



SITE DEVELOPMENT · ENVIRONMENTAL REMEDIATION · SOIL MANAGEMENT

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP RGP Applications Coordinator
5 Post Office Square, Suite 100 (OEP06-01)
Boston, MA 02109-3912

October 4, 2019
File No. 4325.03

Re: Notice of Intent for the Remediation General Permit
Temporary Construction Dewatering for Site Redevelopment
Polar Park
Gold, Assonet and Washington Streets, Worcester, MA

Dear Sir/Madam:

On behalf of the Worcester Redevelopment Authority, W.L French Excavating Corporation (WLF) has submitted this Notice of Intent (NOI) to the U.S. Environmental Protection Agency (U.S. EPA) for coverage under the National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) MAG910000 for the Polar Park project located at Gold, Assonet and Washington Streets in Worcester, Massachusetts (the Site). This letter and supporting documentation were prepared in accordance with the U.S. EPA guidance for construction dewatering under the RGP program. WLF is the earthwork contractor for the project and will have direct responsibility of the subcontractors performing the dewatering activities at the Site. Subcontractors working for WLF on the project will be required to meet the requirements of this NOI and the RGP. The location of the Site and the discharge location via a culvert are shown on Figure 1, and the extent of the Site area is shown on Figure 2.

The Site is located in the vicinity of 37-40 Gold Street in Worcester, Massachusetts as shown on Figure 1. Redevelopment activities at the Site include construction of a minor league baseball park, known as Polar Park. Several Massachusetts Contingency Plan (310 CMR 40.0000) (MCP) sites associated with Release Tracking Numbers (RTNs) 2-10256, 2-20972, 2-21011, 2-21012, 2-21013, 2-21030 and 2-21035 are located within the Site area. A summary of releases, contaminants of concern and regulatory status for the releases are summarized in the table below, and the approximate locations of the RTNs are shown on Figure 2.



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Release Tracking Number (RTN)	Contaminants of Concern	Regulatory Status
RTN 2-10256	Petroleum hydrocarbons, metals, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs).	Class A-3 Response Action Outcome (RAO) with an Activity and Use Limitation (AUL)
RTN 2-20972	Polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, and petroleum hydrocarbons	Open, within active Release Abatement Measure (RAM) area
RTN 2-21011	Lead	Open, within active RAM area
RTN 2-21012	Arsenic and lead	Open, within active RAM area
RTN 2-21013	Petroleum hydrocarbons, metals, and PAHs	Open, within active RAM area
RTN 2-21030	Arsenic	Open, within active RAM area
RTN 2-21035	Petroleum related constituents from a previously undocumented underground storage tank (UST)	Immediate Response Action

The Site is located between Madison Street and Washington, Summit, and Green Streets in Worcester, Massachusetts. Much of the Site was formerly occupied by surface parking lots and two recently demolished building. Two buildings are located along Madison Street and are actively undergoing demolition, and one building located at 90 Washington Street is planned to remain until the beginning of 2020. The majority of the Site is currently an active construction Site undergoing mass soil excavation. An existing below grade drainage conduit known as the Mill Brook Conduit traverses the Site. The top of the conduit is located approximately 7 to 18 feet below ground surface (bgs). Railroad tracks are immediately adjacent to the Site to the north.

Historically, several tenements and dwellings were located at the Site as early as the 1880s. The dwellings were present on the section of the Site bounded by Madison Street, Gold Street, a former extension of Assonet Street and Washington Street until approximately 1978, when the homes were demolished, and parking lots were constructed. A foundry historically operated on the portion of the Site bounded by Gold Street, Madison Street, the CSX railroad tracks, and a former extension of Assonet Street. The foundry operated in this small section of the Site until at least 1936. By 1950, Wyman Gordon used this land for parking and as a fueling station. The fueling station was present until at least 1978. The remaining portions of the Site located north of Madison Street and east of Washington Street were originally



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occupied by dwellings but have been used for commercial purposes or paved parking since approximately 1936. The northeastern most portion of the Site, located north of Plymouth Street, was previously occupied by W.M. Allen Sons Co. boiler works from as early as 1892 through at least 1950. Also located north of W.M. Allen & Sons in 1892 was a railroad freight house. By 1910, the freight house was removed and replaced by Peoples Coal Co. By 1936, Peoples Coal Co. was replaced by a plumbing supply company, followed by an electrical supply company. That parcel is currently occupied by a paved parking lot.

The earthwork to prepare the Site for redevelopment will require excavation of soil from existing grades ranging from approximately Elevation (El.) 450 feet to 490 feet to accommodate a proposed lowest level floor elevation of approximately El. 456.5 feet and the playing field at approximate El. 458 feet. Groundwater is anticipated to be encountered between approximately El. 440 feet to El. 470 feet. Elevations referenced in this report are given in feet and refer to the North American Vertical Datum of 1988. Groundwater that flows into the excavations during construction activities will be treated prior to discharge to an existing storm drain such that the discharged effluent meets the effluent limitations established by NPDES Part 2.1 and Appendix V of the RGP Application. Figure 3 includes a schematic of the proposed dewatering treatment system. The completed NOI for the Remediation General Permit form is included as Appendix A.

The receiving surface water body for the treatment system will be Mill Brook, an underground culvert that daylight at its confluence with the Middle River. At the confluence, the combined water body becomes the Blackstone River. The Middle River was sampled as the receiving surface water body. Information regarding the receiving water was collected from the Massachusetts Year 2014 Integrated List of Waters, which is included in Appendix B. Dilution calculation information including correspondence with DEP is included in Appendix C. Analytical laboratory data for on-Site and surface water sampling is summarized in Tables 1 and 2, respectively, and analytical data reports are included in Appendix D. Municipal correspondence in the form of a memorandum is provided in Appendix E, indicating a notification of discharge into the Middle River, via a municipal storm sewer system has been provided to the Owner of the discharge system. City of Worcester maps and the 2014 Massachusetts Integrated List of Waters map showing the subsurface infrastructure that will be used to convey the discharge are included in Appendix E.

According to the Information for Planning and Conservation (IPaC), the excavation activities will not impact Areas of Critical Environmental Concern (ACEC) or Habitats of Rare Wetland Wildlife. A review of the information on the U.S. Fish and Wildlife Service website led to the conclusion that the project will not impact federally-listed threatened or endangered species. A letter from that agency is included in Appendix F. An email requesting information regarding Oceanic Fisheries was sent to the National Oceanic and Atmospheric Administration (NOAA), and their response, included in Appendix F, states that no listed



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species are known to occur in the vicinity of Worcester, MA in the area of discharge. Additional supplemental information required by the RGP is included in Appendix G, and is referenced within the completed NOI (Appendix A).

Thank you for your consideration of this NOI/Permit. Please feel free to contact us if you wish to discuss the information contained in this application, or if any additional information is needed.

Very truly yours,

W.L. French Excavating Corp., Operator of Permit

James Ganiatsos

James Ganiatsos
Project Manager | W. L. French Excavating Corporation

Encl. Table 1 – Summary of Groundwater Quality
Table 2 – Summary of Surface Water Quality
Figure 1 – Locus Plan
Figure 2 – Site Plan
Figure 3 – Proposed Groundwater Treatment Schematic
Appendix A – Notice of Intent Form
Appendix B – Massachusetts Category 5 Waters “Waters requiring a TDML”
Appendix C – Middle River Dilution Calculations
Appendix D – Analytical Data Reports
Appendix E – Municipal Correspondence
Appendix F – pH Conditioner Material Safety Data Sheet
Appendix G – Federal Correspondence
Appendix H – National Register of Historic Places, Worcester, Massachusetts

cc: City of Worcester
DEP Bureau of Water Resources
Mr. Paul Moosey ~ City of Worcester
Mr. Tom Martinez, AIA ~ DAIQ Architects, Inc.

TABLES

Table 1
Summary of Groundwater Quality
Polar Park
Worcester, MA

LOCATION	RCGW-2	NPDES TBEL	Units	GZ-8	MW-1	HA19-6 (OW)	HA19-6(OW)	HA19-2(OW)	Maximum Detection	Average Detection
SAMPLING DATE				7/23/2019	7/23/2019	7/23/2019	8/8/2019	7/26/2019		
SAMPLE TYPE				WATER	WATER	WATER	WATER	WATER		
Anions by Ion Chromatography										
Chloride	NS	NS	ug/l	11,600	136,000	343,000	NT	191,000	343,000	170,400
Dissolved Metals										
Antimony, Dissolved	8,000	206	ug/l	<4	<4	<4	<4	<4	BDL	BDL
Arsenic, Dissolved	900	104	ug/l	<1	1.1	104.8	2.2	49.4	49.4	13
Cadmium, Dissolved	4	10.2	ug/l	<0.2	<0.2	1.6	<0.2	<0.2	0.1	0.1
Chromium, Dissolved	300	323	ug/l	<1	2	190.4	1.4	<1	2	1.1
Copper, Dissolved	100,000	242	ug/l	4.4	2.2	225.2	1.8	<1	4.4	2.2
Iron, Dissolved	NS	5,000	ug/l	59	434	33,000	599	162	599	314
Lead, Dissolved	10	160	ug/l	<1	<1	122.1	1.3	<1	1.3	0.7
Mercury, Dissolved	20	0.739	ug/l	<0.2	<0.2	0.2	<0.2	<0.2	BDL	BDL
Nickel, Dissolved	200	1,450	ug/l	<2	5.3	143	5.6	<2	5.6	3.2
Selenium, Dissolved	100	235.8	ug/l	5.5	<5	39.5	<5	<5	5.5	3.25
Silver, Dissolved	7	35.1	ug/l	<0.4	<0.4	<0.4	<0.4	<0.4	BDL	BDL
Zinc, Dissolved	900	420	ug/l	14.1	32.1	259.5	<10	<10	32.1	14.1
General Chemistry										
Chromium, Trivalent Total	NS	323	ug/l	<10	51	732	-	<10	732	198
Solids, Total Suspended	NS	30	mg/l	34	430	47,000	-	140	47,000	11,901
Cyanide, Total	0.03	178	mg/l	<0.005	<0.005	<0.005	-	<0.005	BDL	BDL
Chlorine, Total Residual	NS	0.2	mg/l	<0.020	<0.020	<0.020	-	<0.020	BDL	BDL
pH (H)	NS	NS	SU	6.6	7.1	6.9	-	7.5	7.5	7
Nitrogen, Ammonia	NS	NS	mg/l	<0.075	<0.150	<0.375	-	0.089	0.188	0.097
Sulfate	NS	NS	ug/l	32,000	36,000	79,000	-	100,000	100,000	61,750
TPH, SGT-HEM	5	5	mg/l	<4	<4	<4.4	-	<4	BDL	BDL
Phenolics, Total	NS	NS	ug/l	<30	<30	<30	-	<30	BDL	BDL
Chromium, Hexavalent	300	323	ug/l	<10	<10	<10	-	<10	BDL	BDL
Microextractables by GC										
1,2-Dibromoethane	2	0.05	ug/l	<0.01	<0.01	<0.01	-	<0.01	BDL	BDL
1,2-Dibromo-3-chloropropan	1,000	NS	ug/l	<0.01	<0.01	<0.01	-	NT	BDL	BDL
Polychlorinated Biphenyls by GC										
Aroclor 1016	5	NS	ug/l	<0.25	<0.25	<0.272	-	<0.25	BDL	BDL
Aroclor 1221	5	NS	ug/l	<0.25	<0.25	<0.272	-	<0.25	BDL	BDL
Aroclor 1232	5	NS	ug/l	<0.25	<0.25	<0.272	-	<0.25	BDL	BDL
Aroclor 1242	5	NS	ug/l	<0.25	<0.25	<0.272	-	<0.25	BDL	BDL
Aroclor 1248	5	NS	ug/l	<0.25	<0.25	<0.272	-	<0.25	BDL	BDL
Aroclor 1254	5	NS	ug/l	<0.25	<0.25	<0.272	-	<0.25	BDL	BDL
Aroclor 1260	5	NS	ug/l	<0.2	<0.2	<0.217	-	<0.25	BDL	BDL
Semivolatile Organics by GC/MS										
Bis(2-ethylhexyl)phthalate	50,000	101	ug/l	<2.2	<2.2	<2.2	-	<2.2	BDL	BDL
Butyl benzyl phthalate	10,000	NS	ug/l	<5	<5	<5	-	<4.9	BDL	BDL
Di-n-butylphthalate	5,000	NS	ug/l	<5	<5	<5	-	<4.9	BDL	BDL
Di-n-octylphthalate	100,000	NS	ug/l	<5	<5	<5	-	<4.9	BDL	BDL
Diethyl phthalate	9,000	NS	ug/l	<5	<5	<5	-	<4.9	BDL	BDL
Dimethyl phthalate	50,000	NS	ug/l	<5	<5	<5	-	<4.9	BDL	BDL
Total Phthalates	NS	190	ug/l	<27.2	<27.2	<27.2	-	<26.7	BDL	BDL
Semivolatile Organics by GC/MS-SIM										
Pentachlorophenol	200	1	ug/l	<1	<1	<1	-	<0.98	BDL	BDL
Group I Polycyclic Aromatic Hydrocarbons										
Benzo(a)anthracene	1,000	NS	ug/l	0.35	<0.1	<0.1	-	<0.1	0.35	0.13
Benzo(a)pyrene	500	NS	ug/l	0.34	<0.1	<0.1	-	<0.1	0.34	0.12
Benzo(b)fluoranthene	400	NS	ug/l	0.74	0.19	<0.1	-	<0.1	0.74	0.26
Benzo(k)fluoranthene	100	NS	ug/l	0.21	<0.1	<0.1	-	<0.1	0.21	0.09
Chrysene	70	NS	ug/l	0.38	<0.1	<0.1	-	<0.1	0.38	0.13
Dibenzo(a,h)anthracene	40	NS	ug/l	<0.1	<0.1	<0.1	-	<0.1	BDL	BDL
Indeno(1,2,3-cd)pyrene	100	NS	ug/l	0.48	0.2	<0.1	-	<0.1	0.48	0.2
Total Group I PAHs	NS	1	ug/l	2.6	0.89	<0.7	-	<0.7	2.6	1.0
Group II Polycyclic Aromatic Hydrocarbons										
Acenaphthene	10,000	NS	ug/l	<0.1	<0.1	<0.1	-	<0.1	BDL	BDL
Acenaphthylene	40	NS	ug/l	<0.1	<0.1	<0.1	-	<0.1	BDL	BDL
Anthracene	30	NS	ug/l	<0.1	<0.1	<0.1	-	<0.1	BDL	BDL
Benzo(ghi)perylene	20	NS	ug/l	0.45	0.25	<0.1	-	<0.1	0.45	0.2
Fluoranthene	200	NS	ug/l	0.72	0.14	<0.1	-	<0.1	0.72	0.24
Fluorene	40	NS	ug/l	<0.1	<0.1	<0.1	-	<0.1	BDL	BDL
Naphthalene	700	20	ug/l	0.2	<0.1	<0.1	-	<0.1	0.2	0.1
Phenanthrene	10,000	NS	ug/l	0.2	<0.1	<0.1	-	<0.1	0.2	0.1
Pyrene	20	NS	ug/l	0.56	0.12	<0.1	-	<0.1	0.56	0.2
Total Group II PAHs	NS	100	ug/l	2.53	1.11	<0.9	-	<0.9	2.53	1.14
Total Hardness by SM 2340B										
Hardness	NS	NS	ug/l	156,000	388,000	681,000	-	401,000	681,000	406,500
Total Metals										
Antimony, Total	NS	206	ug/l	<4	<4	<4	-	<4	BDL	BDL
Arsenic, Total	NS	104	ug/l	2.78	11.55	141.6	-	52.42	141.6	52.1
Cadmium, Total	NS	10.2	ug/l	<0.2	<0.2	2.1	-	<0.2	2.1	0.6
Chromium, Total	NS	323	ug/l	2.21	51.06	731.9	-	3.78	731.9	197
Copper, Total	NS	242	ug/l	8.94	21.25	403.2	-	3.47	403.2	109
Iron, Total	NS	5,000	ug/l	1,090	17,100	145,000	-	2,400	145,000	41,398
Lead, Total	NS	160	ug/l	6.86	9.24	510	-	1.09	510	132
Mercury, Total	NS	0.739	ug/l	<0.2	<0.2	0.2	-	<0.2	0.2	0.1
Nickel, Total	NS	1,450	ug/l	2.13	68.88	498.4	-	2.37	498.4	143
Selenium, Total	NS	235.8	ug/l	<5	<5	54.44	-	<5	54.44	15.49
Silver, Total	NS	35.1	ug/l	<0.4	<0.4	1.4	-	<0.4	1.4	0.5
Zinc, Total	NS	420	ug/l	21.96	229	790.2	-	12.66	790.2	263

