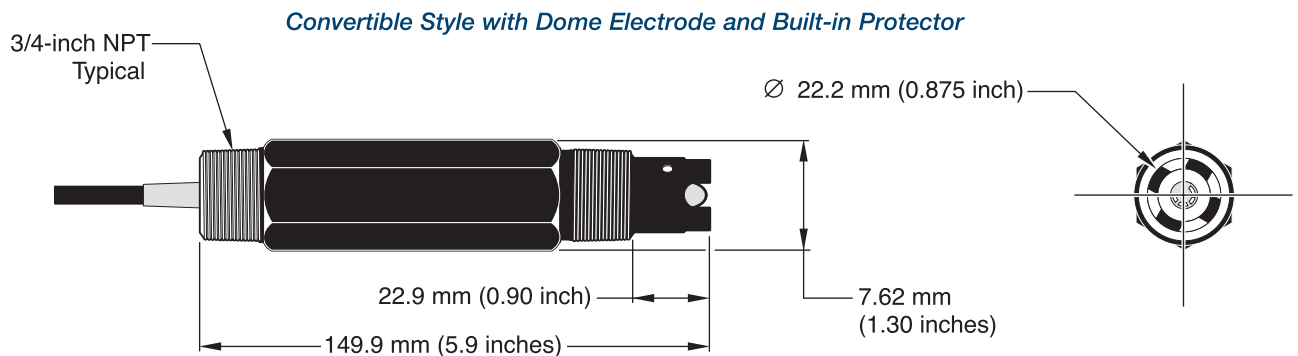
The convertible style sensor has a Ryton® body that features 3/4-inch NPT threads on both ends. The sensor can be directly mounted into a standard 3/4-inch pipe tee for flow-through mounting or fastened onto the end of a pipe for immersion mounting. The convertible style sensor enables inventory consolidation, thereby reducing associated costs. Mounting tees and immersion mounting hardware are offered in a variety of materials to suit application requirements.

Insertion Style Sensor

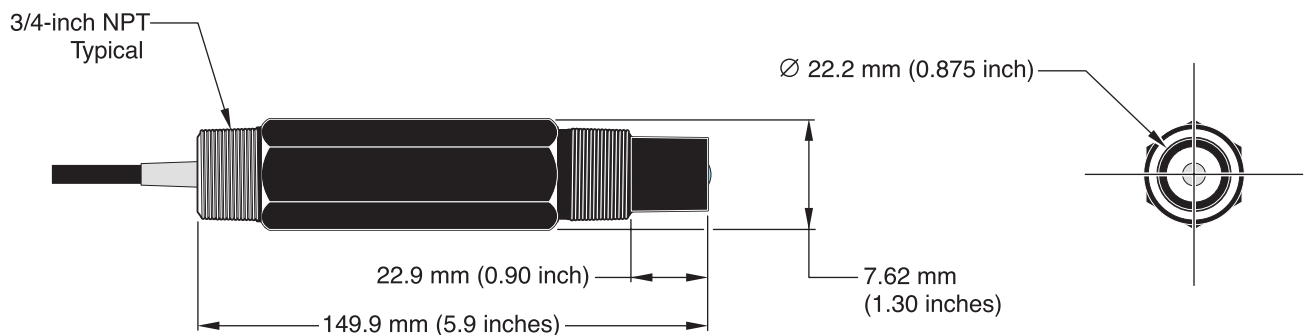
Insertion style sensors feature a longer, non-threaded PVDF body with two Viton® O-rings, providing a seal when used with the optional Hach insertion mount hardware assembly. This ball valve hardware enables sensor insertion and retraction from a pipe or vessel without having to stop the process flow.

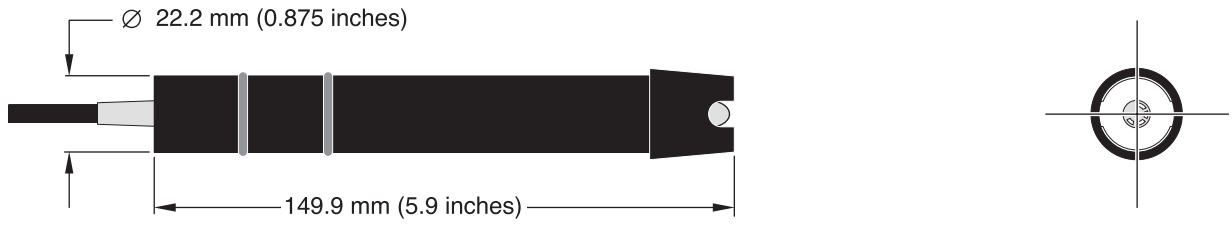
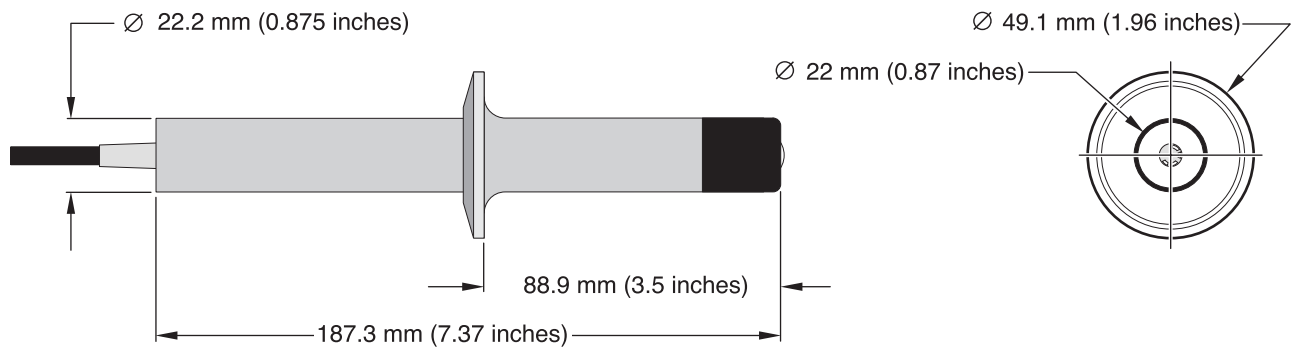
Sanitary Style Sensor

The sanitary style sensor, offered for pH measurement, has a 316 stainless steel-sleeved PVDF body with a 2-inch flange. The sensor mates to a standard 2-inch Tri-Clover fitting. The optional Hach sanitary mounting hardware includes a standard 2-inch sanitary tee, sanitary clamp, and Viton® sanitary gasket.



Convertible Style with Flat Electrode



Dimensions *continued**Insertion Style with Dome Electrode and Built-In Protector**Sanitary Style*

Ordering Information

Digital PC sc and RC sc 3/4-inch Combination pH/ORP Sensors

All PC sc and RC sc 3/4-inch combination sensors come complete with an integral 4.5 m (15 ft.) sensor cable, Digital Gateway, and 1 m (3.3 ft.) digital extension cable.

<i>Product Number</i>	<i>Measurement</i>	<i>Sensor Style</i>	<i>Body Material</i>	<i>Electrode Type</i>	<i>Temp. Comp.</i>
DPC1R1N	pH	Convertible	Ryton	General purpose glass	None
DPC1R1A	pH	Convertible	Ryton	General purpose glass	Pt 1000 ohm RTD
DPC1R2N	pH	Convertible	Ryton	Flat glass, general purpose	None
DPC1R2A	pH	Convertible	Ryton	Flat glass, general purpose	Pt 1000 ohm RTD
DPC1R3A	pH	Convertible	Ryton	HF-resistant glass (see Note)	Pt 1000 ohm RTD
DPC2K1A	pH	Insertion	PVDF	General purpose glass	Pt 1000 ohm RTD
DPC2K2A	pH	Insertion	PVDF	Flat Glass	Pt 1000 ohm RTD
DPC3K2A	pH	Sanitary	316 SS/PVDF	General purpose glass	Pt 1000 ohm RTD
DRC1R5N	ORP	Convertible	Ryton	Platinum	None
DRC2K5N	ORP	Insertion	PVDF	Platinum	None

NOTE

The HF (hydrofluoric acid) resistant glass electrode reduces the HF dissolution of the complete glass surface to extend the lifetime of the electrode in acid fluoride solutions. The electrode will last longer than conventional glass pH electrodes. How much longer depends on the HF concentration and temperature of the solution.

Replacement Digital Gateway

6120600 Use the Digital Gateway to connect analog PC and RC sensors to a Hach sc Digital Controller.

Ordering Information *continued*

Analog PC and RC 3/4-inch Combination pH/ORP Sensors

All PC and RC 3/4-inch combination sensors come with an integral 4.5 m (15 ft.) standard length sensor cable.

<i>Product Number</i>	<i>Measurement</i>	<i>Sensor Style</i>	<i>Body Material</i>	<i>Electrode Type</i>	<i>Temp. Comp.</i>
PC1R1N	pH	Convertible	Ryton	General purpose glass	None
PC1R1A	pH	Convertible	Ryton	General purpose glass	Pt 1000 ohm RTD
PC1R2N	pH	Convertible	Ryton	Flat glass, general purpose	None
PC1R2A	pH	Convertible	Ryton	Flat glass, general purpose	Pt 1000 ohm RTD
PC1R3A	pH	Convertible	Ryton	HF-resistant glass	Pt 1000 ohm RTD
PC2K1A	pH	Insertion	PVDF	General purpose glass	Pt 1000 ohm RTD
PC2K2A	pH	Insertion	PVDF	Flat Glass	Pt 1000 ohm RTD
PC3K2A	pH	Sanitary	316 SS/PVDF	General purpose glass	Pt 1000 ohm RTD
RC1R5N	ORP	Convertible	Ryton	Platinum	None
RC2K5N	ORP	Insertion	PVDF	Platinum	None

Accessories for Digital and Analog 3/4-inch combination pH/ORP Sensors

Cables

Digital cables are used only with digital sensors or gateways when connecting to a Hach sc Digital Controller.

6122400	Digital Extension Cable, 1 m (3.3 ft)
5796000	Digital Extension Cable, 7.7 m (25 ft)
5796100	Digital Extension Cable, 15 m (50 ft)
5796200	Digital Extension Cable, 31 m (100 ft)

Analog cables are used only with analog sensors, junction box, and controller.

1W1100	Analog Interconnect Cable (order per foot)
---------------	--

Digital Termination Box

Used with digital extension cables when the desired cable length between the digital sensor/digital gateway and the Hach sc Digital Controller is between 100 m (328 ft) and 1000 m (3280 ft).

