HALEY ALDRICH

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NPDES RGP APPLICATION FOR TEMPORARY CONSTRUCTION DEWATERING MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) PROPOSED MUSIC BUILDING 48 MASSACHUSETTS AVENUE (REAR) CAMBRIDGE, MASSACHUSETTS 02139

by
Haley & Aldrich, Inc.
Boston, Massachusetts

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

File No. 133856-003
December 2020

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

15 December 2020
File No. 133856-003

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

Attention: Shelley Puleo

Subject: NPDES RGP Application for Temporary Construction Dewatering
Massachusetts Institute of Technology (MIT)
Proposed Music Building
48 Massachusetts Avenue (Rear)
Cambridge, Massachusetts 02139

Dear Ms. Puleo:

On behalf of our client, Massachusetts Institute of Technology (MIT), 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 MIT Music Building development in the Kresge parking lot at the rear of 48 Massachusetts Avenue in Cambridge, Massachusetts (herein referred to as the "site"). A copy of the Notice of Intent (NOI) is included in Appendix A.

GENERAL SITE DESCRIPTION

Historic maps indicate the MIT campus was previously marshland of the Charles River Basin that was filled between 1883 and 1889. Historic reports indicate the material used for site filling consisted primarily of silt with sand and frequent shells, dredged from the Charles River. Additionally, sand, gravel, ashes, and other city waste were used for filling.

Historical maps and Sanborn Fire Insurance Maps indicate the site was undeveloped in the early 1900s**,** but was occupied by roadways including Greenhalge, Amherst, and Princeton Streets. By 1934, Princeton Street and Greenhalge Street (now named Danforth Street) no longer run through the site but stop short to the east and south, respectively. Sanborn maps also show a small structure in the northwestern corner of the site labeled the "Radio Experimental Building." On the 1950 Sanborn map, the Radio Experimental Building is not shown, and Amherst Street is shown extending through the southern portion of the site. The Kresge Auditorium (directly adjacent to the site to the east) was dedicated in 1955 and the loading dock ramp for the auditorium is located within the site limits

(Figure 2). By 1962, most of the site was occupied by a paved parking lot. Various athletic buildings and fields have been constructed in the surrounding areas, but the site has remained an active parking lot.

Given the limited development of the site since filling in the early 1900s, we anticipate any contamination would be due to fill materials and site conditions would be similar to those we have encountered at other adjacent projects (W34 Johnson Athletic Center, W35 Zesiger Sports Center, Jack Barry Field, and DuPont Tennis Courts).

We understand that the proposed development will consist of a new building that includes a performance theater and classroom and office space. The proposed Music Building will be constructed over a two level 32,000 square feet (sq ft) below-grade parking garage, with certain portions of the above-grade structure extending beyond the below-grade limits of the parking garage. The garage is anticipated to have its lowest level floor at approximately El. -1.5 (Cambridge City Base [CCB]) which is approximately 23 ft below existing site grades. The garage will be accessed by an exterior ramp that connects to Amherst Street.

In addition to the new parking garage and building, several existing utilities must be re-routed around the new building. Additionally, stormwater detention structures and green infrastructure will be installed to maximize stormwater recharge. The existing Kresge loading dock will also undergo some modifications as part of the project. Planned finished site grades around the buildings are approximately El. 21.5 to 22.5.

Multiple subsurface exploration programs were conducted at the site from June 2019 through October 2020. Concentrations of semi-volatile organic compounds (SVOCs), petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and metals (antimony, barium, chromium, lead, and zinc) were present in the fill soils at levels above applicable Massachusetts Contingency Plan (MCP, 310 CMR 40.0000) 2014 RCS-1 Reportable Concentrations. These detected compounds are attributed to the historic site filling and represent a 120-day reporting condition to Massachusetts Department of Environmental Protection (MassDEP). Accordingly, a release notification form (RNF) was submitted to MassDEP on 5 October 2020 and MassDEP assigned Release Tracking Number (RTN) 3-36514. A Release Abatement Measure (RAM) Plan will be prepared in accordance with the MCP and submitted to MassDEP by the Owner's LSP prior to the start of soil-disturbing activities (e.g., prior to enabling phase utility work).

RECEIVING WATER INFORMATION

On 10 September 2020, Haley & Aldrich collected a receiving water sample from the Charles River along the Massachusetts Avenue bridge 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 B. 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 MassDEP on 14 October 2020. The StreamStats report, Dilution Factor calculations, and MassDEP confirmation of the 7Q10 and DF are included in Appendix B.

Copies of the "EnterData" and "FreshwaterResults" tabs from the excel file provided as an additional resource by EPA are included in Appendix B 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, groundwater samples were collected from observation well HA20-C3(OW) on 2 June 2020 and 2 October 2002. The well is located within planned building footprint, as shown on Figure 2.

The groundwater samples were submitted to Alpha for chemical analysis of 2017 NPDES RGP parameters including VOCs, SVOCs including polycyclic aromatic hydrocarbons (PAHs), total metals, total petroleum hydrocarbons, pesticides, 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 north and east limits of the project site, as shown on Figure 2. The proposed discharge route is shown on Figure 3. The discharge route flows south along the east side of the site down Danforth Street and discharges to outfall D09OF0000 in the Charles River. We anticipate effluent discharge rates to be about 50 gallons per minute (gpm) or less, with occasional peak flows of about 100 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 the Contractor to meet the applicable 2017 RGP Discharge Effluent Criteria. Prior to discharge, dewatering effluent will be routed through a sedimentation tank and bag filters to remove suspended solids and undissolved chemical constituents, as shown on Figure 4.

TREATMENT CHEMICALS AND ADDITIVES INFORMATION

A pH adjustment system will likely be added to the sedimentation tank (estimated to be 18,000-gallon capacity) at the head of the treatment system. Sulfuric acid (70-100%) will be used to lower the pH as necessary to maintain pH within the prescribed RGP discharge requirements of 6.5 to 8.3, and dosing will be automatically controlled using a meter pump, pH controller, and probe. The sulfuric acid will be stored in a 55-gallon drum within secondary containment. The rest of the water treatment system will remain unchanged.

In accordance with Part 2.5.3.d.i of the RGP, the product information, including chemical formula, SDS, CAS registry number, manufacturer, and associated hazards, toxicological and ecological information, and manufacturer information, including dosing and metering, are provided in Appendix D. A summary of control measures for proper handling and spill prevention are incorporated in the Best Management Practices Plan and include: regular maintenance to ensure proper operation; daily monitoring for the condition of the treatment system; storage in appropriate containers in accordance with local, state, and federal regulations; and appropriate training for employees who have direct or indirect responsibility for ensuring compliance with the RGP.

The estimated maximum magnitude of application ("worst case/ceiling value") would be 48 gallons of sulfuric acid per day at a flow rate of 0.144 million gallons per day, which equates to a concentration of 333 ppm. The lethal concentration to kill 50% of the fish population (LC50) in a receiving water is 500 ppm per the SDS in Attachment B. So even at ceiling values, the sulfuric acid would not exceed LC50. Actual daily application of sulfuric acid is anticipated to be 7 to 8 gallons/day or less for a dose concentration of 85 ppm. The pH adjustment would be installed near the influent of the treatment chain and would be buffered by the rest of the treatment chain. Additionally, this dose of sulfuric acid would be diluted by other flows in the stormwater discharge and the Charles River.

Part F of the RGP NOI requires that chemical additives be identified if applied to the effluent prior to discharge. To satisfy the confirmation requirements of RGP Part 2.5.3.d.ii:

1. The addition of a pH conditioner will not add any pollutants in concentrations which exceed permit effluent limitations;
2. The use of this chemical will not result in the exceedance of any applicable water quality standard; and
3. This chemical will not add any pollutants that would justify the application of permit conditions that are different from or absent in the permit.

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 E. 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.

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 are within the project site. The site is close to the Charles River Basin Historic District (property ID 78000436) but discharges and discharge-related activities are not considered to have the potential to affect to this historic property/area. The project site meets Criterion A. Documentation is included in Appendix F.

SUPPLEMENTAL INFORMATION

Permits for temporary construction dewatering will also be required from the City of Cambridge. The contractor will submit the City of Cambridge permit concurrently with this application. A copy of the permit application is included in Appendix G.

Owner and operation information are provided below for reference:

Owner:
Massachusetts Institute of Technology
77 Massachusetts Avenue, Building N52-496
Cambridge, Massachusetts 02139
Attn: Louis DiBerardinis

Operator:
Lee Kennedy Company
122 Quincy Shore Drive
Quincy, MA 02171
Attn: Joseph Berry

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.

Kate A. Lamberti
Engineer

Keila T. Munz
Scientist

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 Plan
- Figure 3 –Proposed Discharge Route
- Figure 4 –Proposed Treatment System Schematic
- Appendix A – Notice of Intent (NOI)
- Appendix B – Effluent Limitations Documentation
- Appendix C – Laboratory Data Reports
- Appendix D – Chemicals and Additives Information
- Appendix E – Endangered Species Act Assessment
- Appendix F – National Historic Preservation Act Review
- Appendix G – Copy of City of Cambridge Construction Dewatering Permit Application

c: MIT; Sarah Yazici,
MIT, Phyllis Carter

\\haleyaldrich.com\share\CF\Projects\133856\H_Construction_Dewatering\NPDES RGP Application\Text\2020-1215-HAI-MIT Music-NPDES RGP_F.docx

TABLES

TABLE I
SUMMARY OF GROUNDWATER DATA
MIT MUSIC BUILDING
CAMBRIDGE, MA
FILE NO. 133856

	Action Level			
Location Name		HA20-C3(OW)	HA20-C3(OW)	OUTFALL
Sample Name	NPDES RGP Site	HA20-C3(OW)-20200602	HA20-C3(OW)-10220	OUTFALL-20200910
Sample Date	Specific Criteria	06/02/2020	10/02/2020	09/10/2020
Lab Sample ID		L2023024-01	L2042027-01	L2037651-02
Volatile Organic Compounds (ug/L)				
1,1,1-Trichloroethane	200	-	ND (2)	-
1,1,2-Trichloroethane	5	-	ND (1.5)	-
1,1-Dichloroethane	70	-	ND (1.5)	-
1,1-Dichloroethene	3.2	-	ND (1)	-
1,2-Dibromoethane (Ethylene Dibromide)	0.05	-	ND (0.01)	-
1,2-Dichlorobenzene	600	-	ND (5)	-
1,2-Dichloroethane	5	-	ND (1.5)	-
1,3-Dichlorobenzene	320	-	ND (5)	-
1,4-Dichlorobenzene	5	-	ND (5)	-
Acetone	7970	-	ND (10)	-
Benzene	5^	-	ND (1)	-
Carbon tetrachloride	4.4	-	ND (1)	-
cis-1,2-Dichloroethene	70	-	ND (1)	-
Ethylbenzene	^	-	ND (1)	-
m,p-Xylenes	^	-	ND (2)	-
Methyl Tert Butyl Ether	70	-	ND (10)	-
Methylene chloride	4.6	-	ND (1)	-
o-Xylene	^	-	ND (1)	-
Tert-Amyl Methyl Ether (TAME)	90	-	ND (20)	-
Tert-Butyl Alcohol (tert-Butanol)	120	-	ND (100)	-
Tetrachloroethene	5	-	ND (1)	-
Toluene	^	-	ND (1)	-
Trichloroethene	5	-	ND (1)	-
Vinyl chloride	2	-	ND (1)	-
Xylene (total)	^	-	ND (1)	-
Total BTEX	100	-	ND	-
Volatile Organic Compounds SIM (ug/L)				
1,4-Dioxane	200	-	ND (50)	-
Semi-Volatile Organic Compounds (ug/L)				
1,2,4-Trichlorobenzene	NA	ND (5)	-	-
1,2-Dichlorobenzene	NA	ND (2)	-	-
1,3-Dichlorobenzene	NA	ND (2)	-	-
1,4-Dichlorobenzene	NA	ND (2)	-	-
2,2'-oxybis(1-Chloropropane)	NA	ND (2)	-	-
2,4-Dinitrotoluene	NA	ND (5)	-	-
2,6-Dinitrotoluene	NA	ND (5)	-	-
3,3'-Dichlorobenzidine	NA	ND (5)	-	-
4-Bromophenyl phenyl ether	NA	ND (2)	-	-
4-Chloroaniline	NA	ND (5)	-	-
Acetophenone	NA	ND (5)	-	-
Aniline	NA	ND (2)	-	-
Azobenzene	NA	ND (2)	-	-
bis(2-Chloroethoxy)methane	NA	ND (5)	-	-
bis(2-Chloroethyl)ether	NA	ND (2)	-	-
Dibenzofuran	NA	ND (2)	-	-
Isophorone	NA	ND (5)	-	-
Nitrobenzene	NA	ND (2)	-	-
2,4,5-Trichlorophenol	+	ND (5)	-	-
2,4,6-Trichlorophenol	+	ND (5)	-	-
2,4-Dichlorophenol	+	ND (5)	-	-
2,4-Dimethylphenol	+	ND (5)	-	-
2,4-Dinitrophenol	+	ND (20)	-	-
2-Chlorophenol	+	ND (2)	-	-
2-Methylphenol (o-Cresol)	+	ND (5)	-	-
2-Nitrophenol	+	ND (10)	-	-
3&4-Methylphenol	+	ND (5)	-	-
4-Nitrophenol	+	ND (10)	-	-
Phenol	1080+	ND (5)	-	-
Total Phenols (ug/L)	+	ND	ND (30)	-
bis(2-Ethylhexyl)phthalate	101++	ND (3)	ND (2.2)	-
Butyl benzylphthalate	++	ND (5)	ND (5)	-
Diethyl phthalate	++	ND (5)	ND (5)	-
Dimethyl phthalate	++	ND (5)	ND (5)	-
Di-n-butylphthalate	++	ND (5)	ND (5)	-
Di-n-octyl phthalate	++	ND (5)	ND (5)	-
Total Phthalates	190++	ND	ND	-
Semi-Volatile Organic Compounds (SIM) (ug/L)				
2-Chloronaphthalene	NA	ND (0.2)	-	-
2-Methylnaphthalene	NA	ND (0.1)	-	-
Hexachlorobenzene	NA	ND (0.8)	-	-
Hexachlorobutadiene	NA	ND (0.5)	-	-
Hexachloroethane	NA	ND (0.8)	-	-
Pentachlorophenol	1	ND (0.8)	ND (1)	-
Benzo(a)anthracene	1*	ND (0.1)	ND (0.1)	-
Benzo(a)pyrene	1*	ND (0.1)	ND (0.1)	-
Benzo(b)fluoranthene	1*	ND (0.1)	ND (0.1)	-
Benzo(k)fluoranthene	1*	ND (0.1)	ND (0.1)	-
Chrysene	1*	ND (0.1)	ND (0.1)	-
Dibenz(a,h)anthracene	1*	ND (0.1)	ND (0.1)	-
Indeno(1,2,3-cd)pyrene	1*	ND (0.1)	ND (0.1)	-
Total Group I PAHs	1*	ND	ND	-
Acenaphthene	**	ND (0.1)	ND (0.1)	-
Acenaphthylene	**	ND (0.1)	ND (0.1)	-
Anthracene	**	ND (0.1)	ND (0.1)	-
Benzo(g,h,i)perylene	**	ND (0.1)	ND (0.1)	-
Fluoranthene	**	ND (0.1)	ND (0.1)	-
Fluorene	**	ND (0.1)	ND (0.1)	-
Naphthalene	20**	ND (0.1)	ND (0.1)	-
Phenanthrene	**	ND (0.1)	ND (0.1)	-
Pyrene	**	ND (0.1)	ND (0.1)	-
Total Group II PAHs	100**	ND	ND	-
Total Petroleum Hydrocarbons (ug/L)				
Petroleum hydrocarbons	5000	-	ND (4000)	-
Inorganic Compounds (ug/L)				
Antimony, Total	206	ND (4)	ND (4)	ND (20)
Arsenic, Total	104	-	ND (1)	ND (5)
Barium, Total	NA	20	-	-
Cadmium, Total	10.2	-	ND (0.2)	ND (1)
Chromium, Total	323	ND (10)	8.11	ND (5)
Chromium III (Trivalent), Total	323	-	ND (10)	ND (10)
Chromium VI (Hexavalent), Dissolved	323	-	ND (10)	ND (10)
Copper, Total	242	-	3.85	ND (5)
Hardness, Total	NA	-	555000	387000
Iron, Total	5000	-	3650	109
Lead, Total	160	ND (10)	5.4	ND (5)
Mercury, Total	0.739	-	ND (0.2)	ND (0.2)
Nickel, Total	1450	-	8.13	ND (10)
Selenium, Total	235.8	-	ND (5)	ND (25)
Silver, Total	35.1	-	ND (0.4)	ND (2)
Zinc, Total	420	ND (50)	17.81	ND (50)

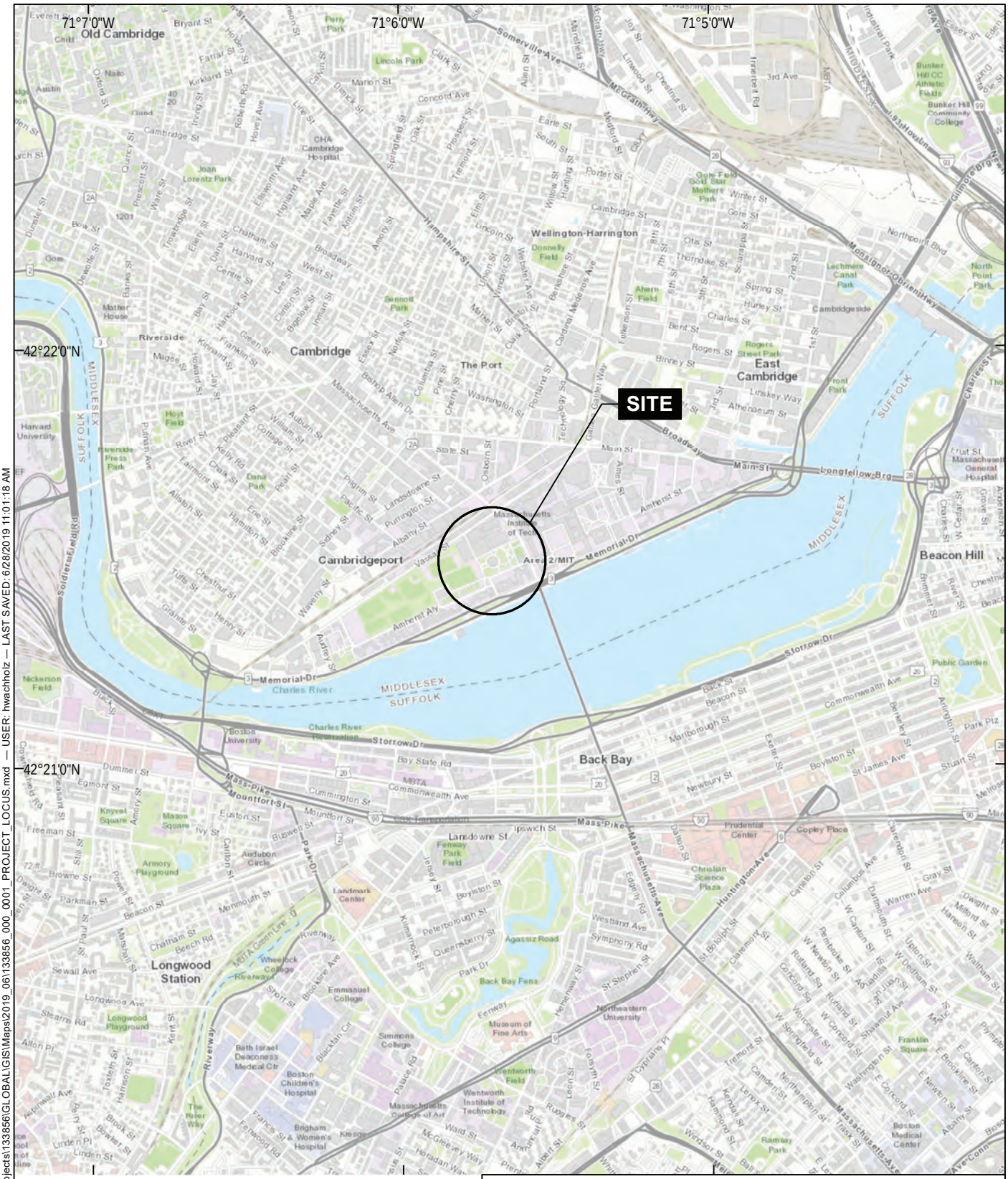
TABLE I
SUMMARY OF GROUNDWATER DATA
MIT MUSIC BUILDING
CAMBRIDGE, MA
FILE NO. 133856

	Action Level			
Location Name		HA20-C3(OW)	HA20-C3(OW)	OUTFALL
Sample Name	NPDES RGP Site	HA20-C3(OW)-20200602	HA20-C3(OW)-10220	OUTFALL-20200910
Sample Date	Specific Criteria	06/02/2020	10/02/2020	09/10/2020
Lab Sample ID		L2023024-01	L2042027-01	L2037651-02
PCBs (ug/L)				
Aroclor-1016 (PCB-1016)	+++	ND (0.25)	ND (0.25)	-
Aroclor-1221 (PCB-1221)	+++	ND (0.25)	ND (0.25)	-
Aroclor-1232 (PCB-1232)	+++	ND (0.25)	ND (0.25)	-
Aroclor-1242 (PCB-1242)	+++	ND (0.25)	ND (0.25)	-
Aroclor-1248 (PCB-1248)	+++	ND (0.25)	ND (0.25)	-
Aroclor-1254 (PCB-1254)	+++	ND (0.25)	ND (0.25)	-
Aroclor-1260 (PCB-1260)	+++	ND (0.25)	ND (0.2)	-
Aroclor-1262 (PCB-1262)	+++	ND (0.25)	-	-
Aroclor-1268 (PCB-1268)	+++	ND (0.25)	-	-
Polychlorinated biphenyls (PCBs)	0.000064+++	ND (0.25)	-	-
Other				
pH (pH units)	NA	-	6.8	7.9
Field Temperature (°C)		-	22.5	20.8
Ammonia, Total (ug/L)	Report	-	3320	121
Chloride, Total (ug/L)	Report	-	1160000	-
Chlorine, residual, Total (ug/L)	0.2	-	ND (20)	-
Cyanide, Total (ug/L)	178000	-	ND (5)	-
Total Suspended Solids (TSS) (ug/L)	30000	-	23000	-

ABBREVIATIONS:
- : Not analyzed
^: Indicates effluent limit is limited as total BTEX of 100 ug/l.
+: Indicates effluent limit is limited as total phenols
++: Indicates effluent limit is limited as total phthalates of 190 ug/l.
+++: Indicates effluent limit is limited as total PCBs of 0.000064 ug/l.
*: Indicates effluent limit is limited as total Group I PAHs of 1 ug/l.
**: Indicates effluent limit is limited as total Group II PAHs of 100 ug/l.
ug/L: micrograms per liter
NA: Not Applicable
ND (2.5): Result not detected above reporting limit (shown in parentheses)

NOTES:
1. Analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
3. **Blue bold** values indicate an exceedance of the applicable site-specific 2017 RGP Criteria.
2. **Bold** values indicate an exceedance of applicable 2014 RCGW-2 Concentrations.

FIGURES



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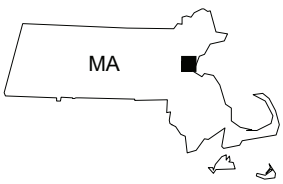

MAP SOURCE: ESRI
SITE COORDINATES: 42°21'28"N, 71°5'42"W

HALEY ALDRICH

MIT MUSIC BUILDING
CAMBRIDGE, MASSACHUSETTS

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
DECEMBER 2020

FIGURE 1

HA20-U1
HA20-A1/B1
HA20-C1/D1
HA20-U2
HA20-A2
HA20-B2
HA20-C2
HA20-D2
HA20-E1/F1
HA20-A3
HA20-B3
HA20-C3(OW)
HA20-D3
W16-B1
W16-B4
HA-19-1
HA20-B4
HA20-C4
HA20-D4
HA20-E4
HA-19-2
HA20-A4
HA20-A5
HA20-B5
HA20-C5
HA20-D5
HA20-E5
HA20-F5
HA20-G5
HA-19-3(OW)
HA20-C6/D6
HA20-E6/F6
HA20-U3

PROPOSED DISCHARGE ROUTE

APPROXIMATE LIMITS OF BELOW GRADE GARAGE

KRESGE AUDITORIUM

JACK BARRY TURF

DUPONT TENNIS COURTS

AMHERST STREET

DANFORTH STREET

PROPOSED OUTFALL LOCATION FOLLOWING - D09OF0000

0 50 100
SCALE IN FEET

LEGEND

HA20-C3(OW) DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING CONDUCTED BY NORTHERN DRILL SERVICE, INC. ON 12 AND 13 MAY 2020 AND OBSERVED BY HALEY & ALDRICH STAFF

HA20-A2 DESIGNATION AND APPROXIMATE LOCATION OF GEOPROBE BORING CONDUCTED BY NORTHERN DRILL SERVICE, INC. ON 4 THROUGH 8 MAY 2020 AND OBSERVED BY HALEY & ALDRICH STAFF

HA-19-1 DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS OF DERRY, NEW HAMPSHIRE AND OBSERVED BY HALEY & ALDRICH, INC. IN JUNE 2019

W16-B1 DESIGNATION AND APPROXIMATE LOCATION OF HISTORICAL EXPLORATION FROM MIT SUBSURFACE DATABASE, AVAILABLE FROM HALEY & ALDRICH INC., FILES

(OW) INDICATES OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE

NOTE

1. BASE PLAN TAKEN FROM AN ELECTRONIC FILE TITLED "ACAD-13360_cut-Model.dwg", PROVIDED BY NITSCH ENGINEERING ON 7 JANUARY 2020.