Table 1
Summary of Groundwater Quality
Polar Park
Worcester, MA

LOCATION	RCGW-2	NPDES TBEL	Units	GZ-8	MW-1	HA19-6 (OW)	HA19-6(OW)	HA19-2(OW)	Maximum Detection	Average Detection
SAMPLING DATE				7/23/2019	7/23/2019	7/23/2019	8/8/2019	7/26/2019		
SAMPLE TYPE				WATER	WATER	WATER	WATER	WATER		
Volatile Organics by GC/MS										
Methylene chloride	2,000	4.6	ug/l	<1	<1	<1	-	<1	BDL	BDL
1,1-Dichloroethane	2,000	70	ug/l	<1.5	<1.5	<1.5	-	<1.5	BDL	BDL
Carbon tetrachloride	2	4.4	ug/l	<1	<1	<1	-	<1	BDL	BDL
1,1,2-Trichloroethane	900	5	ug/l	<1.5	<1.5	<1.5	-	<1.5	BDL	BDL
Tetrachloroethene	50	5	ug/l	<1	<1	<1	-	<1	BDL	BDL
1,2-Dichloroethane	5	5	ug/l	<1.5	<1.5	<1.5	-	<1.5	BDL	BDL
1,1,1-Trichloroethane	4,000	5	ug/l	<2	<2	<2	-	<2	BDL	BDL
Benzene	1,000	5	ug/l	<1	<1	<1	-	<1	BDL	BDL
Toluene	40,000	NS	ug/l	<1	<1	<1	-	<1	BDL	BDL
Ethylbenzene	5,000	NS	ug/l	<1	<1	<1	-	<1	BDL	BDL
Vinyl chloride	2	2	ug/l	<1	<1	<1	-	<1	BDL	BDL
1,1-Dichloroethene	80	3.2	ug/l	<1	<1	<1	-	<1	BDL	BDL
cis-1,2-Dichloroethene	20	70	ug/l	<1	<1	<1	-	<1	BDL	BDL
Trichloroethene	5	5	ug/l	<1	<1	<1	-	<1	BDL	BDL
1,2-Dichlorobenzene	2,000	600	ug/l	<5	<5	<5	-	<5	BDL	BDL
1,3-Dichlorobenzene	6,000	320	ug/l	<5	<5	<5	-	<5	BDL	BDL
1,4-Dichlorobenzene	60	5	ug/l	<5	<5	<5	-	<5	BDL	BDL
p/m-Xylene	3,000	NS	ug/l	<2	<2	<2	-	<2	BDL	BDL
o-xylene	3,000	NS	ug/l	<1	<1	<1	-	<1	BDL	BDL
Xylenes, Total	3,000	NS	ug/l	<1	<1	<1	-	<1	BDL	BDL
Acetone	50	7.97	mg/l	<0.010	<0.010	<0.010	-	<0.010	BDL	BDL
Methyl tert butyl ether	5,000	70	ug/l	<10	<10	<10	-	<10	BDL	BDL
Tert-Butyl Alcohol	NS	120	ug/l	<100	<100	<100	-	<100	BDL	BDL
Tertiary-Amyl Methyl Ether	NS	90	ug/l	<20	<20	<20	-	<20	BDL	BDL
Volatile Organics by GC/MS-SIM										
1,4-Dioxane	6,000	NS	ug/l	<50	<50	<50	-	<50	BDL	BDL

Notes:

1. The samples were collected by Sanborn, Head & Associates, Inc. on the dates indicated and analyzed by Alpha Analytical Laboratories, Inc. of Westborough, Massachusetts.
2. HA19-6(OW) was re-sampled for additional dissolved metals analysis due to high total suspended solids, iron, and arsenic detections in the July 23, 2019 sample.
3. Average concentrations for each analyte were calculated as an average of detected concentrations where half of the detection limit was used where analytes were not detected. Please note, for the maximum and average calcuations, the metals data from July 23, 2019 for the HA19-6(OW) samples was excluded based on elevated total solids likely related to elevated concentrations of dissolved metals in the sample.
4. Bolded values indicate detections of that analyte above laboratory reporting limits.
5. Italicized values indicate detections of that analyte above the applicable Massachusetts Contingency Plan (MCP) Reportable Concentrations for Groundwater (MCP RCGW-2).
6. Highlighted values indicate detections of that analyte above the National Pollution Discharge Elimination System (NPDES) Technology-Based Effluent Limitation (TBEL) criteria.
7. Total metals are provided for informational purposes only and are not compared to RCGW-2 or NPDES TBEL criteria.
8. Abbreviations:
"<" indicates the analyte was not detected above the laboratory reporting limit shown
BDL = below detection limit
NS = no standard
NT = not tested
ug/l = micrograms per liter
mg/l = milligrams per liter

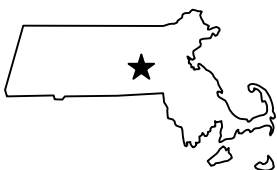
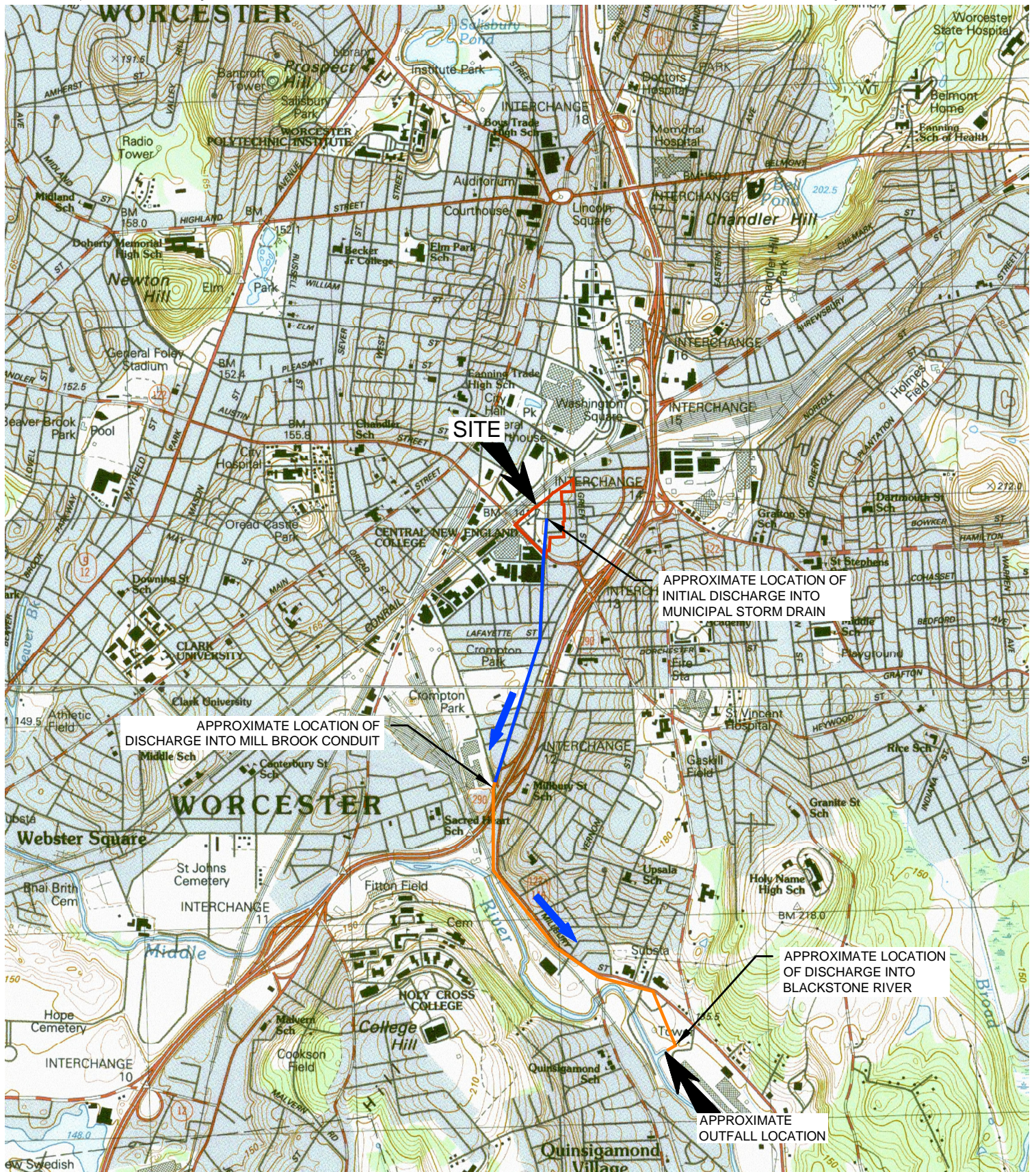
Table 2
Summary of Surface Water Quality
Polar Park
Worcester, MA

LOCATION	Units	MIDDLE RIVER
SAMPLING DATE		7/26/2019
SAMPLE TYPE		WATER
General Chemistry		
pH (H)	SU	7.5
Nitrogen, Ammonia	mg/l	0.125
Total Hardness by SM 2340B		
Hardness	ug/l	56,600
Total Metals		
Antimony, Total	ug/l	<4
Arsenic, Total	ug/l	17.16
Cadmium, Total	ug/l	0.66
Chromium, Total	ug/l	5.63
Copper, Total	ug/l	17.31
Iron, Total	ug/l	4,970
Lead, Total	ug/l	25.32
Mercury, Total	ug/l	<0.2
Nickel, Total	ug/l	4.38
Selenium, Total	ug/l	<5
Silver, Total	ug/l	<0.4
Zinc, Total	ug/l	57.55

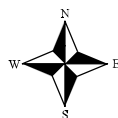
Notes:

1. The samples were collected by Sanborn, Head & Associates, Inc. on the dates indicated and analyzed by Alpha Analytical Laboratories, Inc. of Westborough, Massachusetts.
2. Bolded values indicate detections of that analyte above laboratory reporting limits.
3. Abbreviations:
"<" indicates the analyte was not detected above the laboratory reporting limit shown
NS = no standard
ug/l = micrograms per liter
mg/l = milligrams per liter

FIGURES



NOTES:
Base map was taken from the "Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Information Technology Division"
7.5 minute USGS Quadrangle Maps: Worcester, Massachusetts, REV: 1983



Drawn By: C.Dias
Designed By: C.Disenhof
Reviewed By: P.Pinto
Project No: 4325.03
Date: October 2019

SCALE: 1:25,000

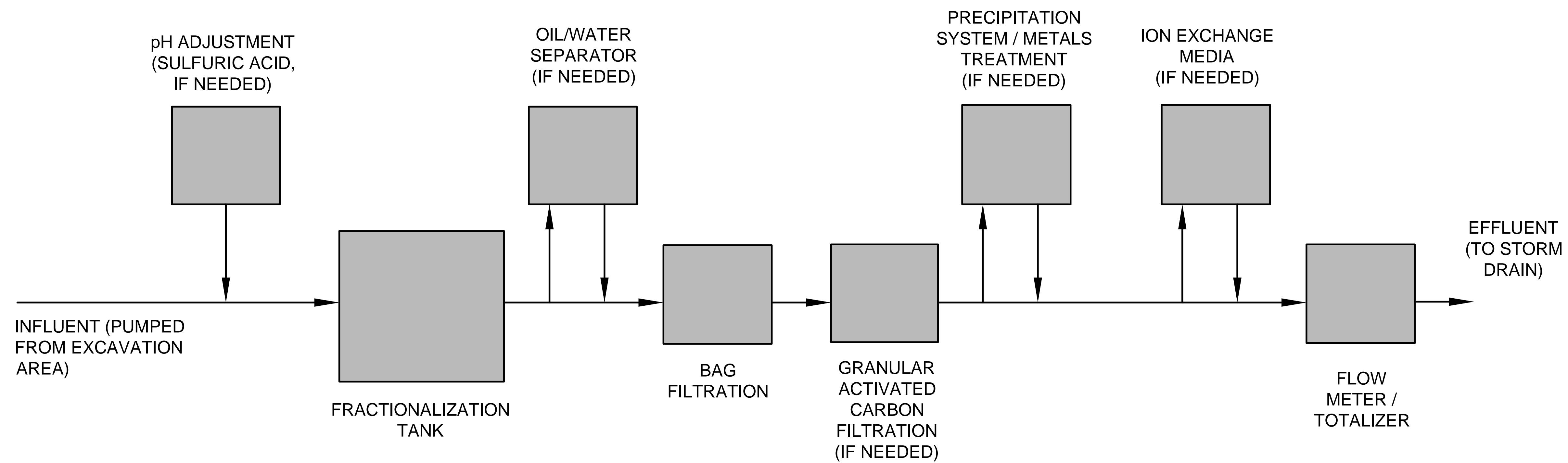
SANBORN HEAD

Figure 1

Locus Plan

Notice of Intent for Remediation
General Permit

Polar Park
Worcester, Massachusetts



NOTES:

1. SYSTEM ASSUMES A MAXIMUM FLOW OF 200 GALLONS PER MINUTE (GPM).
2. SAMPLING PORTS TO BE LOCATED ON ALL TREATMENT SYSTEM COMPONENTS.