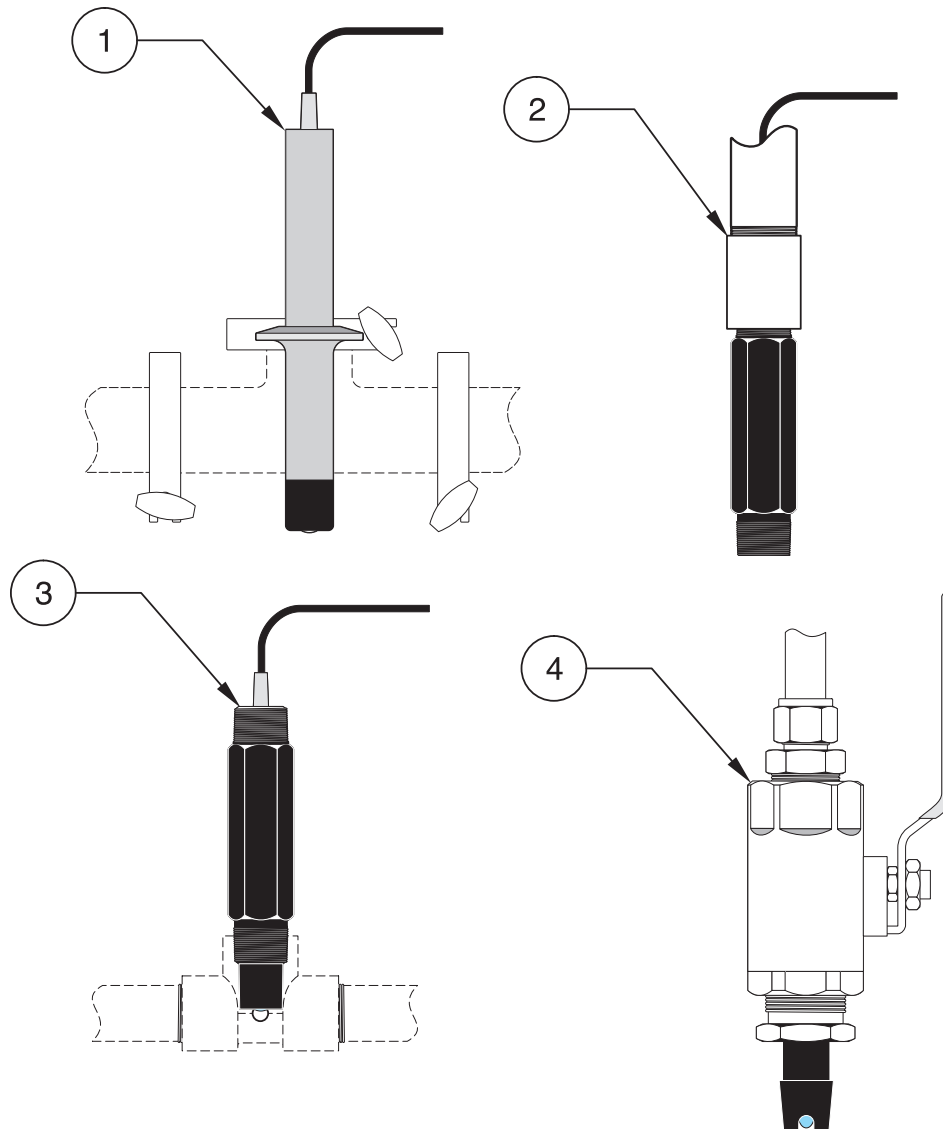
5867000	Digital Termination Box
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Analog Junction Box

Used with analog interconnect cable when the desired cable length between analog sensor and analog controller is greater than the standard length of sensor cable. Each junction box includes terminal strip and gasket.

60A2053	Junction Box, Surface-mount, aluminum (includes mounting hardware)
60A9944	Junction Box, Pipe-mount, PVC, for 1/2-inch diameter pipe (includes mounting hardware)
60G2052	Junction Box, Pipe-mount, PVC, for 1-inch diameter pipe (includes mounting hardware)
76A4010-001	Junction Box, NEMA 4X (no mounting hardware included)

Ordering Information *continued*



1. Sanitary Mounting

2. Immersion Mounting

3. Flow-through Mounting

4. Insertion Mounting

Mounting Hardware for PC sc and RC sc Combination Sensors

Sanitary Mount Hardware

- 9H1310** 2-inch Sanitary Tee
- 9H1132** 2-inch Sanitary Clamp
- 9H1384** 2-inch Sanitary Viton Gasket

Immersion Mount Hardware

Each immersion hardware includes a 1/2-inch diameter x 4 foot long pipe, 1/2 x 3/4-inch NPT coupling, and plastic pipe-mount junction box with terminal strip.

- MH432G** CPVC Pipe

Flow-through Mount Hardware

Each tee is a standard 3/4-inch tee with 3/4-inch NPT threads on all three openings.

- MH313N3NZ** 316 SS Tee
- MH333N3NZ** CPVC Tee
- MH373N3NZ** PVC Tee

Insertion Mount Hardware

The insertion hardware includes a 1-1/2 inch ball valve, 1-1/2 inch NPT close nipple for process connection, sensor connection tube, stainless steel extension pipe, and stainless steel compression fitting with washer and lock nut.

- MH116M3MZ** 316 SS Hardware

To complete your pH and ORP measurement system, choose from these Hach controllers...

Model sc200 Controller

(see Lit. #2665)

The sc200 controller platform can be configured to operate either 2 Digital Sensor Inputs, or 1 or 2 Analog Sensor Inputs, or a combination of Digital and Analog Sensor Inputs. Customers may choose their communication options from a variety of offerings ranging from MODBUS RTU to Profibus DPV1.



sc200 for Hach Digital Sensors

- LXV404.99.00552** sc200 controller, 2 channel, digital
- LXV404.99.00502** sc200 controller, 1 channel, digital
- LXV404.99.00542** sc200 controller, 2 channel, digital & mA input
- LXV404.99.00512** sc200 controller, 2 channel, digital & pH/DO
- LXV404.99.00522** sc200 controller, 2 channel, digital & Conductivity
- LXV404.99.00532** sc200 controller, 2 channel, digital & Flow

sc200 for Hach Analog Sensors

- LXV404.99.00102** sc200 controller, 1 channel, pH/DO
- LXV404.99.00112** sc200 controller, 2 channel, pH/DO
- LXV404.99.00202** sc200 controller, 1 channel, Conductivity
- LXV404.99.00222** sc200 controller, 2 channel, Conductivity
- LXV404.99.00212** sc200 controller, 2 channel, pH/DO & Conductivity
- LXV404.99.00302** sc200 controller, 1 channel, Flow
- LXV404.99.00332** sc200 controller, 2 channel, Flow
- LXV404.99.00312** sc200 controller, 2 channel, Flow & pH/DO
- LXV404.99.00322** sc200 controller, 2 channel, Flow & Conductivity

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

Note: Communication options (MODBUS and Profibus DPV1) are available.

Model sc1000 Controller

(see Lit. #2403)

Each sc1000 Probe Module provides power to the system and can accept up to 8 digital sensors/expansion boards. Probe Modules can be networked together to accommodate up to 32 digital sensors/expansion boards attached to the same network.



- LXV402.99.00002** sc1000 Display Module
- LXV400.99.1R572** sc1000 Probe Module, 4 sensors, 4 mA Out, 4 mA In, 4 Relays, 110-230V
- LXV400.99.1B572** sc1000 Probe Module, 4 sensors, 4 mA Out, 4 mA In, 4 Relays, RS-485 (MODBUS), 110-230V
- LXV400.99.1F572** sc1000 Probe Module, 4 sensors, 4 mA Out, 4 mA In, 4 Relays, PROFIBUS DP, 110-230V
- LXV400.99.1R582** sc1000 Probe Module, 6 sensors, 4 mA Out, 4 mA In, 4 Relays, 110-230V

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.



At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...

Keep it pure.

Make it simple.

Be right.

For current price information, technical support, and ordering assistance, contact the Hach office or distributor serving your area.

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Fax: 970-669-2932
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www.hach.com

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www.hach-lange.com



Be Right™

95-Gallon OverPack Salvage Drum #A95OVER - 32" dia x 41.5", 1 each/package



Stock a SpillTech® OverPack with sorbents for emergency spill response, or use it as a salvage drum to ship damaged containers or hazardous waste.

- **DOT-Approved for Salvage:** All SpillTech® OverPacks are DOT-approved and X-rated for use as salvage drums. Helps companies conform to federal regulations when shipping damaged or leaking containers of hazardous materials, or absorbents contaminated with hazardous substances.
- **Perfect for Spill Kits:** Stores sorbent products (not included) for easy access as needed for spill control. Saves time when quick response is necessary.
- **Sturdy Construction:** 100% polyethylene OverPack resists chemicals, rust and corrosion for years of use. Integrated handles make them easy to lift, move or carry with standard material handling equipment. Twist-on, double-wall lid with closed-cell gasket provides sealed, secure closure to prevent leaks and protect contents from moisture, dirt and damage. Durable to withstand rough handling.
- **Customized for You:** We can customize a Spill Kit to your exact specifications, including the container, its contents and accessories, with no upcharge! Contact your local Distributor for details.

A95OVER Specifications

Dimensions:	ext. dia. 32" x 41.5" H
Shipping	31.75" W x 41.5" L x 31.75" H
Dimensions:	
Sold as:	1 per package
Color:	Yellow
Composition:	Polyethylene
Weight:	48 lbs.
# per Pallet:	3
Incinerable:	No
UN RATING:	1H2/X295/S
Ship Class:	250

Metric Equivalent Specifications

Dimensions:	ext. dia. 81.3cm x 105.4cm H
Shipping	80.6cm W x 105.4cm L x 80.6cm H
Dimensions:	
Weight:	21.8 kg

A95OVER Technical Information

Warnings & Restrictions:

There are no known warnings and restrictions for this product.

Regulations and Compliance:

49 CFR 173.3(c)(1) - If a container of hazardous waste is damaged or leaking, it can be placed in a compatible salvage drum that meets UN criteria for shipping

49 CFR 173.12(b)(2)(iv) - When labpacking, "Inner packagings...must be surrounded by a chemically compatible absorbent material in sufficient quantity to absorb the total liquid contents."

49 CFR 173.12(b) - A container used for labpacking must be "a UN 1A2 or UN 1B2 metal drum, a UN 1D plywood drum, a UN 1G fiber drum or a UN 1H2 plastic drum tested and marked at least for the Packing Group III performance level for liquids or solids."

Technical Documents:

(Available at spilltech.com)

Product Data Sheet (PDS)

Chemical Compatibility (CCG)



Online:
spilltech.com

Phone:
1-800-228-3877 (N.Am.)
1-770-475-3877 (Other)

Fax:
1-800-872-3764 (N.Am.)
1-770-410-1812 (Other)

Email:
sales@spilltech.com

SAFETY DATA SHEET

Creation Date 12-Nov-2010

Revision Date 24-May-2017

Revision Number 5

1. Identification

Product Name Sulfuric Acid (Certified ACS Plus)

Cat No. : A300-212; A300-225LB; A300-500; A300-612GAL; A300-700LB;
A300C212; A300C212EA; A300P500; A300S212; A300S212EA;
A300S500; A300SI212

Synonyms Hydrogen sulfate; Vitriol brown oil; Oil of vitriol

Recommended Use Laboratory chemicals.

Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company

Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number

CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word

Danger

Hazard Statements

Causes severe skin burns and eye damage
May cause respiratory irritation



Precautionary Statements**Prevention**

Do not breathe dust/fume/gas/mist/vapors/spray
 Wear protective gloves/protective clothing/eye protection/face protection
 Wash face, hands and any exposed skin thoroughly after handling
 Use only outdoors or in a well-ventilated area

Response

Immediately call a POISON CENTER or doctor/physician

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Skin

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
 Wash contaminated clothing before reuse

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Ingestion

IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

Storage

Store locked up
 Store in a well-ventilated place. Keep container tightly closed

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

WARNING! This product contains a chemical known in the State of California to cause cancer.