APPROXIMATE LOCATION OF POTENTIAL CATCH BASIN, DRAIN LINE, OR MANHOLE PROPOSED FOR DISCHARGE

HALEY ALDRICH

MIT MUSIC BUILDING
CAMBRIDGE, MASSACHUSETTS

SITE AND SUBSURFACE EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
DECEMBER 2020

FIGURE 2

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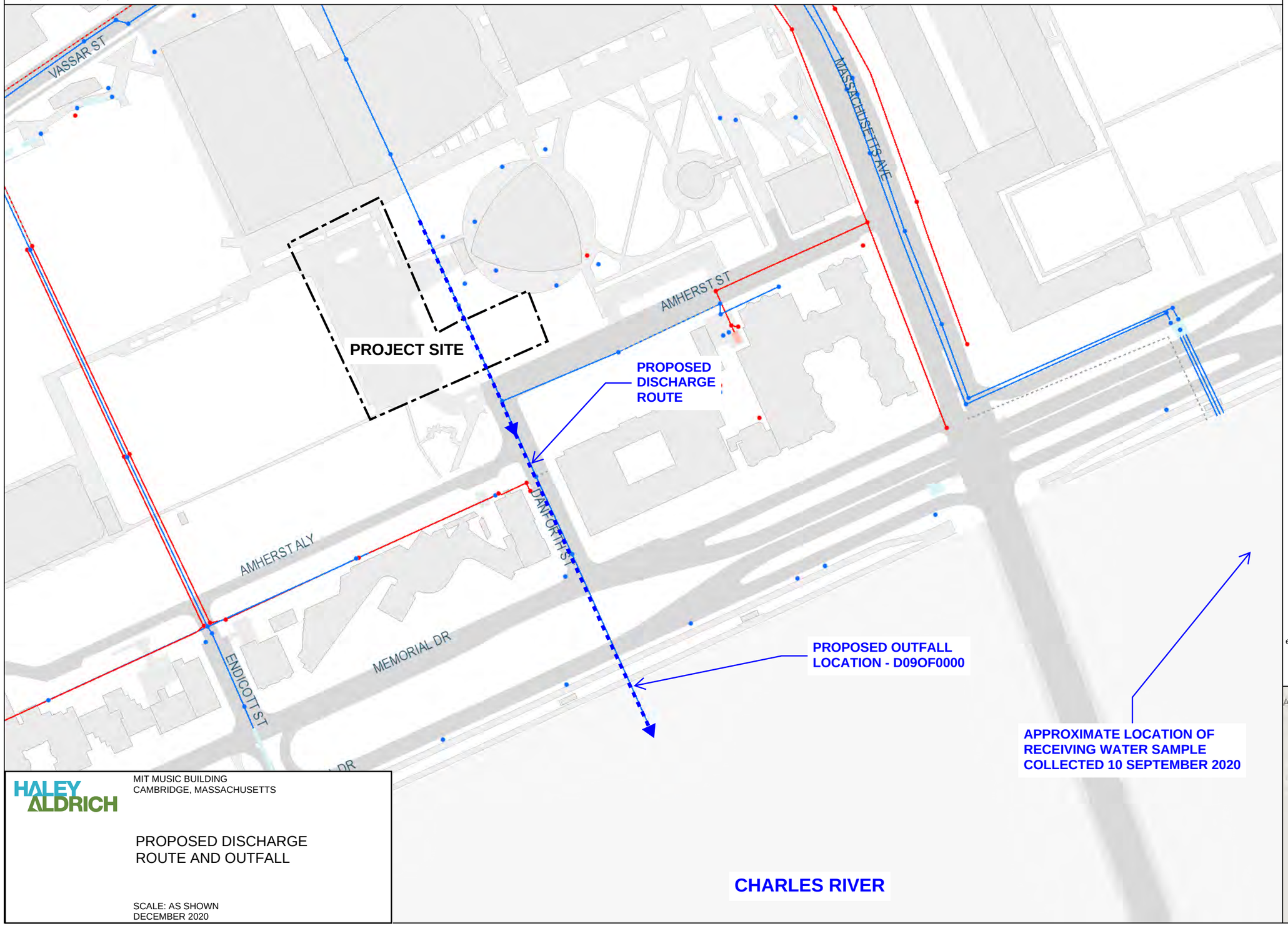
City of Cambridge

October 22, 2020



LEGEND

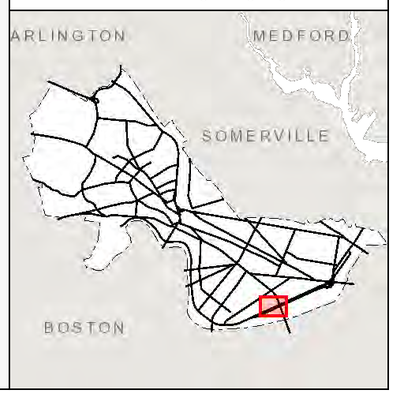
Gravity Mai
- Stormwater
- Sewage
- Combined Sewage
- Abandoned

Zoom Three Paved Surfaces
- Paved Roads
- Other Paved Surface
- Bridges
- Public Footpath

City of Cambridge
Massachusetts

1" = 139 ft

www.cambridgema.gov/gis



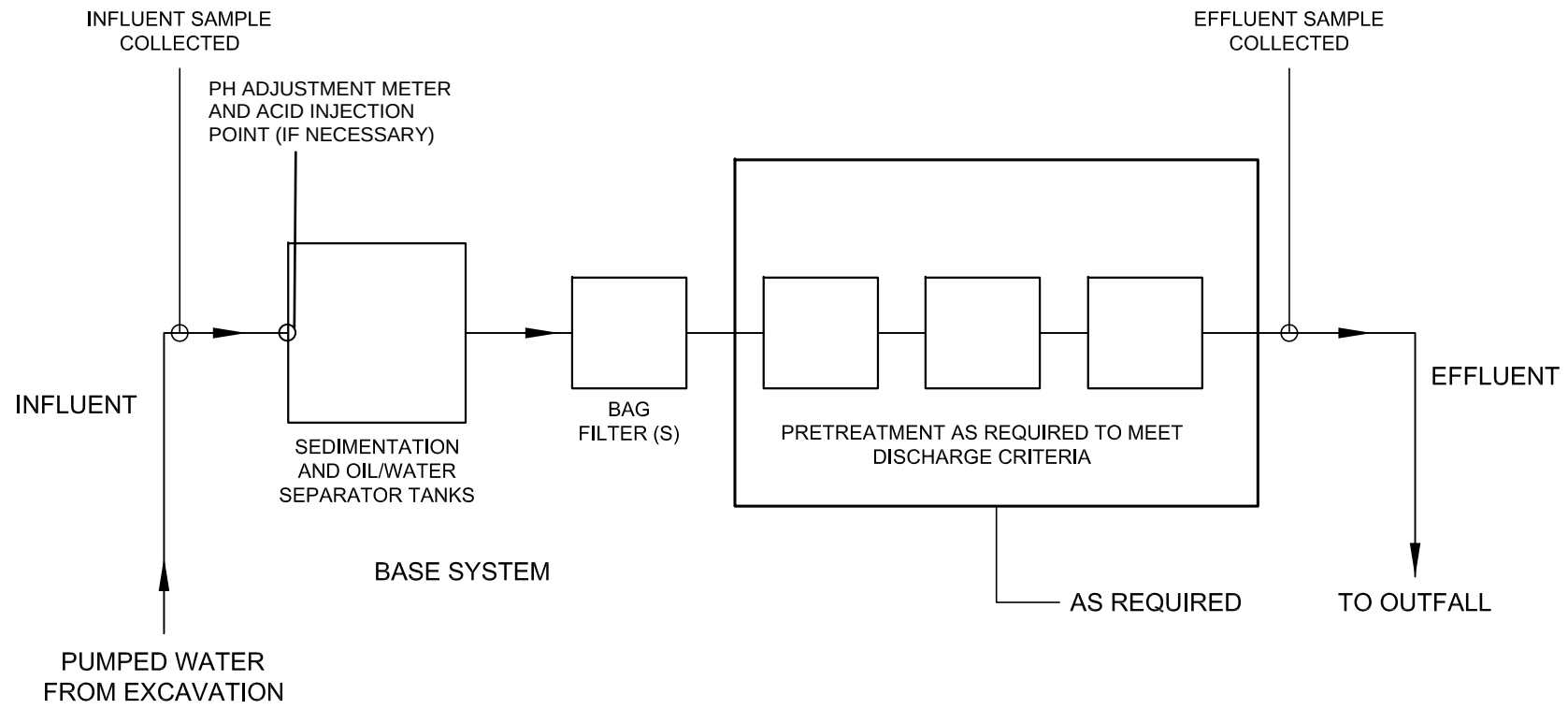
HALEY ALDRICH

MIT MUSIC BUILDING
CAMBRIDGE, MASSACHUSETTS

PROPOSED DISCHARGE ROUTE AND OUTFALL

SCALE: AS SHOWN
DECEMBER 2020

G:\38625\NPDES\FIGURES\COPY-A142.DWG



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.
2. PH ADJUSTMENT ACID STORAGE TO BE ADJACENT TO TREATMENT NEAR INJECTION POINT. REFER TO EQUIPMENT CUT SHEETS IN APPENDIX D.

HALEY ALDRICH

MIT MUSIC BUILDING
CAMBRIDGE, MASSACHUSETTS

PROPOSED TREATMENT SYSTEM SCHEMATIC

SCALE: NONE
DECEMBER 2020

FIGURE 4

APPENDIX A

Notice of Intent (NOI)

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

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Massachusetts Institute of Technology (MIT) Music Building</td><td colspan="3">Site address: 48 Massachusetts Avenue (Rear)
Street: Massachusetts Avenue</td></tr>
<tr><td>City: Cambridge</td><td>State: MA</td><td>Zip: 02139</td></tr>
<tr><td rowspan="4">2. Site owner
Massachusetts Institute of Technology

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
■ Other; if so, specify: Institution</td><td colspan="3">Contact Person: Louis DiBerardinis</td></tr>
<tr><td colspan="2">Telephone: 617-253-9389</td><td>Email: loudib@mit.edu</td></tr>
<tr><td colspan="3">Mailing address: 77 Massachusetts Avenue, Building N52-496
Street:</td></tr>
<tr><td>City: Cambridge</td><td>State: MA</td><td>Zip: 02139</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
Lee Kennedy Company</td><td colspan="3">Contact Person: Joseph Berry</td></tr>
<tr><td colspan="2">Telephone: 617-825-6930</td><td>Email: jberry@leekennedy.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 122 Quincy Shore Drive</td></tr>
<tr><td>City: Quincy</td><td>State: MA</td><td>Zip: 02171</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:
N/A

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):
■ MA Chapter 21e; list RTN(s): 3-36514
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ POTW Pretreatment
☐ CWA Section 404</td></tr>
</table>

B. Receiving water information:

1. Name of receiving water(s):	Waterbody identification of receiving water(s):	Classification of receiving water(s):
Charles River	MA72-38	Class B

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

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

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

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. The Lower Charles River is on the MA Integrated List and all uses are considered impaired. TMDL is available for Pathogens and Phosphorus.

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.	29.2 cfs
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	132.04

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ■ Yes ☐ No
If yes, indicate date confirmation received: 10/14/2020

7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No

C. Source water information:

1. Source water(s) is (check any that apply):

☐ Contaminated groundwater Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ Yes ☐ No	☐ Contaminated surface water Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ☐ Yes ☐ No	☐ The receiving water ☐ A surface water other than the receiving water; if so, indicate waterbody:	☐ Potable water; if so, indicate municipality or origin: ■ Other; if so, specify: construction site dewatering

2. Source water contaminants: Select inorganics. See table 4.	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): ☐ Yes ■ No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII.	b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ■ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ■ New discharge ☐ New source	
Outfall(s): CITY OF CAMBRIDGE OUTFALL LOCATION NO. D08OF0000	Outfall location(s): (Latitude, Longitude) Approx. 42.355901, -71.094192 (Refer to Figure 3 of Haley & Aldrich Letter)
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Discharges through City of Cambridge stormwater main on Danforth Street and outfalls at Location No. D08OF0000. See attached Figure 3 ☐ A private storm sewer system ■ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): ■ Yes ☐ No Has the operator has received permission from the owner to use such system for discharges? (check one): ☐ Yes ■ No, if so, explain, with an estimated timeframe for obtaining permission: City of Cambridge application for dewatering discharge submitted concurrently with NPDES NOI Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ☐ No	
Provide the expected start and end dates of discharge(s) (month/year): January 2021 - June 2022 Indicate if the discharge is expected to occur over a duration of: ☐ less than 12 months ■ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No	

<table>
<tr><td>2. Activity Category: (check all that apply)</td><td colspan="2">3. Contamination Type Category: (check all that apply)</td></tr>
<tr><td rowspan="5">☐ I – Petroleum-Related Site Remediation
☐ II – Non-Petroleum-Related Site Remediation
■ III – Contaminated Site Dewatering
☐ IV – Dewatering of Pipelines and Tanks
☐ V – Aquifer Pump Testing
☐ VI – Well Development/Rehabilitation
☐ VII – Collection Structure Dewatering/Remediation
☐ VIII – Dredge-Related Dewatering</td><td colspan="2">a. If Activity Category I or II: (check all that apply)

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

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

* - Detected in soil only

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	4500NH3-	0.075	3,320	3,320	Report mg/L	---
Chloride		✔	1	2540D	500	1160000	1160000	Report µg/l	---
Total Residual Chlorine	✔		1	4500CL-D	0.02	<0.02	<0.02	0.2 mg/L	1452
Total Suspended Solids		✔	1	2540D	5	23	23	30 mg/L	---
Antimony		✔ *	2	3,200.8	4	<4	<4	206 µg/L	84507
Arsenic		✔ *	1	3,200.8	1	<1	<1	104 µg/L	1320
Cadmium		✔ *	1	3,200.8	0.2	<0.2	<0.2	10.2 µg/L	97.6
Chromium III	✔		1	107,-	10	<10	<10	323 µg/L	34563
Chromium VI		✔ *	1	1,7196A	10	<10	<10	323 µg/L	1509
Copper		✔	1	3,200.8	1	3.85	3.85	242 µg/L	3926
Iron		✔	1	3,200.8	50	3650	3650	5,000 µg/L	117758
Lead		✔	2	3,200.8	1	7.7	7.7	160 µg/L	2362
Mercury		✔ *	1	3,245.1	0.2	<0.2	<0.2	0.739 µg/L	119.6
Nickel		✔	1	3,200.8	2	8.13	8.13	1,450 µg/L	21701
Selenium		✔ *	1	3,200.8	5	<5	<5	235.8 µg/L	660.2
Silver		✔ *	1	3,200.8	0.4	<0.4	<0.4	35.1 µg/L	5152
Zinc		✔	2	3,200.8	10	33.9	33.9	420 µg/L	49934
Cyanide	✔		1	4500CN-C	0.005	<0.005	<0.005	178 mg/L	686.6
B. Non-Halogenated VOCs									
Total BTEX	✔		1	NA	NA	0	0	100 µg/L	---
Benzene	✔		1	624.1	1	<1	<1	5.0 µg/L	---
1,4 Dioxane	✔		1	624.1-SIM	50	<50	<50	200 µg/L	---
Acetone		✔ *	1	624.1	10	<10	<10	7.97 mg/L	---
Phenol	✔		1	8270D	5	<5	<5	1,080 µg/L	39613

* - Detected in soil only

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	624.1	1	<1	<1	4.4 µg/L	211.3
1,2 Dichlorobenzene	✔		1	8270D	2	<2	<2	600 µg/L	---
1,3 Dichlorobenzene	✔		1	8270D	2	<2	<2	320 µg/L	---
1,4 Dichlorobenzene	✔		1	8270D	2	<2	<2	5.0 µg/L	---
Total dichlorobenzene	✔		1	8270D	2	<2	<2	763 µg/L in NH	---
1,1 Dichloroethane	✔		1	624.1	1.5	<1.5	<1.5	70 µg/L	---
1,2 Dichloroethane	✔		1	624.1	1.5	<1.5	<1.5	5.0 µg/L	---
1,1 Dichloroethylene	✔		1	624.1	1	<1	<1	3.2 µg/L	---
Ethylene Dibromide	✔		1	624.1	0.01	<0.01	<0.01	0.05 µg/L	---
Methylene Chloride	✔		1	624.1	1	<1	<1	4.6 µg/L	---
1,1,1 Trichloroethane	✔		1	624.1	2	<2	<2	200 µg/L	---
1,1,2 Trichloroethane	✔		1	624.1	1.5	<1.5	<1.5	5.0 µg/L	---
Trichloroethylene	✔		1	624.1	1	<1	<1	5.0 µg/L	---
Tetrachloroethylene	✔		1	624.1	1	<1	<1	5.0 µg/L	435.7
cis-1,2 Dichloroethylene	✔		1	624.1	1	<1	<1	70 µg/L	---
Vinyl Chloride	✔		1	624.1	1	<1	<1	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✔		2	625.1		ND	ND	190 µg/L	
Diethylhexyl phthalate	✔		2	625.1	3	<3	<3	101 µg/L	290.5
Total Group I PAHs		✔ *	2	625.1-SIM		ND	ND	1.0 µg/L	---
Benzo(a)anthracene		✔ *	2	625.1-SIM	0.1	<0.1	<0.1	As Total PAHs	0.5018
Benzo(a)pyrene		✔ *	2	625.1-SIM	0.1	<0.1	<0.1		0.5018
Benzo(b)fluoranthene		✔ *	2	625.1-SIM	0.1	<0.1	<0.1		0.5018
Benzo(k)fluoranthene		✔ *	2	625.1-SIM	0.1	<0.1	<0.1		0.5018
Chrysene		✔ *	2	625.1-SIM	0.1	<0.1	<0.1		0.5018
Dibenzo(a,h)anthracene		✔ *	2	625.1-SIM	0.1	<0.1	<0.1		0.5018
Indeno(1,2,3-cd)pyrene		✔ *	2	625.1-SIM	0.1	<0.1	<0.1		0.5018

* - Detected in soil only

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs		✔ *	2	625.1-SIM	0.1	<0.1	<0.1	100 µg/L	---
Naphthalene		✔ *	2	625.1-SIM	0.1	<0.1	<0.1	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs		✔ *	1	608.3	0.25	<0.25	<0.25	0.000064 µg/L	---
Pentachlorophenol	✔		2	625.1-SIM	1	<1	<1	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons		✔ *	1		4	<4	<4	5.0 mg/L	---
Ethanol**	✔		1	NA	NA	NA	NA	Report mg/L	---
Methyl-tert-Butyl Ether	✔		1	624.1	10	<10	<10	70 µg/L	2641
tert-Butyl Alcohol	✔		1	624.1	100	<100	<100	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		1	624.1	20	<20	<20	90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
Hardness, Total		✔	1	19,200.7	660	555000	555000		

* - Detected in soil only
** - Refer to cover letter

Additional compounds detected in soil only:

VOCs
Acetone
Carbon disulfide
Chloroform (Trichloromethane)
Naphthalene
Toluene

Metals
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Chromium VI (Hexavalent)
Mercury
Selenium
Silver
Thalium
Vanadium

SVOCs
2-Methylnaphthalene
3&4-Methylphenol
Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
bis(2-Ethylhexyl)phthalate
Butyl benzylphthalate
Chrysene
Dibenz(a,h)anthracene
Dibenzofuran
Fluoranthene
Fluorene
Indeno(1,2,3-cd)pyrene
Naphthalene
Phenanthrene
Pyrene

Other
Lead TCLP
Aroclor-1260 (PCB-1260)
Petroleum Hydrocarbons
4,4'-DDE
4,4'-DDT
Chlordane
Total Solids (%)
Oxidation reduction potential (millivolts)
Conductivity (umhos/cm)

E. Treatment system information

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

☐ Adsorption/Absorption ☐ Advanced Oxidation Processes ☐ Air Stripping ■ Granulated Activated Carbon ("GAC")/Liquid Phase Carbon Adsorption

■ Ion Exchange ☐ Precipitation/Coagulation/Flocculation ■ Separation/Filtration ■ Other; if so, specify:

Applied as necessary to meet effluent discharge criteria.

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 a bag filter and other necessary treatment components (potentially: Ion exchange, GAC, oil/water seperator), to remove suspended solids and undissolved chemical constituents, as shown on Figure 4 of the NPDES permit application.

Identify each major treatment component (check any that apply):

■ Fractionation tanks☐ Equalization tank ☐ Oil/water separator ☐ Mechanical filter ☐ Media filter

☐ Chemical feed tank ☐ Air stripping unit ■ Bag filter ■ Other; if so, specify: GAC, Ion Exchange and other treatments as needed to meet discharge criteria

Indicate if either of the following will occur (check any that apply):

☐ Chlorination ☐ De-chlorination

3. Provide the **design flow capacity** in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: Flow meter Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	
Provide the proposed maximum effluent flow in gpm.	100
Provide the average effluent flow in gpm.	50
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	NA

4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): ■ Yes ☐ No

F. Chemical and additive information

1. Indicate the type(s) of chemical or additive that will be applied to effluent prior to discharge or that may otherwise be present in the discharge(s): (check all that apply)

☐ Algaecides/biocides ☐ Antifoams ☐ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ■ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ■ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:
pH conditioners may be added to the treatment system if necessary to meet effluent limits

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

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

See attached manufacturers cut sheets and SDSs for equipment which may be utilized if necessary. This information is only included as a contingency and is not currently needed based on groundwater data. Exact specifications on frequency, duration, quantity, and method of application are not known at this time. If the system eventually requires chemical additives, these details will be provided to EPA.

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.

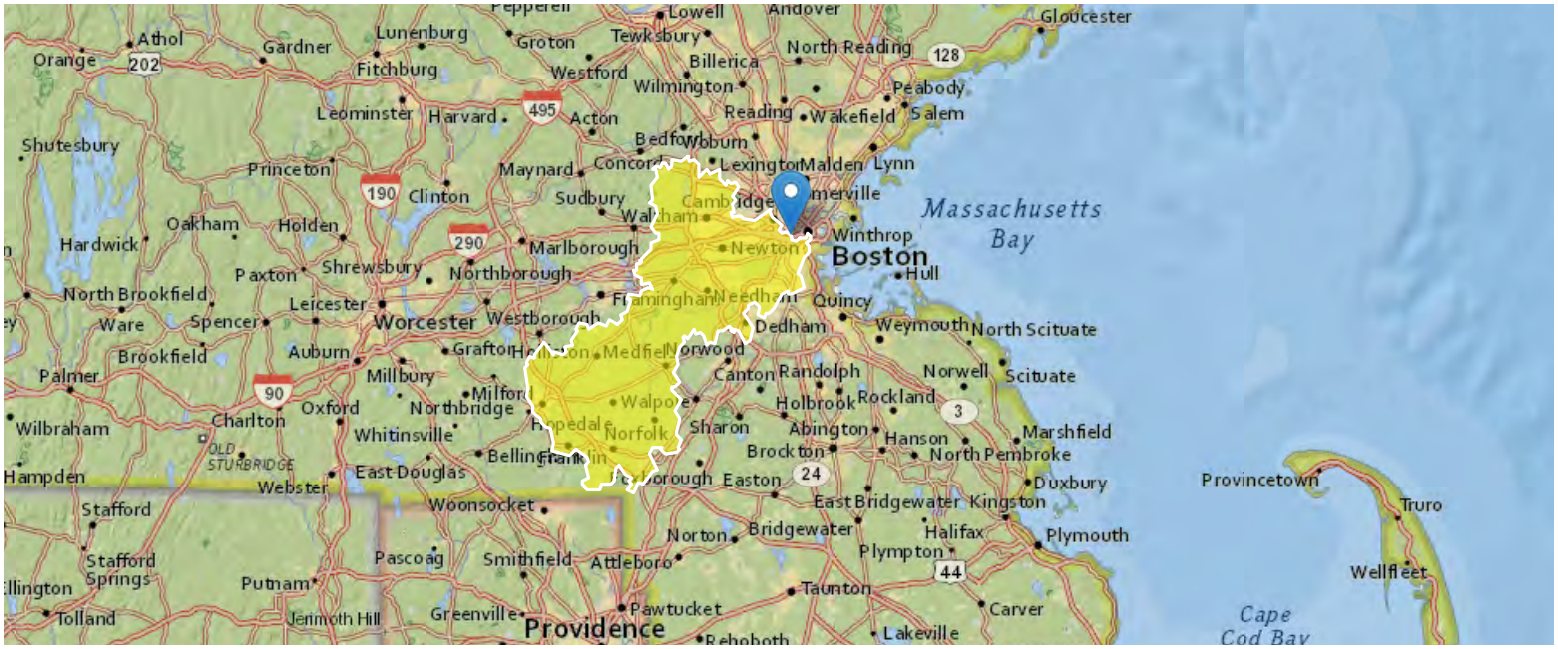
BMPP certification statement:	A BMPP meeting the requirements of this general permit will be implemented at the site upon initiation of discharge.
Notification provided to the appropriate State, including a copy of this NOI, if required.	Check one: Yes ■ No ☐
Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐
Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested. Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.	Check one: Yes ■ No ☐ NA ☐ City of Cambridge application for dewatering discharge submitted concurrently with NPDES 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:	Date: 12.14.20
Print Name and Title:	Joseph Berry, Project Executive, Lee Kennedy Company

APPENDIX B

Effluent Limitations Documentation

StreamStats Report - MIT Music Building

Region ID: MA
Workspace ID: MA20201013200627854000
Clicked Point (Latitude, Longitude): 42.35444, -71.09290
Time: 2020-10-13 16:06:47 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	307	square miles
ELEV	Mean Basin Elevation	192	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	12.26	percent
BSLDEM250	Mean basin slope computed from 1:250K DEM	2.341	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

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	307	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	2.341	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	57.3	ft^3/s
7 Day 10 Year Low Flow	29.2	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/)

Application Version: 4.4.0

HALEY & ALDRICH, INC.		**CALCULATIONS**	**FILE NO.**	**134856**	
			SHEET	**1 of 1**	
CLIENT	**MASSACHUSETTS INSTITUTE OF TECHNOLOGY**		**DATE**	**13-Oct-20**	
PROJECT	**MIT MUSIC BUILDING**		**COMPUTED BY**	**KTM**	
SUBJECT	**DILUTION FACTOR CALCULATIONS**		**CHECKED BY**	**LRH**	

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 29.2 cfs (from StreamStats 4.0)
2. A conversion of 7.48 is used to convert cubic feet to gallons
3. A maximum discharge flowrate of 100 gpm is assumed

CALCULATIONS:

7Q10 Low Flow Value (Q_S)

$$Q_S = \frac{29.2\ ft^3}{sec} \times \frac{7.48\ gallons}{ft^3} \times \frac{86{,}400\ sec}{day} \times \frac{1\ MG}{1{,}000{,}000\ gallons}$$

Q_S = 18.87 MGD

Discharge Flowrate (Q_D)

$$Q_D = \frac{100\ gallons}{min} \times \frac{1{,}440\ min}{day} \times \frac{1\ MG}{1{,}000{,}000\ gallons}$$

Q_D = 0.144 MGD

Dilution Factor (DF)

$$DF = \frac{Q_S + Q_D}{QD} = \frac{18.87\ MGD + 0.144\ MGD}{0.144\ MGD} = \mathbf{132.04}$$

CONCLUSION: The dilution factor for this project is calculated to be **132.04** based on the provided 7Q10 low flow value and discharge flowrate.

Munz, Keila

From: Ruan, Xiaodan (DEP) <xiaodan.ruan@state.ma.us>
Sent: Wednesday, October 14, 2020 2:00 PM
To: Vakalopoulos, Catherine (DEP); Munz, Keila
Cc: Howard, Lindsey; Lamberti, Katherine
Subject: RE: NPDES RGP Application - 7Q10 + Dilution Factor - MIT Music Building

Hi Keila,

I checked the StreamStats and calculation and can confirm that the 7Q10 of 18.87 MGD and a DF of 132.04 for the proposed project at the MIT Music Building in Cambridge with a maximum flow rate of 0.144 MGD are correct.
.
Here is water quality information in assisting you in filling out the NOI:

> Waterbody and ID: Charles River (MA72-38) 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 "MA72-38" to see the causes of impairments.
> TMDLs: There are two TMDLs (pathogens and phosphorus) 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 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

From: Vakalopoulos, Catherine (DEP) <catherine.vakalopoulos@mass.gov>
Sent: Wednesday, October 14, 2020 11:34 AM
To: Munz, Keila <KMunz@haleyaldrich.com>; Ruan, Xiaodan (DEP) <xiaodan.ruan@mass.gov>
Cc: Howard, Lindsey <LHoward@haleyaldrich.com>; Lamberti, Katherine <KLamberti@haleyaldrich.com>
Subject: Re: NPDES RGP Application - 7Q10 + Dilution Factor - MIT Music Building

Hi Xiaodan,
I know you're working on a deadline for tomorrow but can you please look at this when you can?
Thanks,
Cathy

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

From: "Munz, Keila" <KMunz@haleyaldrich.com>
Date: Wednesday, October 14, 2020 at 9:00 AM
To: "Vakalopoulos, Catherine (DEP)" <catherine.vakalopoulos@mass.gov>, "Ruan, Xiaodan (DEP)" <xiaodan.ruan@mass.gov>
Cc: "Howard, Lindsey" <LHoward@haleyaldrich.com>, "Lamberti, Katherine" <KLamberti@haleyaldrich.com>
Subject: NPDES RGP Application - 7Q10 + Dilution Factor - MIT Music Building

Good morning Cathy,

Attached here is 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. This project is down the street from another site, MIT Stephen A. Schwarzman College of Computing, that we submitted a NPDES RGP Application for last month, and discharges to the same area. The proposed maximum effluent flow is 100 gpm, however we expect closer to 50 GPM for the typical daily flow . Can you please confirm these values are appropriate for our project?