[illegible]

DRAWN BY: C.DIAS
DESIGNED BY: C.DISENHOF
REVIEWED BY: P.PINTO
PROJECT MGR: K.WALKER
PIC: P.PINTO
DATE: OCTOBER 2019

NOTICE OF INTENT FOR REMEDIATION GENERAL PERMIT	P
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POLAR PARK
WORCESTER, MASSACHUSETTS

PROJECT NUMBER:

4325.03

PROPOSED GROUNDWATER TREATMENT SCHEMATIC

FIGURE NUMBER:

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APPENDIX A

NOTICE OF INTENT FORM

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

A. General site information:

1. Name of site: Polar Park	Site address: Gold, Assonet and Washington Street Street:		
2. Site owner Worcester Redevelopment Authority Owner is (check one): <input type="checkbox"/> Federal <input type="checkbox"/> State/Tribal <input type="checkbox"/> Private <input checked="" type="checkbox"/> Other; if so, specify: Local Municipality	City: Worcester	State: MA	Zip: 01610
3. Site operator, if different than owner W.L. French Excavating Corporation	Contact Person: Greg Ormsby Telephone: (508) 799-1400 Email: OrmsbyG@worcesterma.gov Mailing address: City Hall 4th Floor Street: 455 Main Street City: Worcester State: MA Zip: 01608		
4. NPDES permit number assigned by EPA: NA NPDES permit is (check all that apply): <input type="checkbox"/> RGP <input type="checkbox"/> DGP <input type="checkbox"/> CGP <input type="checkbox"/> MSGP <input type="checkbox"/> Individual NPDES permit <input type="checkbox"/> Other; if so, specify:	5. Other regulatory program(s) that apply to the site (check all that apply): <input checked="" type="checkbox"/> MA Chapter 21e; list RTN(s): 2-21030, and 2-21035 <input type="checkbox"/> CERCLA 2-10256, 2-20972, 2-21011, 2-21012, 2-21013 <input type="checkbox"/> UIC Program <input type="checkbox"/> NH Groundwater Management Permit or <input type="checkbox"/> POTW Pretreatment Groundwater Release Detection Permit: <input type="checkbox"/> CWA Section 404		

B. Receiving water information:

1. Name of receiving water(s): Blackstone River	Waterbody identification of receiving water(s): MA51-03	Classification of receiving water(s): Class B
Receiving water is (check any that apply): <input type="checkbox"/> Outstanding Resource Water <input type="checkbox"/> Ocean Sanctuary <input type="checkbox"/> territorial sea <input type="checkbox"/> Wild and Scenic River		
2. Has the operator attached a location map in accordance with the instructions in B, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No See Figure 1 Are sensitive receptors present near the site? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, specify:		
3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. See Appendix B		
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.		1.90 MGD See Appendix C
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.		7.60
6. Has the operator received confirmation from the appropriate State for the 7Q10 and dilution factor indicated? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, indicate date confirmation received: August 13, 2019		
7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No See Table 1 and Appendix D		

C. Source water information:

1. Source water(s) is (check any that apply):			
<input checked="" type="checkbox"/> Contaminated groundwater Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No See Appendix D	<input type="checkbox"/> Contaminated surface water Has the operator attached a summary of influent sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> The receiving water	<input type="checkbox"/> Potable water; if so, indicate municipality or origin: <input type="checkbox"/> Other; if so, specify:
		<input type="checkbox"/> A surface water other than the receiving water; if so, indicate waterbody:	

2. Source water contaminants: Chloride, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Selenium, Silver, Zinc, TSS, Ammonia, Sulfate, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Indeno(1,2,3-cd)pyrene, Benzo(ghi)perylene, Fluoranthene, Naphthalene, Phenanthrene, Pyrene	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII.	b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): <input type="checkbox"/> Existing discharge <input checked="" type="checkbox"/> New discharge <input type="checkbox"/> New source	
Outfall(s): Via drain to an underground culvert, Unnamed Tributary "Mill Brook" (MA51-08), which discharges to Blackstone River	Outfall location(s): (Latitude, Longitude) 42.23402, -71.79342
Discharges enter the receiving water(s) via (check any that apply): <input type="checkbox"/> Direct discharge to the receiving water <input checked="" type="checkbox"/> Indirect discharge, if so, specify: Effluent will enter an existing storm water drainage system that discharges into Mill Brook, an existing below-grade conduit. Mill Brook discharges into the Blackstone River at the approximate Lat/Long specified. <input type="checkbox"/> A private storm sewer system <input checked="" type="checkbox"/> A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No See Appendix E Has the operator has received permission from the owner to use such system for discharges? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No, if so, explain, with an estimated timeframe for obtaining permission: Prior to discharge, a copy of the NOI approval will be provided to the City of Worcester as requested. Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Provide the expected start and end dates of discharge(s) (month/year): November 2019 to April 2020	
Indicate if the discharge is expected to occur over a duration of: <input checked="" type="checkbox"/> less than 12 months <input type="checkbox"/> 12 months or more <input type="checkbox"/> is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

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

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✓	4	4500NH3-	0.075	0.188	0.097	Report mg/L	---
Chloride		✓	4	300.0	0.5	343,000	170,400	Report µg/l	---
Total Residual Chlorine	✓		4	4500CL-D	0.02	ND		0.2 mg/L	84
Total Suspended Solids		✓	4	2540D	16	47,000	11,901	30 mg/L	---
Antimony	✓		4	200.8	40	ND		206 µg/L	
Arsenic		✓	4	200.8	1	141.6	52.09	104 µg/L	10
Cadmium		✓	4	200.8	0.2	2.1	0.6	10.2 µg/L	0.2759
Chromium III		✓	4	200.8	1	731.9	197.2	323 µg/L	
Chromium VI	✓		4	200.8	10	ND		323 µg/L	
Copper		✓	4	200.8	1	403.2	109.2	242 µg/L	9.5
Iron		✓	4	200.7	50	145,000	41,398	5,000 µg/L	1000
Lead		✓	4	200.8	1	510	132	160 µg/L	3.29
Mercury		✓	4	245.1	0.2	0.2	0.1	0.739 µg/L	
Nickel		✓	4	200.8	2	498.4	142.9	1,450 µg/L	376.3
Selenium		✓	4	200.8	5	54.44	15.49	235.8 µg/L	38
Silver		✓	4	200.8	0.4	1.4	0.5	35.1 µg/L	
Zinc		✓	4	200.8	10	790.2	263.5	420 µg/L	
Cyanide	✓		4	4500CN-C	0.005	ND		178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX	✓		4	624.1	1	ND		100 µg/L	---
Benzene	✓		4	624.1	1	ND		5.0 µg/L	---
1,4 Dioxane	✓		4	624.1-SIM	50	ND		200 µg/L	---
Acetone	✓		4	624.1	0.010	ND		7.97 mg/L	---
Phenol	✓		4	420.1	30	ND		1,080 µg/L	

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✓		4	624.1	1	ND		4.4 µg/L	
1,2 Dichlorobenzene	✓		4	624.1	5	ND		600 µg/L	---
1,3 Dichlorobenzene	✓		4	624.1	5	ND		320 µg/L	---
1,4 Dichlorobenzene	✓		4	624.1	5	ND		5.0 µg/L	---
Total dichlorobenzene	✓		4	624.1	5	ND		763 µg/L in NH	---
1,1 Dichloroethane	✓		4	624.1	1.5	ND		70 µg/L	---
1,2 Dichloroethane	✓		4	624.1	1.5	ND		5.0 µg/L	---
1,1 Dichloroethylene	✓		4	624.1	1	ND		3.2 µg/L	---
Ethylene Dibromide								0.05 µg/L	---
Methylene Chloride	✓		4	624.1	1	ND		4.6 µg/L	---
1,1,1 Trichloroethane	✓		4	624.1	2	ND		200 µg/L	---
1,1,2 Trichloroethane	✓		4	624.1	1.5	ND		5.0 µg/L	---
Trichloroethylene	✓		4	624.1	1	ND		5.0 µg/L	---
Tetrachloroethylene	✓		4	624.1	1	ND		5.0 µg/L	
cis-1,2 Dichloroethylene	✓		4	624.1	1	ND		70 µg/L	---
Vinyl Chloride	✓		4	624.1	1	ND		2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✓		4	625.1	5	ND		190 µg/L	
Diethylhexyl phthalate	✓		4	625.1	2.2	ND		101 µg/L	
Total Group I PAHs		✓	4	625.1-SIM	0.1	2.6	1.05	1.0 µg/L	---
Benzo(a)anthracene		✓	4	625.1-SIM	0.1	0.35	0.13	As Total PAHs	0.0289
Benzo(a)pyrene		✓	4	625.1-SIM	0.1	0.34	0.12		0.0289
Benzo(b)fluoranthene		✓	4	625.1-SIM	0.1	0.74	0.26		0.0289
Benzo(k)fluoranthene		✓	4	625.1-SIM	0.1	0.21	0.09		0.0289
Chrysene		✓	4	625.1-SIM	0.1	0.38	0.13		0.0289
Dibenzo(a,h)anthracene	✓		4	625.1-SIM	0.1	ND			
Indeno(1,2,3-cd)pyrene		✓	4	625.1-SIM	0.1	0.48	0.2		0.0289

[illegible]

E. Treatment system information

<p>1. Indicate the type(s) of treatment that will be applied to effluent prior to discharge: (check all that apply)</p> <p> <input type="checkbox"/> Adsorption/Absorption <input type="checkbox"/> Advanced Oxidation Processes <input type="checkbox"/> Air Stripping <input checked="" type="checkbox"/> Granulated Activated Carbon (“GAC”)/Liquid Phase Carbon Adsorption <input checked="" type="checkbox"/> Ion Exchange <input type="checkbox"/> Precipitation/Coagulation/Flocculation <input checked="" type="checkbox"/> Separation/Filtration <input type="checkbox"/> Other; if so, specify: pH adjustment (if needed) </p>	
<p>2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.</p> <p>The first element of the treatment system will be a fractionalization tank where solids will settle out. The effluent will then pass through the following as necessary: a bag filter, a granular activated carbon vessel, and a cation resin vessel. The effluent will be discharged to an existing catch basin on-site with discharges to the existing storm drain system.</p> <p>Identify each major treatment component (check any that apply):</p> <p> <input checked="" type="checkbox"/> Fractionation tanks <input type="checkbox"/> Equalization tank <input type="checkbox"/> Oil/water separator <input type="checkbox"/> Mechanical filter <input type="checkbox"/> Media filter <input type="checkbox"/> Chemical feed tank <input type="checkbox"/> Air stripping unit <input checked="" type="checkbox"/> Bag filter <input checked="" type="checkbox"/> Other; if so, specify: Cation resin vessel and/or carbon vessels (if needed) </p> <p>Indicate if either of the following will occur (check any that apply):</p> <p> <input type="checkbox"/> Chlorination <input type="checkbox"/> De-chlorination </p>	
<p>3. Provide the design flow capacity in gallons per minute (gpm) of the most limiting component.</p> <p>Indicate the most limiting component: Fractionalization tank</p> <p>Is use of a flow meter feasible? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No, if so, provide justification:</p>	200
<p>Provide the proposed maximum effluent flow in gpm.</p>	200
<p>Provide the average effluent flow in gpm.</p>	50
<p>If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:</p>	
<p>4. Has the operator attached a schematic of flow in accordance with the instructions in E, above? (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	

F. Chemical and additive information

<p>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)</p> <p><input type="checkbox"/> Algaecides/biocides <input type="checkbox"/> Antifoams <input type="checkbox"/> Coagulants <input type="checkbox"/> Corrosion/scale inhibitors <input type="checkbox"/> Disinfectants <input type="checkbox"/> Flocculants <input type="checkbox"/> Neutralizing agents <input type="checkbox"/> Oxidants <input type="checkbox"/> Oxygen <input type="checkbox"/> scavengers <input checked="" type="checkbox"/> pH conditioners <input type="checkbox"/> Bioremedial agents, including microbes <input type="checkbox"/> Chlorine or chemicals containing chlorine <input type="checkbox"/> Other; if so, specify:</p>
<p>2. Provide the following information for each chemical/additive, using attachments, if necessary:</p> <p>Sulfuric Acid (See Appendix F)</p> <p>a. Product name, chemical formula, and manufacturer of the chemical/additive;</p> <p>b. Purpose or use of the chemical/additive or remedial agent;</p> <p>c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive;</p> <p>d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive;</p> <p>e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and</p> <p>f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).</p>
<p>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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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): <input type="checkbox"/> Yes <input type="checkbox"/> No</p>

G. Endangered Species Act eligibility determination

<p>1. Indicate under which criterion the discharge(s) is eligible for coverage under this general permit:</p> <p><input type="checkbox"/> 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”.</p> <p><input checked="" type="checkbox"/> 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): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No; if no, is consultation underway? (check one): <input type="checkbox"/> Yes <input type="checkbox"/> No See Appendix F</p> <p><input type="checkbox"/> 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) <input type="checkbox"/> the operator <input type="checkbox"/> EPA <input type="checkbox"/> Other; if so, specify:</p>
--

☒ **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. See Appendix G

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

See Appendix H

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.

Appendix B includes the Massachusetts Category 5 Waters "Waters requiring a TMDL" and lists pollutants for the Middle River
Appendix C includes calculations for the dilution factor
Appendix D includes the analytical data collected by Sanborn, Head & Associates, Inc.
Appendix E includes municipal correspondence
Appendix F includes the proposed pH conditioner material safety data sheet
Appendix G includes correspondence from the National Oceanic and Atmospheric Administration and the US Fish and Wildlife Service
Appendix H includes a list of Historic Places in Worcester, Massachusetts

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 developed and implemented 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.

Check one: Yes ☒ No ☐ NA ☐

Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.