Unknown Acute Toxicity

3. Composition / information on ingredients

Component	CAS-No	Weight %
Sulfuric acid	7664-93-9	90 - 98
Water	7732-18-5	2 - 10

4. First-aid measures

General Advice	Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.
Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing before re-use. Call a physician immediately.
Inhalation	If not breathing, give artificial respiration. Remove from exposure, lie down. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician immediately.
Ingestion	Do not induce vomiting. Clean mouth with water. Never give anything by mouth to an unconscious person. Call a physician immediately.
Most important symptoms/effects	Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media CO₂, dry chemical, dry sand, alcohol-resistant foam.

Unsuitable Extinguishing Media DO NOT USE WATER

Flash Point Not applicable
Method - No information available

Autoignition Temperature No information available

Explosion Limits

Upper No data available

Lower No data available

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes.

Hazardous Combustion Products

Sulfur oxides Hydrogen

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health
3

Flammability
0

Instability
2

Physical hazards
W

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental Precautions Should not be released into the environment.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe vapors or spray mist. Do not ingest.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from water. Corrosives area.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Sulfuric acid	TWA: 0.2 mg/m ³	(Vacated) TWA: 1 mg/m ³ TWA: 1 mg/m ³	IDLH: 15 mg/m ³ TWA: 1 mg/m ³	TWA: 1 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures	Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.
Personal Protective Equipment	
Eye/face Protection	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin and body protection	Long sleeved clothing.
Respiratory Protection	Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Clear, Colorless to brown
Odor	Odorless
Odor Threshold	No information available
pH	0.3 (1N)
Melting Point/Range	10 °C / 50 °F
Boiling Point/Range	290 - 338 °C / 554 - 640.4 °F
Flash Point	Not applicable
Evaporation Rate	Slower than ether
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	< 0.001 mmHg @ 20 °C
Vapor Density	3.38 (Air = 1.0)
Specific Gravity	1.84
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	340°C
Viscosity	No information available
Molecular Formula	H2SO4
Molecular Weight	98.08

10. Stability and reactivity

Reactive Hazard	Yes
Stability	Reacts violently with water. Hygroscopic.
Conditions to Avoid	Incompatible products. Excess heat. Exposure to moist air or water.
Incompatible Materials	Water, Organic materials, Strong acids, Strong bases, Metals, Alcohols, Cyanides, Sulfides
Hazardous Decomposition Products	Sulfur oxides, Hydrogen
Hazardous Polymerization	Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Oral LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Dermal LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Vapor LC50

Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sulfuric acid	2140 mg/kg (Rat)	Not listed	LC50 = 510 mg/m ³ (Rat) 2 h
Water	-	Not listed	Not listed

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation

Causes severe burns by all exposure routes

Sensitization

No information available

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen. Exposure to strong inorganic mists containing sulfuric acid may cause cancer by inhalation.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Sulfuric acid	7664-93-9	Group 1	Known	A2	X	A2
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed

IARC: (International Agency for Research on Cancer)

IARC: (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

A1 - Known Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

Mexico - Occupational Exposure Limits - Carcinogens

A1 - Confirmed Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Confirmed Animal Carcinogen

A4 - Not Classifiable as a Human Carcinogen

A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects

No information available

Reproductive Effects

No information available.

Developmental Effects

No information available.

Teratogenicity

No information available.

STOT - single exposure

Respiratory system

STOT - repeated exposure

None known

Aspiration hazard

No information available

Symptoms / effects, both acute and delayed

Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

This product contains the following substance(s) which are hazardous for the environment. .

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sulfuric acid	-	LC50: > 500 mg/L, 96h static (Brachydanio rerio)	-	EC50: 29 mg/L/24h

Persistence and Degradability No information available

Bioaccumulation/ Accumulation No information available.

Mobility No information available.

13. Disposal considerations

Waste Disposal Methods 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 to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1830
 Proper Shipping Name Sulfuric acid
 Hazard Class 8
 Packing Group II

TDG

UN-No UN1830
 Proper Shipping Name SULFURIC ACID
 Hazard Class 8
 Packing Group II

IATA

UN-No UN1830
 Proper Shipping Name SULFURIC ACID
 Hazard Class 8
 Packing Group II

IMDG/IMO

UN-No UN1830
 Proper Shipping Name SULFURIC ACID
 Hazard Class 8
 Packing Group II

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Sulfuric acid	X	X	-	231-639-5	-		X	X	X	X	X
Water	X	X	-	231-791-2	-		X	-	X	X	X

Legend:

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Sulfuric acid	7664-93-9	90 - 98	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	Yes

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Sulfuric acid	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Sulfuric acid	1000 lb	1000 lb

California Proposition 65 This product contains the following proposition 65 chemicals

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Sulfuric acid	7664-93-9	Carcinogen	-	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Sulfuric acid	X	X	X	X	X
Water	-	-	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 12-Nov-2010
Revision Date 24-May-2017
Print Date 24-May-2017
Revision Summary SDS sections updated. 2.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

PULSAFEEDER®

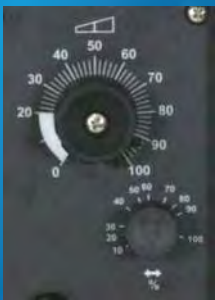
The Pulsatron Series A Plus offers manual function controls over stroke length and stroke rate as standard with the option to select external pace for automatic control.

Ten distinct models are available, having pressure capabilities to 250 PSIG (17 BAR) @ 12 GPD (1.9 lph), and flow capacities to 58 GPD (9.1 lph) @ 100 PSIG (7.0 BAR), with a standard turndown ratio of 100:1, and optional ratio of 1000:1. Metering performance is reproducible to within $\pm 3\%$ of maximum capacity.

Features

- Manual Control by on-line adjustable stroke rate and stroke length.
- Highly Reliable timing circuit.
- Circuit Protection against voltage and current upsets.
- Solenoid Protection by thermal overload with auto-reset.
- Water Resistant, for outdoor and indoor applications.
- Internally Dampened To Reduce Noise.
- Guided Ball Check Valve Systems, to reduce back flow and enhance outstanding priming characteristics.
- Few Moving Parts and Wall Mountable.
- Safe & Easy Priming with durable leak-free bleed valve assembly (standard).
- Optional Control: External pace with auto/manual selection.

Controls



Manual Stroke Rate

Manual Stroke Length

External Pacing - Optional

External Pace With Stop - Optional (125 SPM only)

Controls Options

Feature	Standard Configuration	Optional Configuration ¹
External Pacing	—	Auto / Manual Selection ²
External Pace w/ Stop (125 SPM only)	—	Auto / Manual Selection ²
Manual Stroke Rate	10:1 Ratio	100:1 Ratio
Manual Stroke Length	10:1 Ratio	10:1 Ratio
Total Turndown Ratio	100:1 Ratio	1000:1 Ratio

Note 1: On S2, S3 & S4 sizes only.

Note 2: Not available on 1000:1 turndown pumps.

1. Tested and Certified by WQA against NSF/ANSI 61 & 372.



1. PVDF and Degassing Head Pumps
See www.wqa.org for certification parameters.

Operating Benefits

- Reliable metering performance.
- Rated "hot" for continuous duty.
- High viscosity capability.
- Leak-free, sealless, liquid end.



Aftermarket

- KOPkits
- Gauges
- Dampeners
- Pressure Relief Valves
- Tanks
- Pre-Engineered Systems
- Process Controllers (MicroVision)



PULSAtron® Series A Plus
Electronic Metering Pumps

PULSAtron® Series A Plus

Specifications and Model Selection

MODEL		LBC2	LB02	LBC3	LB03	LB04	LB64	LBC4	LBS2	LBS3	LBS4		
Capacity nominal (max.)	GPH	0.25	0.25	0.42	0.50	1.00	1.25	2.00	0.50	1.38	2.42		
	GPD	6	6	10	12	24	30	48	12	33	58		
	LPH	0.9	0.9	1.6	1.9	3.8	4.7	7.6	1.9	5.2	9.14		
Pressure ³ (max.)	GFPP, PVDF, 316SS or PVC (W code) w/TFE Seats	PSIG (Bar)	250 (17)	150 (10)	250 (17)	150 (10)	100 (7)	100 (7)	50 (3.3)	250 (17)	150 (10)	100 (7)	
	PVC (V code) Viton or CSPE Seats / Degas Liquid End		150 (10)										
Connections:	Tubing	1/4" ID X 3/8" OD						3/8" ID X 1/2" OD		1/4" ID X 3/8" OD			
	Piping	1/4" FNPT											
Strokes/Minute	SPM	125								250			

Note 3: Pumps with rated pressure above 150 PSI will be de-rated to 150 PSI Max. when selecting certain valve options, see Price Book for details.

Engineering Data

Pump Head Materials Available: GFPP, PVC, PVDF, 316 SS, PTFE-faced CSPE-backed

Diaphragm: PTFE-faced CSPE-backed

Check Valves Materials Available: PTFE, CSPE, Viton

Seats/O-Rings: PTFE, CSPE, Viton

Balls: Ceramic, PTFE, 316 SS, Alloy C

Fittings Materials Available: GFPP, PVC, PVDF

Bleed Valve: Same as fitting and check valve selected, except 316SS

Injection Valve & Foot Valve Assy: Same as fitting and check valve selected

Tubing: Clear PVC, White PE

Important: Material Code - GFPP=Glass-filled Polypropylene, PVC=Polyvinyl Chloride, PE=Polyethylene, PVDF=Polyvinylidene Fluoride, CSPE=Generic formulation of Hypalon, a registered trademark of E.I. DuPont Company. Viton is a registered trademark of E.I. DuPont Company. PVC wetted end recommended for sodium hypochlorite.

Engineering Data

Reproducibility: +/- 3% at maximum capacity

Viscosity Max CPS: 1000 CPS

Stroke Frequency Max SPM: 125 / 250 by Model

Stroke Frequency Turn-Down Ratio: 10:1/100:1 by Model

Stroke Length Turn-Down Ratio: 10:1

Power Input: 115 VAC/50-60 HZ/1 ph, 230 VAC/50-60 HZ/1 ph

Average Current Draw:

@ 115 VAC; Amps: 0.6 Amps

@ 230 VAC; Amps: 0.3 Amps

Peak Input Power: 130 Watts

Average Input Power @ Max SPM: 50 Watts

Custom Engineered Designs – Pre-Engineered Systems

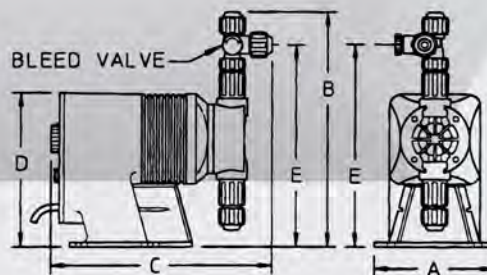


Pre-Engineered Systems
Pulsafeeder's Pre-Engineered Systems are designed to provide complete chemical feed solutions for all electronic metering applications. From stand alone simplex pH control applications to full-featured, redundant sodium hypochlorite disinfection metering, these rugged fabricated assemblies offer turn-key simplicity and industrial-grade durability. The UV-stabilized, high-grade HDPE frame offers maximum chemical compatibility and structural rigidity. Each system is factory assembled and hydrostatically tested prior to shipment.