Project:
MIT Music Building
Cambridge, MA
Discharge will be to the Charles River near the Mass. Ave Bridge, via City of Cambridge stormwater outfall

Please let me know if you need any other information. Thanks!

Keila T. Munz
Staff Scientist

Haley & Aldrich, Inc.
465 Medford Street | Suite 2200
Boston, MA 02129

T: (617) 886-7590

www.haleyaldrich.com

Enter number values in green boxes below

Enter values in the units specified

↓

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

Enter a dilution factor, if other than zero

↓

132.04

Enter values in the units specified

↓

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

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

↓

7.9	pH in **Standard Units**
	Temperature in **°C**
0.121	Ammonia in **mg/L**
387	Hardness in **mg/L** $CaCO_3$
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**
0	Copper in **µg/L**
109	Iron in **µg/L**
0	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
0	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

↓

0	TRC in **µg/L**
3.32	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**
3.85	Copper in **µg/L**
3650	Iron in **µg/L**
5.4	Lead in **µg/L**
0	Mercury in **µg/L**
8.13	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
17.81	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	Benzo(a)pyrene in **µg/L**
0	Benzo(b)fluoranthene in **µg/L**
0	Benzo(k)fluoranthene in **µg/L**
0	Chrysene in **µg/L**
0	Dibenzo(a,h)anthracene in **µg/L**
0	Indeno(1,2,3-cd)pyrene in **µg/L**
0	Methyl-tert butyl ether in **µg/L**

Notes:

Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor
Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry

Discharge flow is equal to the design flow or 1 MGD, whichever is less
Only if approved by State as the entry for Q_R; leave 0 if no entry

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

Freshwater only

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

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

I. Dilution Factor Calculation Method

A. 7Q10

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

B. Dilution Factor

Calculated as follows:

$$Df = \frac{Q_R + Q_P}{Q_P}$$

Q_R = 7Q10 in MGD

Q_P = Discharge flow, in MGD

II. Effluent Limitation Calculation Method

A. Calculate Water Quality Criterion:

Step 1. Downstream hardness, calculated as follows:

$$C_r = \frac{Q_dC_d + Q_sC_s}{Q_r}$$

C_r = Downstream hardness in mg/L

Q_d = Discharge flow in MGD

C_d = Discharge hardness in mg/L

Q_s = Upstream flow (7Q10) in MGD

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

Q_r = Downstream receiving water flow in MGD

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

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

m_c = Pollutant-specific coefficient (m_a for silver)

b_c = Pollutant-specific coefficient (b_a for silver)

ln = Natural logarithm

h = Hardness calculated in Step 1

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

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

B. Calculate WQBEL:

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

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

C_r = Water quality criterion in µg/L

Q_d = Discharge flow in MGD

C_d = WQBEL in µg/L

Q_s = Upstream flow (7Q10) in MGD

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

Q_r = Downstream receiving water flow in MGD

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

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

C_r = Water quality criterion in µg/L

Q_d = Discharge flow in MGD

Q_r = Downstream receiving water flow in MGD

C. Determine if a WQBEL applies:

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

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

C_r = Downstream concentration in µg/L

Q_d = Discharge flow in MGD

C_d = Influent concentration in µg/L

Q_s = Upstream flow (7Q10) in MGD

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

Q_r = Downstream receiving water flow in MGD

The WQBEL applies if:

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

AND

2) the WQBEL determined for that parameter in accordance with II.B, abov
the TBEL in Part 2.1.1 of the RGP for that parameter. Otherwise, the TBEL

of the RGP for that parameter applies.

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

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

AND

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

Part 2.1.1 of the RGP for that parameter applies.

Dilution Factor	132.0			
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded	
Ammonia	**Report**	mg/L	---	
Chloride	**Report**	µg/L	---	
Total Residual Chlorine	**0.2**	mg/L	1452	µg/L
Total Suspended Solids	**30**	mg/L	---	
Antimony	**206**	µg/L	84507	µg/L
Arsenic	**104**	µg/L	1320	µg/L
Cadmium	**10.2**	µg/L	97.6262	µg/L
Chromium III	**323**	µg/L	34563.6	µg/L
Chromium VI	**323**	µg/L	1509.8	µg/L
Copper	**242**	µg/L	3926.1	µg/L
Iron	**5000**	µg/L	117758	µg/L
Lead	**160**	µg/L	2362.25	µg/L
Mercury	**0.739**	µg/L	119.61	µg/L
Nickel	**1450**	µg/L	21701.2	µg/L
Selenium	**235.8**	µg/L	660.2	µg/L
Silver	**35.1**	µg/L	5152.6	µg/L
Zinc	**420**	µg/L	49934.7	µg/L
Cyanide	**178**	mg/L	686.6	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	39613	µg/L
C. Halogenated VOCs				
Carbon Tetrachloride	**4.4**	µg/L	211.3	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	435.7	µg/L
cis-1,2 Dichloroethylene	**70**	µg/L	---	

Vinyl Chloride	**2.0**	µg/L	---	
D. Non-Halogenated SVOCs				
Total Phthalates	**190**	µg/L	---	µg/L
Diethylhexyl phthalate	**101**	µg/L	290.5	µg/L
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---	
Benzo(a)anthracene	**1.0**	µg/L	0.5018	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.5018	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.5018	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.5018	µg/L
Chrysene	**1.0**	µg/L	0.5018	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.5018	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.5018	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	---	
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	2641	µg/L
tert-Butyl Alcohol	**120**	µg/L	---	
tert-Amyl Methyl Ether	**90**	µg/L	---	

Compliance Level applies if shown		
---	µg/L	
---	µg/L	

---	µg/L
---	µg/L
---	µg/L
---	µg/L
---	µg/L
---	µg/L
---	µg/L

0.5	µg/L

APPENDIX C

Laboratory Data Reports

ANALYTICAL REPORT

Lab Number:	L2023024
Client:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Charlestown, MA 02129-1400
ATTN:	Mike Weaver
Phone:	(617) 886-7373
Project Name:	MIT MUSIC BUILDING
Project Number:	133856-003 SID 3
Report Date:	06/10/20

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: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2023024-01	HA20-C3(OW)	WATER	CAMBRIDGE, MA	06/02/20 11:05	06/04/20

Project Name: MIT MUSIC BUILDING **Lab Number:** L2023024

Project Number: 133856-003 SID 3 **Report Date:** 06/10/20

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	MIT MUSIC BUILDING	**Lab Number:**	L2023024
Project Number:	133856-003 SID 3	**Report Date:**	06/10/20

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: MIT MUSIC BUILDING **Lab Number:** L2023024
Project Number: 133856-003 SID 3 **Report Date:** 06/10/20

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

The analyses performed were specified by the client.

Semivolatile Organics

L2023024-01 (HA20-C3(OW)), WG1378476-1, WG1378476-2, and WG1378476-3: The initial calibration utilized a quadratic fit for Bis(2-ethylhexyl)phthalate, Di-n-octylphthalate and Butyl benzyl phthalate.

Semivolatile Organics by SIM

L2023024-01 (HA20-C3(OW)), WG1378477-1, WG1378477-2, and WG1378477-3: The initial calibration utilized a quadratic fit for Pentachlorophenol.

Total Metals

In reference to question G:

L2023024-01 (HA20-C3(OW)): One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

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: Michelle M. Morris

Title: Technical Director/Representative Date: 06/10/20

QC OUTLIER SUMMARY REPORT

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Semivolatile Organics - Westborough Lab								
8270D	Batch QC	WG1378476-2	Aniline	LCS	18	40-140	01	potential low bias
8270D	Batch QC	WG1378476-2	2,4-Dimethylphenol	LCS	27	30-130	01	potential low bias
8270D	Batch QC	WG1378476-3	Hexachlorobenzene	LCSD	21	20	01	non-directional bias
8270D	Batch QC	WG1378476-3	Bis(2-chloroethyl)ether	LCSD	23	20	01	non-directional bias
8270D	Batch QC	WG1378476-3	1,2-Dichlorobenzene	LCSD	23	20	01	non-directional bias
8270D	Batch QC	WG1378476-3	1,3-Dichlorobenzene	LCSD	25	20	01	non-directional bias
8270D	Batch QC	WG1378476-3	1,4-Dichlorobenzene	LCSD	29	20	01	non-directional bias
8270D	Batch QC	WG1378476-3	Hexachlorobutadiene	LCSD	22	20	01	non-directional bias
8270D	Batch QC	WG1378476-3	Hexachloroethane	LCSD	23	20	01	non-directional bias
8270D	Batch QC	WG1378476-3	Nitrobenzene	LCSD	24	20	01	non-directional bias
8270D	Batch QC	WG1378476-3	Aniline	LCSD	18	40-140	01	potential low bias
8270D	Batch QC	WG1378476-3	2,4-Dimethylphenol	LCSD	26	30-130	01	potential low bias
8270D	Batch QC	WG1378476-3	2-Nitrophenol	LCSD	21	20	01	non-directional bias

ORGANICS

SEMIVOLATILES

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3
Lab Number: L2023024
Report Date: 06/10/20

SAMPLE RESULTS

Lab ID: L2023024-01
Client ID: HA20-C3(OW)
Sample Location: CAMBRIDGE, MA

Date Collected: 06/02/20 11:05
Date Received: 06/04/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 97,8270D
Analytical Date: 06/10/20 03:15
Analyst: JG

Extraction Method: EPA 3510C
Extraction Date: 06/05/20 16:03

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
Acetophenone	ND		ug/l	5.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1

Project Name: MIT MUSIC BUILDING **Lab Number:** L2023024

Project Number: 133856-003 SID 3 **Report Date:** 06/10/20

SAMPLE RESULTS

Lab ID: L2023024-01 Date Collected: 06/02/20 11:05

Client ID: HA20-C3(OW) Date Received: 06/04/20

Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	70		15-110
Phenol-d6	59		15-110
Nitrobenzene-d5	82		30-130
2-Fluorobiphenyl	83		30-130
2,4,6-Tribromophenol	80		15-110
4-Terphenyl-d14	82		30-130

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

SAMPLE RESULTS

Lab ID: L2023024-01
Client ID: HA20-C3(OW)
Sample Location: CAMBRIDGE, MA

Date Collected: 06/02/20 11:05
Date Received: 06/04/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 97,8270D-SIM
Analytical Date: 06/06/20 11:54
Analyst: CB

Extraction Method: EPA 3510C
Extraction Date: 06/05/20 16:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics by SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.10	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	0.10	--	1
Benzo(a)anthracene	ND		ug/l	0.10	--	1
Benzo(a)pyrene	ND		ug/l	0.10	--	1
Benzo(b)fluoranthene	ND		ug/l	0.10	--	1
Benzo(k)fluoranthene	ND		ug/l	0.10	--	1
Chrysene	ND		ug/l	0.10	--	1
Acenaphthylene	ND		ug/l	0.10	--	1
Anthracene	ND		ug/l	0.10	--	1
Benzo(ghi)perylene	ND		ug/l	0.10	--	1
Fluorene	ND		ug/l	0.10	--	1
Phenanthrene	ND		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--	1
Pyrene	ND		ug/l	0.10	--	1
2-Methylnaphthalene	ND		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: MIT MUSIC BUILDING
Lab Number: L2023024
Project Number: 133856-003 SID 3
Report Date: 06/10/20

SAMPLE RESULTS

Lab ID: L2023024-01
Client ID: HA20-C3(OW)
Sample Location: CAMBRIDGE, MA
Date Collected: 06/02/20 11:05
Date Received: 06/04/20
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics by SIM - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	65		15-110
Phenol-d6	53		15-110
Nitrobenzene-d5	73		30-130
2-Fluorobiphenyl	82		30-130
2,4,6-Tribromophenol	105		15-110
4-Terphenyl-d14	107		30-130

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3
Lab Number: L2023024
Report Date: 06/10/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 06/10/20 00:03
Analyst: JG

Extraction Method: EPA 3510C
Extraction Date: 06/05/20 16:03

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1378476-1					
Acenaphthene	ND		ug/l	2.0	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
1,2-Dichlorobenzene	ND		ug/l	2.0	--
1,3-Dichlorobenzene	ND		ug/l	2.0	--
1,4-Dichlorobenzene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 06/10/20 00:03
Analyst: JG

Extraction Method: EPA 3510C
Extraction Date: 06/05/20 16:03

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1378476-1					
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
Aniline	ND		ug/l	2.0	--
4-Chloroaniline	ND		ug/l	5.0	--
Dibenzofuran	ND		ug/l	2.0	--
2-Methylnaphthalene	ND		ug/l	2.0	--
Acetophenone	ND		ug/l	5.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	10	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
Pentachlorophenol	ND		ug/l	10	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol	ND		ug/l	5.0	--
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--
2,4,5-Trichlorophenol	ND		ug/l	5.0	--

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3
Lab Number: L2023024
Report Date: 06/10/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 06/10/20 00:03
Analyst: JG

Extraction Method: EPA 3510C
Extraction Date: 06/05/20 16:03

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1378476-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	45		15-110
Phenol-d6	36		15-110
Nitrobenzene-d5	60		30-130
2-Fluorobiphenyl	61		30-130
2,4,6-Tribromophenol	64		15-110
4-Terphenyl-d14	77		30-130

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D-SIM
Analytical Date: 06/06/20 10:50
Analyst: CB

Extraction Method: EPA 3510C
Extraction Date: 06/05/20 16:04

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics by SIM - Westborough Lab for sample(s): 01 Batch: WG1378477-1					
Acenaphthene	ND		ug/l	0.10	--
2-Chloronaphthalene	ND		ug/l	0.20	--
Fluoranthene	ND		ug/l	0.10	--
Hexachlorobutadiene	ND		ug/l	0.50	--
Naphthalene	ND		ug/l	0.10	--
Benzo(a)anthracene	ND		ug/l	0.10	--
Benzo(a)pyrene	ND		ug/l	0.10	--
Benzo(b)fluoranthene	ND		ug/l	0.10	--
Benzo(k)fluoranthene	ND		ug/l	0.10	--
Chrysene	ND		ug/l	0.10	--
Acenaphthylene	ND		ug/l	0.10	--
Anthracene	ND		ug/l	0.10	--
Benzo(ghi)perylene	ND		ug/l	0.10	--
Fluorene	ND		ug/l	0.10	--
Phenanthrene	ND		ug/l	0.10	--
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--
Pyrene	ND		ug/l	0.10	--
2-Methylnaphthalene	ND		ug/l	0.10	--
Pentachlorophenol	ND		ug/l	0.80	--
Hexachlorobenzene	ND		ug/l	0.80	--
Hexachloroethane	ND		ug/l	0.80	--

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3
Lab Number: L2023024
Report Date: 06/10/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D-SIM
Analytical Date: 06/06/20 10:50
Analyst: CB

Extraction Method: EPA 3510C
Extraction Date: 06/05/20 16:04

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics by SIM - Westborough Lab for sample(s): 01 Batch: WG1378477-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	44		15-110
Phenol-d6	34		15-110
Nitrobenzene-d5	57		30-130
2-Fluorobiphenyl	66		30-130
2,4,6-Tribromophenol	78		15-110
4-Terphenyl-d14	111		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1378476-2 WG1378476-3								
Acenaphthene	62		75		40-140	19		20
1,2,4-Trichlorobenzene	64		78		40-140	20		20
Hexachlorobenzene	72		89		40-140	**21**	Q	20
Bis(2-chloroethyl)ether	59		74		40-140	**23**	Q	20
2-Chloronaphthalene	70		82		40-140	16		20
1,2-Dichlorobenzene	57		72		40-140	**23**	Q	20
1,3-Dichlorobenzene	56		72		40-140	**25**	Q	20
1,4-Dichlorobenzene	55		74		40-140	**29**	Q	20
3,3'-Dichlorobenzidine	61		68		40-140	11		20
2,4-Dinitrotoluene	71		83		40-140	16		20
2,6-Dinitrotoluene	84		100		40-140	17		20
Azobenzene	70		84		40-140	18		20
Fluoranthene	73		84		40-140	14		20
4-Bromophenyl phenyl ether	79		88		40-140	11		20
Bis(2-chloroisopropyl)ether	56		68		40-140	19		20
Bis(2-chloroethoxy)methane	70		81		40-140	15		20
Hexachlorobutadiene	66		82		40-140	**22**	Q	20
Hexachloroethane	61		77		40-140	**23**	Q	20
Isophorone	76		92		40-140	19		20
Naphthalene	61		74		40-140	19		20
Nitrobenzene	71		90		40-140	**24**	Q	20
Bis(2-ethylhexyl)phthalate	87		92		40-140	6		20
Butyl benzyl phthalate	89		99		40-140	11		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1378476-2 WG1378476-3								
Di-n-butylphthalate	75		82		40-140	9		20
Di-n-octylphthalate	91		102		40-140	11		20
Diethyl phthalate	79		93		40-140	16		20
Dimethyl phthalate	88		102		40-140	15		20
Benzo(a)anthracene	77		86		40-140	11		20
Benzo(a)pyrene	86		94		40-140	9		20
Benzo(b)fluoranthene	85		92		40-140	8		20
Benzo(k)fluoranthene	81		90		40-140	11		20
Chrysene	75		82		40-140	9		20
Acenaphthylene	72		86		40-140	18		20
Anthracene	68		79		40-140	15		20
Benzo(ghi)perylene	80		92		40-140	14		20
Fluorene	66		79		40-140	18		20
Phenanthrene	64		76		40-140	17		20
Dibenzo(a,h)anthracene	78		92		40-140	16		20
Indeno(1,2,3-cd)pyrene	77		87		40-140	12		20
Pyrene	73		84		40-140	14		20
Aniline	**18**	Q	**18**	Q	40-140	0		20
4-Chloroaniline	52		60		40-140	14		20
Dibenzofuran	64		76		40-140	17		20
2-Methylnaphthalene	64		75		40-140	16		20
Acetophenone	75		92		40-140	20		20
2,4,6-Trichlorophenol	76		91		30-130	18		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC BUILDING

Project Number: 133856-003 SID 3

Lab Number: L2023024

Report Date: 06/10/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1378476-2 WG1378476-3								
2-Chlorophenol	63		77		30-130	20		20
2,4-Dichlorophenol	71		86		30-130	19		20
2,4-Dimethylphenol	**27**	Q	**26**	Q	30-130	4		20
2-Nitrophenol	69		85		30-130	**21**	Q	20
4-Nitrophenol	77		90		30-130	16		20
2,4-Dinitrophenol	98		101		30-130	3		20
Pentachlorophenol	83		93		30-130	11		20
Phenol	51		60		30-130	16		20
2-Methylphenol	56		63		30-130	12		20
3-Methylphenol/4-Methylphenol	63		74		30-130	16		20
2,4,5-Trichlorophenol	81		95		30-130	16		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	50		63		15-110
Phenol-d6	46		56		15-110
Nitrobenzene-d5	65		83		30-130
2-Fluorobiphenyl	66		78		30-130
2,4,6-Tribromophenol	68		77		15-110
4-Terphenyl-d14	68		77		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics by SIM - Westborough Lab Associated sample(s): 01 Batch: WG1378477-2 WG1378477-3								
Acenaphthene	87		94		40-140	8		20
2-Chloronaphthalene	84		92		40-140	9		20
Fluoranthene	94		101		40-140	7		20
Hexachlorobutadiene	78		86		40-140	10		20
Naphthalene	81		88		40-140	8		20
Benzo(a)anthracene	90		97		40-140	7		20
Benzo(a)pyrene	97		106		40-140	9		20
Benzo(b)fluoranthene	109		118		40-140	8		20
Benzo(k)fluoranthene	103		111		40-140	7		20
Chrysene	94		101		40-140	7		20
Acenaphthylene	82		91		40-140	10		20
Anthracene	90		95		40-140	5		20
Benzo(ghi)perylene	105		112		40-140	6		20
Fluorene	90		96		40-140	6		20
Phenanthrene	91		96		40-140	5		20
Dibenzo(a,h)anthracene	98		105		40-140	7		20
Indeno(1,2,3-cd)pyrene	116		126		40-140	8		20
Pyrene	96		101		40-140	5		20
2-Methylnaphthalene	84		92		40-140	9		20
Pentachlorophenol	76		89		30-130	16		20
Hexachlorobenzene	95		101		40-140	6		20
Hexachloroethane	70		77		40-140	10		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics by SIM - Westborough Lab Associated sample(s): 01 Batch: WG1378477-2 WG1378477-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	56		60		15-110
Phenol-d6	47		50		15-110
Nitrobenzene-d5	66		72		30-130
2-Fluorobiphenyl	73		80		30-130
2,4,6-Tribromophenol	93		99		15-110
4-Terphenyl-d14	100		106		30-130

PCBS

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3
Lab Number: L2023024
Report Date: 06/10/20

SAMPLE RESULTS

Lab ID: L2023024-01
Client ID: HA20-C3(OW)
Sample Location: CAMBRIDGE, MA

Date Collected: 06/02/20 11:05
Date Received: 06/04/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 97,8082A
Analytical Date: 06/07/20 11:13
Analyst: JM

Extraction Method: EPA 3510C
Extraction Date: 06/06/20 03:38
Cleanup Method: EPA 3665A
Cleanup Date: 06/06/20
Cleanup Method: EPA 3660B
Cleanup Date: 06/06/20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - 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	0.250	--	1	A
Aroclor 1262	ND		ug/l	0.250	--	1	A
Aroclor 1268	ND		ug/l	0.250	--	1	A
PCBs, Total	ND		ug/l	0.250	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		30-150	A
Decachlorobiphenyl	73		30-150	A
2,4,5,6-Tetrachloro-m-xylene	62		30-150	B
Decachlorobiphenyl	69		30-150	B

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3
Lab Number: L2023024
Report Date: 06/10/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 06/07/20 10:32
Analyst: JM

Extraction Method: EPA 3510C
Extraction Date: 06/06/20 03:38
Cleanup Method: EPA 3665A
Cleanup Date: 06/06/20
Cleanup Method: EPA 3660B
Cleanup Date: 06/06/20

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1378571-1						
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	0.250	--	A
Aroclor 1262	ND		ug/l	0.250	--	A
Aroclor 1268	ND		ug/l	0.250	--	A
PCBs, Total	ND		ug/l	0.250	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	64		30-150	A
Decachlorobiphenyl	77		30-150	A
2,4,5,6-Tetrachloro-m-xylene	66		30-150	B
Decachlorobiphenyl	74		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC BUILDING

Project Number: 133856-003 SID 3

Lab Number: L2023024

Report Date: 06/10/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1378571-2 WG1378571-3									
Aroclor 1016	63		68		40-140	8		20	A
Aroclor 1260	68		72		40-140	6		20	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	60		64		30-150	A
Decachlorobiphenyl	71		75		30-150	A
2,4,5,6-Tetrachloro-m-xylene	60		64		30-150	B
Decachlorobiphenyl	67		71		30-150	B

METALS

Project Name: MIT MUSIC BUILDING
Lab Number: L2023024
Project Number: 133856-003 SID 3
Report Date: 06/10/20

SAMPLE RESULTS

Lab ID: L2023024-01
Client ID: HA20-C3(OW)
Sample Location: CAMBRIDGE, MA
Date Collected: 06/02/20 11:05
Date Received: 06/04/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.0040	--	1	06/05/20 11:55	06/09/20 14:16	EPA 3005A	97,6020B	CD
Barium, Total	0.020		mg/l	0.010	--	1	06/05/20 11:55	06/10/20 08:03	EPA 3005A	97,6010D	LC
Chromium, Total	ND		mg/l	0.010	--	1	06/05/20 11:55	06/10/20 08:03	EPA 3005A	97,6010D	LC
Lead, Total	ND		mg/l	0.010	--	1	06/05/20 11:55	06/10/20 08:03	EPA 3005A	97,6010D	LC
Zinc, Total	ND		mg/l	0.050	--	1	06/05/20 11:55	06/10/20 08:03	EPA 3005A	97,6010D	LC

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3
Lab Number: L2023024
Report Date: 06/10/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1378308-1										
Barium, Total	ND		mg/l	0.010	--	1	06/05/20 11:55	06/10/20 07:40	97,6010D	LC
Chromium, Total	ND		mg/l	0.010	--	1	06/05/20 11:55	06/10/20 07:40	97,6010D	LC
Lead, Total	ND		mg/l	0.010	--	1	06/05/20 11:55	06/10/20 07:40	97,6010D	LC
Zinc, Total	ND		mg/l	0.050	--	1	06/05/20 11:55	06/10/20 07:40	97,6010D	LC

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1378309-1										
Antimony, Total	ND		mg/l	0.0040	--	1	06/05/20 11:55	06/09/20 14:03	97,6020B	CD

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC BUILDING

Project Number: 133856-003 SID 3

Lab Number: L2023024

Report Date: 06/10/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1378308-2 WG1378308-3								
Barium, Total	88		87		80-120	1		20
Chromium, Total	89		88		80-120	1		20
Lead, Total	105		106		80-120	1		20
Zinc, Total	92		90		80-120	2		20
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1378309-2 WG1378309-3								
Antimony, Total	97		91		80-120	6		20

Project Name: MIT MUSIC BUILDING
Project Number: 133856-003 SID 3

Lab Number: L2023024
Report Date: 06/10/20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2023024-01A	Vial HCl preserved	A	NA		3.0	Y	Absent		ARCHIVE()
L2023024-01B	Vial HCl preserved	A	NA		3.0	Y	Absent		ARCHIVE()
L2023024-01C	Vial HCl preserved	A	NA		3.0	Y	Absent		ARCHIVE()
L2023024-01D	Amber 120ml unpreserved	A	7	7	3.0	Y	Absent		MCP-8082-10-LVI(365)
L2023024-01E	Amber 120ml unpreserved	A	7	7	3.0	Y	Absent		MCP-8082-10-LVI(365)
L2023024-01F	Plastic 250ml unpreserved	A	7	7	3.0	Y	Absent		-
L2023024-01G	Plastic 500ml HNO3 preserved	A	<2	<2	3.0	Y	Absent		MCP-CR-6010T-10(180),MCP-ZN-6010T-10(180),MCP-SB-6020T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2023024-01H	Amber 250ml unpreserved	A	7	7	3.0	Y	Absent		MCP-8270SIM-10-LVI(7),MCP-8270-10-LVI(7)
L2023024-01I	Amber 250ml unpreserved	A	7	7	3.0	Y	Absent		MCP-8270SIM-10-LVI(7),MCP-8270-10-LVI(7)
L2023024-01J	Amber 1000ml HCl preserved	A	<2	<2	3.0	Y	Absent		ARCHIVE()
L2023024-01K	Amber 1000ml HCl preserved	A	<2	<2	3.0	Y	Absent		ARCHIVE()
L2023024-01X	Plastic 120ml HNO3 preserved Filtrates	A	NA		3.0	Y	Absent		HOLD-METAL-DISSOLVED(180)

*Values in parentheses indicate holding time in days

Project Name:	MIT MUSIC BUILDING	**Lab Number:**	L2023024
Project Number:	133856-003 SID 3	**Report Date:**	06/10/20

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.

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.

Footnotes

Report Format: Data Usability Report

Project Name:	MIT MUSIC BUILDING	**Lab Number:**	L2023024
Project Number:	133856-003 SID 3	**Report Date:**	06/10/20

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. 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.

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 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

Report Format: Data Usability Report

Project Name:	MIT MUSIC BUILDING	**Lab Number:**	L2023024
Project Number:	133856-003 SID 3	**Report Date:**	06/10/20

Data Qualifiers

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.