See Appendix E

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: 10/4/19

Print Name and Title:

James Ganiatsos, Project Manager

APPENDIX B

MASSACHUSETTS CATEGORY 5 WATERS “WATERS REQUIRING A TMDL”

Massachusetts Category 5 Waters "Waters requiring a TMDL"

NAME	SEGMENT ID	DESCRIPTION	SIZE	UNITS	IMPAIRMENT CAUSE	EPA TMDL NO.
Blackstone						
Aldrich Pond	MA51002	Sutton	2	ACRES	(Non-Native Aquatic Plants*) Aquatic Plants (Macrophytes)	
Arcade Pond	MA51003	Northbridge	20	ACRES	(Non-Native Aquatic Plants*) Excess Algal Growth	
Arnolds Brook	MA51-32	Perennial portion only, from outlet of unnamed pond at Whitehall Way, Bellingham to confluence with Peters River, Bellingham.	1.7	MILES	Escherichia coli	
Beaver Brook	MA51-07	Outlet of small unnamed impoundment north of Beth Israel School and Flag Street School, Worcester to confluence with Middle River, Worcester. (Includes underground portion)	2.9	MILES	(Debris/Floatables/Trash*) (Fish Kills*) (Physical substrate habitat alterations*) Bottom Deposits Escherichia coli Taste and Odor	
Blackstone River	MA51-03	Confluence of Middle River and Mill Brook (downstream of the railroad spur bridge west of Tobias Boland Boulevard), Worcester to Fisherville Dam, Grafton. (through a portion of Fisherville Pond formerly segment MA51048)	10.4	MILES	(Debris/Floatables/Trash*) (Other flow regime alterations*) (Physical substrate habitat alterations*) Ambient Bioassays -- Chronic Aquatic Toxicity Aquatic Macroinvertebrate Bioassessments Escherichia coli Excess Algal Growth Fishes Bioassessments Foam/Flocs/Scum/Oil Slicks Lead Nutrient/Eutrophication Biological Indicators Other Oxygen, Dissolved Phosphorus (Total) Sedimentation/Siltation Taste and Odor Turbidity	



Massachusetts Category 5 Waters "Waters requiring a TMDL"

NAME	SEGMENT ID	DESCRIPTION	SIZE	UNITS	IMPAIRMENT CAUSE	EPA TMDL NO.
Poor Farm Brook	MA51-17	Headwaters, West Boylston to the inlet of Shirley Street Pond, Shrewsbury (through City Farm Pond formerly segment MA51020).	3.6	MILES	(Low flow alterations*) Aquatic Plants (Macrophytes) Sedimentation/Siltation	
Riley Pond	MA51134	Northbridge	7	ACRES	Turbidity	
Singletary Brook	MA51-31	Headwaters, outlet Singletary Pond, Millbury to confluence with the Blackstone River, Millbury (excluding the approximately 0.4 miles through Brierly Pond segment MA51010).	1.5	MILES	(Non-Native Aquatic Plants*) Aquatic Plants (Macrophytes)	
Sutton Falls	MA51163	Sutton	10	ACRES	Turbidity	
Tatnuck Brook	MA51-15	Outlet Holden Reservoir #2, Holden to inlet of Coes Reservoir, Worcester (through Cook Pond formerly segment MA51027 and Patch Reservoir formerly segment MA51118).	3.3	MILES	(Debris/Floatables/Trash*) (Non-Native Aquatic Plants*) (Other flow regime alterations*) Aquatic Macroinvertebrate Bioassessments Sedimentation/Siltation Turbidity	
Unnamed Tributary	MA51-08	(Also known as "Mill Brook") Outlet Indian Lake, Worcester to confluence with Middle River (downstream of the railroad spur bridge west of Tobias Boland Boulevard), Worcester (through Salisbury Pond formerly segment MA51142).	5.6	MILES	(Debris/Floatables/Trash*) (Physical substrate habitat alterations*) Ammonia (Un-ionized) Aquatic Plants (Macrophytes) Fecal Coliform Foam/Flocs/Scum/Oil Slicks Nutrient/Eutrophication Biological Indicators Other Sedimentation/Siltation Taste and Odor Turbidity	2319 2319
Unnamed Tributary	MA51-20	From the outlet of Leesville Pond, Worcester to the confluence with the Middle River, Worcester (through Curtis ponds formerly reported as segments MA51033 and MA51032).	1.4	MILES	(Debris/Floatables/Trash*) (Low flow alterations*) (Non-Native Aquatic Plants*) Aquatic Plants (Macrophytes) Aquatic Plants (Macrophytes) Fecal Coliform Nutrient/Eutrophication Biological Indicators Sedimentation/Siltation	360 361

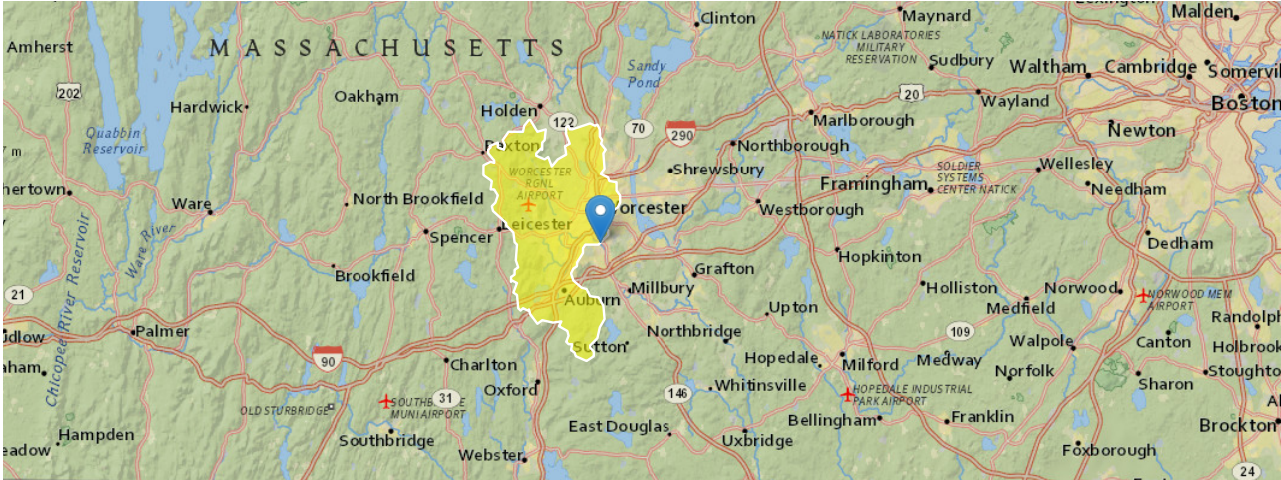


APPENDIX C

MIDDLE RIVER DILUTION CALCULATIONS

StreamStats Report

Region ID:MA
Workspace ID:MA20190806202847788000
Clicked Point (Latitude, Longitude):42.23465, -71.79388
Time:2019-08-06 16:29:03 -0400



Basin Characteristics			
Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	63	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	4.39	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.0828	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

Low-Flow Statistics Parameters

[Statewide Low Flow WRI00 4135]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	63	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	4.39	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.0828	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

Low-Flow Statistics Flow Report

[Statewide Low Flow WRI00 4135]

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

Statistic	Value	Unit	PIl	Plu	SE	SEp
7 Day 2 Year Low Flow	6.5	ft^3/s	1.87	21.8	49.5	49.5
7 Day 10 Year Low Flow	2.94	ft^3/s	0.693	11.6	70.8	70.8

Low-Flow Statistics Citations

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

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

PURPOSE:

To calculate the dilution factor (DF) for metal concentrations in a potential discharge from on-site construction dewatering activities.

METHOD:

$$DF = (Q_d + Q_s) / Q_d$$

Where: DF = Dilution Factor

Q_d = Design flow rate of the discharge in million gallons per day (MGD)

Q_s = Receiving water 7Q₁₀ flow (MGD) where 7Q₁₀ is the minimum flow for 7 consecutive days with a recurrence interval of 10 years

GIVEN:

1.0 gpm = 0.00144 MGD

1.0 cfs = 0.64632 MGD

Q_d = 200 gpm = 0.288 MGD

Q_s = 2.94 cfs = 1.90 MGD of flow into the Blackstone River [Reference 1]

CALCULATION:

$$DF = (0.288 \text{ MGD} + 1.90 \text{ MGD}) / 0.288 \text{ MGD}$$

$$\mathbf{DF = 7.60}$$

RESULTS:

The resulting dilution factor to be used when discharging to the Blackstone River is 7.60.

REFERENCES:

[1] StreamStats Report. Accessed online: <http://streamstatsags.cr.usgs.gov/streamstats/> (Refer to Attachment A)

From: [Ruan, Xiaodan \(DEP\)](#)
To: [Vakalopoulos, Catherine \(DEP\)](#)
Cc: [Danielle M. DeWolfe](#)
Subject: RE: Worcester, MA RGP
Date: Tuesday, October 8, 2019 3:27:51 PM

Good afternoon Danielle,

I can confirm that your new dilution factor 7.60 for the changed design flow 200 gpm at the same discharge location is correct.

Please let us know if you have any questions.

Thanks,
Xiaodan

*Xiaodan Ruan
Environmental Engineer
Massachusetts Department of Environmental Protection
One Winter Street, Boston, MA 02108
(617) 654-6517
xiaodan.ruan@mass.gov*

From: Vakalopoulos, Catherine (DEP)
Sent: Monday, October 07, 2019 11:12 AM
To: Ruan, Xiaodan (DEP)
Cc: DDewolfe@sanbornhead.com
Subject: Fw: Worcester, MA RGP

Hi Xiaodan,
Can you please look at this when you have the chance?
Thanks,
Cathy

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

From: Danielle M. DeWolfe <DDewolfe@sanbornhead.com>
Sent: Monday, October 7, 2019 8:41 AM
To: Vakalopoulos, Catherine (DEP)
Subject: Worcester, MA RGP

Good morning Catherine,

I would like to confirm the following 7Q10 value for a RGP project located in Worcester, MA. We previously received approval from you for a DF of 27.39 for this project – see attached.

However, since that time the design flow rate has been changed from 50 GPM to 200 GPM. We used StreamStats to delineate a nearby point upstream of our outlet on the Middle River.

Site Address: 37-40 Gold Street, Worcester, MA

Type of Discharge: Via drain to the underground Mill Brook Culvert, discharging to daylight in the Middle River at the approximate latitude/longitude indicated below.

Approximate Discharge Lat/Long:

Lat: 42.23402 Long: -71.79342

Approximate Basin Delineation Point Selected:

Lat: 42.23465 Long: -71.79388

Upstream StreamStats generated 7Q10: 2.94 cfs = 1.90 MGD

Design flow: 200 gpm or 0.288 MGD

Dilution Factor: DF = 7.60

Please let me know if there is any other information that you need.

Thanks,
Danielle

--

Danielle DeWolfe
Senior Project Engineer

SANBORN, HEAD & ASSOCIATES, INC.

1 Technology Park Drive, Westford, MA 01886

T 978.392.0900 D 978.577.1016 C 508.333.8695

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Enter number values in green boxes below

Enter values in the units specified

↓	
1.9	Q _R = Enter upstream flow in MGD
0.288	Q _P = Enter discharge flow in MGD
0	Downstream 7Q10

Enter a dilution factor, if other than zero

↓
7.6

Enter values in the units specified

↓	
406.5	C _d = Enter influent hardness in mg/L CaCO ₃
56.6	C _s = Enter receiving water hardness in mg/L CaCO ₃

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

↓	
7.5	pH in Standard Units
25	Temperature in °C
0.125	Ammonia in mg/L
56.6	Hardness in mg/L CaCO ₃
0	Salinity in ppt
0	Antimony in µg/L
17.16	Arsenic in µg/L
0.66	Cadmium in µg/L
5.63	Chromium III in µg/L
0	Chromium VI in µg/L
17.31	Copper in µg/L
4970	Iron in µg/L
25.32	Lead in µg/L
0	Mercury in µg/L
4.38	Nickel in µg/L
0	Selenium in µg/L
0	Silver in µg/L
57.55	Zinc in µg/L

Enter **influent** concentrations in the units specified

↓	
0	TRC in µg/L
0.188	Ammonia in mg/L
0	Antimony in µg/L
141.6	Arsenic in µg/L
2.1	Cadmium in µg/L
731.9	Chromium III in µg/L
0	Chromium VI in µg/L
403.2	Copper in µg/L
145000	Iron in µg/L
510	Lead in µg/L
0.2	Mercury in µg/L
498.4	Nickel in µg/L
54.44	Selenium in µg/L
1.4	Silver in µg/L
790.2	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
0.35	Benzo(a)anthracene in µg/L
0.34	Benzo(a)pyrene in µg/L
0.74	Benzo(b)fluoranthene in µg/L
0.21	Benzo(k)fluoranthene in µg/L
0.38	Chrysene in µg/L
0	Dibenzo(a,h)anthracene in µg/L
0.48	Indeno(1,2,3-cd)pyrene in µg/L
0	Methyl-tert butyl ether in µg/L

Notes:

Freshwater: critical low flow equal to the 7Q10; enter alternate low flow if approved by the State
Saltwater (estuarine and marine): enter critical low flow if approved by the State; enter 0 if no entry
Discharge flow is equal to the design flow or 1 MGD, whichever is less
Optional entry for Q_r; leave 0 if no entry

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

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:

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

$$Q_P$$

$$Q_R = 7Q_{10} \text{ in MGD}$$

$$Q_P = \text{Discharge flow, in MGD}$$

II. Effluent Limitation Calculation Method

A. Calculate Water Quality Criterion:

Step 1. Downstream hardness, calculated as follows:

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

$$C_r = \text{Downstream hardness in mg/L}$$

$$Q_d = \text{Discharge flow in MGD}$$

$$C_d = \text{Discharge hardness in mg/L}$$

$$Q_s = \text{Upstream flow (7Q10) in MGD}$$

$$C_s = \text{Upstream (receiving water) hardness in mg/L}$$

$$Q_r = \text{Downstream receiving water flow in MGD}$$

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

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

$$m_c = \text{Pollutant-specific coefficient (} m_a \text{ for silver)}$$

$$b_c = \text{Pollutant-specific coefficient (} b_a \text{ for silver)}$$

$$\ln = \text{Natural logarithm}$$

$$h = \text{Hardness calculated in Step 1}$$

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

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

B. Calculate WQBEL:

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

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

$$C_r = \text{Water quality criterion in } \mu\text{g/L}$$

$$Q_d = \text{Discharge flow in MGD}$$

$$C_d = \text{WQBEL in } \mu\text{g/L}$$

$$Q_s = \text{Upstream flow (7Q10) in MGD}$$

$$C_s = \text{Ustream (receiving water) concentration in } \mu\text{g/L}$$

$$Q_r = \text{Downstream receiving water flow in MGD}$$

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 $\mu\text{g/L}$

Q_d = Discharge flow in MGD

Q_r = Downstream receiving water flow in MGD

C. Determine if a WQBEL applies:

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

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

C_r = Downstream concentration in $\mu\text{g/L}$

Q_d = Discharge flow in MGD

C_d = Influent concentration in $\mu\text{g/L}$

Q_s = Upstream flow (7Q10) in MGD

C_s = Upstream (receiving water) concentration in $\mu\text{g/L}$

Q_r = Downstream receiving water flow in MGD

The WQBEL applies if:

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

AND

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

of the RGP for that parameter applies.

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

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

AND

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

Part 2.1.1 of the RGP for that parameter applies.