Dimensions

Series A PLUS Dimensions (inches)						
Model No.	A	B	C	D	E	Shipping Weight
LB02 / S2	5.0	9.6	9.5	6.5	8.2	10
LBC2	5.0	9.9	9.5	6.5	8.5	10
LBC3	5.0	9.9	9.5	6.5	8.5	10
LB03 / S3	5.0	9.9	9.5	6.5	8.5	10
LB04 / S4	5.0	9.9	9.5	6.5	8.5	10
LB64	5.0	9.9	9.5	6.5	8.5	10
LBC4	5.0	9.9	9.5	6.5	8.5	10

NOTE: Inches X 2.54 = cm





Applied Polymer Systems

519 Industrial Drive, Woodstock, GA 30189

www.siltstop.com

Phone: 678-494-5998

Toll-free: 866-200-9868

Fax: 678-494-5298

APS 700 Series Floc Logs[®]

Polyacrylamide Sediment and Turbidity Control Applicator Logs

APS 700 Series Floc Logs are a group of soil-specific tailored log-blocks that contain blends of water treatment components and polyacrylamide co-polymer for water clarification. They reduce and prevent fine particles and colloidal clays from suspension in stormwater. There are several types of Floc Logs designed to treat most water and soil types. Contact Applied Polymer Systems, Inc. or your local distributor for free testing and site-specific application information.

Primary Applications

- Mine tailings and waste pile ditches
- Stormwater drainage from construction and building sites
- Road and highway construction runoff ditches
- Ditch and treatment system placement for all forms of highly turbid waters (less than 4% solids)
- Dredging operations as a flocculent

Features and Benefits

- Removes solubilized soils and clay from water
- Prevents colloidal solutions in water within ditch systems
- Binds cationic metals within water, reducing solubilization
- Binds pesticides and fertilizers within runoff water
- Reduces operational and cleanup costs
- Reduces environmental risks and helps meet compliance

Specifications / Compliances

- ANSI/NSF Standard 60 Drinking water treatment chemical additives
- 48h or 96h Acute Toxicity Tests (*D. magna* or *O. mykiss*)
- 7 Day Chronic Toxicity Tests (*P. promelas* or *C. dubia*)

Packaging

APS 700 Series Floc Logs are packaged in boxes of four (4)

Technical Information

Appearance - semi-solid block

Biodegradable internal coconut skeleton

Percent Moisture - 40% maximum

pH 0.5% Solution - 6-8

Shelf Life – up to 5 years when stored out of UV rays



Applied Polymer Systems

519 Industrial Drive, Woodstock, GA 30189

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Phone: 678-494-5998

Toll-free: 866-200-9868

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Placement

Floc Logs are designed for placement within ditches averaging three feet wide by two feet deep. Floc log placement is based on gallon per minute flow rates. Note: actual GPM or dosage will vary based on site criteria and soil/water testing.

Directions for Use

(Water and Floc Log Mixing is Very Important!)

APS 700 Series Floc Logs should be placed within the upper quarter to half of a *stabilized* ditch system or as close as possible to active earth moving activities. Floc Logs have built in ropes with attachment loops which can be looped over stakes to ensure they remain where placed. Mixing is key! If the flow rate is too slow, adding sand bags, cinder blocks, etc., can create the turbulence required for proper mixing. Floc Logs are designed to treat dirty water, not liquid mud; when the water contains heavy solids (exceeding 4%), it will be necessary to create a sediment or grit pit to let the heavy solids settle before treating the water.

Floc Logs must not be placed in areas where heavy erosion would result in the Floc Logs becoming buried. Where there is heavy sedimentation, maintenance will be required.

APS 700 Series Floc Logs can easily be moved to different locations as site conditions change. Water quality will be improved with the addition of a dispersion field or soft armor covered ditch checks below the Floc Log(s) to collect flocculated particulate. Construction of mixing weirs may be required in areas where short ditch lines, swelling clays, heavy particle concentrations, or steep slopes may be encountered.

Cleanup:

Latex or rubber gloves are recommended for handling during usage. Use soap and water to wash hands after handling.

Precautions / Limitations

- APS 700 Series Floc Logs are extremely slippery when wet.
- Clean up spills quickly. Do not use water unless necessary as extremely slippery conditions will result and if water is necessary, use pressure washer.
- APS Floc Log will remain viable for up to 5 years when stored out of UV rays.
- APS 700 Series Floc Logs have been specifically tailored to specific water and soil types and samples must be tested. Testing is necessary and is free.
- For product information, treatment system design assistance, or performance issues, contact Applied Polymer Systems.

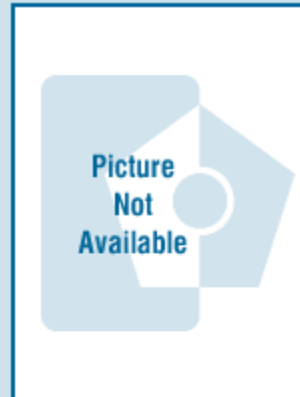


89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

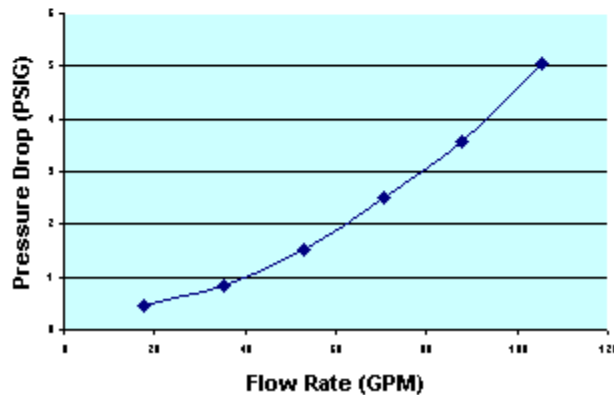
HPAF SERIES FILTERS MODEL HPAF-2000

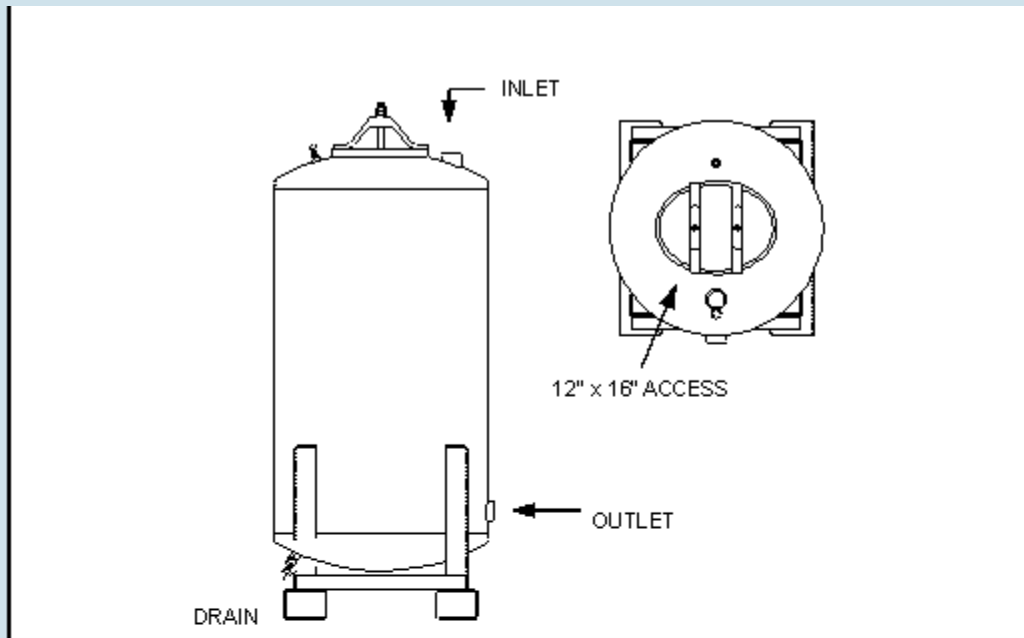
The HPAF-2000 filter is a media filter vessel designed to treat liquid streams. While the typical design application is a activated carbon adsorption unit, the filter can easily accommodate many medias. Some applications include:

- 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



PRESSURE DROP GRAPH
(As Filled - 8"30 GAC)





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	75 PSIG / 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

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Charcoal, Activated Carbon

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

Product name : Charcoal, Activated Carbon

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: S25246

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:



Irritant

Eye irritation, category 2A
Specific target organ toxicity following single exposure, category 3



Flammable

Flammable solids, category 1

Eye Irrit. 2

STOT SE 3

Hazards Not Otherwise Classified - Combustible Dust

Flam. Sol. 2

Signal word :Danger

Hazard statements:

Flammable solid

Causes serious eye irritation

May cause respiratory irritation

Precautionary statements:

If medical advice is needed, have product container or label at hand

Keep out of reach of children

Read label before use

Keep away from heat/sparks/open flames/hot surfaces. No smoking

Ground/bond container and receiving equipment

Use explosion-proof electrical/ventilating/light/equipment

Avoid breathing dust/fume/gas/mist/vapours/spray

Wash skin thoroughly after handling

Use only outdoors or in a well-ventilated area

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Charcoal, Activated Carbon

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

Do not eat, drink or smoke when using this product

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

In case of fire: Use agents recommended in section 5 for extinction

If eye irritation persists get medical advice/attention

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do.

Continue rinsing

Store locked up

Store in a well ventilated place. Keep container tightly closed

Dispose of contents and container to an approved waste disposal plant

Combustible Dust Hazard: :

May form combustible dust concentrations in air (during processing).

Other Non-GHS Classification:

WHMIS



NFPA/HMIS



NFPA SCALE (0-4)

Health	1
Flammability	2
Physical Hazard	0
Personal Protection	X

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:

CAS 7440-44-0

Carbon

100 %

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

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Charcoal, Activated Carbon

concerned.

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists.

Most important symptoms and effects, both acute and delayed:

Irritation, Nausea, Headache, 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 appropriate fire suppression agents for adjacent combustible materials or sources of ignition. Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

For safety reasons unsuitable extinguishing agents: None identified.

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors. Thermal decomposition can lead to release of irritating gases and vapors.

Advice for firefighters:

Protective equipment: Use NIOSH-approved respiratory protection/breathing apparatus.

Additional information (precautions): Move product containers away from fire or keep cool with water spray as a protective measure, where feasible. Use spark-proof tools and explosion-proof equipment. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. 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:

Wear protective equipment. Use spark-proof tools and explosion-proof equipment. Ensure that air-handling systems are operational. Ensure adequate ventilation.

Environmental precautions:

Prevent from reaching drains, sewer or waterway. Collect contaminated soil for characterization per Section 13. Should not be released into environment.

Methods and material for containment and cleaning up:

Keep in suitable closed containers for disposal. Wear protective eyewear, gloves, and clothing. Refer to Section 8. Always obey local regulations. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Collect solids in powder form using vacuum with (HEPA filter). Evacuate personnel to safe areas.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Minimize dust generation and accumulation. Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Do not eat, drink, smoke, or use personal products when handling chemical substances. Avoid contact with eyes, skin, and clothing.

Conditions for safe storage, including any incompatibilities:

Store away from incompatible materials. Protect from freezing and physical damage. Keep away from food and beverages. Provide ventilation for containers. Avoid storage near extreme heat, ignition sources or open flame.