Report Format: Data Usability Report

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 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 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; 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.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

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

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, 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, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

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

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

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

ALPHA

CHAIN OF CUSTODY

Service Centers
Brewer, ME 04412 Portsmouth, NH 03801 Mahwah, NJ 07430 Albany, NY 12205 Tonawanda, NY 14150 Holmes, PA 19043

Westborough, MA 01581 8 Walkup Dr. TEL: 508-898-9220 FAX: 508-898-9193

Mansfield, MA 02048 320 Forbes Blvd TEL: 508-822-9300 FAX: 508-822-3288

Page 1 of 1

Date Rec'd in Lab: 6/4/20

ALPHA Job #: L2023024

Project Information
Project Name: MIT Music Building
Project Location: Cambridge, MA
Project #: 133856-005 SID 3
(Use Project name as Project #)
Project Manager: M Weaver
ALPHAQuote #:

Turn-Around Time
Standard ☒ Due Date:
Rush (if pre approved) ☐ # of Days: 5 Day

H&A Information
H&A Client: MIT
H&A Address: 465 Medford St Boston, MA 02129-1400
H&A Phone: 617-886-7400
H&A Fax:
H&A Email: Lhoward, Jmooney

Deliverables
☒ Email ☐ Fax
☐ EQuIS (1 File) ☒ EQuIS (4 File)
☐ Other:

Regulatory Requirements (Program/Criteria)
MA RCS-1

Note: Select State from menu & identify criteria.

Billing Information
☐ Same as Client Info
PO #

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility: ☐ NJ ☐ NY ☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:
Only report the following metal: Antimony, barium, chromium, lead, zinc
DISSOLVED METALS ON HOLD

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	1. SVOCs	2. PCBs	3. Total Metals*	4. Dissolved Metals**HOLD	Sample Specific Comments	Total Bottles
23024-01	HA20-C3(OW)	6-2-20	1105	SO	DMO	X	X	X	X		4

Container Type	AV	A	P	P
Preservative	B	A	C	A

Preservative Code: A = None, B = HCl, C = HNO_3, D = H_2SO_4, E = NaOH, F = MeOH, G = $NaHSO_4$, H = $Na_2S_2O_3$, 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 = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	6-2-20	[signature] ABL	6/4/20 1045
[signature]	6/4/20 1700	[signature]	6/4/20 1700

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.

Document ID: 20455 Rev 1 (1/28/2016)

ANALYTICAL REPORT

Lab Number:	L2037651
Client:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Charlestown, MA 02129-1400
ATTN:	Todd Butler
Phone:	(617) 886-7424
Project Name:	MIT-SCC
Project Number:	134283-002
Report Date:	09/15/20

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: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2037651-01	HA20-E3	WATER	VASSAR STREET, CAMBRIDGE, MA	09/10/20 12:00	09/10/20
L2037651-02	OUTFALL	WATER	VASSAR STREET, CAMBRIDGE, MA	09/10/20 13:20	09/10/20
L2037651-03	TRIP BLANK	WATER	VASSAR STREET, CAMBRIDGE, MA	09/10/20 11:00	09/10/20

Project Name:	MIT-SCC	**Lab Number:**	L2037651
Project Number:	134283-002	**Report Date:**	09/15/20

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:	MIT-SCC	**Lab Number:**	L2037651
Project Number:	134283-002	**Report Date:**	09/15/20

Case Narrative (continued)

Report Submission

September 15, 2020: This final report includes the results of all requested analyses.

September 14, 2020: This is a preliminary report.

The analysis of Glycol 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.

Sample Receipt

L2037651-03: A sample identified as "TRIP BLANK" was received; however, analysis was not requested.

Total Metals

L2037651-01 and -02 (all samples): The sample has elevated detection limits for all elements, with the exception of iron and mercury, due to the dilution required by the high concentrations of non-target elements.

Cyanide, Total

WG1408840: A Laboratory Duplicate was prepared with the sample batch, however, the native sample required re-analysis; therefore, the result could not be reported.

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: 09/15/20

ORGANICS

VOLATILES

Project Name: MIT-SCC **Lab Number:** L2037651

Project Number: 134283-002 **Report Date:** 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01 Date Collected: 09/10/20 12:00
Client ID: HA20-E3 Date Received: 09/10/20
Sample Location: VASSAR STREET, CAMBRIDGE, MA Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 09/12/20 09:29
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: MIT-SCC **Lab Number:** L2037651

Project Number: 134283-002 **Report Date:** 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01 Date Collected: 09/10/20 12:00

Client ID: HA20-E3 Date Received: 09/10/20

Sample Location: VASSAR STREET, CAMBRIDGE, MA 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	100		60-140
Fluorobenzene	96		60-140
4-Bromofluorobenzene	102		60-140

Project Name: MIT-SCC **Lab Number:** L2037651

Project Number: 134283-002 **Report Date:** 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01 Date Collected: 09/10/20 12:00

Client ID: HA20-E3 Date Received: 09/10/20

Sample Location: VASSAR STREET, CAMBRIDGE, MA Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Analytical Method: 128,624.1-SIM

Analytical Date: 09/12/20 09:29

Analyst: KJD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	50	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	99		60-140
4-Bromofluorobenzene	104		60-140

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01
Client ID: HA20-E3
Sample Location: VASSAR STREET, CAMBRIDGE, MA

Date Collected: 09/10/20 12:00
Date Received: 09/10/20
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 09/11/20 15:32
Analyst: AMM

Extraction Method: EPA 504.1
Extraction Date: 09/11/20 13:26

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

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 09/11/20 14:38
Analyst: AMM

Extraction Method: EPA 504.1
Extraction Date: 09/11/20 13:26

Parameter	Result	Qualifier	Units	RL	MDL	
Microextractables by GC - Westborough Lab for sample(s): 01 Batch: WG1408929-1						
1,2-Dibromoethane	ND		ug/l	0.010	--	B

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1-SIM
Analytical Date: 09/12/20 08:52
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1409385-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	100		60-140
4-Bromofluorobenzene	111		60-140

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 09/12/20 08:52
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1409389-4					
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: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 09/12/20 08:52
Analyst: MKS

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1409389-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	101		60-140
Fluorobenzene	99		60-140
4-Bromofluorobenzene	97		60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC

Project Number: 134283-002

Lab Number: L2037651

Report Date: 09/15/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab	Associated sample(s): 01		Batch: WG1408929-2						
1,2-Dibromoethane	106		-		80-120	-			B

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

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: WG1409385-3								
1,4-Dioxane	110		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	101				60-140
4-Bromofluorobenzene	109				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC

Project Number: 134283-002

Lab Number: L2037651

Report Date: 09/15/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1409389-3								
Methylene chloride	95		-		60-140	-		28
1,1-Dichloroethane	95		-		50-150	-		49
Carbon tetrachloride	95		-		70-130	-		41
1,1,2-Trichloroethane	100		-		70-130	-		45
Tetrachloroethene	100		-		70-130	-		39
1,2-Dichloroethane	100		-		70-130	-		49
1,1,1-Trichloroethane	100		-		70-130	-		36
Benzene	100		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	100		-		60-140	-		63
Vinyl chloride	80		-		5-195	-		66
1,1-Dichloroethene	90		-		50-150	-		32
cis-1,2-Dichloroethene	110		-		60-140	-		30
Trichloroethene	90		-		65-135	-		48
1,2-Dichlorobenzene	95		-		65-135	-		57
1,3-Dichlorobenzene	90		-		70-130	-		43
1,4-Dichlorobenzene	90		-		65-135	-		57
p/m-Xylene	92		-		60-140	-		30
o-xylene	90		-		60-140	-		30
Acetone	96		-		40-160	-		30
Methyl tert butyl ether	90		-		60-140	-		30
Tert-Butyl Alcohol	100		-		60-140	-		30
Tertiary-Amyl Methyl Ether	90		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC

Project Number: 134283-002

Lab Number: L2037651

Report Date: 09/15/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1409389-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	102				60-140
Fluorobenzene	98				60-140
4-Bromofluorobenzene	97				60-140

Matrix Spike Analysis

Batch Quality Control

Project Name: MIT-SCC

Project Number: 134283-002

Lab Number: L2037651

Report Date: 09/15/20

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: WG1408929-3 QC Sample: L2036508-01 Client ID: MS Sample													
1,2-Dibromoethane	ND	0.244	0.301	**124**	Q	-	-		80-120	-		20	B
1,2-Dibromo-3-chloropropane	ND	0.244	0.265	109		-	-		80-120	-		20	B
1,2,3-Trichloropropane	ND	0.244	0.218	90		-	-		80-120	-		20	B

SEMIVOLATILES

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01
Client ID: HA20-E3
Sample Location: VASSAR STREET, CAMBRIDGE, MA

Date Collected: 09/10/20 12:00
Date Received: 09/10/20
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 09/11/20 20:34
Analyst: JG

Extraction Method: EPA 625.1
Extraction Date: 09/11/20 02:13

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	116		42-122
2-Fluorobiphenyl	85		46-121
4-Terphenyl-d14	92		47-138

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01
Client ID: HA20-E3
Sample Location: VASSAR STREET, CAMBRIDGE, MA

Date Collected: 09/10/20 12:00
Date Received: 09/10/20
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 09/11/20 17:30
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 09/11/20 02:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.100	--	1
Fluoranthene	0.100		ug/l	0.100	--	1
Naphthalene	13.2		ug/l	0.100	--	1
Benzo(a)anthracene	ND		ug/l	0.100	--	1
Benzo(a)pyrene	ND		ug/l	0.100	--	1
Benzo(b)fluoranthene	ND		ug/l	0.100	--	1
Benzo(k)fluoranthene	ND		ug/l	0.100	--	1
Chrysene	ND		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	0.267		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	ND		ug/l	0.100	--	1
Pentachlorophenol	ND		ug/l	1.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	51		25-87
Phenol-d6	39		16-65
Nitrobenzene-d5	80		42-122
2-Fluorobiphenyl	78		46-121
2,4,6-Tribromophenol	92		45-128
4-Terphenyl-d14	79		47-138

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 09/11/20 17:51
Analyst: JG

Extraction Method: EPA 625.1
Extraction Date: 09/11/20 02:13

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1408646-1					
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	112		42-122
2-Fluorobiphenyl	81		46-121
4-Terphenyl-d14	86		47-138

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 09/11/20 16:24
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 09/11/20 02:17

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1408647-1					
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	49		25-87
Phenol-d6	37		16-65
Nitrobenzene-d5	78		42-122
2-Fluorobiphenyl	77		46-121
2,4,6-Tribromophenol	86		45-128
4-Terphenyl-d14	78		47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC

Project Number: 134283-002

Lab Number: L2037651

Report Date: 09/15/20

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: WG1408646-2								
Bis(2-ethylhexyl)phthalate	105		-		29-137	-		82
Butyl benzyl phthalate	91		-		1-140	-		60
Di-n-butylphthalate	88		-		8-120	-		47
Di-n-octylphthalate	104		-		19-132	-		69
Diethyl phthalate	85		-		1-120	-		100
Dimethyl phthalate	81		-		1-120	-		183

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	113				42-122
2-Fluorobiphenyl	80				46-121
4-Terphenyl-d14	83				47-138

Lab Control Sample Analysis
Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

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: WG1408647-2								
Acenaphthene	75		-		60-132	-		30
Fluoranthene	80		-		43-121	-		30
Naphthalene	74		-		36-120	-		30
Benzo(a)anthracene	79		-		42-133	-		30
Benzo(a)pyrene	77		-		32-148	-		30
Benzo(b)fluoranthene	78		-		42-140	-		30
Benzo(k)fluoranthene	82		-		25-146	-		30
Chrysene	76		-		44-140	-		30
Acenaphthylene	83		-		54-126	-		30
Anthracene	80		-		43-120	-		30
Benzo(ghi)perylene	72		-		1-195	-		30
Fluorene	78		-		70-120	-		30
Phenanthrene	76		-		65-120	-		30
Dibenzo(a,h)anthracene	76		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	77		-		1-151	-		30
Pyrene	80		-		70-120	-		30
Pentachlorophenol	85		-		38-152	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

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: WG1408647-2								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	49				25-87
Phenol-d6	38				16-65
Nitrobenzene-d5	76				42-122
2-Fluorobiphenyl	74				46-121
2,4,6-Tribromophenol	86				45-128
4-Terphenyl-d14	75				47-138

PCBS

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01
Client ID: HA20-E3
Sample Location: VASSAR STREET, CAMBRIDGE, MA

Date Collected: 09/10/20 12:00
Date Received: 09/10/20
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 09/11/20 10:56
Analyst: CW

Extraction Method: EPA 608.3
Extraction Date: 09/11/20 00:32
Cleanup Method: EPA 3665A
Cleanup Date: 09/11/20
Cleanup Method: EPA 3660B
Cleanup Date: 09/11/20

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	63		37-123	B
Decachlorobiphenyl	57		38-114	B
2,4,5,6-Tetrachloro-m-xylene	61		37-123	A
Decachlorobiphenyl	51		38-114	A

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 127,608.3
Analytical Date: 09/11/20 11:27
Analyst: CW

Extraction Method: EPA 608.3
Extraction Date: 09/11/20 00:32
Cleanup Method: EPA 3665A
Cleanup Date: 09/11/20
Cleanup Method: EPA 3660B
Cleanup Date: 09/11/20

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1408626-1						
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	68		37-123	B
Decachlorobiphenyl	60		38-114	B
2,4,5,6-Tetrachloro-m-xylene	65		37-123	A
Decachlorobiphenyl	55		38-114	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC

Project Number: 134283-002

Lab Number: L2037651

Report Date: 09/15/20

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: WG1408626-2									
Aroclor 1016	73		-		50-140	-		36	A
Aroclor 1260	62		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67				37-123	B
Decachlorobiphenyl	58				38-114	B
2,4,5,6-Tetrachloro-m-xylene	65				37-123	A
Decachlorobiphenyl	53				38-114	A

METALS

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01
Client ID: HA20-E3
Sample Location: VASSAR STREET, CAMBRIDGE, MA
Date Collected: 09/10/20 12:00
Date Received: 09/10/20
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	ND		mg/l	0.02000	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00602		mg/l	0.00500	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00100	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00500	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Copper, Total	ND		mg/l	0.00500	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Iron, Total	0.568		mg/l	0.050	--	1	09/11/20 12:15	09/11/20 18:34	EPA 3005A	19,200.7	GD
Lead, Total	ND		mg/l	0.00500	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/11/20 12:43	09/11/20 17:00	EPA 245.1	3,245.1	AL
Nickel, Total	ND		mg/l	0.01000	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.02500	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00200	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.05000	--	5	09/11/20 12:15	09/14/20 10:37	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	159		mg/l	0.660	NA	1	09/11/20 12:15	09/11/20 18:34	EPA 3005A	19,200.7	GD
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.010	--	1		09/14/20 10:37	NA	107,-	

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-02
Client ID: OUTFALL
Sample Location: VASSAR STREET, CAMBRIDGE, MA
Date Collected: 09/10/20 13:20
Date Received: 09/10/20
Field Prep: Not Specified

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	0.02000	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00500	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00100	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00500	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Copper, Total	ND		mg/l	0.00500	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Iron, Total	0.109		mg/l	0.050	--	1	09/11/20 12:15	09/11/20 19:34	EPA 3005A	19,200.7	GD
Lead, Total	ND		mg/l	0.00500	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/11/20 12:43	09/11/20 16:47	EPA 245.1	3,245.1	AL
Nickel, Total	ND		mg/l	0.01000	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.02500	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00200	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.05000	--	5	09/11/20 12:15	09/14/20 10:48	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	387		mg/l	0.660	NA	1	09/11/20 12:15	09/11/20 19:34	EPA 3005A	19,200.7	GD
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.010	--	1		09/14/20 10:48	NA	107,-	

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

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): 01-02 Batch: WG1408831-1										
Antimony, Total	ND		mg/l	0.00400	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/11/20 12:15	09/14/20 08:56	3,200.8	AM

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): 01-02 Batch: WG1408835-1										
Iron, Total	ND		mg/l	0.050	--	1	09/11/20 12:15	09/11/20 19:07	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): 01-02 Batch: WG1408835-1										
Hardness	ND		mg/l	0.660	NA	1	09/11/20 12:15	09/11/20 19:07	19,200.7	GD

Prep Information

Digestion Method: EPA 3005A

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

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): 01-02 Batch: WG1408838-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/11/20 12:43	09/11/20 16:41	3,245.1	AL

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC

Project Number: 134283-002

Lab Number: L2037651

Report Date: 09/15/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1408831-2								
Antimony, Total	94		-		85-115	-		
Arsenic, Total	102		-		85-115	-		
Cadmium, Total	106		-		85-115	-		
Chromium, Total	101		-		85-115	-		
Copper, Total	104		-		85-115	-		
Lead, Total	106		-		85-115	-		
Nickel, Total	95		-		85-115	-		
Selenium, Total	103		-		85-115	-		
Silver, Total	103		-		85-115	-		
Zinc, Total	110		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1408835-2								
Iron, Total	102		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 Batch: WG1408835-2								
Hardness	106		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1408838-2								
Mercury, Total	101		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1408831-3 QC Sample: L2037651-01 Client ID: HA20-E3												
Antimony, Total	ND	0.5	0.5672	113		-	-		70-130	-		20
Arsenic, Total	0.00602	0.12	0.1323	105		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05537	108		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2020	101		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2603	104		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5495	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4888	98		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1261	105		-	-		70-130	-		20
Silver, Total	ND	0.05	0.05335	107		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5468	109		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1408835-3 QC Sample: L2037651-01 Client ID: HA20-E3												
Iron, Total	0.568	1	1.59	102		-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1408835-3 QC Sample: L2037651-01 Client ID: HA20-E3												
Hardness	159	66.2	224	98		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1408838-3 QC Sample: L2037651-02 Client ID: OUTFALL												
Mercury, Total	ND	0.005	0.00488	98		-	-		70-130	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1408831-4 QC Sample: L2037651-01 Client ID: HA20-E3						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.00602	0.00625	mg/l	4		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	ND	ND	mg/l	NC		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1408835-4 QC Sample: L2037651-01 Client ID: HA20-E3						
Iron, Total	0.568	0.559	mg/l	2		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1408835-4 QC Sample: L2037651-01 Client ID: HA20-E3						
Hardness	159	156	mg/l	2		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1408838-4 QC Sample: L2037651-02 Client ID: OUTFALL						
Mercury, Total	ND	ND	mg/l	NC		20

INORGANICS
&
MISCELLANEOUS

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-01
Client ID: HA20-E3
Sample Location: VASSAR STREET, CAMBRIDGE, MA

Date Collected: 09/10/20 12:00
Date Received: 09/10/20
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	6.1		mg/l	5.0	NA	1	-	09/11/20 07:30	121,2540D	JT
Cyanide, Total	ND		mg/l	0.005	--	1	09/11/20 11:10	09/11/20 15:49	121,4500CN-CE	AG
Cyanide, Free	ND		ug/l	2.00	--	1	09/11/20 16:00	09/11/20 22:17	109,9016	AT
Cyanide, Physiologically Available	ND		mg/l	0.005	--	1	09/14/20 10:35	09/14/20 13:20	64,9014(M)	AG
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/10/20 23:24	121,4500CL-D	AS
pH (H)	7.0		SU	-	NA	1	-	09/10/20 20:57	121,4500H+-B	AS
Nitrogen, Ammonia	0.397		mg/l	0.075	--	1	09/11/20 03:25	09/11/20 21:45	121,4500NH3-BH	AT
TPH, SGT-HEM	ND		mg/l	4.40	--	1.1	09/11/20 20:00	09/11/20 22:00	74,1664A	TL
Phenolics, Total	ND		mg/l	0.030	--	1	09/11/20 05:20	09/11/20 09:14	4,420.1	MV
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/10/20 22:55	09/10/20 23:24	1,7196A	CB
Anions by Ion Chromatography - Westborough Lab										
Chloride	731.		mg/l	25.0	--	50	-	09/12/20 00:21	44,300.0	SH

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

SAMPLE RESULTS

Lab ID: L2037651-02
Client ID: OUTFALL
Sample Location: VASSAR STREET, CAMBRIDGE, MA

Date Collected: 09/10/20 13:20
Date Received: 09/10/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
pH (H)	7.9		SU	-	NA	1	-	09/10/20 20:57	121,4500H+-B	AS
Nitrogen, Ammonia	0.121		mg/l	0.075	--	1	09/11/20 03:25	09/11/20 21:48	121,4500NH3-BH	AT
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/10/20 22:55	09/10/20 23:25	1,7196A	CB

Project Name: MIT-SCC
Project Number: 134283-002
Lab Number: L2037651
Report Date: 09/15/20

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): 01-02 Batch: WG1408613-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/11/20 03:25	09/11/20 21:34	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1408614-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/10/20 22:55	09/10/20 23:22	1,7196A	CB
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1408618-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/10/20 23:24	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1408680-1										
Phenolics, Total	ND		mg/l	0.030	--	1	09/11/20 05:20	09/11/20 09:07	4,420.1	MV
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1408691-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/11/20 07:30	121,2540D	JT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1408840-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/10/20 18:00	09/11/20 15:38	121,4500CN-CE	AG
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1408980-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	09/11/20 20:00	09/11/20 22:00	74,1664A	TL
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1409003-1										
Cyanide, Free	ND		ug/l	2.00	--	1	09/11/20 16:00	09/11/20 22:12	109,9016	AT
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1409099-1										
Chloride	ND		mg/l	0.500	--	1	-	09/11/20 17:23	44,300.0	SH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1409554-1										
Cyanide, Physiologically Available	ND		mg/l	0.005	--	1	09/14/20 10:35	09/14/20 13:10	64,9014(M)	AG

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1408589-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1408613-2								
Nitrogen, Ammonia	102		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1408614-2								
Chromium, Hexavalent	104		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1408618-2								
Chlorine, Total Residual	104		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1408680-2								
Phenolics, Total	99		-		70-130	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1408691-2								
Solids, Total Suspended	109		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1408840-2								
Cyanide, Total	97		-		90-110	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1408980-2					
TPH	87	-	64-132	-	34
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1409003-2					
Cyanide, Free	97	-	75-125	-	
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG1409099-2					
Chloride	101	-	90-110	-	
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1409554-2					
Cyanide, Physiologically Available	90	-	80-120	-	
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1409554-3					
Cyanide, Physiologically Available	**1**	-	0-10	-	

Matrix Spike Analysis
Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1408613-4 QC Sample: L2037651-01 Client ID: HA20-E3												
Nitrogen, Ammonia	0.397	4	4.23	96		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1408614-4 QC Sample: L2037651-01 Client ID: HA20-E3												
Chromium, Hexavalent	ND	0.1	0.104	104		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1408618-4 QC Sample: L2037651-01 Client ID: HA20-E3												
Chlorine, Total Residual	ND	0.25	0.20	80		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1408680-4 QC Sample: L2037211-02 Client ID: MS Sample												
Phenolics, Total	ND	0.4	0.42	105		-	-		70-130	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1408840-4 QC Sample: L2037163-01 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.106	**53**	Q	-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1408980-4 QC Sample: L2037651-01 Client ID: HA20-E3												
TPH	ND	20.6	14.4	70		-	-		64-132	-		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1409003-3 QC Sample: L2036760-09 Client ID: MS Sample												
Cyanide, Free	ND	50	37.1	74		-	-		70-130	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1409099-3 QC Sample: L2037537-03 Client ID: MS Sample												
Chloride	12.6	4	16.0	**85**	Q	-	-		90-110	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1409554-5 QC Sample: L2037651-01 Client ID: HA20-E3												
Cyanide, Physiologically Available	ND	0.2	0.185	92		-	-		75-125	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1408589-2 QC Sample: L2037651-02 Client ID: OUTFALL						
pH (H)	7.9	7.9	SU	0		5
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1408613-3 QC Sample: L2037651-01 Client ID: HA20-E3						
Nitrogen, Ammonia	0.397	0.404	mg/l	2		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1408614-3 QC Sample: L2037651-01 Client ID: HA20-E3						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1408618-3 QC Sample: L2037651-01 Client ID: HA20-E3						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1408680-3 QC Sample: L2037211-02 Client ID: DUP Sample						
Phenolics, Total	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1408691-3 QC Sample: L2037152-01 Client ID: DUP Sample						
Solids, Total Suspended	76	78	mg/l	3		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1408980-3 QC Sample: L2037039-01 Client ID: DUP Sample						
TPH	ND	ND	mg/l	NC		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1409003-4 QC Sample: L2036760-09 Client ID: DUP Sample						
Cyanide, Free	ND	ND	ug/l	NC		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1409099-4 QC Sample: L2037537-03 Client ID: DUP Sample						
Chloride	12.6	12.5	mg/l	1		18

Lab Duplicate Analysis

Batch Quality Control

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1409554-4 QC Sample: L2037651-01 Client ID: HA20-E3					
Cyanide, Physiologically Available	ND	ND	mg/l	NC	20

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2037651-01A	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(7)
L2037651-01A1	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(7)
L2037651-01B	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(7)
L2037651-01B1	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(7)
L2037651-01C	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(7)
L2037651-01D	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		624.1-SIM-RGP(7),624.1-RGP(7)
L2037651-01E	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		504(14)
L2037651-01F	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		504(14)
L2037651-01G	Vial unpreserved	A	NA		2.5	Y	Absent		SUB-ETHANOL(14)
L2037651-01G1	Vial unpreserved	A	NA		2.5	Y	Absent		SUB-ETHANOL(14)
L2037651-01H	Vial unpreserved	A	NA		2.5	Y	Absent		SUB-ETHANOL(14)
L2037651-01I	Plastic 250ml unpreserved	A	7	7	2.5	Y	Absent		CL-300(28),HEXCR-7196(1),TRC-4500(1),PH-4500(.01)
L2037651-01J	Plastic 250ml NaOH preserved	A	>12	>12	2.5	Y	Absent		PACN(14)
L2037651-01K	Plastic 250ml NaOH preserved	A	>12	>12	2.5	Y	Absent		TCN-4500(14),FCN-9016(14)
L2037651-01L	Plastic 250ml HNO3 preserved	A	<2	<2	2.5	Y	Absent		HOLD-METAL-DISSOLVED(180)
L2037651-01M	Plastic 250ml HNO3 preserved	A	<2	<2	2.5	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),HARDU(180),CU-2008T(180),FE-UI(180),AS-2008T(180),HG-U(28),AG-2008T(180),SE-2008T(180),SB-2008T(180),CR-2008T(180),PB-2008T(180)
L2037651-01N	Plastic 500ml H2SO4 preserved	A	<2	<2	2.5	Y	Absent		NH3-4500(28)
L2037651-01O	Plastic 950ml unpreserved	A	7	7	2.5	Y	Absent		CL-300(28),HEXCR-7196(1),TRC-4500(1),PH-4500(.01)
L2037651-01P	Plastic 950ml unpreserved	A	7	7	2.5	Y	Absent		TSS-2540(7)
L2037651-01Q	Amber 950ml H2SO4 preserved	A	<2	<2	2.5	Y	Absent		TPHENOL-420(28)

*Values in parentheses indicate holding time in days

Project Name: MIT-SCC
Project Number: 134283-002

Lab Number: L2037651
Report Date: 09/15/20

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2037651-01R	Amber 1000ml HCl preserved	A	NA		2.5	Y	Absent		TPH-1664(28)
L2037651-01S	Amber 1000ml HCl preserved	A	NA		2.5	Y	Absent		TPH-1664(28)
L2037651-01T	Amber 1000ml Na2S2O3	A	7	7	2.5	Y	Absent		PCB-608.3(365)
L2037651-01U	Amber 1000ml Na2S2O3	A	7	7	2.5	Y	Absent		PCB-608.3(365)
L2037651-01V	Amber 1000ml Na2S2O3	A	7	7	2.5	Y	Absent		PCB-608.3(365)
L2037651-01W	Amber 1000ml Na2S2O3	A	7	7	2.5	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L2037651-01X	Amber 1000ml Na2S2O3	A	7	7	2.5	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L2037651-01Y	Amber 1000ml Na2S2O3	A	7	7	2.5	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L2037651-02A	Plastic 250ml unpreserved	A	7	7	2.5	Y	Absent		HEXCR-7196(1),PH-4500(.01)
L2037651-02B	Plastic 250ml HNO3 preserved	A	<2	<2	2.5	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),FE-UI(180),CU-2008T(180),HARDU(180),AG-2008T(180),SE-2008T(180),AS-2008T(180),HG-U(28),SB-2008T(180),CR-2008T(180),PB-2008T(180)
L2037651-02C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.5	Y	Absent		NH3-4500(28)
L2037651-03A	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		ARCHIVE()
L2037651-03B	Vial Na2S2O3 preserved	A	NA		2.5	Y	Absent		ARCHIVE()

*Values in parentheses indicate holding time in days

Project Name:	MIT-SCC	**Lab Number:**	L2037651
Project Number:	134283-002	**Report Date:**	09/15/20

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.