Dilution Factor	7.6					
	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
A. Inorganics						
Ammonia	Report	mg/L	---			
Chloride	Report	µg/L	---			
Total Residual Chlorine	0.2	mg/L	84	µg/L	---	µg/L
Total Suspended Solids	30	mg/L	---			
Antimony	206	µg/L	4862	µg/L		
Arsenic	104	µg/L	10	µg/L		
Cadmium	10.2	µg/L	0.2759	µg/L		
Chromium III	323	µg/L	631.8	µg/L		
Chromium VI	323	µg/L	86.9	µg/L		
Copper	242	µg/L	9.5	µg/L		
Iron	5000	µg/L	1000	µg/L		
Lead	160	µg/L	3.29	µg/L		
Mercury	0.739	µg/L	6.88	µg/L		
Nickel	1450	µg/L	376.3	µg/L		
Selenium	235.8	µg/L	38.0	µg/L		
Silver	35.1	µg/L	30.1	µg/L		
Zinc	420	µg/L	551.0	µg/L		
Cyanide	178	mg/L	39.5	µg/L	---	µg/L
B. Non-Halogenated VOCs						
Total BTEX	100	µg/L	---			
Benzene	5.0	µg/L	---			
1,4 Dioxane	200	µg/L	---			
Acetone	7970	µg/L	---			
Phenol	1,080	µg/L	2279	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	4.4	µg/L	12.2	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	25.1	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	16.7	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	1.0	µg/L	---			
Benzo(a)anthracene	1.0	µg/L	0.0289	µg/L	0.1	µg/L
Benzo(a)pyrene	1.0	µg/L	0.0289	µg/L	0.1	µg/L
Benzo(b)fluoranthene	1.0	µg/L	0.0289	µg/L	0.1	µg/L
Benzo(k)fluoranthene	1.0	µg/L	0.0289	µg/L	0.1	µg/L
Chrysene	1.0	µg/L	0.0289	µg/L	0.1	µg/L
Dibenzo(a,h)anthracene	1.0	µg/L	0.0289	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	0.0289	µg/L	0.1	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	100	µg/L	---			
Naphthalene	20	µg/L	---			

E. Halogenated SVOCs

Total Polychlorinated Biphenyls	0.000064	µg/L	---		0.5	µg/L
Pentachlorophenol	1.0	µg/L	---			

F. Fuels Parameters

Total Petroleum Hydrocarbons	5.0	mg/L	---			
Ethanol	Report	mg/L	---			
Methyl-tert-Butyl Ether	70	µg/L	152	µg/L		
tert-Butyl Alcohol	120	µg/L	---			
tert-Amyl Methyl Ether	90	µg/L	---			

APPENDIX D

ANALYTICAL DATA REPORTS



ANALYTICAL REPORT

Lab Number:	L1932442
Client:	Sanborn, Head & Associates, Inc. 1 Technology Park Drive Westford, MA 01886
ATTN:	Kent Walker
Phone:	(978) 577-1003
Project Name:	POLAR PARK
Project Number:	4325.03
Report Date:	07/31/19

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

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

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



Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1932442-01	GZ-8	WATER	WORCESTER, MA	07/23/19 08:25	07/23/19
L1932442-02	MW-1	WATER	WORCESTER, MA	07/23/19 08:45	07/23/19
L1932442-03	HA19-6 (OW)	WATER	WORCESTER, MA	07/23/19 11:00	07/23/19

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

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: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Case Narrative (continued)

Nitrogen, Ammonia

L1932442-02 and -03: The sample has an elevated detection limit due to the dilution required by the sample matrix.

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

Authorized Signature:



Kelly Stenstrom

Title: Technical Director/Representative

Date: 07/31/19

ORGANICS

VOLATILES

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01
 Client ID: GZ-8
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:25
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 07/25/19 11:21
 Analyst: GT

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: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01

Date Collected: 07/23/19 08:25

Client ID: GZ-8

Date Received: 07/23/19

Sample Location: WORCESTER, 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	104		60-140
Fluorobenzene	100		60-140
4-Bromofluorobenzene	103		60-140

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01
 Client ID: GZ-8
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:25
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1-SIM
 Analytical Date: 07/25/19 11:21
 Analyst: GT

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	88		60-140
4-Bromofluorobenzene	101		60-140

Project Name: POLAR PARK**Project Number:** 4325.03**Lab Number:** L1932442**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01
Client ID: GZ-8
Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:25
Date Received: 07/23/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 07/30/19 18:33
Analyst: BM

Extraction Method: EPA 8011
Extraction Date: 07/30/19 11:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.010	--	1	A
1,2-Dibromo-3-chloropropane	ND		ug/l	0.010	--	1	A

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-02
 Client ID: MW-1
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:45
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 07/25/19 11:59
 Analyst: GT

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: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-02

Date Collected: 07/23/19 08:45

Client ID: MW-1

Date Received: 07/23/19

Sample Location: WORCESTER, 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	105		60-140
Fluorobenzene	100		60-140
4-Bromofluorobenzene	99		60-140

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-02
 Client ID: MW-1
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:45
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1-SIM
 Analytical Date: 07/25/19 11:59
 Analyst: GT

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			87		60-140	
4-Bromofluorobenzene			102		60-140	

Project Name: POLAR PARK**Project Number:** 4325.03**Lab Number:** L1932442**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-02
Client ID: MW-1
Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:45
Date Received: 07/23/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 07/30/19 18:49
Analyst: BM

Extraction Method: EPA 8011
Extraction Date: 07/30/19 11:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.010	--	1	A
1,2-Dibromo-3-chloropropane	ND		ug/l	0.010	--	1	A

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-03
 Client ID: HA19-6 (OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 11:00
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 07/25/19 12:36
 Analyst: GT

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: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-03

Date Collected: 07/23/19 11:00

Client ID: HA19-6 (OW)

Date Received: 07/23/19

Sample Location: WORCESTER, 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	105		60-140
Fluorobenzene	101		60-140
4-Bromofluorobenzene	99		60-140

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-03
 Client ID: HA19-6 (OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 11:00
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1-SIM
 Analytical Date: 07/25/19 12:36
 Analyst: GT

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

1,4-Dioxane	ND		ug/l	50	--	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	88		60-140
4-Bromofluorobenzene	103		60-140

Project Name: POLAR PARK**Project Number:** 4325.03**Lab Number:** L1932442**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-03
Client ID: HA19-6 (OW)
Sample Location: WORCESTER, MA

Date Collected: 07/23/19 11:00
Date Received: 07/23/19
Field Prep: Refer to COC

Sample Depth:

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 07/30/19 19:05
Analyst: BM

Extraction Method: EPA 8011
Extraction Date: 07/30/19 11:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Microextractables by GC - Westborough Lab							
1,2-Dibromoethane	ND		ug/l	0.010	--	1	A
1,2-Dibromo-3-chloropropane	ND		ug/l	0.010	--	1	A

Project Name: POLAR PARK

Lab Number: L1932442

Project Number: 4325.03

Report Date: 07/31/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 07/25/19 10:37
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03 Batch: WG1264431-8					
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: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 07/25/19 10:37
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-03 Batch: WG1264431-8					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	93		60-140
Fluorobenzene	101		60-140
4-Bromofluorobenzene	98		60-140

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1-SIM

Analytical Date: 07/25/19 10:37

Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-03 Batch: WG1265079-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	88		60-140
4-Bromofluorobenzene	104		60-140

Project Name: POLAR PARK**Project Number:** 4325.03**Lab Number:** L1932442**Report Date:** 07/31/19**Method Blank Analysis**
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 07/30/19 18:00
Analyst: BM

Extraction Method: EPA 8011
Extraction Date: 07/30/19 11:10

Parameter	Result	Qualifier	Units	RL	MDL
Microextractables by GC - Westborough Lab for sample(s): 01-03 Batch: WG1266249-1					
1,2-Dibromoethane	ND		ug/l	0.010	-- A
1,2-Dibromo-3-chloropropane	ND		ug/l	0.010	-- A

Lab Control Sample Analysis Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1264431-7								
Methylene chloride	90		-		60-140	-		28
1,1-Dichloroethane	80		-		50-150	-		49
Carbon tetrachloride	120		-		70-130	-		41
1,1,2-Trichloroethane	100		-		70-130	-		45
Tetrachloroethene	110		-		70-130	-		39
1,2-Dichloroethane	110		-		70-130	-		49
1,1,1-Trichloroethane	120		-		70-130	-		36
Benzene	105		-		65-135	-		61
Toluene	110		-		70-130	-		41
Ethylbenzene	105		-		60-140	-		63
Vinyl chloride	95		-		5-195	-		66
1,1-Dichloroethene	105		-		50-150	-		32
cis-1,2-Dichloroethene	105		-		60-140	-		30
Trichloroethene	105		-		65-135	-		48
1,2-Dichlorobenzene	100		-		65-135	-		57
1,3-Dichlorobenzene	100		-		70-130	-		43
1,4-Dichlorobenzene	100		-		65-135	-		57
p/m-Xylene	102		-		60-140	-		30
o-xylene	100		-		60-140	-		30
Acetone	92		-		40-160	-		30
Methyl tert butyl ether	85		-		60-140	-		30
Tert-Butyl Alcohol	78		-		60-140	-		30
Tertiary-Amyl Methyl Ether	90		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1264431-7

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	104				60-140
Fluorobenzene	101				60-140
4-Bromofluorobenzene	102				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-03 Batch: WG1265079-3								
1,4-Dioxane	120		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	89				60-140
4-Bromofluorobenzene	103				60-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab Associated sample(s): 01-03 Batch: WG1266249-2									
1,2-Dibromoethane	106		-		80-120	-			A
1,2-Dibromo-3-chloropropane	114		-		80-120	-			A

Matrix Spike Analysis

Batch Quality Control

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

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): 01-03 QC Batch ID: WG1266249-3 QC Sample: L1932788-02 Client ID: MS Sample													
1,2-Dibromoethane	ND	0.248	0.180	72	Q	-	-		80-120	-		20	A
1,2-Dibromo-3-chloropropane	ND	0.248	0.224	90		-	-		80-120	-		20	A
1,2,3-Trichloropropane	ND	0.248	0.193	78	Q	-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01
 Client ID: GZ-8
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:25
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 07/28/19 03:58
 Analyst: ALS

Extraction Method: EPA 625.1
 Extraction Date: 07/25/19 17:26

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--	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

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	67		42-122
2-Fluorobiphenyl	74		46-121
4-Terphenyl-d14	100		47-138

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01
 Client ID: GZ-8
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:25
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1-SIM
 Analytical Date: 07/27/19 19:29
 Analyst: CB

Extraction Method: EPA 625.1
 Extraction Date: 07/25/19 17:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
Fluoranthene	0.72		ug/l	0.10	--	1
Naphthalene	0.20		ug/l	0.10	--	1
Benzo(a)anthracene	0.35		ug/l	0.10	--	1
Benzo(a)pyrene	0.34		ug/l	0.10	--	1
Benzo(b)fluoranthene	0.74		ug/l	0.10	--	1
Benzo(k)fluoranthene	0.21		ug/l	0.10	--	1
Chrysene	0.38		ug/l	0.10	--	1
Acenaphthylene	ND		ug/l	0.10	--	1
Anthracene	ND		ug/l	0.10	--	1
Benzo(ghi)perylene	0.45		ug/l	0.10	--	1
Fluorene	ND		ug/l	0.10	--	1
Phenanthrene	0.20		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	0.48		ug/l	0.10	--	1
Pyrene	0.56		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	26		25-87
Phenol-d6	26		16-65
Nitrobenzene-d5	71		42-122
2-Fluorobiphenyl	76		46-121
2,4,6-Tribromophenol	59		45-128
4-Terphenyl-d14	82		47-138

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-02
 Client ID: MW-1
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:45
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 07/28/19 04:23
 Analyst: ALS

Extraction Method: EPA 625.1
 Extraction Date: 07/25/19 17:26

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--	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

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	100		42-122
2-Fluorobiphenyl	88		46-121
4-Terphenyl-d14	106		47-138

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-02
 Client ID: MW-1
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:45
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1-SIM
 Analytical Date: 07/27/19 19:45
 Analyst: CB

Extraction Method: EPA 625.1
 Extraction Date: 07/25/19 17:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
Fluoranthene	0.14		ug/l	0.10	--	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	0.19		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	0.25		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	0.20		ug/l	0.10	--	1
Pyrene	0.12		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	49		25-87
Phenol-d6	35		16-65
Nitrobenzene-d5	97		42-122
2-Fluorobiphenyl	83		46-121
2,4,6-Tribromophenol	81		45-128
4-Terphenyl-d14	82		47-138

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-03
 Client ID: HA19-6 (OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 11:00
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 07/28/19 05:39
 Analyst: ALS

Extraction Method: EPA 625.1
 Extraction Date: 07/25/19 17:26

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--	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

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	86		42-122
2-Fluorobiphenyl	79		46-121
4-Terphenyl-d14	80		47-138

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-03
 Client ID: HA19-6 (OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 11:00
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1-SIM
 Analytical Date: 07/27/19 20:02
 Analyst: CB

Extraction Method: EPA 625.1
 Extraction Date: 07/25/19 17:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
Fluoranthene	ND		ug/l	0.10	--	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
Pentachlorophenol	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	54		25-87
Phenol-d6	42		16-65
Nitrobenzene-d5	89		42-122
2-Fluorobiphenyl	81		46-121
2,4,6-Tribromophenol	89		45-128
4-Terphenyl-d14	69		47-138

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 07/26/19 18:59
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 07/25/19 17:26

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-03 Batch: WG1264628-1					
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
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	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	87		42-122
2-Fluorobiphenyl	77		46-121
4-Terphenyl-d14	99		47-138

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 07/27/19 11:40
Analyst: CB

Extraction Method: EPA 625.1
Extraction Date: 07/25/19 17:28

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-03 Batch: WG1264630-1					
Acenaphthene	ND		ug/l	0.10	--
Fluoranthene	ND		ug/l	0.10	--
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	--
Pentachlorophenol	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	49		25-87
Phenol-d6	35		16-65
Nitrobenzene-d5	92		42-122
2-Fluorobiphenyl	79		46-121
2,4,6-Tribromophenol	73		45-128
4-Terphenyl-d14	79		47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-03 Batch: WG1264628-3								
Bis(2-ethylhexyl)phthalate	109		-		29-137	-		82
Butyl benzyl phthalate	112		-		1-140	-		60
Di-n-butylphthalate	107		-		8-120	-		47
Di-n-octylphthalate	109		-		19-132	-		69
Diethyl phthalate	97		-		1-120	-		100
Dimethyl phthalate	92		-		1-120	-		183

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	92				42-122
2-Fluorobiphenyl	83				46-121
4-Terphenyl-d14	107				47-138

Lab Control Sample Analysis Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-03 Batch: WG1264630-2								
Acenaphthene	68		-		60-132	-		30
Fluoranthene	83		-		43-121	-		30
Naphthalene	59		-		36-120	-		30
Benzo(a)anthracene	90		-		42-133	-		30
Benzo(a)pyrene	82		-		32-148	-		30
Benzo(b)fluoranthene	88		-		42-140	-		30
Benzo(k)fluoranthene	77		-		25-146	-		30
Chrysene	79		-		44-140	-		30
Acenaphthylene	73		-		54-126	-		30
Anthracene	84		-		43-120	-		30
Benzo(ghi)perylene	83		-		1-195	-		30
Fluorene	74		-		70-120	-		30
Phenanthrene	83		-		65-120	-		30
Dibenzo(a,h)anthracene	84		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	88		-		1-151	-		30
Pyrene	83		-		70-120	-		30
Pentachlorophenol	80		-		38-152	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-03 Batch: WG1264630-2								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	38				25-87
Phenol-d6	30				16-65
Nitrobenzene-d5	73				42-122
2-Fluorobiphenyl	69				46-121
2,4,6-Tribromophenol	74				45-128
4-Terphenyl-d14	80				47-138

PCBS

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01
 Client ID: GZ-8
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:25
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 127,608.3
 Analytical Date: 07/29/19 11:34
 Analyst: WR

Extraction Method: EPA 608.3
 Extraction Date: 07/26/19 12:18
 Cleanup Method: EPA 3665A
 Cleanup Date: 07/27/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 07/27/19

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	77		37-123	B
Decachlorobiphenyl	79		38-114	B
2,4,5,6-Tetrachloro-m-xylene	76		37-123	A
Decachlorobiphenyl	77		38-114	A

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-02
 Client ID: MW-1
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:45
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 127,608.3
 Analytical Date: 07/29/19 11:47
 Analyst: WR