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Charcoal, Activated Carbon

Store in cool, dry conditions in well sealed containers. Store with like hazards

SECTION 8 : Exposure controls/personal protection



Control Parameters: , , OSHA PEL TWA (Total Dust) 15 mg/m³ (50 mppcf*)
 , , ACGIH TLV TWA (inhalable particles) 10 mg/m³

Appropriate Engineering controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use/handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or dusts (total/respirable) below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Respiratory protection: 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. 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):	Black solid	Explosion limit lower: Explosion limit upper:	Not Determined Not Determined
Odor:	Odorless	Vapor pressure:	1 mm Hg @ 3586C
Odor threshold:	Not Determined	Vapor density:	Not Determined
pH-value:	6.0 - 9.0	Relative density:	1.8 - 2.1
Melting/Freezing point:	3652 - 3697°C / 6606 - 6687°F	Solubilities:	Insoluble in water.
Boiling point/Boiling range:	Decomposes	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:	1 mm Hg @ 3586C

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Charcoal, Activated Carbon

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.Ignition sources, dust generation, moisture, excess heat.

Incompatible materials:May react vigorously or violently when mixed with strong oxidizing agents such as chlorates, bromates and nitrates, especially when heated. Incompatible with chlorinated paraffins, Lead oxide, manganese oxide, iron oxide, liquid oxygen, oils, and moisture.

Hazardous decomposition products:Oxides of carbon.

SECTION 11 : Toxicological information

Acute Toxicity:		
Oral:	Effect level > 8000 mg/kg bw	LD50 rat
Inhalation:	Effect level > 4.6 mg/m ³ air Exp. duration 4 h	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

Brachydanio rerio (new name: Danio rerio) Duration 96 h Endpoint LC0 : Effect conc. 1000 mg/L

Daphnia magna 24 h Endpoint EC100: Effect conc. 10000 mg/L

Persistence and degradability:

Bioaccumulative potential:

Mobility in soil:

Other adverse effects:

SECTION 13 : Disposal considerations

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Charcoal, Activated Carbon

Waste disposal recommendations:

Contact a licensed professional waste disposal service to dispose of this material. Dispose of empty containers as unused product. Product or containers must not be disposed with household garbage. 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

1362

UN proper shipping name

Carbon Activated

Transport hazard class(es)



Class:

4.2 Substances liable to spontaneous combustion

Packing group:III

Environmental hazard:

Transport in bulk:

Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

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

Fire

SARA Section 313 (Specific toxic chemical listings):

None of the ingredients is listed

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):

None of the ingredients is listed

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

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Charcoal, Activated Carbon

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 : 03.02.2015

Last updated : 03.19.2015



CGS

**CATION EXCHANGE RESIN
SOFTENING GRADE
Na FORM**

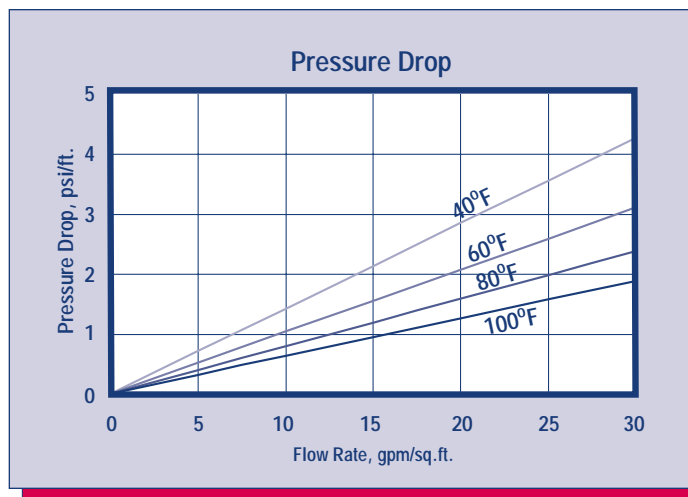
RESINTECH CGS is a high purity, light colored, high capacity, gel type sulfonated polystyrene cation resin supplied in the sodium form as moist, tough uniform spherical beads. *ResinTech CGS* specifically is intended for use in all water softening applications, including beverages, potable water and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

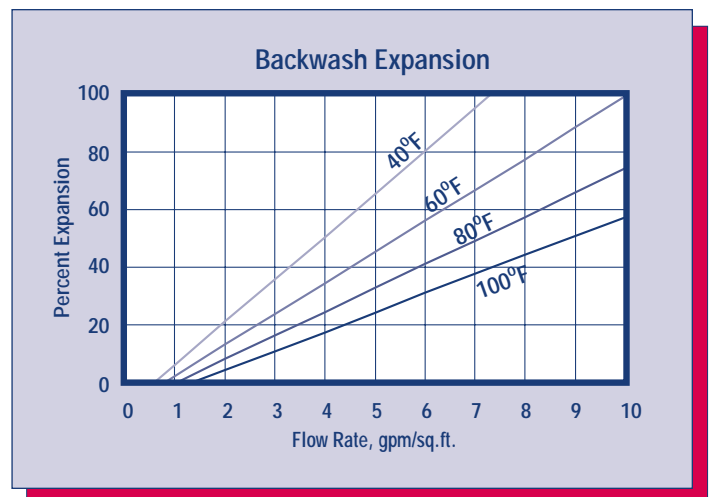
- **COMPLIES WITH FDA REGULATIONS FOR POTABLE WATER APPLICATIONS**
Conforms to paragraph 21CFR173.25 of the Food Additives Regulations of the F.D.A.*
- **EXCELLENT REGENERATION EFFICIENCY**
Virtually the same operating capacity as premium grade *ResinTech CG8-BL*
- **NSF/ANSI-61 VALIDATED** 
- **UNIFORM 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.

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 CaCO₃, 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 CaCO₃, is shown in the following table:

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

APPLICATIONS

Softening

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

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

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

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CGSver010603



SBG1

**ANION EXCHANGE RESIN
TYPE ONE GEL
CI 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.

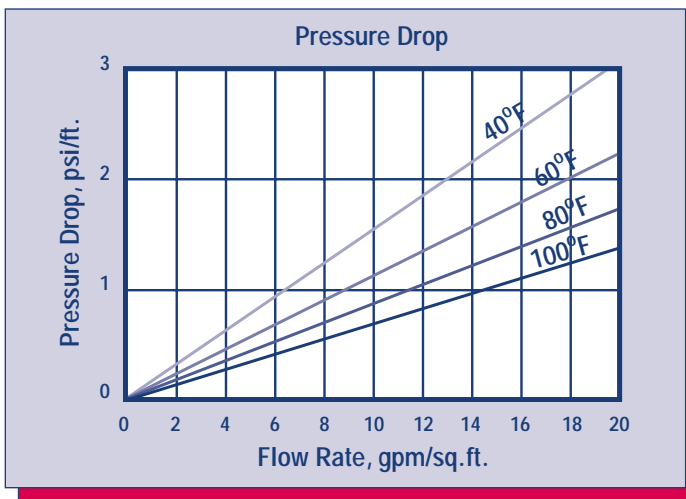
- SUPERIOR PHYSICAL STABILITY**

- LOWER TOC LEACH RATE**

Makes it ideal for polishing mixed beds in wafer washing and other high purity water polishing applications.

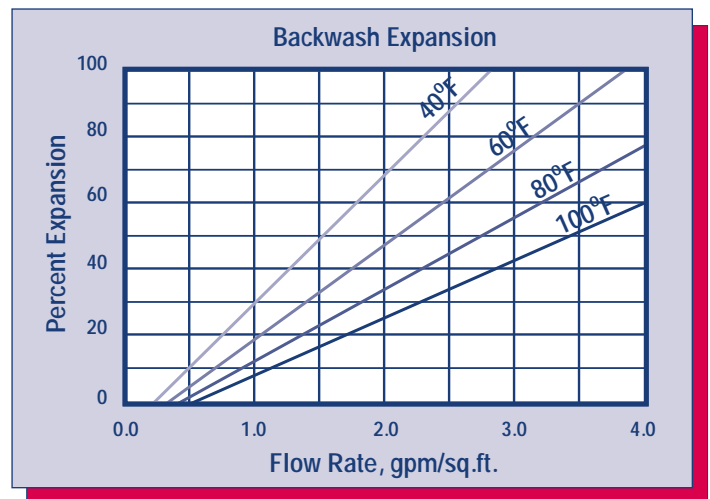
*For potable water applications, the resin must be properly pre-treated, usually by multiple exhaustion and regeneration cycles, to ensure compliance with extractable levels.

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 to 14
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 CaCO₃ is shown in the following table:

Pounds NaOH/ft ³	Capacity Kilograms per cubic foot			
	HCl	H ₂ SO ₄	H ₂ SiO ₃	H ₂ CO 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

DEMINEERALIZATION – *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.

RESINTECH is a registered trademark ® of RESINTECH INC.

SBG1serv050102



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	856-768-9600
	Email	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.

Section 2A: Hazard classification UN OSHA globally harmonized system



WARNING

(contains ion exchange resin)

H320: Causes eye irritation

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	Trimethylamine functionalized chloromethylated copolymer of polystyrene in the chloride form.
3b	Ingredients	
	Trimethylamine functionalized Chloromethylated copolymer of Styrene and divinylbenzene in the Chloride form	CAS# 60177-39-1 (35 - 65%)
	Water	CAS# 7732-18-5 (35 – 65%)

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 230° C. Auto ignition can occur above 500° 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 bases 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. Keep resin moist and avoid allowing resin to completely dry. |
| 7b | Storage | Store in a cool dry place (0° to 45° 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 50° 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	Amber, yellow, or red beads approx. 0.6 mm diameter.
Flammability or explosive limits	Flammable above 500° C
Odor	Little or no 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 710 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 500° C
Evaporation rate	Does not evaporate
Partition Coefficient (n-octanol/water)	Not applicable
Auto-ignition temperature	Approx 500° C
Decomposition temperature	Above 230° 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	Trimethylamine, charred polystyrene, aromatic acids and hydrocarbons, organic amines, nitrogen oxides, carbon oxides, chlorinated hydrocarbons.
10d Incompatible materials	Strong oxidizing agents, e.g. nitric acid (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)	None known.
	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	Mild Rash.
	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.

APPENDIX F

Endangered Species Act



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:

December 07, 2021

Consultation Code: 05E1NE00-2022-SLI-0735

Event Code: 05E1NE00-2022-E-02613

Project Name: BHCC Project

Subject: List of threatened and endangered species that may occur in your proposed project location 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: 05E1NE00-2022-SLI-0735

Event Code: Some(05E1NE00-2022-E-02613)

Project Name: BHCC Project

Project Type: DEVELOPMENT

Project Description: Dewatering Permit

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.3745604,-71.06963187626364,14z>



Counties: Suffolk County, Massachusetts

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, 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.

-
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.

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

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

MassDEP - Bureau of Waste Site Cleanup

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

Site Information:

BHCC
250 NEW RUTHERFORD AVE, BOSTON, 02129 BOSTON, MA

NAD83 UTM Meters:
4693412mN , 329658mE (Zone: 19)
December 7, 2021

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



MassDEP

Commonwealth of Massachusetts
Department of Environmental Protection



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

APPENDIX G

National Historic Preservation Act Review

National Register of Histori...

National Park Service
U.S. Department of the Interior

Public, non-restricted data depicting National Register spatial data process...