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.

Footnotes

Report Format: Data Usability Report

Project Name:	MIT-SCC	**Lab Number:**	L2037651
Project Number:	134283-002	**Report Date:**	09/15/20

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. 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 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

Report Format: Data Usability Report

Project Name:	MIT-SCC	**Lab Number:**	L2037651
Project Number:	134283-002	**Report Date:**	09/15/20

Data Qualifiers

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.

Report Format: Data Usability Report

Project Name:	MIT-SCC	**Lab Number:**	L2037651
Project Number:	134283-002	**Report Date:**	09/15/20

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.

64 Quality Assurance and Quality Control Requirements and Performance Standards for SW-846 Methods. MADEP BWSC. WSC-CAM-IIA (Revision 4), WSC-CAM-V C (Revision 2), WSC-CAM-IIIA (Revision 5). August 2004.

74 Method 1664,Revision A: 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-98-002, February 1999.

107 Alpha Analytical - In-house calculation method.

109 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Revision 0, June 2010.

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.

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 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; 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.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

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

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, 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, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

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

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

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

CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA 01581, 8 Walkup Dr., TEL: 508-898-9220, FAX: 508-898-9193

Mansfield, MA 02048, 320 Forbes Blvd, TEL: 508-822-9300, FAX: 508-822-3288

Service Centers: Brewer, ME 04412; Portsmouth, NH 03801; Mahwah, NJ 07430; Albany, NY 12205; Tonawanda, NY 14150; Holmes, PA 19043

Page 1 of 1

Date Rec'd in Lab: 9/10/20

ALPHA Job #: L2037651

Project Information

Project Name:	MIT - SCC
Project Location:	Vassar Street, Cambridge, MA
Project #	134283-002
(Use Project name as Project #)	
Project Manager:	T. Butler
ALPHAQuote #:	12002

H&A Information

H&A Client:	MIT
H&A Address:	465 Medford St, #220
	Boston, MA 02129
H&A Phone:	6178867400
H&A Fax:	
H&A Email:	kscalise@haleyaldrich.com

Turn-Around Time

Standard — Due Date:

Rush (only if pre approved) — # of Days: 2

Deliverables

Email Fax

EQuIS (1 File) EQuIS (4 File)

Other:

Billing Information

Same as Client Info

PO #

Regulatory Requirements (Program/Criteria)

MA MCP RCS-1

Note: Select State from menu & identify criteria.

Disposal Site Information

Please identify below location of applicable disposal facilities.

Disposal Facility:

NJ NY

Other:

These samples have been previously analyzed by Alpha

Other project specific requirements/comments:

Please refer to Alpha Quote # 12002
Total NPDES Metals = Sb, As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Zn

Please specify Metals or TAL.

Sample Filtration: Done (circled) / Lab to do
Preservation: Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Depth	NPDES RGP Parameters + CL-300	Ethanol by 1671	Ammonia Nitrogen - SM 4500	Dissolved NPDES Metals See Note #1	Total Hardness	Total NPDES Metals, + Hex Cr + Tri Cr	pH	Free Cyanide + Phys. Available Cyanide	Sample Specific Comments	Total Bottles
37651-01	HA20-E3	9/10/2020	1200	aq	MJD	--	x	x	x	x	x		x	x	1. HOLD, field filtered	24
-02	Outfall	"	1320	aq	MJD	--			x		x	x	x		Temp:	3
															2 Trip Blanks @1100	2
															31 TOTAL	

Container Type

Preservative

Preservative Code: A = None; B = HCl; C = HNO_3; D = H_2SO_4; E = NaOH; F = MeOH; G = $NaHSO_4$; H = $Na_2S_2O_3$; 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 = BOD Bottle

Westboro: Certification No: MA935

Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	9/10/2020 1620	[signature] DICK AAL	9/10/20 1620
[signature] DICK AAL	9/10/20 2315	[signature]	9/10/20 2315

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# 2019-23-Alpha Analytical by and between Haley & Aldrich, Inc., its subsidiaries and affiliates and Alpha Analytical.

Document ID: 20455 Rev 3 (1/17/2019)

Teklab, Inc.
Environmental Laboratory
http://www.teklabinc.com/

September 15, 2020

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

RE: L2037651 **WorkOrder:** 20090770

Dear Melissa Gulli:

TEKLAB, INC received 1 sample on 9/14/2020 8:40:00 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,

Marvin L. Darling II

Marvin L. Darling
Project Manager
(618)344-1004 ex 41
mdarling@teklabinc.com

Teklab, Inc.
Environmental Laboratory

Report Contents

http://www.teklabinc.com/

Client: Alpha Analytical
Work Order: 20090770
Client Project: L2037651
Report Date: 15-Sep-2020

This reporting package includes the following:

Teklab, Inc.
Environmental Laboratory

Definitions

http://www.teklabinc.com/

Client: Alpha Analytical **Work Order:** 20090770

Client Project: L2037651 **Report Date:** 15-Sep-2020

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
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)

Qualifiers

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

Teklab, Inc.
Environmental Laboratory

Case Narrative

http://www.teklabinc.com/

Client: Alpha Analytical
Client Project: L2037651

Work Order: 20090770
Report Date: 15-Sep-2020

Cooler Receipt Temp: 9.0 °C

Locations

Collinsville

Address 5445 Horseshoe Lake Road
Collinsville, IL 62234-7425
Phone (618) 344-1004
Fax (618) 344-1005
Email jhriley@teklabinc.com

Springfield

Address 3920 Pintail Dr
Springfield, IL 62711-9415
Phone (217) 698-1004
Fax (217) 698-1005
Email KKlostermann@teklabinc.com

Kansas City

Address 8421 Nieman Road
Lenexa, KS 66214
Phone (913) 541-1998
Fax (913) 541-1998
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

Chicago

Address 1319 Butterfield Rd.
Downers Grove, IL 60515
Phone (630) 324-6855
Fax
Email arenner@teklabinc.com

Teklab, Inc. Environmental Laboratory

Accreditations

http://www.teklabinc.com/

Client: Alpha Analytical

Work Order: 20090770

Client Project: L2037651

Report Date: 15-Sep-2020

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

Teklab, Inc.
Environmental Laboratory

Laboratory Results

http://www.teklabinc.com/

Client: Alpha Analytical
Work Order: 20090770
Client Project: L2037651
Report Date: 15-Sep-2020
Lab ID: 20090770-001
Client Sample ID: HA20-E3
Matrix: AQUEOUS
Collection Date: 09/10/2020 12:00

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	09/14/2020 19:17	R281509

Teklab, Inc. Environmental Laboratory

Quality Control Results

http://www.teklabinc.com/

Client: Alpha Analytical
Client Project: L2037651

Work Order: 20090770
Report Date: 15-Sep-2020

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

Batch R281509 **SampType:** MBLK Units **mg/L**
SampID: MBLK-091420

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Ethanol	*	20		**ND**						09/14/2020

Batch R281509 **SampType:** LCS Units **mg/L**
SampID: LCS-091420

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Ethanol	*	20		**110**	100.0	0	105.2	70	132	09/14/2020

Batch R281509 **SampType:** MS Units **mg/L**
SampID: 20090368-003AMS

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Ethanol	*	20		**120**	100.0	0	119.1	70	132	09/14/2020

Batch R281509 **SampType:** MSD Units **mg/L** RPD Limit **30**
SampID: 20090368-003AMSD

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Ethanol	*	20	R	**85**	100.0	0	85.4	119.1	33.01	09/14/2020

Teklab, Inc. Environmental Laboratory

Receiving Check List

http://www.teklabinc.com/

Client: Alpha Analytical

Client Project: L2037651

Work Order: 20090770

Report Date: 15-Sep-2020

Carrier: UPS

Received By: AMD

Completed by: Amber M. Dilallo
On: 14-Sep-2020

Reviewed by: Elizabeth A. Hurley
On: 14-Sep-2020

Pages to follow: Chain of custody 1 Extra pages included 0

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C 9.0
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Reported field parameters measured:	Field ☐	Lab ☐	NA ☑	
Container/Temp Blank temperature in compliance?	Yes ☐	No ☑		
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 ☑	No ☐	No VOA vials ☐	
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑	
Water - pH acceptable upon receipt?	Yes ☑	No ☐	NA ☐	
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑	

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

The sample was out of temperature compliance upon receipt. Per Melissa Gulli, proceed with analysis. - adilallo - 9/14/2020 8:50:02 AM

Subcontract Chain of Custody

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

Alpha Job Number
L2037651

Client Information

Client: Alpha Analytical Labs
Address: Eight Walkup Drive
Westborough, MA 01581-1019

Phone: 603.319.5010
Email: mgulli@alphalab.com

Project Information

Project Location: MA
Project Manager: Melissa Gulli

Turnaround & Deliverables Information

Due Date: 09/15/20 (RUSH)
Deliverables:

Regulatory Requirements/Report Limits

State/Federal Program:

Regulatory Criteria: RCS-1-14;S1/G1-14

Project Specific Requirements and/or Report Requirements

Reference following Alpha Job Number on final report/deliverables: L2037651

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
L2037651-01	HA20-E3	09-10-20 12:00	WATER	Ethanol by EPA 1671 Revision A	

ONE DAY TAT

	Relinquished By:	Date/Time:	Received By:	Date/Time:
		9/14/20		9/14/20 840

Form No: AL_subcoc

ANALYTICAL REPORT

Lab Number:	L2042027
Client:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Charlestown, MA 02129-1400
ATTN:	Heather Ballantyne
Phone:	(617) 886-3061
Project Name:	MIT MUSIC
Project Number:	133856-003 SID 6
Report Date:	10/09/20

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: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2042027-01	HA20-C3(OW)-10220	WATER	AMHERST ALLEY, CAMBRIDGE, MA	10/02/20 12:05	10/02/20

Project Name:	MIT MUSIC	**Lab Number:**	L2042027
Project Number:	133856-003 SID 6	**Report Date:**	10/09/20

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:	MIT MUSIC	**Lab Number:**	L2042027
Project Number:	133856-003 SID 6	**Report Date:**	10/09/20

Case Narrative (continued)

Semivolatile Organics by SIM

The WG1417780-2 LCS recoveries, associated with L2042027-01 (HA20-C3(OW)-10220), are outside the acceptance criteria for acenaphthene (59%), fluorene (61%), phenanthrene (62%) and pyrene (64%); however, the MS recoveries are within the method criteria. The results of the associated sample are reported.

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: 10/09/20

ORGANICS

VOLATILES

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6
Lab Number: L2042027
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01
Client ID: HA20-C3(OW)-10220
Sample Location: AMHERST ALLEY, CAMBRIDGE, MA
Date Collected: 10/02/20 12:05
Date Received: 10/02/20
Field Prep: None

Sample Depth:
Matrix: Water
Analytical Method: 128,624.1
Analytical Date: 10/05/20 17:10
Analyst: AD

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: MIT MUSIC **Lab Number:** L2042027

Project Number: 133856-003 SID 6 **Report Date:** 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01 Date Collected: 10/02/20 12:05

Client ID: HA20-C3(OW)-10220 Date Received: 10/02/20

Sample Location: AMHERST ALLEY, CAMBRIDGE, MA Field Prep: None

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	96		60-140
Fluorobenzene	113		60-140
4-Bromofluorobenzene	94		60-140

Project Name: MIT MUSIC
Lab Number: L2042027
Project Number: 133856-003 SID 6
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01
Client ID: HA20-C3(OW)-10220
Sample Location: AMHERST ALLEY, CAMBRIDGE, MA
Date Collected: 10/02/20 12:05
Date Received: 10/02/20
Field Prep: None

Sample Depth:
Matrix: Water
Analytical Method: 128,624.1-SIM
Analytical Date: 10/05/20 17:10
Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	50	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	112		60-140
4-Bromofluorobenzene	106		60-140

Project Name: MIT MUSIC
Lab Number: L2042027
Project Number: 133856-003 SID 6
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01
Client ID: HA20-C3(OW)-10220
Sample Location: AMHERST ALLEY, CAMBRIDGE, MA

Date Collected: 10/02/20 12:05
Date Received: 10/02/20
Field Prep: None

Sample Depth:
Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 10/06/20 13:18
Analyst: AMM

Extraction Method: EPA 504.1
Extraction Date: 10/05/20 15:52

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: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 10/06/20 12:03
Analyst: AMM

Extraction Method: EPA 504.1
Extraction Date: 10/05/20 15:52

Parameter	Result	Qualifier	Units	RL	MDL	
Microextractables by GC - Westborough Lab for sample(s): 01 Batch: WG1418203-1						
1,2-Dibromoethane	ND		ug/l	0.010	--	A

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6
Lab Number: L2042027
Report Date: 10/09/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 10/05/20 13:24
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1418533-4					
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: MIT MUSIC
Project Number: 133856-003 SID 6
Lab Number: L2042027
Report Date: 10/09/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 10/05/20 13:24
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1418533-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	92		60-140
Fluorobenzene	111		60-140
4-Bromofluorobenzene	92		60-140

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6
Lab Number: L2042027
Report Date: 10/09/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1-SIM
Analytical Date: 10/05/20 13:24
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1418535-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	112		60-140
4-Bromofluorobenzene	115		60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab	Associated sample(s): 01		Batch: WG1418203-2						
1,2-Dibromoethane	94		-		80-120	-			A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1418533-3								
Methylene chloride	105		-		60-140	-		28
1,1-Dichloroethane	105		-		50-150	-		49
Carbon tetrachloride	115		-		70-130	-		41
1,1,2-Trichloroethane	100		-		70-130	-		45
Tetrachloroethene	90		-		70-130	-		39
1,2-Dichloroethane	130		-		70-130	-		49
1,1,1-Trichloroethane	120		-		70-130	-		36
Benzene	125		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	95		-		60-140	-		63
Vinyl chloride	90		-		5-195	-		66
1,1-Dichloroethene	105		-		50-150	-		32
cis-1,2-Dichloroethene	95		-		60-140	-		30
Trichloroethene	110		-		65-135	-		48
1,2-Dichlorobenzene	95		-		65-135	-		57
1,3-Dichlorobenzene	90		-		70-130	-		43
1,4-Dichlorobenzene	90		-		65-135	-		57
p/m-Xylene	85		-		60-140	-		30
o-xylene	85		-		60-140	-		30
Acetone	112		-		40-160	-		30
Methyl tert butyl ether	100		-		60-140	-		30
Tert-Butyl Alcohol	140		-		60-140	-		30
Tertiary-Amyl Methyl Ether	110		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1418533-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	96				60-140
Fluorobenzene	115				60-140
4-Bromofluorobenzene	91				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

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: WG1418535-3								
1,4-Dioxane	120		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	112				60-140
4-Bromofluorobenzene	116				60-140

Matrix Spike Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

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: WG1418203-3 QC Sample: L2040877-01 Client ID: MS Sample													
1,2-Dibromoethane	ND	0.246	0.234	95		-	-		80-120	-		20	A
1,2-Dibromo-3-chloropropane	ND	0.246	0.418	**170**	Q	-	-		80-120	-		20	A
1,2,3-Trichloropropane	ND	0.246	0.178	**72**	Q	-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6
Lab Number: L2042027
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01
Client ID: HA20-C3(OW)-10220
Sample Location: AMHERST ALLEY, CAMBRIDGE, MA

Date Collected: 10/02/20 12:05
Date Received: 10/02/20
Field Prep: None

Sample Depth:
Matrix: Water
Analytical Method: 129,625.1
Analytical Date: 10/07/20 11:39
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 10/03/20 14:55

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	85		42-122
2-Fluorobiphenyl	59		46-121
4-Terphenyl-d14	59		47-138

Project Name: MIT MUSIC
Lab Number: L2042027
Project Number: 133856-003 SID 6
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01
Client ID: HA20-C3(OW)-10220
Sample Location: AMHERST ALLEY, CAMBRIDGE, MA
Date Collected: 10/02/20 12:05
Date Received: 10/02/20
Field Prep: None

Sample Depth:
Matrix: Water
Analytical Method: 129,625.1-SIM
Analytical Date: 10/07/20 15:11
Analyst: DV
Extraction Method: EPA 625.1
Extraction Date: 10/03/20 14:54

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.100	--	1
Fluoranthene	ND		ug/l	0.100	--	1
Naphthalene	ND		ug/l	0.100	--	1
Benzo(a)anthracene	ND		ug/l	0.100	--	1
Benzo(a)pyrene	ND		ug/l	0.100	--	1
Benzo(b)fluoranthene	ND		ug/l	0.100	--	1
Benzo(k)fluoranthene	ND		ug/l	0.100	--	1
Chrysene	ND		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	ND		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	ND		ug/l	0.100	--	1
Pentachlorophenol	ND		ug/l	1.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	35		25-87
Phenol-d6	29		16-65
Nitrobenzene-d5	62		42-122
2-Fluorobiphenyl	56		46-121
2,4,6-Tribromophenol	54		45-128
4-Terphenyl-d14	55		47-138

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 10/07/20 09:42
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 10/03/20 14:55

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1417779-1					
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	93		42-122
2-Fluorobiphenyl	66		46-121
4-Terphenyl-d14	68		47-138

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 10/07/20 14:38
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 10/03/20 14:54

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1417780-1					
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	39		25-87
Phenol-d6	32		16-65
Nitrobenzene-d5	69		42-122
2-Fluorobiphenyl	66		46-121
2,4,6-Tribromophenol	57		45-128
4-Terphenyl-d14	65		47-138

Lab Control Sample Analysis
Batch Quality Control

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

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: WG1417779-3								
Bis(2-ethylhexyl)phthalate	85		-		29-137	-		82
Butyl benzyl phthalate	81		-		1-140	-		60
Di-n-butylphthalate	82		-		8-120	-		47
Di-n-octylphthalate	85		-		19-132	-		69
Diethyl phthalate	72		-		1-120	-		100
Dimethyl phthalate	76		-		1-120	-		183

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	74				42-122
2-Fluorobiphenyl	79				46-121
4-Terphenyl-d14	75				47-138

Lab Control Sample Analysis
Batch Quality Control

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

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: WG1417780-2								
Acenaphthene	**59**	Q	-		60-132	-		30
Fluoranthene	66		-		43-121	-		30
Naphthalene	60		-		36-120	-		30
Benzo(a)anthracene	66		-		42-133	-		30
Benzo(a)pyrene	64		-		32-148	-		30
Benzo(b)fluoranthene	63		-		42-140	-		30
Benzo(k)fluoranthene	64		-		25-146	-		30
Chrysene	65		-		44-140	-		30
Acenaphthylene	68		-		54-126	-		30
Anthracene	66		-		43-120	-		30
Benzo(ghi)perylene	62		-		1-195	-		30
Fluorene	**61**	Q	-		70-120	-		30
Phenanthrene	**62**	Q	-		65-120	-		30
Dibenzo(a,h)anthracene	64		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	65		-		1-151	-		30
Pyrene	**64**	Q	-		70-120	-		30
Pentachlorophenol	68		-		38-152	-		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

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: WG1417780-2								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	41				25-87
Phenol-d6	33				16-65
Nitrobenzene-d5	71				42-122
2-Fluorobiphenyl	62				46-121
2,4,6-Tribromophenol	61				45-128
4-Terphenyl-d14	64				47-138

PCBS

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6
Lab Number: L2042027
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01
Client ID: HA20-C3(OW)-10220
Sample Location: AMHERST ALLEY, CAMBRIDGE, MA

Date Collected: 10/02/20 12:05
Date Received: 10/02/20
Field Prep: None

Sample Depth:
Matrix: Water
Analytical Method: 127,608.3
Analytical Date: 10/04/20 11:47
Analyst: AD

Extraction Method: EPA 608.3
Extraction Date: 10/03/20 12:17
Cleanup Method: EPA 3665A
Cleanup Date: 10/03/20
Cleanup Method: EPA 3660B
Cleanup Date: 10/03/20

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	73		37-123	B
Decachlorobiphenyl	72		38-114	B
2,4,5,6-Tetrachloro-m-xylene	78		37-123	A
Decachlorobiphenyl	70		38-114	A

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 127,608.3
Analytical Date: 10/04/20 11:25
Analyst: AD

Extraction Method: EPA 608.3
Extraction Date: 10/03/20 12:17
Cleanup Method: EPA 3665A
Cleanup Date: 10/03/20
Cleanup Method: EPA 3660B
Cleanup Date: 10/03/20

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1417743-1						
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	95		37-123	B
Decachlorobiphenyl	89		38-114	B
2,4,5,6-Tetrachloro-m-xylene	87		37-123	A
Decachlorobiphenyl	68		38-114	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

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: WG1417743-2									
Aroclor 1016	109		-		50-140	-		36	A
Aroclor 1260	92		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	85				37-123	B
Decachlorobiphenyl	85				38-114	B
2,4,5,6-Tetrachloro-m-xylene	87				37-123	A
Decachlorobiphenyl	72				38-114	A

METALS

Project Name: MIT MUSIC
Lab Number: L2042027
Project Number: 133856-003 SID 6
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01
Client ID: HA20-C3(OW)-10220
Sample Location: AMHERST ALLEY, CAMBRIDGE, MA
Date Collected: 10/02/20 12:05
Date Received: 10/02/20
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	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Chromium, Total	0.00811		mg/l	0.00100	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Copper, Total	0.00385		mg/l	0.00100	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Iron, Total	3.65		mg/l	0.050	--	1	10/07/20 06:25	10/09/20 17:33	EPA 3005A	19,200.7	GD
Lead, Total	0.00540		mg/l	0.00100	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	10/07/20 09:18	10/07/20 12:28	EPA 245.1	3,245.1	EW
Nickel, Total	0.00813		mg/l	0.00200	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Zinc, Total	0.01781		mg/l	0.01000	--	1	10/07/20 06:25	10/07/20 11:30	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	555		mg/l	0.660	NA	1	10/07/20 06:25	10/09/20 17:33	EPA 3005A	19,200.7	GD
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.010	--	1		10/07/20 11:30	NA	107,-	

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6
Lab Number: L2042027
Report Date: 10/09/20

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: WG1418627-1										
Iron, Total	ND		mg/l	0.050	--	1	10/07/20 06:25	10/07/20 15:16	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: WG1418627-1										
Hardness	ND		mg/l	0.660	NA	1	10/07/20 06:25	10/07/20 15:16	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: WG1418628-1										
Antimony, Total	ND		mg/l	0.00400	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	10/07/20 06:25	10/07/20 10:27	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6
Lab Number: L2042027
Report Date: 10/09/20

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: WG1418630-1										
Mercury, Total	ND		mg/l	0.00020	--	1	10/07/20 09:18	10/07/20 11:59	3,245.1	EW

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1418627-2								
Iron, Total	102		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1418627-2								
Hardness	104		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1418628-2								
Antimony, Total	97		-		85-115	-		
Arsenic, Total	102		-		85-115	-		
Cadmium, Total	104		-		85-115	-		
Chromium, Total	104		-		85-115	-		
Copper, Total	99		-		85-115	-		
Lead, Total	103		-		85-115	-		
Nickel, Total	95		-		85-115	-		
Selenium, Total	103		-		85-115	-		
Silver, Total	103		-		85-115	-		
Zinc, Total	106		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1418630-2								
Mercury, Total	99		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418627-3 QC Sample: L2041996-01 Client ID: MS Sample												
Iron, Total	5.95	1	6.49	**54**	Q	-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418627-3 QC Sample: L2041996-01 Client ID: MS Sample												
Hardness	637	66.2	669	**48**	Q	-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418627-7 QC Sample: L2041996-02 Client ID: MS Sample												
Iron, Total	0.051	1	6.24	**619**	Q	-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418627-7 QC Sample: L2041996-02 Client ID: MS Sample												
Hardness	381	66.2	660	**422**	Q	-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418628-3 QC Sample: L2041996-01 Client ID: MS Sample												
Antimony, Total	ND	0.5	0.5149	103		-	-		70-130	-		20
Arsenic, Total	0.01061	0.12	0.1398	108		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05436	106		-	-		70-130	-		20
Chromium, Total	0.00719	0.2	0.2251	109		-	-		70-130	-		20
Copper, Total	0.02108	0.25	0.2743	101		-	-		70-130	-		20
Lead, Total	0.01089	0.51	0.5893	113		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4927	98		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1503	125		-	-		70-130	-		20
Silver, Total	ND	0.05	0.05031	101		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5342	107		-	-		70-130	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

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: WG1418628-5 QC Sample: L2041996-02 Client ID: MS Sample									
Antimony, Total	ND	0.5	0.5389	108	-	-	70-130	-	20
Arsenic, Total	0.00970	0.12	0.1381	107	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.05516	108	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2119	106	-	-	70-130	-	20
Copper, Total	ND	0.25	0.2586	103	-	-	70-130	-	20
Lead, Total	ND	0.51	0.5764	113	-	-	70-130	-	20
Nickel, Total	0.03296	0.5	0.5164	97	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1264	105	-	-	70-130	-	20
Silver, Total	ND	0.05	0.05016	100	-	-	70-130	-	20
Zinc, Total	ND	0.5	0.5102	102	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418630-3 QC Sample: L2042092-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.00513	103	-	-	70-130	-	20

Lab Duplicate Analysis
Batch Quality Control

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418627-4 QC Sample: L2041996-01 Client ID: DUP Sample						
Iron, Total	5.95	5.62	mg/l	6		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418627-8 QC Sample: L2041996-02 Client ID: DUP Sample						
Iron, Total	0.051	5.45	mg/l	**196**	Q	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418628-4 QC Sample: L2041996-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.01061	0.00841	mg/l	**23**	Q	20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00719	0.00728	mg/l	1		20
Copper, Total	0.02108	0.02056	mg/l	2		20
Lead, Total	0.01089	0.01060	mg/l	3		20
Nickel, Total	ND	ND	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418628-6 QC Sample: L2041996-02 Client ID: DUP Sample					
Antimony, Total	ND	ND	mg/l	NC	20
Arsenic, Total	0.00970	0.00862	mg/l	12	20
Cadmium, Total	ND	ND	mg/l	NC	20
Chromium, Total	ND	ND	mg/l	NC	20
Copper, Total	ND	ND	mg/l	NC	20
Lead, Total	ND	ND	mg/l	NC	20
Nickel, Total	0.03296	0.03381	mg/l	3	20
Selenium, Total	ND	ND	mg/l	NC	20
Silver, Total	ND	ND	mg/l	NC	20
Zinc, Total	ND	ND	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1418630-4 QC Sample: L2042092-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20