Extraction Method: EPA 608.3
 Extraction Date: 07/26/19 12:18
 Cleanup Method: EPA 3665A
 Cleanup Date: 07/27/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 07/27/19

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	74		37-123	B
Decachlorobiphenyl	79		38-114	B
2,4,5,6-Tetrachloro-m-xylene	75		37-123	A
Decachlorobiphenyl	78		38-114	A

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-03
 Client ID: HA19-6 (OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/23/19 11:00
 Date Received: 07/23/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 127,608.3
 Analytical Date: 07/29/19 12:00
 Analyst: WR

Extraction Method: EPA 608.3
 Extraction Date: 07/26/19 12:18
 Cleanup Method: EPA 3665A
 Cleanup Date: 07/27/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 07/27/19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.272	--	1	A
Aroclor 1221	ND		ug/l	0.272	--	1	A
Aroclor 1232	ND		ug/l	0.272	--	1	A
Aroclor 1242	ND		ug/l	0.272	--	1	A
Aroclor 1248	ND		ug/l	0.272	--	1	A
Aroclor 1254	ND		ug/l	0.272	--	1	A
Aroclor 1260	ND		ug/l	0.217	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		37-123	B
Decachlorobiphenyl	57		38-114	B
2,4,5,6-Tetrachloro-m-xylene	76		37-123	A
Decachlorobiphenyl	55		38-114	A

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Method Blank Analysis Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 07/29/19 10:19
 Analyst: WR

Extraction Method: EPA 608.3
 Extraction Date: 07/26/19 12:18
 Cleanup Method: EPA 3665A
 Cleanup Date: 07/27/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 07/27/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-03 Batch: WG1264996-1						
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	74		37-123	B
Decachlorobiphenyl	84		38-114	B
2,4,5,6-Tetrachloro-m-xylene	75		37-123	A
Decachlorobiphenyl	81		38-114	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-03 Batch: WG1264996-2									
Aroclor 1016	79		-		50-140	-		36	A
Aroclor 1260	76		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	80				37-123	B
Decachlorobiphenyl	88				38-114	B
2,4,5,6-Tetrachloro-m-xylene	81				37-123	A
Decachlorobiphenyl	86				38-114	A

METALS

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01

Date Collected: 07/23/19 08:25

Client ID: GZ-8

Date Received: 07/23/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00278		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Chromium, Total	0.00221		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Copper, Total	0.00894		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Iron, Total	1.09		mg/l	0.050	--	1	07/24/19 21:20	07/26/19 18:21	EPA 3005A	19,200.7	AB
Lead, Total	0.00686		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	07/26/19 13:05	07/26/19 19:37	EPA 245.1	3,245.1	GD
Nickel, Total	0.00213		mg/l	0.00200	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Zinc, Total	0.02196		mg/l	0.01000	--	1	07/24/19 21:20	07/25/19 20:55	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	156		mg/l	0.660	NA	1	07/24/19 21:20	07/26/19 18:21	EPA 3005A	19,200.7	AB

General Chemistry - Mansfield Lab

Chromium, Trivalent	ND		mg/l	0.010	--	1		07/25/19 20:55	NA	107,-	
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Dissolved Metals - Mansfield Lab

Antimony, Dissolved	ND		mg/l	0.0040	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0044		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Iron, Dissolved	0.059		mg/l	0.050	--	1	07/25/19 08:00	07/25/19 18:42	EPA 3005A	19,200.7	LC
Lead, Dissolved	ND		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	07/26/19 14:14	07/26/19 19:44	EPA 245.1	3,245.1	GD



Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-01

Date Collected: 07/23/19 08:25

Client ID: GZ-8

Date Received: 07/23/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Nickel, Dissolved	ND		mg/l	0.0020	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Selenium, Dissolved	0.0055		mg/l	0.0050	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0141		mg/l	0.0100	--	1	07/25/19 08:49	07/25/19 17:54	EPA 3005A	3,200.8	AM



Project Name: POLAR PARK

Lab Number: L1932442

Project Number: 4325.03

Report Date: 07/31/19

SAMPLE RESULTS

Lab ID: L1932442-02

Date Collected: 07/23/19 08:45

Client ID: MW-1

Date Received: 07/23/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Arsenic, Total	0.01155		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Chromium, Total	0.05106		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Copper, Total	0.02125		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Iron, Total	17.1		mg/l	0.050	--	1	07/24/19 21:20	07/26/19 18:26	EPA 3005A	19,200.7	AB
Lead, Total	0.00924		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	07/26/19 13:05	07/26/19 19:39	EPA 245.1	3,245.1	GD
Nickel, Total	0.06888		mg/l	0.00200	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Zinc, Total	0.2290		mg/l	0.01000	--	1	07/24/19 21:20	07/25/19 21:00	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	388		mg/l	0.660	NA	1	07/24/19 21:20	07/26/19 18:26	EPA 3005A	19,200.7	AB

General Chemistry - Mansfield Lab

Chromium, Trivalent	0.051		mg/l	0.010	--	1		07/25/19 21:00	NA	107,-	
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Dissolved Metals - Mansfield Lab

Antimony, Dissolved	ND		mg/l	0.0040	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0011		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0020		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0022		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Iron, Dissolved	0.434		mg/l	0.050	--	1	07/25/19 08:00	07/25/19 18:47	EPA 3005A	19,200.7	LC
Lead, Dissolved	ND		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	07/26/19 14:14	07/26/19 19:50	EPA 245.1	3,245.1	GD



Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-02

Date Collected: 07/23/19 08:45

Client ID: MW-1

Date Received: 07/23/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Nickel, Dissolved	0.0053		mg/l	0.0020	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.0321		mg/l	0.0100	--	1	07/25/19 08:49	07/25/19 19:08	EPA 3005A	3,200.8	AM



Project Name: POLAR PARK

Lab Number: L1932442

Project Number: 4325.03

Report Date: 07/31/19

SAMPLE RESULTS

Lab ID: L1932442-03

Date Collected: 07/23/19 11:00

Client ID: HA19-6 (OW)

Date Received: 07/23/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Arsenic, Total	0.1416		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00210		mg/l	0.00020	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Chromium, Total	0.7319		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Copper, Total	0.4032		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Iron, Total	145		mg/l	0.050	--	1	07/24/19 21:20	07/26/19 18:30	EPA 3005A	19,200.7	AB
Lead, Total	0.5100		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Mercury, Total	0.00020		mg/l	0.00020	--	1	07/26/19 13:05	07/26/19 19:40	EPA 245.1	3,245.1	GD
Nickel, Total	0.4984		mg/l	0.00200	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Selenium, Total	0.05444		mg/l	0.00500	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Silver, Total	0.00140		mg/l	0.00040	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Zinc, Total	0.7902		mg/l	0.01000	--	1	07/24/19 21:20	07/25/19 21:04	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	681		mg/l	0.660	NA	1	07/24/19 21:20	07/26/19 18:30	EPA 3005A	19,200.7	AB

General Chemistry - Mansfield Lab

Chromium, Trivalent	0.732		mg/l	0.010	--	1		07/25/19 21:04	NA	107,-	
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Dissolved Metals - Mansfield Lab

Antimony, Dissolved	ND		mg/l	0.0040	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.1048		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	0.0016		mg/l	0.0002	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.1904		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.2252		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Iron, Dissolved	33.0		mg/l	0.050	--	1	07/25/19 08:00	07/25/19 18:51	EPA 3005A	19,200.7	LC
Lead, Dissolved	0.1221		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	07/26/19 14:14	07/26/19 19:51	EPA 245.1	3,245.1	GD



Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**SAMPLE RESULTS**

Lab ID: L1932442-03

Date Collected: 07/23/19 11:00

Client ID: HA19-6 (OW)

Date Received: 07/23/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Nickel, Dissolved	0.1430		mg/l	0.0020	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Selenium, Dissolved	0.0395		mg/l	0.0050	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM
Zinc, Dissolved	0.2595		mg/l	0.0100	--	1	07/25/19 08:49	07/25/19 19:13	EPA 3005A	3,200.8	AM



Project Name: POLAR PARK

Lab Number: L1932442

Project Number: 4325.03

Report Date: 07/31/19

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): 01-03 Batch: WG1264095-1										
Iron, Total	ND		mg/l	0.050	--	1	07/24/19 21:20	07/26/19 14:08	19,200.7	LC

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): 01-03 Batch: WG1264095-1										
Hardness	ND		mg/l	0.660	NA	1	07/24/19 21:20	07/26/19 17:55	19,200.7	AB

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): 01-03 Batch: WG1264097-1										
Antimony, Total	ND		mg/l	0.00400	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	07/24/19 21:20	07/25/19 21:44	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Project Name: POLAR PARK

Lab Number: L1932442

Project Number: 4325.03

Report Date: 07/31/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1264249-1										
Iron, Dissolved	ND		mg/l	0.050	--	1	07/25/19 08:00	07/25/19 17:38	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1264298-1										
Antimony, Dissolved	ND		mg/l	0.0040	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Lead, Dissolved	ND		mg/l	0.0010	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	07/25/19 08:49	07/25/19 17:37	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	07/25/19 08:49	07/25/19 17:37	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): 01-03 Batch: WG1265030-1										
Mercury, Total	ND		mg/l	0.0002	--	1	07/26/19 13:05	07/26/19 19:03	3,245.1	GD

Prep Information

Digestion Method: EPA 245.1



Project Name: POLAR PARK

Lab Number: L1932442

Project Number: 4325.03

Report Date: 07/31/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1265058-1										
Mercury, Dissolved	ND		mg/l	0.00020	--	1	07/26/19 14:14	07/26/19 19:41	3,245.1	GD

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1264095-2								
Iron, Total	105		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-03 Batch: WG1264095-2								
Hardness	104		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1264097-2								
Antimony, Total	88		-		85-115	-		
Arsenic, Total	99		-		85-115	-		
Cadmium, Total	115		-		85-115	-		
Chromium, Total	110		-		85-115	-		
Copper, Total	105		-		85-115	-		
Lead, Total	108		-		85-115	-		
Nickel, Total	111		-		85-115	-		
Selenium, Total	112		-		85-115	-		
Silver, Total	107		-		85-115	-		
Zinc, Total	114		-		85-115	-		
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1264249-2								
Iron, Dissolved	108		-		85-115	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1264298-2					
Antimony, Dissolved	86	-	85-115	-	
Arsenic, Dissolved	103	-	85-115	-	
Cadmium, Dissolved	109	-	85-115	-	
Chromium, Dissolved	104	-	85-115	-	
Copper, Dissolved	104	-	85-115	-	
Lead, Dissolved	104	-	85-115	-	
Nickel, Dissolved	106	-	85-115	-	
Selenium, Dissolved	107	-	85-115	-	
Silver, Dissolved	103	-	85-115	-	
Zinc, Dissolved	110	-	85-115	-	
Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1265030-2					
Mercury, Total	98	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1265058-2					
Mercury, Dissolved	92	-	85-115	-	

Matrix Spike Analysis

Batch Quality Control

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

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): 01-03 QC Batch ID: WG1264095-3 QC Sample: L1932202-01 Client ID: MS Sample												
Iron, Total	ND	1	1.07	107		-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264095-3 QC Sample: L1932202-01 Client ID: MS Sample												
Hardness	134	66.2	194	91		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264095-7 QC Sample: L1931556-01 Client ID: MS Sample												
Iron, Total	ND	1	0.967	97		-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264095-7 QC Sample: L1931556-01 Client ID: MS Sample												
Hardness	198	66.2	238	60	Q	-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264097-3 QC Sample: L1931556-01 Client ID: MS Sample												
Antimony, Total	ND	0.5	0.4258	85		-	-		70-130	-		20
Arsenic, Total	ND	0.12	0.1203	100		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05525	108		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2117	106		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2479	99		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5409	106		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.5284	106		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1291	108		-	-		70-130	-		20
Silver, Total	ND	0.05	0.05163	103		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5459	109		-	-		70-130	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264249-3 QC Sample: L1900007-163 Client ID: MS Sample												
Iron, Dissolved	0.992	1	2.08	109		-	-		75-125	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264298-3 QC Sample: L1932442-01 Client ID: GZ-8									
Antimony, Dissolved	ND	0.5	0.4286	86	-	-	70-130	-	20
Arsenic, Dissolved	ND	0.12	0.1341	112	-	-	70-130	-	20
Cadmium, Dissolved	ND	0.051	0.0563	110	-	-	70-130	-	20
Chromium, Dissolved	ND	0.2	0.2140	107	-	-	70-130	-	20
Copper, Dissolved	0.0044	0.25	0.2585	102	-	-	70-130	-	20
Lead, Dissolved	ND	0.51	0.5377	105	-	-	70-130	-	20
Nickel, Dissolved	ND	0.5	0.5276	106	-	-	70-130	-	20
Selenium, Dissolved	0.0055	0.12	0.1313	105	-	-	70-130	-	20
Silver, Dissolved	ND	0.05	0.0522	104	-	-	70-130	-	20
Zinc, Dissolved	0.0141	0.5	0.5651	110	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1265030-3 QC Sample: L1931353-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0044	89	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1265030-5 QC Sample: L1931361-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0045	90	-	-	70-130	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1265058-3 QC Sample: L1932442-01 Client ID: GZ-8									
Mercury, Dissolved	ND	0.005	0.00443	89	-	-	75-125	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264095-4 QC Sample: L1932202-01 Client ID: DUP Sample						
Iron, Total	ND	ND	mg/l	NC		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264095-4 QC Sample: L1932202-01 Client ID: DUP Sample						
Hardness	134	132	mg/l	2		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264095-8 QC Sample: L1931556-01 Client ID: DUP Sample						
Iron, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264097-4 QC Sample: L1931556-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	ND	ND	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	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
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264249-4 QC Sample: L1900007-163 Client ID: DUP Sample						
Iron, Dissolved	0.992	1.02	mg/l	3		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1264298-4 QC Sample: L1932442-01 Client ID: GZ-8					
Antimony, Dissolved	ND	0.0045	mg/l	NC	20
Arsenic, Dissolved	ND	0.001	mg/l	NC	20
Cadmium, Dissolved	ND	ND	mg/l	NC	20
Chromium, Dissolved	ND	ND	mg/l	NC	20
Copper, Dissolved	0.0044	0.0043	mg/l	4	20
Lead, Dissolved	ND	ND	mg/l	NC	20
Nickel, Dissolved	ND	ND	mg/l	NC	20
Selenium, Dissolved	0.0055	0.0055	mg/l	1	20
Silver, Dissolved	ND	ND	mg/l	NC	20
Zinc, Dissolved	0.0141	0.0142	mg/l	1	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1265030-4 QC Sample: L1931353-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1265030-6 QC Sample: L1931361-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-03 QC Batch ID: WG1265058-4 QC Sample: L1932442-01 Client ID: GZ-8					
Mercury, Dissolved	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