200
<https://www.openstreetmap.org/copyright> contributors | Cultural Resources GIS, National Park Service | Geocoding by Esri | Esri

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

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

Inv. No.	Property Name	Street	Town	Year
BOS.CE	2-22 Hill Street - 1-5 Mystic Place		Boston	
BOS.CG	Crystal Place		Boston	
BOS.CH	Saint Francis de Sales Roman Catholic Church		Boston	
BOS.CJ	Belmont Street Area		Boston	
BOS.CK	1-8 Avon Place		Boston	
BOS.RL	Charlestown B and M Railroad Industrial Area		Boston	
BOS.RM	Charlestown Mystic River Industrial Area		Boston	
BOS.RX	Charlestown Heights		Boston	
BOS.TB	Middlesex Canal Historic and Archaeological District		Boston	
BOS.ZU	Terminal Storage Warehouse District		Boston	
BOS.AAV	Bolton Place, 3-15		Boston	
BOS.AAW	Essex Street, 4-21		Boston	
BOS.AAY	Russell Street, 19-35		Boston	
BOS.4224	Dyar, Smith House	5 Albion Pl	Boston	r 1835
BOS.4223	Clark, Aaron - Varney, Enos House	20 Albion Pl	Boston	c 1840
BOS.4225	Johnson, George House	23 Albion Pl	Boston	c 1845
BOS.9052	Alford Street Bridge - Malden Bridge	Alford St	Boston	1966
BOS.13985	Sullivan Square T Station	Alford St	Boston	
BOS.13984		32 Alford St	Boston	c 1950
BOS.4226	Burbank, Silas and Son Varnish Factory	62 Alford St	Boston	c 1880
BOS.4227	Charlestown Sewerage Pumping Station	171 Alford St	Boston	1895
BOS.4228	Littlefield, Ivory House	13 Allston St	Boston	c 1848
BOS.4229	Littlefield, Ivory House	15 Allston St	Boston	c 1848
BOS.12858	ACME Rubber Company	Arlington Ave	Boston	r 1935
BOS.13982		20 Arlington Ave	Boston	c 1960
BOS.4230	Charlestown Gas Company Gasometer Building	21 Arlington Ave	Boston	c 1853

Inv. No.	Property Name	Street	Town	Year
BOS.4233	Boston Elevated Railway Carpentry Mill	21 Arlington Ave	Boston	r 1885
BOS.13980		90 Arlington Ave	Boston	c 1890
BOS.13979		96 Arlington Ave	Boston	c 1947
BOS.4232		21 Arlington St	Boston	c 1900
BOS.4240	Wellington, Charles W. House	1 Auburn St	Boston	1857
BOS.4241	Wellington, Charles W. House	3 Auburn St	Boston	1857
BOS.4242	Wellington, Charles W. House	5 Auburn St	Boston	c 1860
BOS.4243	Wellington, Charles W. House	7 Auburn St	Boston	c 1860
BOS.4234	Bridge, Abel E. Row House	8 Auburn St	Boston	c 1868
BOS.4244	Wellington, Charles W. House	9 Auburn St	Boston	c 1860
BOS.4235	Bridge, Abel E. Row House	10 Auburn St	Boston	c 1868
BOS.4245	Wellington, Charles W. House	11 Auburn St	Boston	c 1860
BOS.4236	Bridge, Abel E. Row House	12 Auburn St	Boston	c 1868
BOS.4246	Wellington, Charles W. House	13 Auburn St	Boston	c 1860
BOS.4237	Bridge, Abel E. Row House	14 Auburn St	Boston	c 1868
BOS.4247	Wellington, Charles W. House	15 Auburn St	Boston	c 1860
BOS.4238	Bridge, Abel E. Row House	16 Auburn St	Boston	c 1868
BOS.4248	Wellington, Charles W. House	17 Auburn St	Boston	1861
BOS.4249	Wellington, Charles W. House	19 Auburn St	Boston	1861
BOS.4239	Hall, Moses B. House	20 Auburn St	Boston	1843
BOS.4250	Wellington, Charles W. House	21 Auburn St	Boston	1861
BOS.4277	Hill, Joseph W. House	41 Baldwin St	Boston	c 1870
BOS.4278	Hill, Joseph W. House	43 Baldwin St	Boston	c 1870
BOS.4279	Hill, Joseph W. House	45 Baldwin St	Boston	c 1870
BOS.4258	Taylor, Dolphin D. House	46 Baldwin St	Boston	c 1856
BOS.4280	Hill, Joseph W. House	47 Baldwin St	Boston	c 1870
BOS.4259	Taylor, Dolphin D. House	48 Baldwin St	Boston	c 1856
BOS.4281	Hill, Joseph W. House	49 Baldwin St	Boston	c 1870
BOS.4260	Taylor, Dolphin D. House	50 Baldwin St	Boston	c 1856
BOS.4282	Hill, Joseph W. House	51 Baldwin St	Boston	c 1870
BOS.4261	Taylor, Dolphin D. House	52 Baldwin St	Boston	c 1856
BOS.4283	Hill, Joseph W. House	53 Baldwin St	Boston	c 1870
BOS.4262	Taylor, Dolphin D. House	54 Baldwin St	Boston	c 1856
BOS.4284	Hill, Joseph W. House	55 Baldwin St	Boston	c 1870
BOS.4263	Taylor, Dolphin D. House	56 Baldwin St	Boston	c 1856
BOS.4285	Hill, Joseph W. House	57 Baldwin St	Boston	c 1870
BOS.4264	Taylor, Dolphin D. House	58 Baldwin St	Boston	c 1856
BOS.4286	Hill, Joseph W. House	59 Baldwin St	Boston	c 1870

Inv. No.	Property Name	Street	Town	Year
BOS.4265	Taylor, Dolphin D. House	60 Baldwin St	Boston	c 1856
BOS.4287	Hill, Joseph W. House	61 Baldwin St	Boston	c 1870
BOS.4288	Hill, Joseph W. House	63 Baldwin St	Boston	c 1870
BOS.4289	Hill, Joseph W. House	65 Baldwin St	Boston	c 1870
BOS.4290	Rice, Peter G. House	67 Baldwin St	Boston	1898
BOS.5038	Bunker Hill School	68 Baldwin St	Boston	1866
BOS.4291	Rice, Peter G. House	69 Baldwin St	Boston	1898
BOS.4292	Rice, Peter G. House	71 Baldwin St	Boston	1898
BOS.4293	Baldwin, George R. Double House	84 Baldwin St	Boston	c 1850
BOS.4294	Baldwin, George R. Double House	86 Baldwin St	Boston	c 1850
BOS.4266	Bradford, Jeremiah B. House	88 Baldwin St	Boston	1849
BOS.4267	Bradford, Jeremiah B. House	90 Baldwin St	Boston	1849
BOS.4295	Cooper, James Double House	91 Baldwin St	Boston	c 1848
BOS.4268	Bradford, Jeremiah B. House	92 Baldwin St	Boston	1849
BOS.4296	Cooper, James Double House	93 Baldwin St	Boston	c 1848
BOS.4269	Bradford, Jeremiah B. House	94 Baldwin St	Boston	1849
BOS.4297	Stimpson, Jeremiah House	95 Baldwin St	Boston	c 1855
BOS.4270	Bradford, Jeremiah B. House	96 Baldwin St	Boston	1849
BOS.4298	Sandford, William W. - Mayers, Hartford House	97 Baldwin St	Boston	c 1849
BOS.4299	Sandford, William W. - Mayers, Hartford House	99 Baldwin St	Boston	c 1849
BOS.4300	Page, Benjamin Town House	101 Baldwin St	Boston	c 1849
BOS.4301	Page, Benjamin Town House	103 Baldwin St	Boston	c 1849
BOS.4271	Cheever, John House	104 Baldwin St	Boston	c 1869
BOS.4302	Page, Benjamin Town House	105 Baldwin St	Boston	1849
BOS.4272	Cheever, John House	106 Baldwin St	Boston	c 1869
BOS.4303	Page, Benjamin Town House	107 Baldwin St	Boston	c 1849
BOS.4273	Cheever, John House	108 Baldwin St	Boston	c 1869
BOS.4304	Page, Benjamin Town House	109 Baldwin St	Boston	c 1849
BOS.4274	Cheever, John House	110 Baldwin St	Boston	c 1869
BOS.4305	Page, Benjamin Town House	111 Baldwin St	Boston	c 1849
BOS.4275	Cheever, John House	112 Baldwin St	Boston	c 1869
BOS.4306	Page, Benjamin Town House	113 Baldwin St	Boston	c 1849
BOS.4276	Cheever, John House	114 Baldwin St	Boston	c 1869
BOS.4307	Page, Benjamin Town House	115 Baldwin St	Boston	c 1849
BOS.4308	Page, Benjamin Town House	117 Baldwin St	Boston	c 1849
BOS.4318	Whittier, Isaac Double House	92-94 Bartlett St	Boston	c 1848
BOS.4319	Stone, Phineas J. Double House	112-114 Bartlett St	Boston	c 1842
BOS.12859	Boston Edison Building	Beacham St	Boston	r 1850

Inv. No.	Property Name	Street	Town	Year
BOS.4320	Blaban, Nathaniel House	1 Blaban Pl	Boston	c 1845
BOS.4321	Blaban, Nathaniel House	2 Blaban Pl	Boston	c 1845
BOS.4322	Blaban, Nathaniel House	3 Blaban Pl	Boston	c 1845
BOS.4323	Weston, David B. - Mason, Rufus House	3 Bolton Pl	Boston	1861
BOS.4324	Weston, David B. - Mason, Rufus House	4 Bolton Pl	Boston	1861
BOS.4325	Weston, David B. - Mason, Rufus House	5 Bolton Pl	Boston	1861
BOS.4326	Weston, David B. - Mason, Rufus House	6 Bolton Pl	Boston	1861
BOS.4327	Weston, David B. - Mason, Rufus House	7 Bolton Pl	Boston	1861
BOS.4328	Weston, David B. - Mason, Rufus House	8 Bolton Pl	Boston	1861
BOS.4329	Weston, David B. - Mason, Rufus House	9 Bolton Pl	Boston	1861
BOS.4330	Weston, David B. - Mason, Rufus House	11 Bolton Pl	Boston	1861
BOS.4331	Weston, David B. - Mason, Rufus House	13 Bolton Pl	Boston	1861
BOS.4332	Weston, David B. - Mason, Rufus House	15 Bolton Pl	Boston	1861
BOS.4333	Pruden, Israel R. House	6 Brighton St	Boston	1848
BOS.4335	Pruden, Israel R. House	6 Brighton St	Boston	c 1846
BOS.4337	Williams, Gilbert House	17 Brighton St	Boston	c 1869
BOS.4338	Williams, Gilbert House	19 Brighton St	Boston	c 1869
BOS.4334	Bancroft, Henry House	28 Brighton St	Boston	c 1847
BOS.4339	Lamprey, Frank House	33 Brighton St	Boston	c 1877
BOS.4336	Davidson Rubber Company - Davidson Syringe Company	50 Brighton St	Boston	1868
BOS.4350		238-240 Bunker Hill St	Boston	r 1805
BOS.4368	Stone, Jasper House	249 Bunker Hill St	Boston	c 1849
BOS.4369	Stone, Jasper House	251 Bunker Hill St	Boston	c 1849
BOS.4354	Hager, James House	252 Bunker Hill St	Boston	c 1854
BOS.4355	Adams, Simeon P. House	276 Bunker Hill St	Boston	c 1855
BOS.4356	Seavey, William House	278 Bunker Hill St	Boston	c 1855
BOS.4357	Brown, James House	280 Bunker Hill St	Boston	c 1855
BOS.4358	Page, Benjamin House	284 Bunker Hill St	Boston	c 1855
BOS.4360	Page, Benjamin - Huntly, Russell House	285 Bunker Hill St	Boston	1850
BOS.4359	Page, Benjamin House	286 Bunker Hill St	Boston	c 1855
BOS.4361	Page, Benjamin - Huntly, Russell House	287 Bunker Hill St	Boston	1850
BOS.4362	Page, Benjamin - Huntly, Russell House	289 Bunker Hill St	Boston	1850
BOS.4363	Kelly, Hugh House	291 Bunker Hill St	Boston	c 1865
BOS.4364	Kelly, Hugh House	293 Bunker Hill St	Boston	c 1865
BOS.4365	Kelly, Hugh House	295 Bunker Hill St	Boston	c 1865
BOS.4341	Saint Francis de Sales Roman Catholic Rectory	303 Bunker Hill St	Boston	1881
BOS.4340	Saint Francis de Sales Roman Catholic Church	315 Bunker Hill St	Boston	c 1859