INORGANICS
&
MISCELLANEOUS

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

SAMPLE RESULTS

Lab ID: L2042027-01
Client ID: HA20-C3(OW)-10220
Sample Location: AMHERST ALLEY, CAMBRIDGE, MA

Date Collected: 10/02/20 12:05
Date Received: 10/02/20
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										
Solids, Total Suspended	23.		mg/l	5.0	NA	1	-	10/07/20 12:15	121,2540D	AC
Cyanide, Total	ND		mg/l	0.005	--	1	10/03/20 16:20	10/05/20 11:36	121,4500CN-CE	AG
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/03/20 04:20	121,4500CL-D	JA
Nitrogen, Ammonia	3.32		mg/l	0.075	--	1	10/05/20 12:09	10/06/20 19:23	121,4500NH3-BH	AT
TPH, SGT-HEM	ND		mg/l	4.00	--	1	10/06/20 17:00	10/07/20 13:15	74,1664A	DR
Phenolics, Total	ND		mg/l	0.030	--	1	10/06/20 04:40	10/08/20 07:13	4,420.1	MV
Chromium, Hexavalent	ND		mg/l	0.010	--	1	10/03/20 08:00	10/03/20 09:08	1,7196A	MA
Anions by Ion Chromatography - Westborough Lab										
Chloride	1160		mg/l	25.0	--	50	-	10/05/20 18:54	44,300.0	SH

Project Name: MIT MUSIC **Lab Number:** L2042027

Project Number: 133856-003 SID 6 **Report Date:** 10/09/20

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: WG1417622-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	10/03/20 04:20	121,4500CL-D	JA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1417689-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	10/03/20 08:00	10/03/20 09:02	1,7196A	MA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1417784-1										
Cyanide, Total	ND		mg/l	0.005	--	1	10/03/20 16:20	10/05/20 11:13	121,4500CN-CE	AG
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1418056-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	10/05/20 12:09	10/06/20 19:04	121,4500NH3-BH	AT
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1418367-1										
Chloride	ND		mg/l	0.500	--	1	-	10/05/20 17:38	44,300.0	SH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1418421-1										
Phenolics, Total	ND		mg/l	0.030	--	1	10/06/20 04:40	10/08/20 06:02	4,420.1	MV
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1418791-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	10/06/20 17:00	10/07/20 13:15	74,1664A	DR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1419194-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	10/07/20 12:15	121,2540D	AC

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1417622-2								
Chlorine, Total Residual	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1417689-2								
Chromium, Hexavalent	103		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1417784-2								
Cyanide, Total	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1418056-2								
Nitrogen, Ammonia	94		-		80-120	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG1418367-2								
Chloride	106		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1418421-2								
Phenolics, Total	109		-		70-130	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1418791-2								
TPH	88		-		64-132	-		34

Lab Control Sample Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1419194-2					
Solids, Total Suspended	97	-	80-120	-	

Matrix Spike Analysis
Batch Quality Control

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417622-4 QC Sample: L2041980-08 Client ID: MS Sample												
Chlorine, Total Residual	0.85	0.5	1.2	**64**	Q	-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417689-4 QC Sample: L2042027-01 Client ID: HA20-C3(OW)-10220												
Chromium, Hexavalent	ND	0.1	0.093	93		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417784-4 QC Sample: L2042150-04 Client ID: MS Sample												
Cyanide, Total	0.005	0.2	0.192	93		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418056-4 QC Sample: L2041751-01 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.41	85		-	-		80-120	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418367-3 QC Sample: L2042033-01 Client ID: MS Sample												
Chloride	304	40	332	**69**	Q	-	-		90-110	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418421-4 QC Sample: L2042239-02 Client ID: MS Sample												
Phenolics, Total	ND	0.4	0.42	106		-	-		70-130	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418791-4 QC Sample: L2041865-28 Client ID: MS Sample												
TPH	ND	19	8.86	**47**	Q	-	-		64-132	-		34

Lab Duplicate Analysis

Batch Quality Control

Project Name: MIT MUSIC

Project Number: 133856-003 SID 6

Lab Number: L2042027

Report Date: 10/09/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417622-3 QC Sample: L2041980-08 Client ID: DUP Sample						
Chlorine, Total Residual	0.85	0.82	mg/l	4		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417689-3 QC Sample: L2042027-01 Client ID: HA20-C3(OW)-10220						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1417784-3 QC Sample: L2042150-02 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418056-3 QC Sample: L2041751-01 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418367-4 QC Sample: L2042033-01 Client ID: DUP Sample						
Chloride	304	307	mg/l	1		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418421-3 QC Sample: L2042239-02 Client ID: DUP Sample						
Phenolics, Total	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1418791-3 QC Sample: L2041595-01 Client ID: DUP Sample						
TPH	ND	ND	mg/l	NC		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1419194-3 QC Sample: L2041896-02 Client ID: DUP Sample						
Solids, Total Suspended	36	35	mg/l	3		29

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2042027-01A	Vial Na2S2O3 preserved	A	NA		3.5	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L2042027-01A1	Vial Na2S2O3 preserved	A	NA		3.5	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L2042027-01B	Vial Na2S2O3 preserved	A	NA		3.5	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L2042027-01B1	Vial Na2S2O3 preserved	A	NA		3.5	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L2042027-01C	Vial Na2S2O3 preserved	A	NA		3.5	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L2042027-01C1	Vial Na2S2O3 preserved	A	NA		3.5	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L2042027-01D	Vial Na2S2O3 preserved	A	NA		3.5	Y	Absent		504(14)
L2042027-01E	Vial Na2S2O3 preserved	A	NA		3.5	Y	Absent		504(14)
L2042027-01F	Vial unpreserved	A	NA		3.5	Y	Absent		HOLD-SUB()
L2042027-01G	Vial unpreserved	A	NA		3.5	Y	Absent		HOLD-SUB()
L2042027-01H	Vial unpreserved	A	NA		3.5	Y	Absent		HOLD-SUB()
L2042027-01I	Plastic 250ml NaOH preserved	A	>12	>12	3.5	Y	Absent		HOLD-WETCHEM(),TCN-4500(14)
L2042027-01J	Plastic 250ml HNO3 preserved	A	<2	<2	3.5	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AS-2008T(180),HG-U(28),AG-2008T(180),SE-2008T(180),PB-2008T(180),SB-2008T(180),CR-2008T(180)
L2042027-01K	Plastic 500ml H2SO4 preserved	A	<2	<2	3.5	Y	Absent		NH3-4500(28)
L2042027-01L	Plastic 950ml unpreserved	A	7	7	3.5	Y	Absent		CL-300(28),HEXCR-7196(1),TRC-4500(1)
L2042027-01M	Plastic 950ml unpreserved	A	7	7	3.5	Y	Absent		TSS-2540(7)
L2042027-01N	Amber 950ml H2SO4 preserved	A	<2	<2	3.5	Y	Absent		TPHENOL-420(28)
L2042027-01O	Amber 1000ml Na2S2O3	A	7	7	3.5	Y	Absent		PCB-608.3(365)
L2042027-01P	Amber 1000ml Na2S2O3	A	7	7	3.5	Y	Absent		PCB-608.3(365)
L2042027-01Q	Amber 1000ml Na2S2O3	A	7	7	3.5	Y	Absent		625.1-RGP(7)
L2042027-01R	Amber 1000ml Na2S2O3	A	7	7	3.5	Y	Absent		625.1-RGP(7)

*Values in parentheses indicate holding time in days

Project Name: MIT MUSIC
Project Number: 133856-003 SID 6

Lab Number: L2042027
Report Date: 10/09/20

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2042027-01S	Amber 1000ml Na2S2O3	A	7	7	3.5	Y	Absent		625.1-SIM-RGP(7)
L2042027-01T	Amber 1000ml Na2S2O3	A	7	7	3.5	Y	Absent		625.1-SIM-RGP(7)
L2042027-01U	Amber 1000ml HCl preserved	A	NA		3.5	Y	Absent		TPH-1664(28)
L2042027-01V	Amber 1000ml HCl preserved	A	NA		3.5	Y	Absent		TPH-1664(28)
L2042027-01W	Plastic 250ml unpreserved split	A	7	7	3.5	Y	Absent		-
L2042027-01X	Plastic 120ml HNO3 preserved Filtrates	A	NA		3.5	Y	Absent		HOLD-METAL-DISSOLVED(180)

*Values in parentheses indicate holding time in days

Project Name:	MIT MUSIC	**Lab Number:**	L2042027
Project Number:	133856-003 SID 6	**Report Date:**	10/09/20

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:	MIT MUSIC	**Lab Number:**	L2042027
Project Number:	133856-003 SID 6	**Report Date:**	10/09/20

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. 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 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.

Report Format: Data Usability Report

Project Name:	MIT MUSIC	**Lab Number:**	L2042027
Project Number:	133856-003 SID 6	**Report Date:**	10/09/20

Data Qualifiers

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.

Report Format: Data Usability Report

Project Name:	MIT MUSIC	**Lab Number:**	L2042027
Project Number:	133856-003 SID 6	**Report Date:**	10/09/20

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.

74 Method 1664,Revision A: 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-98-002, February 1999.

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.

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 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; 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.
EPA TO-12 Non-methane organics
EPA 3C Fixed gases
Biological Tissue Matrix: EPA 3050B

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

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, 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, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

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

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

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

ALPHA — CHAIN OF CUSTODY

Service Centers
Brewer, ME 04412 Portsmouth, NH 03801 Mahwah, NJ 07430 Albany, NY 12205 Tonawanda, NY 14150 Holmes, PA 19043

Page 2 of 2

Date Rec'd in Lab: 10/2/20

ALPHA Job #: L2042027

Westborough, MA 01581, 8 Walkup Dr., TEL: 508-898-9220, FAX: 508-898-9193
Mansfield, MA 02048, 320 Forbes Blvd, TEL: 508-822-9300, FAX: 508-822-3288

Project Information

Project Name: MIT Music
Project Location: Amherst Alley, Cambridge, MA
Project #: 130866-003 SID-6
(Use Project name as Project ☐)
Project Manager: H Ballantyne
ALPHAQuote #: 8307

H&A Information

H&A Client: MIT
H&A Address: 465 Medford St
Boston, MA 02129-1400
H&A Phone: 617-886-7400
H&A Fax:
H&A Email: lhoward@haleyaldrich.com

Turn-Around Time

Standard ☑ Due Date:
(only if pre approved) ☐ # of Days:

Deliverables

☑ Email ☐ Fax
☑ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other:

Billing Information

☑ Same as Client Info
PO #

Regulatory Requirements (Program/Criteria)

Note: Select State from menu & identify criteria.

Disposal Site Information

Please identify below location of applicable disposal facilities.
Disposal Facility: ☐ NJ ☐ NY ☐ Other:

These samples have been previously analyzed by Alpha ☐

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 - 2540; 2. TRC-4500; 3. TCN-4500 HOLD PACN & ACN; 4. 504; 5. 8260 & 8260 SIM for Dioxane; 6. HEXCR-3500 & Trivalent Chromium; 7. TPHENOL-420; 8. 625/NTOL (including Diethylhexylphthalate); 9. 625/NTOL-SIM; 10. CL-300; 11. Total Metals - Ag, As, Cd, Cr, Cu, Ni, Pb, Sb, Se, Zn, Fe, Hg; 12. Dissolved Metals - Ag, As, Be, Cd, Cr, Cu, Ni, Pb, Sb, Se, Tl, Zn; 13. Ammonia; 14. Total Hardness; 15. A2-ALCOHOL (Ethanol); 16. TPH-1664; 17. PCB-608

Sample Filtration: ☐ Done ☐ Lab to do
Preservation: ☐ Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Sample Specific Comments	Total Bottles
42027-01	HA20-C3(OW)-10220	10/2/20	1205	AQ	AF	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	Temp - 22.5 pH - 6.80	25

Container Type
Preservative

Preservative Code: A = None, B = HCl, C = HNO_3, D = H_2SO_4, E = NaOH, F = MeOH, G = $NaHSO_4$, H = $Na_2S_2O_3$, 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 = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	10/2/20 1445	[signature] AAL	10/2/20 1445
[signature] AAL	10/2/20 1730	[signature]	10/2/20 1730

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.

Document ID: 20455 Rev 1 (1/28/2016)

APPENDIX D

Chemicals and Additives 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.

HACH®
Be Right™

Controller Comparison

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

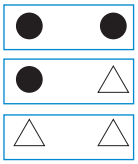
Choose from Hach's Broad Range of Digital and Analog Sensors

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

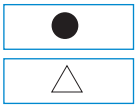
● = Digital △ = Analog

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

2 Channel Configurations



1 Channel Configurations



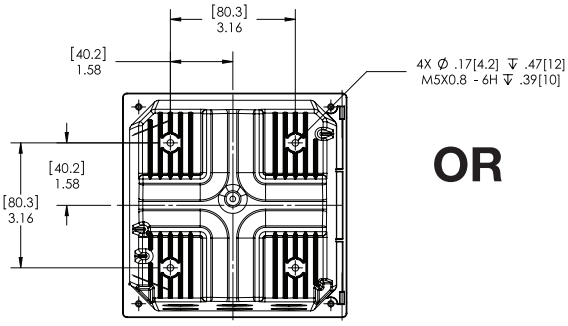
Specifications*

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

Subject to change without notice.

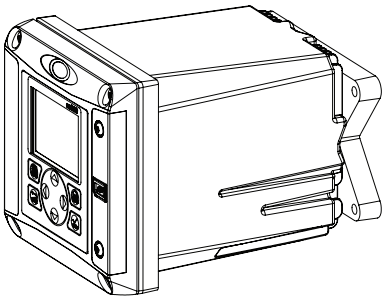
Dimensions

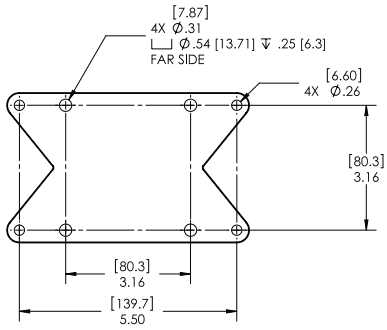
Surface Mounting Dimensions



Mounting Dimensions
(Rear View)

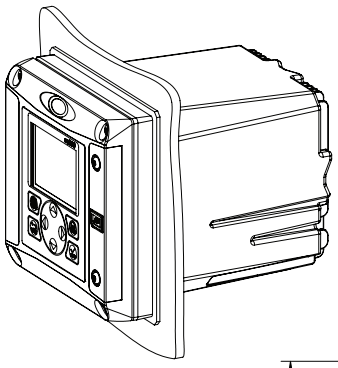
OR

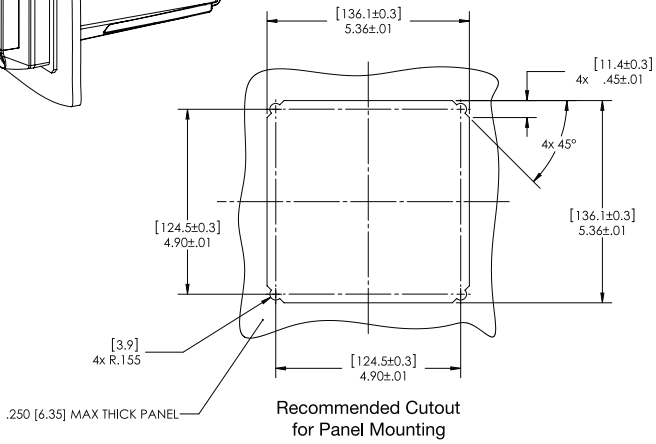




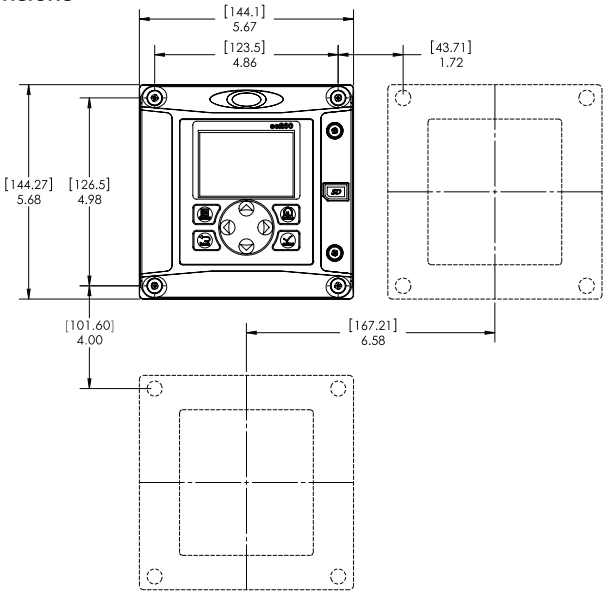
Bracket (supplied) for Surface Mounting
(Not compatible with Weather and Sun Shield
p/n 9220600 when surface mounting.)

Panel Mounting Dimensions



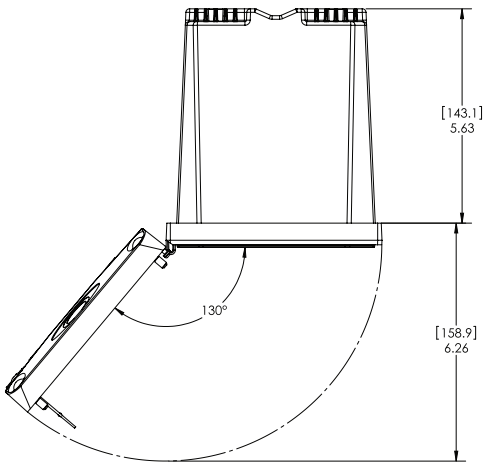


Recommended Cutout
for Panel Mounting

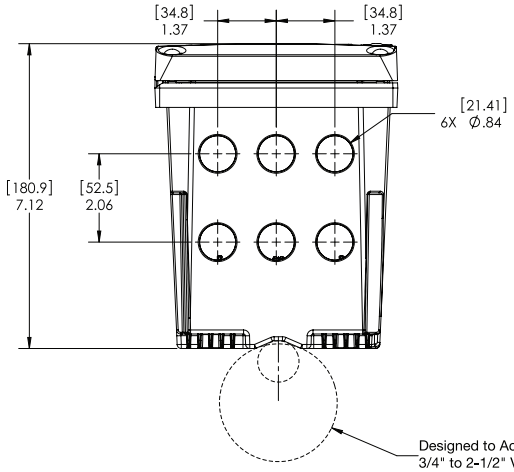


Minimum Spacing Dimensions
for Group Mounting

Top and Bottom Views



Door Opening Details



Ordering Information

sc200 for Hach Digital and Analog Sensors

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

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

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

sc200 for Ultrapure Sensors

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

Sensor and Communication Modules

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

Accessories

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

HACH COMPANY World Headquarters: Loveland, Colorado USA

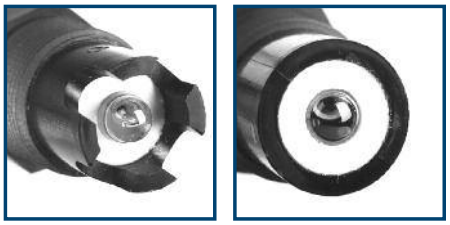
United States: 800-227-4224 tel 970-669-2932 fax orders@hach.com
Outside United States: 970-669-3050 tel 970-461-3939 fax int@hach.com
hach.com

LIT2665 Rev 7
K13 Printed in U.S.A.

HACH®
Be Right™

3/4-inch Combination pH and ORP Sensor Kits

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 105ºC 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.

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 (± 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.*

Engineering Specifications

1. The pH sensor shall be available in convertible, insertion or sanitary styles. The ORP sensor shall be available in only convertible or insertion styles.
2. 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.
3. 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.
4. The sensor shall communicate via MODBUS® RS-485 to a Hach sc Digital Controller.
5. 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.

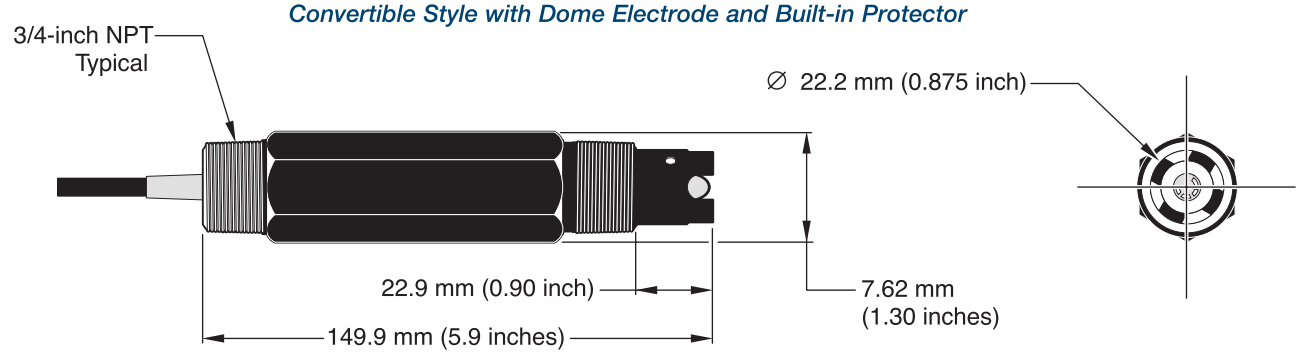
Insertion Style Sensor

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.

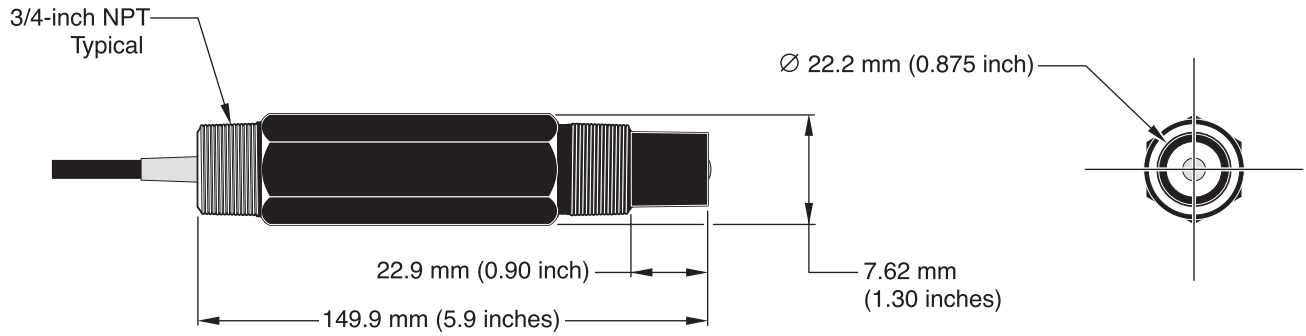
Sanitary Style Sensor

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 Dome Electrode and Built-in Protector

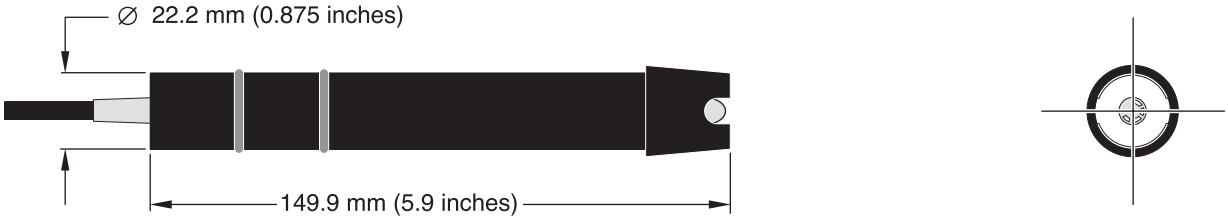


Convertible Style with Flat Electrode

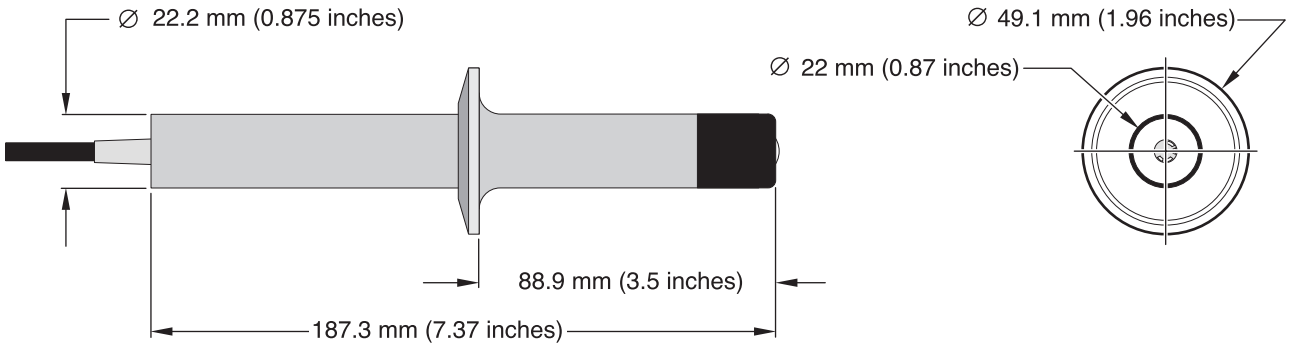


Dimensions *continued*

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.

Product Number	*Measurement*	*Sensor Style*	*Body Material*	*Electrode Type*	*Temp. Comp.*
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.

Product Number	*Measurement*	*Sensor Style*	*Body Material*	*Electrode Type*	*Temp. Comp.*
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

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.

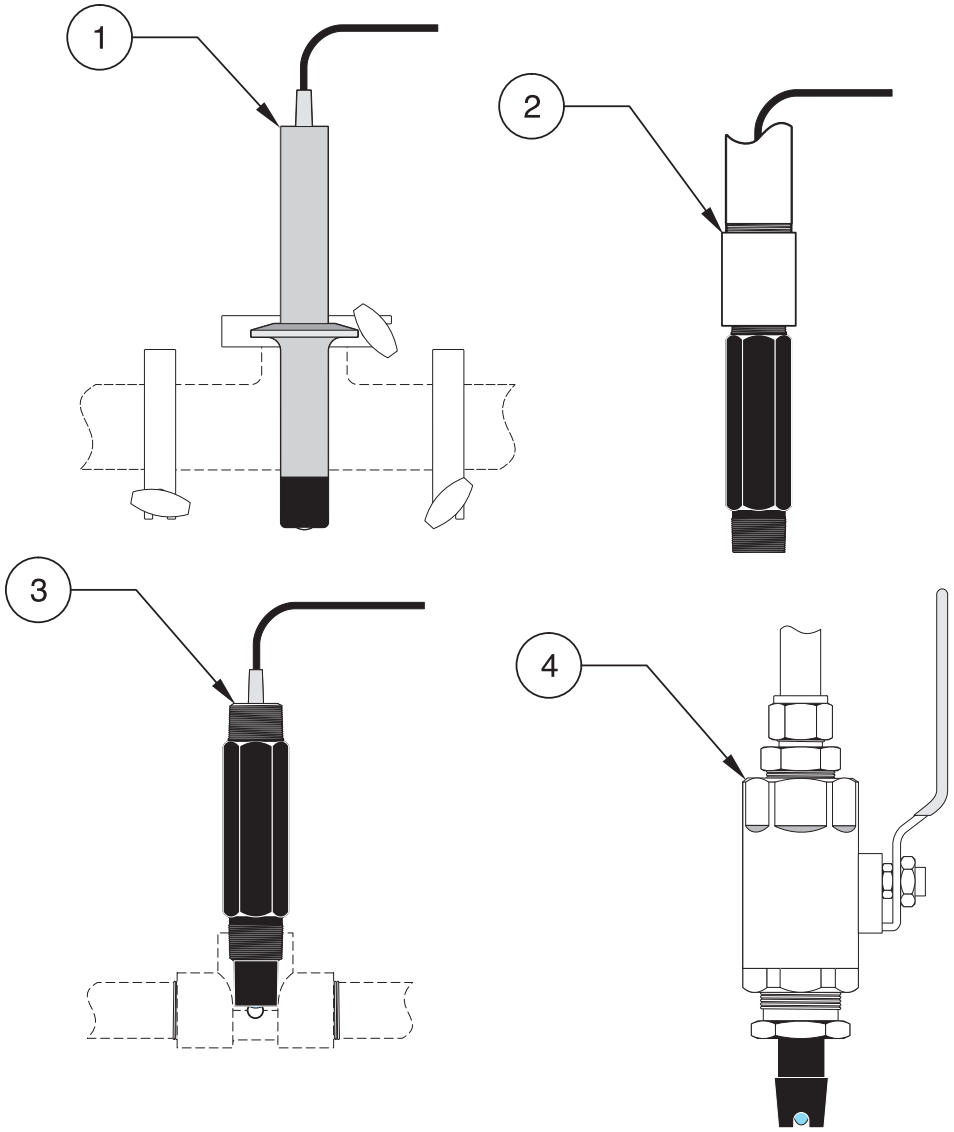
60A2053 Junction Box, Surface-mount, aluminum (includes mounting hardware)

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

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.