SAMPLE RESULTS

Lab ID: L1932442-01

Client ID: GZ-8

Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:25

Date Received: 07/23/19

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	34.		mg/l	5.0	NA	1	-	07/24/19 14:30	121,2540D	DR
Cyanide, Total	ND		mg/l	0.005	--	1	07/24/19 11:55	07/24/19 15:03	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/24/19 00:18	121,4500CL-D	AS
pH (H)	6.6		SU	-	NA	1	-	07/23/19 23:18	121,4500H+-B	AS
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/24/19 05:05	07/26/19 22:37	121,4500NH3-BH	AT
Sulfate	32.		mg/l	10	--	1	07/29/19 12:01	07/29/19 12:01	121,4500SO4-E	BR
TPH, SGT-HEM	ND		mg/l	4.00	--	1	07/25/19 16:30	07/25/19 21:55	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	07/26/19 06:30	07/26/19 09:48	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	07/24/19 04:00	07/24/19 04:59	1,7196A	JW
Anions by Ion Chromatography - Westborough Lab										
Chloride	11.6		mg/l	0.500	--	1	-	07/25/19 02:10	44,300.0	AT



Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

SAMPLE RESULTS

Lab ID: L1932442-02

Client ID: MW-1

Sample Location: WORCESTER, MA

Date Collected: 07/23/19 08:45

Date Received: 07/23/19

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	430		mg/l	16	NA	3.3	-	07/24/19 14:30	121,2540D	DR
Cyanide, Total	ND		mg/l	0.005	--	1	07/24/19 11:55	07/24/19 15:07	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/24/19 00:18	121,4500CL-D	AS
pH (H)	7.1		SU	-	NA	1	-	07/23/19 23:18	121,4500H+-B	AS
Nitrogen, Ammonia	ND		mg/l	0.150	--	2	07/24/19 05:05	07/26/19 22:40	121,4500NH3-BH	AT
Sulfate	36.		mg/l	20	--	2	07/29/19 12:01	07/29/19 12:01	121,4500SO4-E	BR
TPH, SGT-HEM	ND		mg/l	4.00	--	1	07/25/19 16:30	07/25/19 21:55	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	07/26/19 06:30	07/26/19 09:51	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	07/24/19 04:00	07/24/19 05:00	1,7196A	JW
Anions by Ion Chromatography - Westborough Lab										
Chloride	136.		mg/l	25.0	--	50	-	07/24/19 21:00	44,300.0	AT



Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

SAMPLE RESULTS

Lab ID: L1932442-03

Client ID: HA19-6 (OW)

Sample Location: WORCESTER, MA

Date Collected: 07/23/19 11:00

Date Received: 07/23/19

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	47000		mg/l	500	NA	100	-	07/24/19 14:30	121,2540D	DR
Cyanide, Total	ND		mg/l	0.005	--	1	07/24/19 11:55	07/24/19 15:09	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/24/19 00:18	121,4500CL-D	AS
pH (H)	6.9		SU	-	NA	1	-	07/23/19 23:18	121,4500H+-B	AS
Nitrogen, Ammonia	ND		mg/l	0.375	--	5	07/24/19 05:05	07/26/19 22:41	121,4500NH3-BH	AT
Sulfate	79.		mg/l	25	--	2.5	07/29/19 12:01	07/29/19 12:01	121,4500SO4-E	BR
TPH, SGT-HEM	ND		mg/l	4.40	--	1.1	07/25/19 16:30	07/25/19 21:55	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	07/26/19 06:30	07/26/19 09:52	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	07/24/19 04:00	07/24/19 05:01	1,7196A	JW
Anions by Ion Chromatography - Westborough Lab										
Chloride	343.		mg/l	25.0	--	50	-	07/24/19 21:10	44,300.0	AT



Project Name: POLAR PARK

Lab Number: L1932442

Project Number: 4325.03

Report Date: 07/31/19

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): 01-03 Batch: WG1263589-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/24/19 00:18	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1263598-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/24/19 05:05	07/26/19 22:34	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1263634-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	07/24/19 04:00	07/24/19 04:37	1,7196A	JW
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1263800-1										
Cyanide, Total	ND		mg/l	0.005	--	1	07/24/19 11:55	07/24/19 15:16	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1263856-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	07/24/19 14:30	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1264596-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	07/25/19 16:30	07/25/19 21:55	74,1664A	ML
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-03 Batch: WG1264625-1										
Chloride	ND		mg/l	0.500	--	1	-	07/24/19 17:42	44,300.0	AT
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1264838-1										
Phenolics, Total	ND		mg/l	0.030	--	1	07/26/19 06:30	07/26/19 09:46	4,420.1	BR
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1265722-1										
Sulfate	ND		mg/l	10	--	1	07/29/19 12:01	07/29/19 12:01	121,4500SO4-E	BR

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1263570-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1263589-2								
Chlorine, Total Residual	92		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1263598-2								
Nitrogen, Ammonia	98		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1263634-2								
Chromium, Hexavalent	103		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1263800-2								
Cyanide, Total	97		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1264596-2								
TPH	82		-		64-132	-		34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-03 Batch: WG1264625-2								
Chloride	102		-		90-110	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1932442

Report Date: 07/31/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1264838-2					
Phenolics, Total	100	-	70-130	-	
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1265722-2					
Sulfate	90	-	90-110	-	

Matrix Spike Analysis

Batch Quality Control

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

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): 01-03				QC Batch ID: WG1263589-4			QC Sample: L1932442-02			Client ID: MW-1		
Chlorine, Total Residual	ND	0.25	0.28	112		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03				QC Batch ID: WG1263598-4			QC Sample: L1932442-01			Client ID: GZ-8		
Nitrogen, Ammonia	ND	4	3.72	93		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03				QC Batch ID: WG1263634-4			QC Sample: L1932442-02			Client ID: MW-1		
Chromium, Hexavalent	ND	0.1	0.097	97		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03				QC Batch ID: WG1263800-4			QC Sample: L1932442-02			Client ID: MW-1		
Cyanide, Total	ND	0.2	0.193	96		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01-03				QC Batch ID: WG1264596-4			QC Sample: L1932457-02			Client ID: MS Sample		
TPH	ND	20	16.0	80		-	-		64-132	-		34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-03				QC Batch ID: WG1264625-3			QC Sample: L1931756-01			Client ID: MS Sample		
Chloride	32.2	4	34.8	65	Q	-	-		90-110	-		18
General Chemistry - Westborough Lab Associated sample(s): 01-03				QC Batch ID: WG1264838-4			QC Sample: L1932442-01			Client ID: GZ-8		
Phenolics, Total	ND	0.4	0.37	92		-	-		70-130	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-03				QC Batch ID: WG1265722-4			QC Sample: L1932442-01			Client ID: GZ-8		
Sulfate	32	50	81	98		-	-		55-147	-		14

Lab Duplicate Analysis

Batch Quality Control

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1263570-2 QC Sample: L1930973-01 Client ID: DUP Sample						
pH	2.2	2.2	SU	0		5
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1263589-3 QC Sample: L1932442-01 Client ID: GZ-8						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1263598-3 QC Sample: L1932442-01 Client ID: GZ-8						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1263634-3 QC Sample: L1932442-01 Client ID: GZ-8						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1263800-3 QC Sample: L1932442-01 Client ID: GZ-8						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1263856-2 QC Sample: L1932601-01 Client ID: DUP Sample						
Solids, Total Suspended	130	150	mg/l	14		29
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1264596-3 QC Sample: L1932457-02 Client ID: DUP Sample						
TPH	ND	ND	mg/l	NC		34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1264625-4 QC Sample: L1931756-01 Client ID: DUP Sample						
Chloride	32.2	32.2	mg/l	0		18
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1264838-3 QC Sample: L1932442-01 Client ID: GZ-8						
Phenolics, Total	ND	ND	mg/l	NC		20

Project Name: POLAR PARK
Project Number: 4325.03

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1932442
Report Date: 07/31/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1265722-3 QC Sample: L1932442-01 Client ID: GZ-8					
Sulfate	32	31	mg/l	3	14

Project Name: POLAR PARK
Project Number: 4325.03

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1932442-01A	Vial Na2S2O3 preserved	A	NA		3.6	Y	Absent		504(14)
L1932442-01B	Vial Na2S2O3 preserved	A	NA		3.6	Y	Absent		504(14)
L1932442-01C	Vial Na2S2O3 preserved	A	NA		3.6	Y	Absent		504(14)
L1932442-01D	Vial Na2S2O3 preserved	A	NA		3.6	Y	Absent		504(14)
L1932442-01E	Vial Na2S2O3 preserved	A	NA		3.6	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-01F	Vial Na2S2O3 preserved	A	NA		3.6	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-01G	Vial Na2S2O3 preserved	A	NA		3.6	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-01H	Vial Na2S2O3 preserved	A	NA		3.6	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-01I	Vial HCl preserved	A	NA		3.6	Y	Absent		HOLD-SUB()
L1932442-01J	Vial HCl preserved	A	NA		3.6	Y	Absent		HOLD-SUB()
L1932442-01K	Vial HCl preserved	A	NA		3.6	Y	Absent		HOLD-SUB()
L1932442-01L	Plastic 250ml NaOH preserved	A	>12	>12	3.6	Y	Absent		TCN-4500(14)
L1932442-01M	Plastic 250ml HNO3 preserved	A	<2	<2	3.6	Y	Absent		AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1932442-01N	Plastic 250ml HNO3 preserved	A	<2	<2	3.6	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1932442-01O	Plastic 500ml H2SO4 preserved	A	NA		3.6	Y	Absent		NH3-4500(28)
L1932442-01P	Plastic 950ml unpreserved	A	7	7	3.6	Y	Absent		SO4-4500(28),CL-300(28),HEXCR-7196(1),TRC-4500(1),PH-4500(.01)
L1932442-01Q	Plastic 950ml unpreserved	A	7	7	3.6	Y	Absent		TSS-2540(7)

Project Name: POLAR PARK
Project Number: 4325.03

Serial_No:07311917:01
Lab Number: L1932442
Report Date: 07/31/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1932442-01R	Amber 950ml H2SO4 preserved	A	<2	<2	3.6	Y	Absent		TPHENOL-420(28)
L1932442-01S	Amber 1000ml HCl preserved	A	NA		3.6	Y	Absent		TPH-1664(28)
L1932442-01T	Amber 1000ml HCl preserved	A	NA		3.6	Y	Absent		TPH-1664(28)
L1932442-01U	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-01V	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-01W	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-01X	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-01Y	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-01Z	Amber 1000ml Na2S2O3	A	7	7	3.6	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-02A	Vial Na2S2O3 preserved	B	NA		4.2	Y	Absent		504(14)
L1932442-02B	Vial Na2S2O3 preserved	B	NA		4.2	Y	Absent		504(14)
L1932442-02C	Vial Na2S2O3 preserved	B	NA		4.2	Y	Absent		504(14)
L1932442-02D	Vial Na2S2O3 preserved	B	NA		4.2	Y	Absent		504(14)
L1932442-02E	Vial Na2S2O3 preserved	B	NA		4.2	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-02F	Vial Na2S2O3 preserved	B	NA		4.2	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-02G	Vial Na2S2O3 preserved	B	NA		4.2	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-02H	Vial Na2S2O3 preserved	B	NA		4.2	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-02I	Vial HCl preserved	B	NA		4.2	Y	Absent		HOLD-SUB()
L1932442-02J	Vial HCl preserved	B	NA		4.2	Y	Absent		HOLD-SUB()
L1932442-02K	Vial HCl preserved	B	NA		4.2	Y	Absent		HOLD-SUB()
L1932442-02L	Plastic 250ml NaOH preserved	B	>12	>12	4.2	Y	Absent		TCN-4500(14)
L1932442-02M	Plastic 250ml HNO3 preserved	B	<2	<2	4.2	Y	Absent		AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1932442-02N	Plastic 250ml HNO3 preserved	B	<2	<2	4.2	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1932442-02O	Plastic 500ml H2SO4 preserved	B	<2	<2	4.2	Y	Absent		NH3-4500(28)

Project Name: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1932442-02P	Plastic 950ml unpreserved	B	7	7	4.2	Y	Absent		SO4-4500(28),CL-300(28),HEXCR-7196(1),TRC-4500(1),PH-4500(.01)
L1932442-02Q	Plastic 950ml unpreserved	B	7	7	4.2	Y	Absent		TSS-2540(7)
L1932442-02R	Amber 950ml H2SO4 preserved	B	<2	<2	4.2	Y	Absent		TPHENOL-420(28)
L1932442-02S	Amber 1000ml HCl preserved	B	NA		4.2	Y	Absent		TPH-1664(28)
L1932442-02T	Amber 1000ml HCl preserved	B	NA		4.2	Y	Absent		TPH-1664(28)
L1932442-02U	Amber 1000ml Na2S2O3	B	7	7	4.2	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-02V	Amber 1000ml Na2S2O3	B	7	7	4.2	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-02W	Amber 1000ml Na2S2O3	B	7	7	4.2	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-02X	Amber 1000ml Na2S2O3	B	7	7	4.2	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-02Y	Amber 1000ml Na2S2O3	B	7	7	4.2	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-02Z	Amber 1000ml Na2S2O3	B	7	7	4.2	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-03A	Vial Na2S2O3 preserved	C	NA		4.0	Y	Absent		504(14)
L1932442-03B	Vial Na2S2O3 preserved	C	NA		4.0	Y	Absent		504(14)
L1932442-03C	Vial Na2S2O3 preserved	C	NA		4.0	Y	Absent		504(14)
L1932442-03D	Vial Na2S2O3 preserved	C	NA		4.0	Y	Absent		504(14)
L1932442-03E	Vial Na2S2O3 preserved	C	NA		4.0	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-03F	Vial Na2S2O3 preserved	C	NA		4.0	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-03G	Vial Na2S2O3 preserved	C	NA		4.0	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-03H	Vial Na2S2O3 preserved	C	NA		4.0	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1932442-03I	Vial HCl preserved	C	NA		4.0	Y	Absent		HOLD-SUB()
L1932442-03J	Vial HCl preserved	C	NA		4.0	Y	Absent		HOLD-SUB()
L1932442-03K	Vial HCl preserved	C	NA		4.0	Y	Absent		HOLD-SUB()
L1932442-03L	Plastic 250ml NaOH preserved	C	>12	>12	4.0	Y	Absent		TCN-4500(14)
L1932442-03M	Plastic 250ml HNO3 preserved	C	<2	<2	4.0	Y	Absent		AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)

Project Name: POLAR PARK
Project Number: 4325.03

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1932442-03N	Plastic 250ml HNO3 preserved	C	<2	<2	4.0	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1932442-03O	Plastic 500ml H2SO4 preserved	C	<2	<2	4.0	Y	Absent		NH3-4500(28)
L1932442-03P	Plastic 950ml unpreserved	C	7	7	4.0	Y	Absent		SO4-4500(28),CL-300(28),HEXCR-7196(1),TRC-4500(1),PH-4500(.01)
L1932442-03Q	Plastic 950ml unpreserved	C	7	7	4.0	Y	Absent		TSS-2540(7)
L1932442-03R	Amber 950ml H2SO4 preserved	C	NA		4.0	Y	Absent		TPHENOL-420(28)
L1932442-03S	Amber 1000ml HCl preserved	C	NA		4.0	Y	Absent		TPH-1664(28)
L1932442-03T	Amber 1000ml HCl preserved	C	NA		4.0	Y	Absent		TPH-1664(28)
L1932442-03U	Amber 1000ml Na2S2O3	C	7	7	4.0	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-03V	Amber 1000ml Na2S2O3	C	7	7	4.0	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-03W	Amber 1000ml Na2S2O3	C	7	7	4.0	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-03X	Amber 1000ml Na2S2O3	C	7	7	4.0	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-03Y	Amber 1000ml Na2S2O3	C	7	7	4.0	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)
L1932442-03Z	Amber 1000ml Na2S2O3	C	7	7	4.0	Y	Absent		625.1-RGP(7),PCB-608.3(7),625.1-SIM-RGP(7)

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
Report Date: 07/31/19

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: POLAR PARK
Project Number: 4325.03

Lab Number: L1932442
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- 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.