Inv. No.	Property Name	Street	Town	Year
BOS.4343	Saint Francis de Sales Roman Catholic Convent	325 Bunker Hill St	Boston	1901
BOS.4342	Saint Francis de Sales Roman Catholic School	340 Bunker Hill St	Boston	1894
BOS.9048	Charlestown Heights - Doherty Playground	349 Bunker Hill St	Boston	1891
BOS.4366	Charlestown Armory	380 Bunker Hill St	Boston	r 1910
BOS.4367	Boston Engine Company No. 32	442 Bunker Hill St	Boston	1883
BOS.4428	Williams, Horatio House	23 Caldwell St	Boston	c 1892
BOS.4370	Tweed, Benjamin F. Primary School	Cambridge St	Boston	1891
BOS.12847	Graphic Arts Finishers Building	32 Cambridge St	Boston	r 1950
BOS.12848	Puritan Garage	128 Cambridge St	Boston	c 1920
BOS.4430	Page, Benjamin House	1 Coral Pl	Boston	1847
BOS.4431	Page, Benjamin House	2 Coral Pl	Boston	1847
BOS.4432	Page, Benjamin House	3 Coral Pl	Boston	1847
BOS.12849	Boston and Maine Railroad Roundhouse	D St	Boston	r 1900
BOS.13981		10 Dorrance St	Boston	c 1950
BOS.4466	Phipps, Benjamin House	7 Eden St	Boston	r 1845
BOS.4467	Frothingham, James K. House	9 Eden St	Boston	c 1854
BOS.4468	Frothingham, James K. House	11 Eden St	Boston	c 1854
BOS.4469	Frothingham, James K. House	13 Eden St	Boston	c 1854
BOS.4470	Frothingham, James K. House	15 Eden St	Boston	c 1854
BOS.4491		4 Essex St	Boston	r 1850
BOS.4492		6 Essex St	Boston	r 1850
BOS.4493		8 Essex St	Boston	r 1850
BOS.4494		10 Essex St	Boston	r 1850
BOS.4495		12 Essex St	Boston	r 1850
BOS.4496	Standish, Lemuel M. - Woodbury, Charles House	17 Essex St	Boston	r 1850
BOS.4497	Standish, Lemuel M. - Woodbury, Charles House	19 Essex St	Boston	r 1850
BOS.4498	Standish, Lemuel M. - Woodbury, Charles House	21 Essex St	Boston	r 1850
BOS.4499	Weston and Mason House	1 Forest Pl	Boston	1859
BOS.4500	Weston and Mason House	2 Forest Pl	Boston	1859
BOS.4501	Weston and Mason House	3 Forest Pl	Boston	1859
BOS.4502	Weston and Mason House	4 Forest Pl	Boston	1859
BOS.4503	Weston and Mason House	5 Forest Pl	Boston	1859
BOS.4504	Weston and Mason House	6 Forest Pl	Boston	1859
BOS.4231	Charlestown Gas Company Machine Shop and Purifying House	17-19 George St	Boston	c 1900
BOS.4568	Clapp, Frederick W. House	86 High St	Boston	1871
BOS.4569	Clapp, Frederick W. House	88 High St	Boston	1871
BOS.4570	Clapp, Frederick W. House	90 High St	Boston	1871

Inv. No.	Property Name	Street	Town	Year
BOS.4571	Clapp, Frederick W. House	92 High St	Boston	1871
BOS.4572	Clapp, Frederick W. House	94 High St	Boston	1871
BOS.4573	Clapp, Frederick W. House	96 High St	Boston	1871
BOS.4574	Clapp, Frederick W. House	98 High St	Boston	1871
BOS.4575		100 High St	Boston	r 1820
BOS.4576	Hotel Salem	105-107 High St	Boston	c 1881
BOS.4577		108 High St	Boston	r 1830
BOS.4578	Donovan, Patrick J. House	114 High St	Boston	1886
BOS.4579	Donovan, Patrick J. House	116 High St	Boston	1886
BOS.4580	Donovan, Patrick J. House	118 High St	Boston	1886
BOS.4581	Pratt, Caleb Double House	132 High St	Boston	1834
BOS.4582	Doane, Thomas House	1 Holden Row	Boston	r 1880
BOS.4583	Doane, Thomas House	2 Holden Row	Boston	r 1880
BOS.4584	Doane, Thomas House	3 Holden Row	Boston	r 1880
BOS.4585	Doane, Thomas House	4 Holden Row	Boston	r 1880
BOS.4586	Doane, Thomas House	5 Holden Row	Boston	r 1880
BOS.4587	Doane, Thomas House	6 Holden Row	Boston	r 1880
BOS.4588	Doane, Thomas House	7 Holden Row	Boston	r 1880
BOS.4599		61-63 Lawrence St	Boston	r 1845
BOS.4601		65-67 Lawrence St	Boston	r 1845
BOS.4597	Burrell, John H. - Hall, Milton Jr. Double House	73-75 Lawrence St	Boston	c 1845
BOS.4638	Richard, Giles - Bolter, James House	231 Main St	Boston	r 1800
BOS.4639		250-252 Main St	Boston	c 1855
BOS.4640		254-256 Main St	Boston	c 1845
BOS.4641	O'Brien, T. A. Building	258-262 Main St	Boston	1891
BOS.4645	Long, William B. - Phipps, Solomon G. Block	265-271 Main St	Boston	1856
BOS.4646	Perkins, John House	315 Main St	Boston	c 1851
BOS.4652	Weston and Mason House	360 Main St	Boston	1855
BOS.4653	Weston and Mason House	362 Main St	Boston	1855
BOS.4654	Weston and Mason House	364 Main St	Boston	1855
BOS.4655	Weston and Mason House	366 Main St	Boston	1855
BOS.4656	Weston and Mason House	368 Main St	Boston	1855
BOS.4647	Middlesex Canal Worker Housing	372 Main St	Boston	
BOS.4657	Middlesex Canal Company Double House	374-376 Main St	Boston	r 1835
BOS.4650	Middlesex Canal Worker Housing	378 Main St	Boston	
BOS.4651	Middlesex Canal Worker Housing	380 Main St	Boston	
BOS.4658		397 Main St	Boston	1859
BOS.4659		399 Main St	Boston	1859

Inv. No.	Property Name	Street	Town	Year
BOS.4660	Bridge, Abel E. Town House	401 Main St	Boston	1865
BOS.4661	Bridge, Abel E. Town House	403 Main St	Boston	1865
BOS.4662	Bridge, Abel E. Town House	405 Main St	Boston	1865
BOS.4663	Noble, Edward T. Town House	407 Main St	Boston	r 1880
BOS.4664		417 Main St	Boston	c 1871
BOS.4665		419 Main St	Boston	c 1871
BOS.4666	Lord, John B. House	421 Main St	Boston	c 1871
BOS.4667	Hovey, Sarah Double House	443 Main St	Boston	c 1859
BOS.4668	Hovey, Sarah Double House	445 Main St	Boston	c 1859
BOS.4611	Schraffts, William F. and Sons Candy Factory	529 Main St	Boston	c 1925
BOS.12860	Schrafft, William F. and Sons Factory Power House	529 Main St	Boston	1925
BOS.4669	Cauley Hall - Cauley, John H. Commercial Block	540 Main St	Boston	r 1900
BOS.4670	Sullivan Square Garage	635 Main St	Boston	1920
BOS.4671	Middlesex Canal District Double House	651-653 Main St	Boston	c 1840
BOS.4673	Weston, David B. and Mason, Rufus Double House	2-4 Mason Ct	Boston	c 1859
BOS.4674	Foster, Ruth Rose House	38 Mead St	Boston	1840
BOS.4675	Trowbridge, Almarin House	39 Mead St	Boston	c 1845
BOS.4676	Greenleaf, Thomas House	1 Mead Street Ct	Boston	c 1845
BOS.4677	Greenleaf, Thomas House	2 Mead Street Ct	Boston	c 1845
BOS.4678	Greenleaf, Thomas House	3 Mead Street Ct	Boston	c 1845
BOS.4679	Greenleaf, Thomas House	4 Mead Street Ct	Boston	c 1845
BOS.805	Saint Francis de Sales Roman Catholic Burial Groun	Medford St	Boston	c 1830
BOS.9441	Charlestown Heights - Promenade	Medford St	Boston	1932
BOS.9442	Charlestown Heights - Fountain	Medford St	Boston	1892
BOS.9443	Charlestown Heights - D. A. R. Monument	Medford St	Boston	1926
BOS.9444	Charlestown Heights - Path System	Medford St	Boston	1892
BOS.9445	Charlestown Heights - Granite Steps	Medford St	Boston	1893
BOS.9446	Charlestown Heights - Puddingstone Cheek Walls	Medford St	Boston	1893
BOS.9447	Charlestown Heights - Overlook Terrace	Medford St	Boston	1893
BOS.9448	Charlestown Heights - Granite Retaining Wall	Medford St	Boston	1892
BOS.9449	Charlestown Heights - Perimeter Retaining Wall	Medford St	Boston	1892
BOS.9450	Charlestown Heights - Swimming Pool	Medford St	Boston	1945
BOS.9451	Charlestown Heights - Diving Pool	Medford St	Boston	1948
BOS.9452	Charlestown Heights - Bleachers	Medford St	Boston	1947
BOS.9453	Charlestown Heights - Shelter	Medford St	Boston	1968