In the United States, contact:

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P.O. Box 389
Loveland, Colorado 80539-0389
U.S.A.
Telephone: 800-227-4224
Fax: 970-669-2932
E-mail: orders@hach.com
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U.S.A.
Telephone: 970-669-3050
Fax: 970-461-3939
E-mail: intl@hach.com
www.hach.com

In Europe, the Middle East, and Mediterranean Africa, contact:

HACH LANGE GmbH
Willstätterstraße 11
D-40549 Düsseldorf
GERMANY
Tel: +49 (0) 211 5288-0
Fax: +49 (0) 211 5288-143
E-mail: info@hach-lange.de
www.hach-lange.com

LIT2470 Rev 2
Printed in U.S.A.

HACH®
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 Dimensions:	31.75" W x 41.5" L x 31.75" H
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 Dimensions:	80.6cm W x 105.4cm L x 80.6cm H
Weight:	21.8 kg

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**

6455 East Johns Crossing, Suite 375 • Johns Creek GA 30097

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)

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 CO_2, 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	Flammability	Instability	Physical hazards
3	0	2	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/m³ (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)

NTP: (National Toxicity Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
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 ± 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.

Operating Benefits

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

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.

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)							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: GFPPL, PVC, PVDF, 316 SS

Diaphragm: PTFE-faced CSPE-backed

Check Valves Materials Available:

Seats/O-Rings: PTFE, CSPE, Viton

Balls: Ceramic, PTFE, 316 SS, Alloy C

Fittings Materials Available: GFPPL, 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 - GFPPL=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

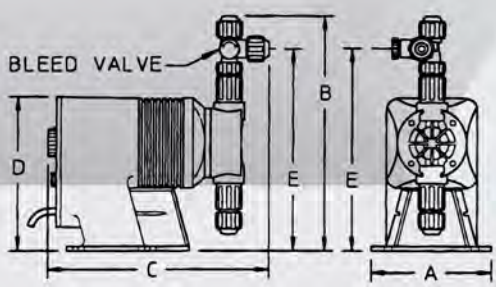
Pre-Engineered Systems

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



PULSAFEEDER
27101 Airport Road
Punta Gorda, FL 33982
Phone: +1(941) 575-3800
Fax: +1(941) 575-4085

www.pulsatron.com

An ISO 9001 Certified Company

IDEX

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. promealas* 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
www.siltstop.com
Phone: 678-494-5998
Toll-free: 866-200-9868
Fax: 678-494-5298

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.

APPENDIX E

Endangered Species Act Assessment

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: October 20, 2020
Consultation Code: 05E1NE00-2021-SLI-0199
Event Code: 05E1NE00-2021-E-00589
Project Name: MIT Music Building

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

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

Project Summary

Consultation Code: 05E1NE00-2021-SLI-0199

Event Code: 05E1NE00-2021-E-00589

Project Name: MIT Music Building

Project Type: DEVELOPMENT

Project Description: Massachusetts Institute of Technology Music Building

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.35774788093511N71.09591829978933W

Counties: Middlesex, MA

Endangered Species Act Species

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

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

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

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

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

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

MassDEP - Bureau of Waste Site Cleanup

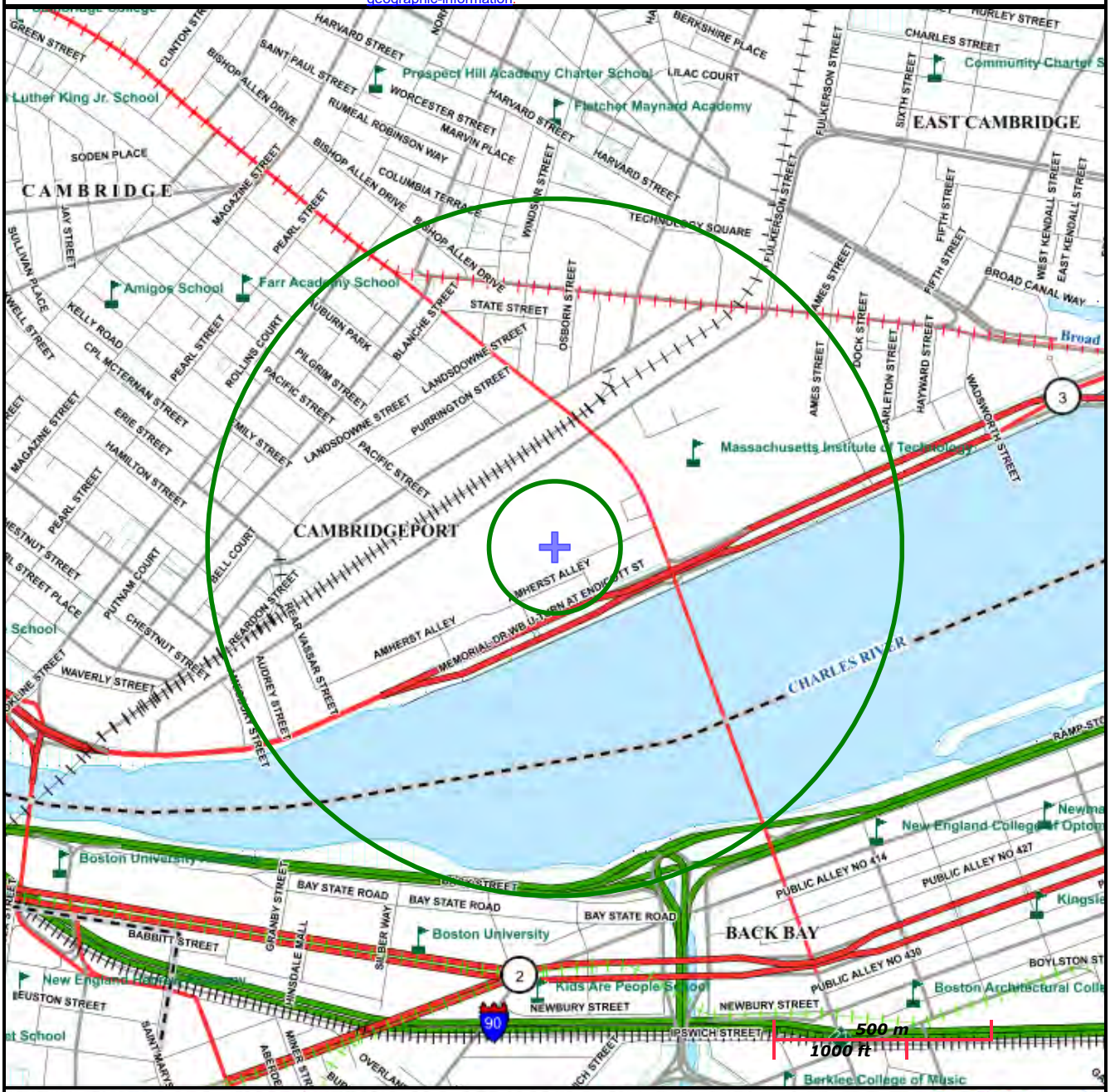
Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:
MIT MUSIC BUILDING
CAMBRIDGE, MA

NAD83 UTM Meters:
4691627mN , 327394mE (Zone: 19)
October 20, 2020

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.

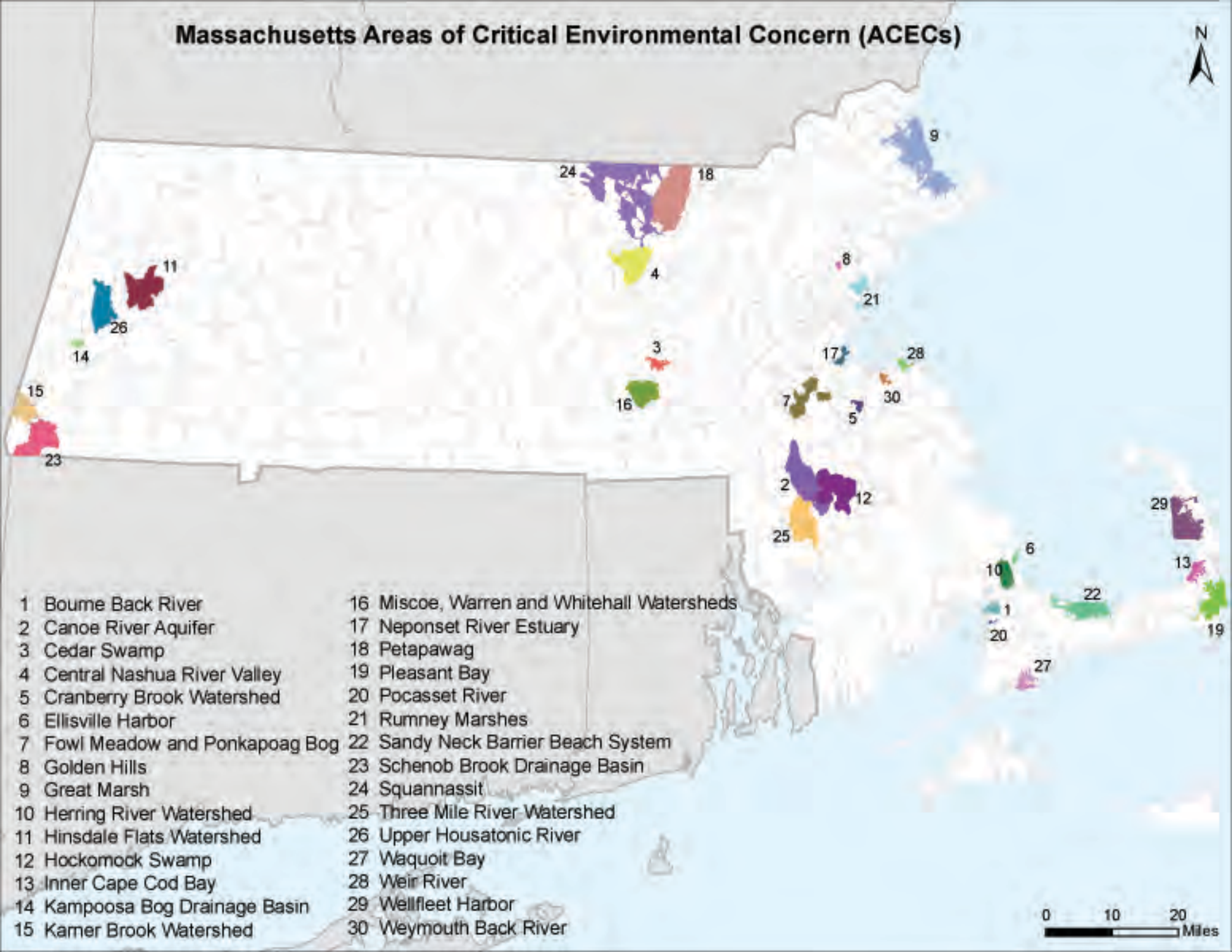
MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct
Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam
Aquifers: Medium Yield, High Yield, EPA Sole Source
Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A
Hydrography: Open Water, PWS Reservoir, Tidal Flat
Wetlands: Freshwater, Saltwater, Cranberry Bog
FEMA 100yr Floodplain; Protected Open Space; ACEC
Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential
Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

Massachusetts Areas of Critical Environmental Concern (ACECs)



1 Bourne Back River
2 Canoe River Aquifer
3 Cedar Swamp
4 Central Nashua River Valley
5 Cranberry Brook Watershed
6 Ellisville Harbor
7 Fowl Meadow and Ponkapoag Bog
8 Golden Hills
9 Great Marsh
10 Herring River Watershed
11 Hinsdale Flats Watershed
12 Hockomock Swamp
13 Inner Cape Cod Bay
14 Kampoosa Bog Drainage Basin
15 Karner Brook Watershed
16 Miscoe, Warren and Whitehall Watersheds
17 Neponset River Estuary
18 Petapawag
19 Pleasant Bay
20 Pocasset River
21 Rumney Marshes
22 Sandy Neck Barrier Beach System
23 Schenob Brook Drainage Basin
24 Squannassit
25 Three Mile River Watershed
26 Upper Housatonic River
27 Waquoit Bay
28 Weir River
29 Wellfleet Harbor
30 Weymouth Back River

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Barnstable	Piping Plover	Threatened	Coastal Beaches	All Towns
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Chatham
	Sandplain gerardia	Endangered	Open areas with sandy soils.	Sandwich and Falmouth.
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Bourne (north of the Cape Cod Canal)
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Berkshire	Bog Turtle	Threatened	Wetlands	Egremont and Sheffield
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Bristol	Piping Plover	Threatened	Coastal Beaches	Fairhaven, Dartmouth, Westport
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Fairhaven, New Bedford, Dartmouth, Westport
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Taunton
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Dukes	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	All Towns
	Piping Plover	Threatened	Coastal Beaches	All Towns
	Northeastern beach tiger beetle	Threatened	Coastal Beaches	Aquinnah and Chilmark
	Sandplain gerardia	Endangered	Open areas with sandy soils.	West Tisbury
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

Updated 02/05/2016

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Essex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Gloucester, Essex and Manchester
	Piping Plover	Threatened	Coastal Beaches	Gloucester, Essex, Ipswich, Rowley, Revere, Newbury, Newburyport and Salisbury
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Franklin	Northeastern bulrush	Endangered	Wetlands	Montague, Warwick
	Dwarf wedgemussel	Endangered	Mill River	Whately
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampshire	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Hadley
	Puritan tiger beetle	Threatened	Sandy beaches along the Connecticut River	Northampton and Hadley
	Dwarf wedgemussel	Endangered	Rivers and Streams.	Hatfield, Amherst and Northampton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hampden	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Southwick
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Middlesex	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Groton
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Nantucket	Piping Plover	Threatened	Coastal Beaches	Nantucket
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Nantucket
	American burying beetle	Endangered	Upland grassy meadows	Nantucket
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

Updated 02/05/2016

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Plymouth	Piping Plover	Threatened	Coastal Beaches	Scituate, Marshfield, Duxbury, Plymouth, Wareham and Mattapoisett
	Northern Red-bellied Cooter	Endangered	Inland Ponds and Rivers	Kingston, Middleborough, Carver, Plymouth, Bourne, Wareham, Halifax, and Pembroke
	Roseate Tern	Endangered	Coastal beaches and the Atlantic Ocean	Plymouth, Marion, Wareham, and Mattapoisett.
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Suffolk	Piping Plover	Threatened	Coastal Beaches	Revere, Winthrop
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Worcester	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Leominster
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

[1]Migratory only, scattered along the coast in small numbers

-Eastern cougar and gray wolf are considered extirpated in Massachusetts.
-Endangered gray wolves are not known to be present in Massachusetts, but dispersing individuals from source populations in Canada may occur statewide.
-Critical habitat for the Northern Red-bellied Cooter is present in Plymouth County.

Updated 02/05/2016

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

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

Location

Middlesex County, Massachusetts

Local office

New England Ecological Services Field Office

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

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

http://www.fws.gov/newengland

Endangered species

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

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

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

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

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

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

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

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

THERE ARE NO ENDANGERED SPECIES EXPECTED TO OCCUR AT THIS LOCATION.

Migratory birds

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

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

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

Additional information can be found using the following links:

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

conservation-measures.php

- Nationwide conservation measures for birds
  http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

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

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

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

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

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

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

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

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

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

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

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

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

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

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

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

Probability of Presence (■)

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

confidence in the presence score if the corresponding survey effort is also high.

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

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

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

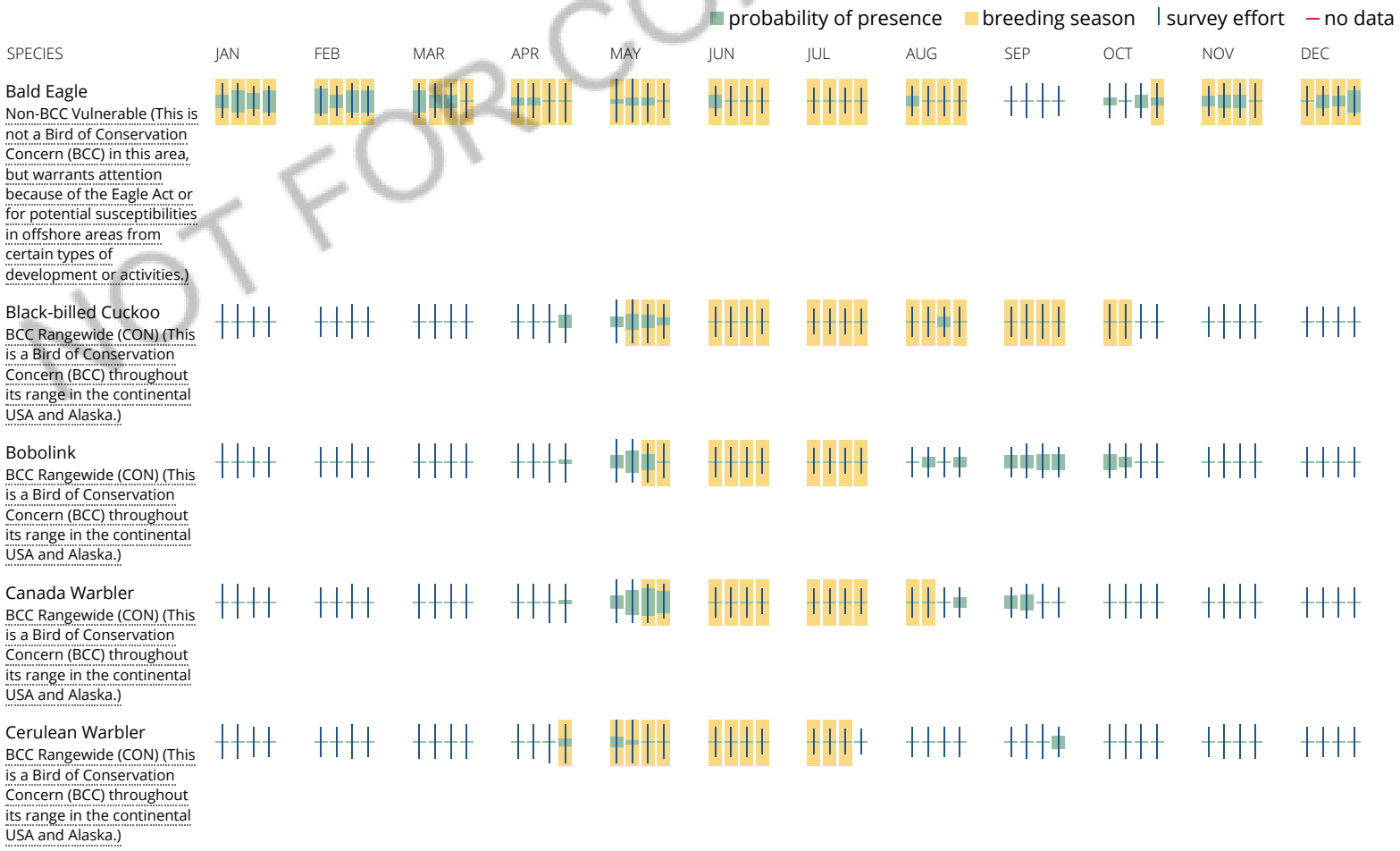
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

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

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

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

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



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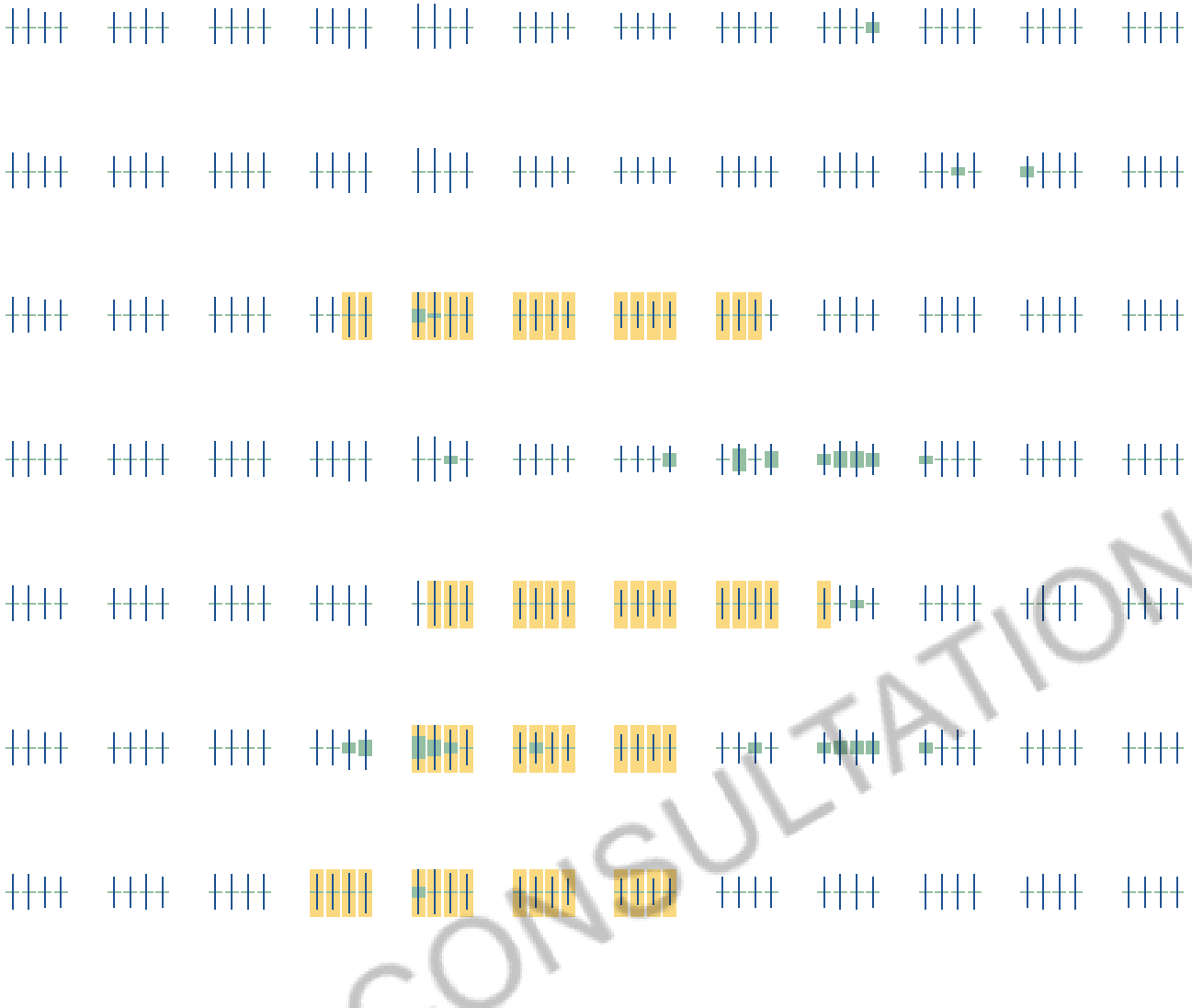
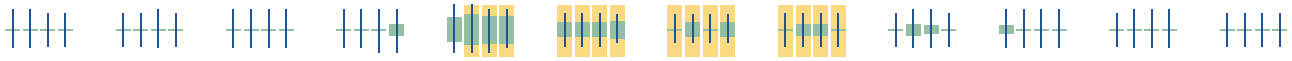


Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



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

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

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

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

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

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

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

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

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

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

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

What are the levels of concern for migratory birds?

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

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

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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

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

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

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

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

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

Data exclusions

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

Data precautions

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

Rare species viewer

Town	Common Name	Scientific Name	Taxonomic Group	MESA Status	Most Recent Obs.
CAMBRIDGE	American Bittern	Botaurus lentiginosus	Bird	Endangered	1906
CAMBRIDGE	American Sea-blite	Suaeda calceoliformis	Vascular Plant	Special Concern	1912
CAMBRIDGE	Andrews' Bottle Gentian	Gentiana andrewsii	Vascular Plant	Endangered	2017
CAMBRIDGE	Barn Owl	Tyto alba	Bird	Special Concern	Historic
CAMBRIDGE	Blue-spotted Salamander (complex)	Ambystoma laterale pop. 1	Amphibian	Special Concern	1917
CAMBRIDGE	Bridle Shiner	Notropis bifrenatus	Fish	Special Concern	1928
CAMBRIDGE	Britton's Violet	Viola brittoniana	Vascular Plant	Threatened	1843
CAMBRIDGE	Common Gallinule	Gallinula galeata	Bird	Special Concern	1890
CAMBRIDGE	Eastern Box Turtle	Terrapene carolina	Reptile	Special Concern	1892
CAMBRIDGE	Eastern Pondmussel	Ligumia nasuta	Mussel	Special Concern	1941
CAMBRIDGE	Eastern Spadefoot	Scaphiopus holbrookii	Amphibian	Threatened	1892
CAMBRIDGE	Engelmann's Flatsedge	Cyperus engelmannii	Vascular Plant	Threatened	2008
CAMBRIDGE	Fries' Pondweed	Potamogeton friesii	Vascular Plant	Endangered	1880
CAMBRIDGE	Imperial Moth	Eacles imperialis	Butterfly/Moth	Threatened	Historic
CAMBRIDGE	Lake Quillwort	Isoetes lacustris	Vascular Plant	Endangered	Historic
CAMBRIDGE	Least Bittern	Ixobrychus exilis	Bird	Endangered	1890
CAMBRIDGE	Long's Bulrush	Scirpus longii	Vascular Plant	Threatened	1913
CAMBRIDGE	New England Medicinal Leech	Macrobdella sestertia	Segmented Worm	Special Concern	1800s
CAMBRIDGE	Pale Green Orchid	Platanthera flava var. herbiola	Vascular Plant	Threatened	Historic
CAMBRIDGE	Peregrine Falcon	Falco peregrinus	Bird	Threatened	2019
CAMBRIDGE	Sedge Wren	Cistothorus platensis	Bird	Endangered	1840
CAMBRIDGE	Slender Woodland Sedge	Carex gracilescens	Vascular Plant	Endangered	1891
CAMBRIDGE	Twelve-spotted Tiger Beetle	Cicindela duodecimguttata	Beetle	Special Concern	1932
CAMBRIDGE	Wood Turtle	Glyptemys insculpta	Reptile	Special Concern	Historic

List provided by Mass.gov (https://www.mass.gov/service-details/rare-species-viewer), accessed 10/13/2020.