Inv. No.	Property Name	Street	Town	Year
BOS.9454	Charlestown Heights - Tot Lot	Medford St	Boston	1972
BOS.9455	Charlestown Heights - Basketball Courts	Medford St	Boston	1975
BOS.9456	Charlestown Heights - Splash Pool	Medford St	Boston	1995
BOS.9457	Charlestown Heights - Swings	Medford St	Boston	1972
BOS.13032	Charlestown Heights - Bath House	Medford St	Boston	1947
BOS.13033	Charlestown Heights - Pump House	Medford St	Boston	1947
BOS.4680	Wiggins Lumber Terminal Complex - Building #3	267-281 Medford St	Boston	1918
BOS.9424	Blue Circle Cement Company Cement Silos	285 Medford St	Boston	c 1980
BOS.12861	Revere Sugar Refinery	333 Medford St	Boston	1918
BOS.4682	Webb, Robert and Company Black Lead Works	412 Medford St	Boston	c 1885
BOS.9423	Amstar - Domino Sugar Plant Sweet Dome	425 Medford St	Boston	1960
BOS.12862	American Sugar - Amstar Domino Sugar Plant	425 Medford St	Boston	1960
BOS.12863	Amstar - Domino Sugar Plant Power House	425 Medford St	Boston	1960
BOS.4684	U. S. Baking Company Complex	465 Medford St	Boston	c 1890
BOS.12864	Brockway-Smith Warehouse and Factory	465 Medford St	Boston	1924
BOS.12865	Howes, S. M. Company Foundry	511 Medford St	Boston	c 1926
BOS.4683	Wemyss Brothers Furniture Company Building	523 Medford St	Boston	1870
BOS.9729	Middlesex Canal	Middlesex Canal	Boston	c 1802
BOS.4778	Richards, David House	3 Mystic St	Boston	c 1856
BOS.4780		4 Mystic St	Boston	1854
BOS.4779	Richards, David House	5 Mystic St	Boston	c 1856
BOS.4781		6 Mystic St	Boston	1854
BOS.4782		8 Mystic St	Boston	1854
BOS.4783		10 Mystic St	Boston	1854
BOS.4784		11 Mystic St	Boston	c 1855
BOS.4785	Kelly, Hugh and Peter J. House	26 Mystic St	Boston	c 1868
BOS.4786	Kelly, Hugh and Peter J. House	28 Mystic St	Boston	c 1868
BOS.4787	Kelly, Hugh and Peter J. House	30 Mystic St	Boston	c 1868
BOS.4788	Kelly, Hugh and Peter J. House	32 Mystic St	Boston	c 1868
BOS.4802	Pierce, John House	33 Mystic St	Boston	1869
BOS.4789	Kelly, Hugh and Peter J. House	34 Mystic St	Boston	c 1868
BOS.4803	Hatch, George W. House	35 Mystic St	Boston	1869
BOS.4790	Kelly, Hugh and Peter J. House	36 Mystic St	Boston	c 1868
BOS.4791	Kelly, Hugh and Peter J. House	38-40 Mystic St	Boston	c 1868
BOS.4792	Kelly, Hugh and Peter J. House	42 Mystic St	Boston	c 1868
BOS.4793	Kelly, Hugh and Peter J. House	44 Mystic St	Boston	c 1868
BOS.4794	Kelly, Hugh and Peter J. House	46 Mystic St	Boston	c 1868
BOS.4795	Kelly, Hugh and Peter J. House	48 Mystic St	Boston	c 1868

Inv. No.	Property Name	Street	Town	Year
BOS.4804		50 Mystic St	Boston	
BOS.4797	Kelly, Hugh and Peter J. House	52 Mystic St	Boston	c 1868
BOS.4798	Kelly, Hugh and Peter J. House	54 Mystic St	Boston	c 1868
BOS.4799	Kelly, Hugh and Peter J. House	56 Mystic St	Boston	c 1868
BOS.4800	Kelly, Hugh and Peter J. House	58 Mystic St	Boston	c 1868
BOS.4801	Kelly, Hugh and Peter J. House	60 Mystic St	Boston	c 1868
BOS.4805	Gilman, John F. House	23 Oak St	Boston	c 1865
BOS.4806	Gilman, John F. House	25 Oak St	Boston	c 1865
BOS.4807	Carr, Samuel House	31 Oak St	Boston	1840
BOS.4828	Towne, Orr N. House	3 Parker St	Boston	c 1844
BOS.13959	Pruden, Israel R. Double House	32 Parker St	Boston	r 1860
BOS.4833	Pratt, Caleb House	32 Pearl St	Boston	c 1843
BOS.4834	Pratt, Caleb House	34 Pearl St	Boston	c 1843
BOS.4835	Pratt, Caleb House	36 Pearl St	Boston	c 1843
BOS.4836		55 Pearl St	Boston	
BOS.4837	Littlefield, Ivory Double House	62-64 Pearl St	Boston	c 1844
BOS.4840	Pierce, Charles Double House	63-65 Pearl St	Boston	c 1844
BOS.4838		68-70 Pearl St	Boston	c 1844
BOS.4839		72-74 Pearl St	Boston	c 1844
BOS.4841	Williams, Gilbert House	79 Pearl St	Boston	c 1856
BOS.4842	Williams, Sheldon Double House	89-91 Pearl St	Boston	c 1845
BOS.4429	Page, Benjamin House	92 Pearl St	Boston	1847
BOS.4829	Page, Benjamin House	1 Pearl Street Pl	Boston	c 1846
BOS.4830	Page, Benjamin House	2 Pearl Street Pl	Boston	c 1846
BOS.4831	Page, Benjamin House	3 Pearl Street Pl	Boston	c 1846
BOS.4832	Page, Benjamin House	4 Pearl Street Pl	Boston	c 1846
BOS.4844	Lawrence, Edward A. - Parker, Benjamin House	71-71B Perkins St	Boston	c 1871
BOS.807	Phipps Street Burying Ground	Phipps St	Boston	1630
BOS.4866	Crosby Steam Gage and Valve Company Factory	24 Roland St	Boston	1888
BOS.4867	Puritan Brewery - Commercial Brewery	40 Roland St	Boston	1898
BOS.12850	Wirth's Bottling Co. - Hanover Bottling Co.	52 Roland St	Boston	c 1908
BOS.12851	Hood, H. P. Ice Cream Company	56 Roland St	Boston	1917
BOS.944	Tobin Bridge	Rt 1	Boston	1950
BOS.4868	Page, Enoch House	5 Russell St	Boston	1841
BOS.4869	Weston, David B. - Mason, Rufus House	19 Russell St	Boston	1857
BOS.4878	Caldwell, John B. Double House	20-22 Russell St	Boston	1845
BOS.4870	Weston, David B. - Mason, Rufus House	21 Russell St	Boston	1857

Inv. No.	Property Name	Street	Town	Year
BOS.4871	Weston, David B. - Mason, Rufus House	23 Russell St	Boston	1857
BOS.4879	Williams, Gilbert House	24 Russell St	Boston	1859
BOS.4872	Weston, David B. - Mason, Rufus House	25 Russell St	Boston	1857
BOS.4880	Williams, Gilbert House	26 Russell St	Boston	1859
BOS.4873	Weston, David B. - Mason, Rufus House	27 Russell St	Boston	1857
BOS.4881	Williams, Gilbert House	28 Russell St	Boston	1859
BOS.4874	Weston, David B. - Mason, Rufus House	29 Russell St	Boston	1857
BOS.4882	Williams, Gilbert House	30 Russell St	Boston	1859
BOS.4875	Weston, David B. - Mason, Rufus House	31 Russell St	Boston	1857
BOS.4883	Williams, Gilbert House	32 Russell St	Boston	1859
BOS.4876	Weston, David B. - Mason, Rufus House	33 Russell St	Boston	1857
BOS.4877	Weston, David B. - Mason, Rufus House	35 Russell St	Boston	1857
BOS.4884	Emery, James Double House	58-60 Russell St	Boston	c 1837
BOS.4886	Monroe, George S. House	115 Russell St	Boston	c 1859
BOS.12852	Rosev Dairy	420-438 Rutherford Ave	Boston	r 1950
BOS.13986		480 Rutherford Ave	Boston	c 1953
BOS.13987		480 Rutherford Ave	Boston	c 1950
BOS.12853	Hood, H. P. and Sons Milk Company	500 Rutherford Ave	Boston	1928
BOS.12854	Hood, H. P. and Sons Power Station	500 Rutherford Ave	Boston	1928
BOS.12855	Sawyer, Henry Printers	586 Rutherford Ave	Boston	r 1900
BOS.4888		2-4 Salem St	Boston	r 1795
BOS.4893	Osgood, Thomas House	8 Salem St	Boston	c 1799
BOS.4887	Rice, Capt. Thomas House	2 Salem Street Ave	Boston	c 1826
BOS.4889	Rand, James H. House	3 Salem Street Ave	Boston	1869
BOS.4890	Rand, James H. House	4 Salem Street Ave	Boston	1869
BOS.4891	Rand, James H. House	5 Salem Street Ave	Boston	1869
BOS.4892	Malloon, Joseph W. House	6 Salem Street Ave	Boston	c 1869
BOS.4894		39 School St	Boston	r 1895
BOS.4896	Osgood and Hart Iron Foundry	3 Sherman St	Boston	r 1870
BOS.12857	Fraser and Malloy Associates Building	Spice St	Boston	r 1935
BOS.4908	D'Este, Julian Brass Finishing Company and Foundry	6 Spice St	Boston	r 1895
BOS.12856	Wright, Henry E. and Son Milk Can Factory	24-26 Spice St	Boston	c 1890
BOS.4910	Bray, Joseph E. House	18 Sullivan St	Boston	1865
BOS.4911	Bray, Joseph E. House	20 Sullivan St	Boston	1865
BOS.4912	Bray, Joseph E. House	22 Sullivan St	Boston	1865
BOS.4913	Bray, Joseph E. House	24 Sullivan St	Boston	1865
BOS.4914	Bray, Joseph E. House	26 Sullivan St	Boston	1865

Inv. No.	Property Name	Street	Town	Year
BOS.4915	Harrington, Thaddeus House	42 Sullivan St	Boston	r 1810
BOS.4916	Kidney, James W. House	52 Sullivan St	Boston	c 1863
BOS.4917	Caldwell, John B. Double House	57-59 Sullivan St	Boston	1845
BOS.4316	Baldwin, J. Thomas House	73 Sullivan St	Boston	c 1876
BOS.12866	Wiggins Lumber Terminal Complex - Building #2	40 Terminal St	Boston	c 1910
BOS.4681	Wiggins Lumber Terminal Complex - Building #1	50 Terminal St	Boston	c 1910
BOS.4950	Green, Mary Ann House	5 Walker St	Boston	c 1851
BOS.4951	Green, Mary Ann House	7 Walker St	Boston	c 1851
BOS.4317	Green, Mary Ann House	9 Walker St	Boston	c 1851
BOS.4952	Green, Mary Ann House	11 Walker St	Boston	c 1851
BOS.4953	Edwards, Clarence R. Jr. Public High School	28 Walker St	Boston	1931
BOS.4954	Pratt, Caleb House	31 Walker St	Boston	1847
BOS.4955	Pratt, Caleb House	33 Walker St	Boston	1847
BOS.4956	Pratt, Caleb House	35 Walker St	Boston	1847
BOS.4957	Stone, John - Page, Susan Double House	1-2 Wall St	Boston	r 1850
BOS.4958	Hitchings, Nathaniel House	3 Wall St	Boston	c 1846
BOS.4959	Jordan, George W. House	4 Wall St	Boston	c 1846
BOS.4960	Mason, David B. - Mason, Rufus House	7 Wall St	Boston	1857
BOS.4961	Mason, David B. - Mason, Rufus House	9 Wall St	Boston	1857
BOS.4962	Mason, David B. - Mason, Rufus House	11 Wall St	Boston	1857
BOS.4963	Mason, David B. - Mason, Rufus House	13 Wall St	Boston	1857
BOS.4964	Mason, David B. - Mason, Rufus House	15 Wall St	Boston	1857
BOS.4965	Mason, David B. - Mason, Rufus House	17 Wall St	Boston	1857
BOS.4966	Mason, David B. - Mason, Rufus House	19 Wall St	Boston	1857
BOS.13983		27 West St	Boston	c 1935