APPENDIX F

National Historical Preservation Act Review

Naonal R egister of Historic Places

Naonal P ark Service
U.S. Department of the Interior

Public, non-restricted data depicng Na onal R egister spaal da ta processed by the Cultural Resources GIS facility. …

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Cambridge; Street No: 77; Street Name: Massachusetts Ave; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Cambridge; Street Name: Massachusetts Ave; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
CAM.635	Holmes Block II - Green Block	2-14 Central Sq	Cambridge	1798
CAM.102	First Parish Church, Unitarian	1-3 Church St	Cambridge	1833
CAM.910	Fitchburg Railroad Signal Bridge	Fitchburg Railroad	Cambridge	c 1930
CAM.177	Old Cambridge Baptist Church	398 Harvard St	Cambridge	1867
CAM.260	M. I. T. Alumni Swimming Pool Building	Massachusetts Ave	Cambridge	1940
CAM.261	Kresge Auditorium	Massachusetts Ave	Cambridge	1953
CAM.262	M. I. T. Chapel	Massachusetts Ave	Cambridge	1954
CAM.901	Harvard Square Subway Kiosk	Massachusetts Ave	Cambridge	1928
CAM.905	Massachusetts Avenue Bridge over Conrail	Massachusetts Ave	Cambridge	1900
CAM.916	Central Square Subway Station	Massachusetts Ave	Cambridge	1912
CAM.921	Harvard Bridge	Massachusetts Ave	Cambridge	r 1890
CAM.938	Cambridge Common	Massachusetts Ave	Cambridge	1631
CAM.939	Cambridge Common South Traffic Island	Massachusetts Ave	Cambridge	1976
CAM.945	Burying Ground Fence	Massachusetts Ave	Cambridge	1891
CAM.946	Flagstaff Park	Massachusetts Ave	Cambridge	1913
CAM.947	North Little Common	Massachusetts Ave	Cambridge	c 1858
CAM.949	Central Square Street Pattern	Massachusetts Ave	Cambridge	c 1630
CAM.334	Cambridge Armory	120 Massachusetts Ave	Cambridge	1902
CAM.332	Metropolitan Storage Warehouse	134 Massachusetts Ave	Cambridge	1895
CAM.1366	New England Confectionery Company Factory	250 Massachusetts Ave	Cambridge	1927
CAM.612	Lamson, The	351-355 Massachusetts Ave	Cambridge	1907
CAM.614	Lafayette Square Fire Station	380 Massachusetts Ave	Cambridge	1893
CAM.613	Shell Gas Station	385 Massachusetts Ave	Cambridge	1948
CAM.615	Salvation Army - Cambridge Citadel	400-402 Massachusetts Ave	Cambridge	1968
CAM.604		401-409 Massachusetts Ave	Cambridge	1966
CAM.603	Taylor, William A. House and Shop	411-413 Massachusetts Ave	Cambridge	1887
CAM.602	Barkin and Gorfinkle Building	415-429 Massachusetts Ave	Cambridge	1925

Inv. No.	Property Name	Street	Town	Year
CAM.616	Kennedy, Frank A. Store	424 Massachusetts Ave	Cambridge	1896
CAM.617	Kutz, Issac Store	428 Massachusetts Ave	Cambridge	c 1910
CAM.229	Kennedy, The	430-442 Massachusetts Ave	Cambridge	1890
CAM.601	Robbins Building	433-447 Massachusetts Ave	Cambridge	1923
CAM.619	Blanchard Building	448-450 Massachusetts Ave	Cambridge	c 1886
CAM.324	South Row	452-458 Massachusetts Ave	Cambridge	1807
CAM.1393	Dana Row - South Row	452-458 Massachusetts Ave	Cambridge	2003
CAM.599	Rogers, F. W. and G. M. Building	453-457 Massachusetts Ave	Cambridge	1885
CAM.620	Freedman Building	460-464 Massachusetts Ave	Cambridge	1933
CAM.598	McDonald's Restaurant	463-467 Massachusetts Ave	Cambridge	1974
CAM.621	Central Square Realty Trust Building	468-480 Massachusetts Ave	Cambridge	1929
CAM.597	Moller's Furniture Store	485 Massachusetts Ave	Cambridge	1926
CAM.622	Longfellow, The	492-498 Massachusetts Ave	Cambridge	1893
CAM.596	Kane's Furniture Store	493-507 Massachusetts Ave	Cambridge	1916
CAM.625	Burger King Restaraunt	506 Massachusetts Ave	Cambridge	1970
CAM.1394	Hovey, Phineas Building	512-514 Massachusetts Ave	Cambridge	1842
CAM.595	Central Trust Building	515-527 Massachusetts Ave	Cambridge	1927
CAM.627	Miller Store	520 Massachusetts Ave	Cambridge	1924
CAM.628	Rosenwald Realty Corporation Building	522-526 Massachusetts Ave	Cambridge	1928
CAM.230	Odd Fellows Hall	536 Massachusetts Ave	Cambridge	1884
CAM.629	Clark - Lamb Building	546-550 Massachusetts Ave	Cambridge	c 1873
CAM.630	Albani Building	552-566 Massachusetts Ave	Cambridge	1925
CAM.592	Bullock, Charles Building	567-569 Massachusetts Ave	Cambridge	1859
CAM.591	Central Square Theater	571-577 Massachusetts Ave	Cambridge	1917
CAM.631	Ginsberg Building - Harvard Bazar	572-590 Massachusetts Ave	Cambridge	1913
CAM.590	Morse, Asa P. Building	579-587 Massachusetts Ave	Cambridge	1893
CAM.589	Cambridgeport National Bank Building	593-597 Massachusetts Ave	Cambridge	1869
CAM.632	Manhattan Market - Purity Supreme Super Market	596-610 Massachusetts Ave	Cambridge	1899
CAM.588	Morse, Asa Second Building	599-601 Massachusetts Ave	Cambridge	1905
CAM.587	Fisk and Coleman Building	603-605 Massachusetts Ave	Cambridge	1892
CAM.633	Prospect House	614-620 Massachusetts Ave	Cambridge	1869
CAM.586	Corcoran, John H. Building	615-627 Massachusetts Ave	Cambridge	1927
CAM.634	Holmes Block I	624-638 Massachusetts Ave	Cambridge	1915
CAM.1395	New Holmes Block	624-638 Massachusetts Ave	Cambridge	1998
CAM.585	Woolworth, F. W. Building	633-641 Massachusetts Ave	Cambridge	1950
CAM.584	Watriss Building	643-649 Massachusetts Ave	Cambridge	1880
CAM.583	Dowse, Thomas House	653-655 Massachusetts Ave	Cambridge	1814

Inv. No.	Property Name	Street	Town	Year
CAM.581	New England Gas and Electric Association II Bldg	671-675 Massachusetts Ave	Cambridge	1966
CAM.642	Central Square Building	674 Massachusetts Ave	Cambridge	1926
CAM.643	Chamberlain - Hyde Building	684-688 Massachusetts Ave	Cambridge	1869
CAM.580	Cambridgeport Savings Bank	689 Massachusetts Ave	Cambridge	1904
CAM.644	Dana Building	692-698 Massachusetts Ave	Cambridge	1872
CAM.645	Southwick Building	700-706 Massachusetts Ave	Cambridge	1908
CAM.646	Norris Building	710-720 Massachusetts Ave	Cambridge	1916
CAM.579	Cambridge Electric Light Building	719 Massachusetts Ave	Cambridge	1912
CAM.647	Thayer Building I	722-724 Massachusetts Ave	Cambridge	1863
CAM.648	Thayer Building II	728-730 Massachusetts Ave	Cambridge	1868
CAM.578	Southwick Building	731-751 Massachusetts Ave	Cambridge	1896
CAM.649	Dobbins and Draper Store	736-750 Massachusetts Ave	Cambridge	1922
CAM.650	Dobbins and Draper Store	736-750 Massachusetts Ave	Cambridge	1922
CAM.231	Cambridge Mutual Fire Insurance Company Building	763 Massachusetts Ave	Cambridge	1888
CAM.232	Central Square Post Office	770 Massachusetts Ave	Cambridge	1933
CAM.233	Cambridge City Hall	795 Massachusetts Ave	Cambridge	1889
CAM.651	Cambridge Senior Center	800-806 Massachusetts Ave	Cambridge	1925
CAM.652	Young Men's Christian Association Building	820-830 Massachusetts Ave	Cambridge	1896
CAM.1396	Brusch Medical Center	825-831 Massachusetts Ave	Cambridge	1951
CAM.653	Saint Peter's Episcopal Church	834 Massachusetts Ave	Cambridge	1867
CAM.654	Modern Manor Apartments	842-864 Massachusetts Ave	Cambridge	1925
CAM.900	Houghton Beech Tree	1000 Massachusetts Ave	Cambridge	
CAM.1127	Brentford Hall	1137 Massachusetts Ave	Cambridge	1899
CAM.1128	Dunham, Israel Houses	1156-1166 Massachusetts Ave	Cambridge	1858
CAM.1129		1168 Massachusetts Ave	Cambridge	c 1892
CAM.1130		1170-1174 Massachusetts Ave	Cambridge	c 1849
CAM.1131	Longfellow Court	1200 Massachusetts Ave	Cambridge	1916
CAM.1132	Gulf Gas Station	1201 Massachusetts Ave	Cambridge	1940
CAM.1133		1206 Massachusetts Ave	Cambridge	1965
CAM.1134		1208-1210 Massachusetts Ave	Cambridge	1842
CAM.1135	Quincy Hall	1218 Massachusetts Ave	Cambridge	1891
CAM.1136		1230 Massachusetts Ave	Cambridge	1907
CAM.1137		1234-1238 Massachusetts Ave	Cambridge	c 1894
CAM.1138	Hamden Hall	1246-1260 Massachusetts Ave	Cambridge	1902
CAM.1139	A. D. Club	1268-1270 Massachusetts Ave	Cambridge	1899
CAM.1140	Niles Building	1280 Massachusetts Ave	Cambridge	1984

Inv. No.	Property Name	Street	Town	Year
CAM.234	Fairfax, The	1300-1306 Massachusetts Ave	Cambridge	1869
CAM.1141	Fairfax - Hilton Block	1310-1312 Massachusetts Ave	Cambridge	1883
CAM.1142	Fairfax - Hilton Block	1316 Massachusetts Ave	Cambridge	1885
CAM.235	Porcellian Club	1320-1324 Massachusetts Ave	Cambridge	1890
CAM.1143	Manter Hall	1325 Massachusetts Ave	Cambridge	1885
CAM.236	Wadsworth House	1341 Massachusetts Ave	Cambridge	1726
CAM.237	Holyoke Center	1350 Massachusetts Ave	Cambridge	1961
CAM.1144	Cambridge Savings Bank	1372-1376 Massachusetts Ave	Cambridge	1923
CAM.1145	Read, Joseph Stacey House	1380-1382 Massachusetts Ave	Cambridge	c 1783
CAM.1146	Bartlett, Joseph House	1384-1392 Massachusetts Ave	Cambridge	c 1800
CAM.1147	Harvard Coop Society	1400 Massachusetts Ave	Cambridge	1924
CAM.1148	Harvard Coop Society	1408-1410 Massachusetts Ave	Cambridge	1956
CAM.1149	Harvard Trust Company	1414 Massachusetts Ave	Cambridge	1923
CAM.1150	College House	1420-1442 Massachusetts Ave	Cambridge	1832
CAM.342	Gannett House	1511 Massachusetts Ave	Cambridge	1838
CAM.343	Hemenway Gymnasium	1517 Massachusetts Ave	Cambridge	1938
CAM.344	Hastings Hall	1519 Massachusetts Ave	Cambridge	1888
CAM.345	Harvard Epworth Methodist Church	1555 Massachusetts Ave	Cambridge	1891
CAM.1334	Francis - Allyn House	1564 Massachusetts Ave	Cambridge	1831
CAM.1333	Sawin - Cobb - Wilson House	1626 Massachusetts Ave	Cambridge	1868
CAM.238	Saunders, Charles Hicks House	1627 Massachusetts Ave	Cambridge	1862
CAM.239	Montrose, The	1648 Massachusetts Ave	Cambridge	1898
CAM.240	Dunvegan, The	1654 Massachusetts Ave	Cambridge	1898
CAM.241	Worcester, Frederick House	1734 Massachusetts Ave	Cambridge	1886
CAM.242	North Avenue Congregational Church	1803 Massachusetts Ave	Cambridge	1845
CAM.243	Lovell Block	1853 Massachusetts Ave	Cambridge	1882
CAM.1385	Cambridge Masonic Temple	1950 Massachusetts Ave	Cambridge	1910
CAM.244	Saint James Episcopal Church	1991 Massachusetts Ave	Cambridge	1888
CAM.245	Henderson Carriage Repository	2067-2089 Massachusetts Ave	Cambridge	1892
CAM.246	Cornerstone Baptist Church	2114 Massachusetts Ave	Cambridge	1854
CAM.247	Mead, Alpheus House	2200 Massachusetts Ave	Cambridge	1867
CAM.248	Snow, Daniel House	2210 Massachusetts Ave	Cambridge	1868
CAM.249	McLean, Isaac House	2218 Massachusetts Ave	Cambridge	1894
CAM.250	Farwell, R. H. Double House	2222-2224 Massachusetts Ave	Cambridge	1891
CAM.251	Saint John's Roman Catholic Church	2270 Massachusetts Ave	Cambridge	1904
CAM.1390		2557 Massachusetts Ave	Cambridge	
CAM.593	Powers, Hannah - Ginsberg, Harris Building	7-15 Norfolk St	Cambridge	c 1894

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Cambridge; Street Name: VASSAR St; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year
CAM.360	Metropolitan Supply Company Warehouse	269 Vassar St	Cambridge	1948
CAM.361	Hovey, F. A. and Company Warehouse	271-275 Vassar St	Cambridge	c 1940
CAM.362	Metropolitan Supply Company Warehouse	277-287 Vassar St	Cambridge	1939
CAM.363	Metropolitan Supply Company Warehouse	289-293 Vassar St	Cambridge	1939

APPENDIX G

Copy of City of Cambridge Construction Dewatering Permit Application

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

15 December 2020
File No. 133856

Cambridge City Hall
Department of Public Works
795 Massachusetts Avenue
Cambridge, Massachusetts 02139

Subject: Request for Approval of Temporary Construction Dewatering
MIT Music Building
Cambridge, Massachusetts

Dear Mr. Wilcox:

On behalf of our client, the Massachusetts Institute of Technology (MIT), this letter submits the City of Cambridge Permit Application for temporary construction dewatering at the proposed MIT Music Building, located in the current Kresge Parking Lot, in Cambridge, MA. Dewatering will be conducted in support of the proposed site redevelopment. The site location is shown in Figure 1.

Dewatering is necessary to enable construction in-the-dry and is anticipated to begin in January 2021 and continue for up to 18 months. Prior to discharge, collected effluent will be routed through a sedimentation tank and bag filter to remove suspended solids and un-dissolved metals. The proposed dewatering discharge route is shown on Figure 2. This letter and attached permit application seek permission to discharge dewatering effluent through City of Cambridge pipes. Discharge of the dewatering effluent is currently under review by the Environmental Protection Agency (EPA) under the Remediation General Permit (RGP).

If you have any questions, please feel free to contact the undersigned at 617-886-7400.

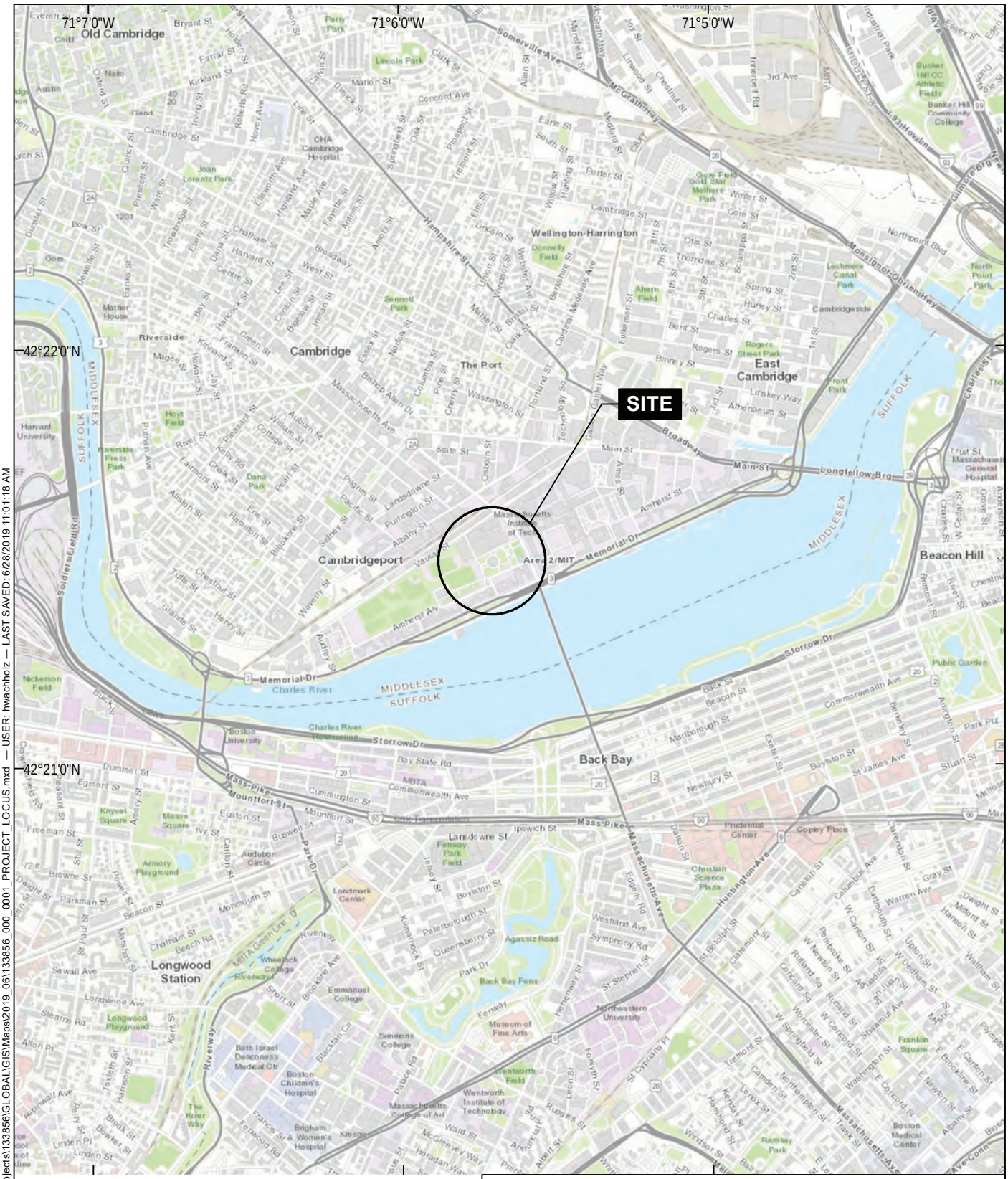
Sincerely yours,
HALEY & ALDRICH, INC.

Lindsey R. Howard, P.E. (NH)
Assistant Project Manager

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

Attachments:
Permit Application to Dewater
Figure 1 – Site Location Plan
Figure 2 – Proposed Dewatering Effluent Discharge Route

\\haleyaldrich.com\share\CF\Projects\133856\H_Construction_Dewatering\NPDES RGP Application\Appendix G - Cambridge Dewatering Permit\2020-1215-HAI-MIT Music-Cambridge Dewatering Letter_F.docx



MA

N

MAP SOURCE: ESRI
SITE COORDINATES: 42°21'28"N, 71°5'42"W

HALEY ALDRICH

MIT MUSIC BUILDING
CAMBRIDGE, MASSACHUSETTS

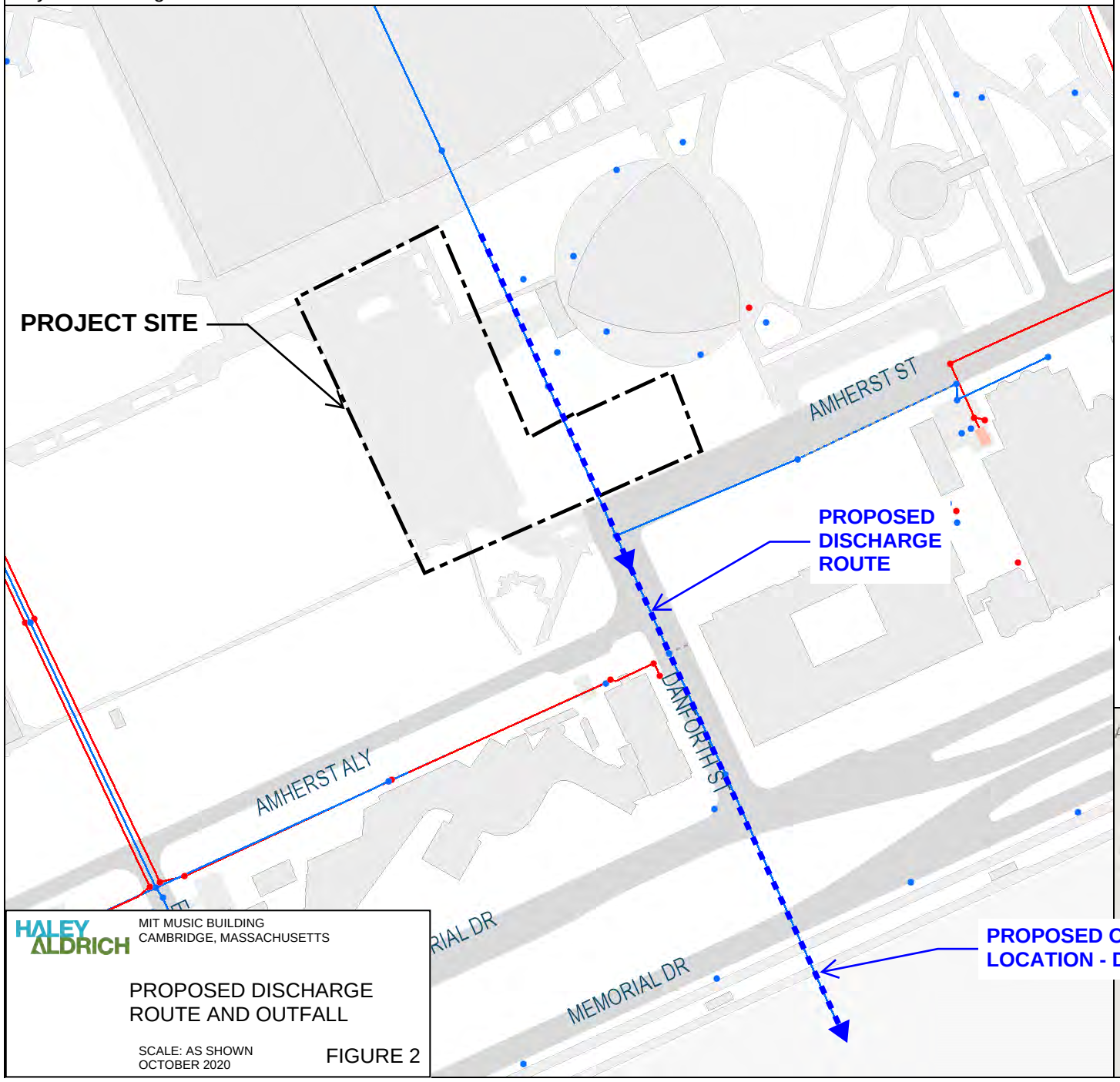
PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
OCTOBER 2020

FIGURE 1

GIS FILE PATH: \\haleyaldrich\share\CF\Projects\133856\GLOBAL\GIS\Maps\2019_06\133856_000_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 6/28/2019 11:01:18 AM

City of Cambridge



LEGEND

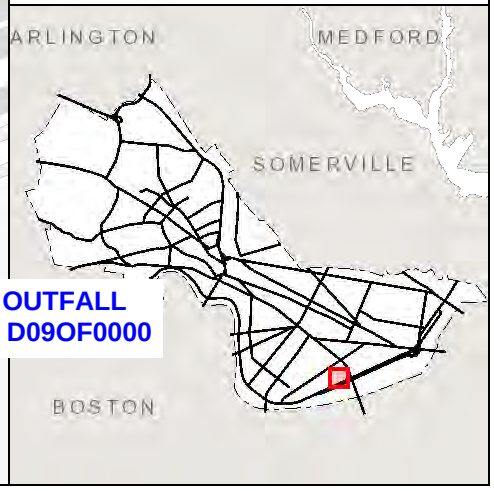
Gravity Mains
- Stormwater
- Sewage
- Combined Sewage
- Abandoned

Zoom Three Paved Surfaces
- Paved Roads
- Other Paved Surface
- Bridges
- Public Footpath

City of Cambridge
Massachusetts

1" = 139 ft

www.cambridgema.gov/gis



HALEY ALDRICH

MIT MUSIC BUILDING
CAMBRIDGE, MASSACHUSETTS

PROPOSED DISCHARGE ROUTE AND OUTFALL

SCALE: AS SHOWN
OCTOBER 2020

FIGURE 2

PERMIT TO DEWATER

Location: MIT Music Building

Owner: Massachusetts Institute of Technology (MIT)

Contractor:

Temporary ✔

Permanent ☐

The property owner, Massachusetts Institute of Technology agrees to hold harmless and indemnify the City of Cambridge for any liability on the part of the City directly or indirectly arising out of the dewatering operation.

The issuance of this permit is based in part in the submission packet of the applicant with documentation as follows:

Haley & Aldrich, Inc. Report on "NPDES RGP Application for Temporary Construction Dewatering, MIT Music Building, Cambridge, Massachusetts", dated ****

In addition, the application has been reviewed by the City under third party agreement as documented in the following reports:

All activities conducted in conjunction with the issuance of this permit must be in accordance with the provisions of the aforementioned reports. Any deviations in conditions must be reported to and approved by the Commissioner of Public Works.

This permit is in addition to any other street permit issued by the Department in connection with any street excavation or obstruction; and all conditions as specified in the Discharge Permit for Dewatering.

For the entire period of time the groundwater is being discharged to a storm drain, the property owner shall provide copies of each Discharge Monitoring Report Form submitted to the EPA, pursuant to the owner's discharge permit.

If in the future the EPA requires the City of Cambridge to bring existing stormwater drainage into compliance with EPA quality standards, as a condition to the continuation of discharge of that stormwater (also including groundwater) into an EPA regulated system into which the MIT (property owner) drains, the owner will agree to maintain its water discharge with such EPA water quality standards.

The property owner and contractor shall at all times meet the conditions specified in the requisite legal agreement/affidavits.

All groundwater pumped from the work shall be disposed of without damage to pavements, other surfaces or property.

Where material or debris has washed or flowed into or has been placed in existing gutters, drains, pipes or structures, such material or debris shall be entirely removed and satisfactorily disposed of by the

Contractor during the progress of work as directed by the Public Works Department.

Any flooding or damage of property and possessions caused by siltation of existing gutters, pipes or structures shall be the responsibility of the Contractor.

Provisions shall be made to insure that no material, water or solid, will freeze on any pavement or in any location which will cause inconvenience or hazard to the general public.

Upon completion of the work, existing gutters, drains, pipes and structures shall be (bucket) cleaned and material disposed of satisfactorily prior to release by the Public Works Department.

Any permit issued by the City of Cambridge shall be revoked upon transfer of any ownership interest unless and until subsequent owner(s) or parties of interest agree to the foregoing terms.

This permit shall remain in effect for one year and shall be renewable thereafter at the agreement of the parties.

The following special conditions as set forth below are part of the permit.

City Manager	Property Manager: Corporate Entity President, General Partner or Trustee Trustee with Instrument of Authority
Date	Date
City Solicitor	Contractor
Date	Date
Commissioner of Public	Contractor
Date	Date

CC: Engineering
Supervisor of Sewer Maintenance and Engineering
Superintendent of Streets
Commissioner of Inspectional Services

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