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.

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 Condensation Product".
- 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 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: POLAR PARK**Lab Number:** L1932442**Project Number:** 4325.03**Report Date:** 07/31/19

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 13

Published Date: 7/30/2019 3:17:52 PM

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Certification Information

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

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

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		PAGE <u>1</u> OF <u> </u>		Date Rec'd in Lab: <u>7/23/19</u>		ALPHA Job #: <u>L1932412</u>																																																																																	
Client Information		Project Information		Report Information - Data Deliverables		Billing Information																																																																																	
8 Walkup Drive Westboro, MA 01581 Tel: 508-898-9220		320 Forbes Blvd Mansfield, MA 02048 Tel: 508-822-9300		<input checked="" type="checkbox"/> ADEX <input checked="" type="checkbox"/> EMAIL		<input checked="" type="checkbox"/> Same as Client info PO #:																																																																																	
Client: <u>Sanborn Head</u> Address: <u>1 Technology Drive</u> <u>Westford, MA 01886</u> Phone: <u>978-342-0900</u> Email: <u>kwalker@sanburnhead.com</u>		Project Name: <u>Polar Park</u> Project Location: <u>Norchester, MA</u> Project #: <u>4325.03</u> Project Manager: <u>K. Walker</u> ALPHA Quote #:		Regulatory Requirements & Project Information Requirements <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No MA MCP Analytical Methods <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No CT RCP Analytical Methods <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Matrix Spike Required on this SDG? (Required for MCP Inorganics) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No GW1 Standards (Info Required for Metals & EPH with Targets) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No NPDES RGP <input type="checkbox"/> Other State /Fed Program _____ Criteria _____																																																																																			
Additional Project Information: * R6P metals include Ag, As, Cd, Cr, Cu, Ni, Pb, Sb, Se, Zn, Fe, Hg, Hex Cr, Tri Cr. * NPDES R6P minimum levels must be met		Turn-Around Time <input checked="" type="checkbox"/> Standard <input type="checkbox"/> RUSH (only confirmed if pre-approved) Date Due:		<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> ANALYSIS VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> 524.2 SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15 METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PP13 EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only <input type="checkbox"/> PCB <input type="checkbox"/> PEST TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint NPDES R6P Package Total + Dissolved Metals * pH, Sulfate, Hardness Ammonia, pH, Hardness Total Metals * Ethanol </div> <div> SAMPLE INFO Filtration <input checked="" type="checkbox"/> Field <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do </div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> TOTAL # BOTTLES </div> </div>																																																																																			
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">ALPHA Lab ID (Lab Use Only)</th> <th rowspan="2">Sample ID</th> <th colspan="2">Collection</th> <th rowspan="2">Sample Matrix</th> <th rowspan="2">Sampler Initials</th> </tr> <tr> <th>Date</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>32412-01</td> <td>GIZ-8</td> <td>7/23/19</td> <td>8:25</td> <td>GW</td> <td>DMP</td> </tr> <tr> <td>-02</td> <td>NW-1</td> <td>↓</td> <td>8:45</td> <td>↓</td> <td>CWM</td> </tr> <tr> <td>-03</td> <td>HA19-6(OW)</td> <td>↓</td> <td>11:00</td> <td>↓</td> <td>DMP</td> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>		ALPHA Lab ID (Lab Use Only)	Sample ID					Collection		Sample Matrix	Sampler Initials	Date	Time	32412-01	GIZ-8	7/23/19	8:25	GW	DMP	-02	NW-1	↓	8:45	↓	CWM	-03	HA19-6(OW)	↓	11:00	↓	DMP																																																							<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Container Type</th> <th>Preservative</th> </tr> </thead> <tbody> <tr> <td>P/A P P</td> <td>O O O</td> </tr> </tbody> </table>	
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Container Type P= Plastic A= Amber glass V= Vial G= Glass B= Bacteria cup C= Cube O= Other E= Encore D= BOD Bottle		Preservative A= None B= HCl C= HNO ₃ D= H ₂ SO ₄ E= NaOH F= MeOH G= NaHSO ₄ H= Na ₂ S ₂ O ₃ I= Ascorbic Acid J= NH ₄ Cl K= Zn Acetate O= Other		Relinquished By: <u>Daniel Depp</u> Date/Time: <u>7/23/19 13:30</u>		Received By: <u>[Signature]</u> Date/Time: <u>7/23/19 1330</u>																																																																																	
All samples submitted are subject to Alpha's Terms and Conditions. See reverse side. FORM NO: 01-01 (rev. 12-Mar-2012)																																																																																							



ANALYTICAL REPORT

Lab Number:	L1933226
Client:	Sanborn, Head & Associates, Inc. 1 Technology Park Drive Westford, MA 01886
ATTN:	Kent Walker
Phone:	(978) 577-1003
Project Name:	POLAR PARK
Project Number:	4325.03
Report Date:	08/06/19

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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: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1933226-01	HA19-2(OW)	WATER	WORCESTER, MA	07/26/19 10:00	07/26/19
L1933226-02	MIDDLE RIVER	WATER	WORCESTER, MA	07/26/19 11:20	07/26/19

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

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: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

Case Narrative (continued)

Report Submission

August 06, 2019: This final report includes the results of all requested analyses.

August 02, 2019: This is a preliminary report.

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:



Cristin Walker

Title: Technical Director/Representative

Date: 08/06/19

ORGANICS

VOLATILES

Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-01
 Client ID: HA19-2(OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/26/19 10:00
 Date Received: 07/26/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 07/29/19 20:24
 Analyst: NLK

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: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-01

Date Collected: 07/26/19 10:00

Client ID: HA19-2(OW)

Date Received: 07/26/19

Sample Location: WORCESTER, 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	96		60-140
Fluorobenzene	94		60-140
4-Bromofluorobenzene	100		60-140

Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-01
 Client ID: HA19-2(OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/26/19 10:00
 Date Received: 07/26/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1-SIM
 Analytical Date: 07/29/19 20:24
 Analyst: NLK

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

1,4-Dioxane	ND		ug/l	50	--	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	98		60-140
4-Bromofluorobenzene	95		60-140

Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-01
 Client ID: HA19-2(OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/26/19 10:00
 Date Received: 07/26/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 14,504.1
 Analytical Date: 08/05/19 23:03
 Analyst: AWS

Extraction Method: EPA 504.1
 Extraction Date: 08/05/19 11:50

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: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 07/29/19 17:29
 Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1266317-4					
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: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 128,624.1
Analytical Date: 07/29/19 17:29
Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1266317-4					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	87		60-140
Fluorobenzene	91		60-140
4-Bromofluorobenzene	99		60-140

Project Name: POLAR PARK**Project Number:** 4325.03**Lab Number:** L1933226**Report Date:** 08/06/19**Method Blank Analysis**
Batch Quality Control

Analytical Method: 128,624.1-SIM

Analytical Date: 07/29/19 17:29

Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1266333-4					
1,4-Dioxane	ND		ug/l	50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Fluorobenzene	95		60-140
4-Bromofluorobenzene	96		60-140

Project Name: POLAR PARK**Project Number:** 4325.03**Lab Number:** L1933226**Report Date:** 08/06/19**Method Blank Analysis**
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 08/05/19 22:47
Analyst: AWS

Extraction Method: EPA 504.1
Extraction Date: 08/05/19 11:50

Parameter	Result	Qualifier	Units	RL	MDL
Microextractables by GC - Westborough Lab for sample(s): 01 Batch: WG1268692-1					
1,2-Dibromoethane	ND		ug/l	0.010	-- A

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

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: WG1266317-3								
Methylene chloride	100		-		60-140	-		28
1,1-Dichloroethane	85		-		50-150	-		49
Carbon tetrachloride	85		-		70-130	-		41
1,1,2-Trichloroethane	95		-		70-130	-		45
Tetrachloroethene	95		-		70-130	-		39
1,2-Dichloroethane	80		-		70-130	-		49
1,1,1-Trichloroethane	105		-		70-130	-		36
Benzene	80		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	105		-		60-140	-		63
Vinyl chloride	90		-		5-195	-		66
1,1-Dichloroethene	105		-		50-150	-		32
cis-1,2-Dichloroethene	100		-		60-140	-		30
Trichloroethene	85		-		65-135	-		48
1,2-Dichlorobenzene	105		-		65-135	-		57
1,3-Dichlorobenzene	100		-		70-130	-		43
1,4-Dichlorobenzene	100		-		65-135	-		57
p/m-Xylene	102		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Acetone	92		-		40-160	-		30
Methyl tert butyl ether	95		-		60-140	-		30
Tert-Butyl Alcohol	100		-		60-140	-		30
Tertiary-Amyl Methyl Ether	65		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1266317-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	98				60-140
Fluorobenzene	84				60-140
4-Bromofluorobenzene	99				60-140

Lab Control Sample Analysis**Batch Quality Control****Project Name:** POLAR PARK**Project Number:** 4325.03**Lab Number:** L1933226**Report Date:** 08/06/19

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: WG1266333-3								
1,4-Dioxane	110		-		60-140	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Fluorobenzene	87				60-140
4-Bromofluorobenzene	93				60-140

Lab Control Sample Analysis
Batch Quality Control**Project Name:** POLAR PARK**Project Number:** 4325.03**Lab Number:** L1933226**Report Date:** 08/06/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab Associated sample(s): 01 Batch: WG1268692-2									
1,2-Dibromoethane	114		-		80-120	-			A

Matrix Spike Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>	<i>Column</i>
Microextractables by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1268692-3 QC Sample: L1932588-02 Client ID: MS Sample													
1,2-Dibromoethane	ND	0.252	0.202	80		-	-		80-120	-		20	A
1,2-Dibromo-3-chloropropane	ND	0.252	0.288	114		-	-		80-120	-		20	A
1,2,3-Trichloropropane	ND	0.252	0.250	99		-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-01
 Client ID: HA19-2(OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/26/19 10:00
 Date Received: 07/26/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 08/02/19 13:04
 Analyst: ALS

Extraction Method: EPA 625.1
 Extraction Date: 08/01/19 07:41

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--	1
Butyl benzyl phthalate	ND		ug/l	4.9	--	1
Di-n-butylphthalate	ND		ug/l	4.9	--	1
Di-n-octylphthalate	ND		ug/l	4.9	--	1
Diethyl phthalate	ND		ug/l	4.9	--	1
Dimethyl phthalate	ND		ug/l	4.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	92		42-122
2-Fluorobiphenyl	75		46-121
4-Terphenyl-d14	96		47-138

Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-01
 Client ID: HA19-2(OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/26/19 10:00
 Date Received: 07/26/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1-SIM
 Analytical Date: 08/01/19 23:47
 Analyst: DV

Extraction Method: EPA 625.1
 Extraction Date: 08/01/19 07:43

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
Fluoranthene	ND		ug/l	0.10	--	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
Pentachlorophenol	ND		ug/l	0.98	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	47		25-87
Phenol-d6	32		16-65
Nitrobenzene-d5	90		42-122
2-Fluorobiphenyl	87		46-121
2,4,6-Tribromophenol	83		45-128
4-Terphenyl-d14	84		47-138

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 08/02/19 12:14
 Analyst: CB

Extraction Method: EPA 625.1
 Extraction Date: 07/31/19 15:40

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1266979-1					
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
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	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	97		42-122
2-Fluorobiphenyl	81		46-121
4-Terphenyl-d14	97		47-138

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1-SIM
Analytical Date: 08/01/19 22:24
Analyst: DV

Extraction Method: EPA 625.1
Extraction Date: 08/01/19 05:33

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1267211-1					
Acenaphthene	ND		ug/l	0.10	--
Fluoranthene	ND		ug/l	0.10	--
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	--
Pentachlorophenol	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	59		25-87
Phenol-d6	45		16-65
Nitrobenzene-d5	89		42-122
2-Fluorobiphenyl	82		46-121
2,4,6-Tribromophenol	78		45-128
4-Terphenyl-d14	89		47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

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: WG1266979-3								
Bis(2-ethylhexyl)phthalate	106		-		29-137	-		82
Butyl benzyl phthalate	96		-		1-140	-		60
Di-n-butylphthalate	99		-		8-120	-		47
Di-n-octylphthalate	104		-		19-132	-		69
Diethyl phthalate	90		-		1-120	-		100
Dimethyl phthalate	81		-		1-120	-		183

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	92				42-122
2-Fluorobiphenyl	76				46-121
4-Terphenyl-d14	92				47-138

Lab Control Sample Analysis Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

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: WG1267211-2								
Acenaphthene	81		-		60-132	-		30
Fluoranthene	94		-		43-121	-		30
Naphthalene	82		-		36-120	-		30
Benzo(a)anthracene	98		-		42-133	-		30
Benzo(a)pyrene	94		-		32-148	-		30
Benzo(b)fluoranthene	89		-		42-140	-		30
Benzo(k)fluoranthene	88		-		25-146	-		30
Chrysene	90		-		44-140	-		30
Acenaphthylene	86		-		54-126	-		30
Anthracene	99		-		43-120	-		30
Benzo(ghi)perylene	94		-		1-195	-		30
Fluorene	84		-		70-120	-		30
Phenanthrene	92		-		65-120	-		30
Dibenzo(a,h)anthracene	96		-		1-200	-		30
Indeno(1,2,3-cd)pyrene	93		-		1-151	-		30
Pyrene	93		-		70-120	-		30
Pentachlorophenol	75		-		38-152	-		30

Lab Control Sample Analysis**Batch Quality Control****Project Name:** POLAR PARK**Project Number:** 4325.03**Lab Number:** L1933226**Report Date:** 08/06/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01 Batch: WG1267211-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	63				25-87
Phenol-d6	50				16-65
Nitrobenzene-d5	95				42-122
2-Fluorobiphenyl	86				46-121
2,4,6-Tribromophenol	82				45-128
4-Terphenyl-d14	86				47-138

PCBS

Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-01
 Client ID: HA19-2(OW)
 Sample Location: WORCESTER, MA

Date Collected: 07/26/19 10:00
 Date Received: 07/26/19
 Field Prep: Refer to COC

Sample Depth:

Matrix: Water
 Analytical Method: 127,608.3
 Analytical Date: 08/04/19 15:57
 Analyst: WR

Extraction Method: EPA 608.3
 Extraction Date: 08/01/19 08:07
 Cleanup Method: EPA 3665A
 Cleanup Date: 08/01/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 08/01/19

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	42		37-123	B
Decachlorobiphenyl	41		38-114	B
2,4,5,6-Tetrachloro-m-xylene	43		37-123	A
Decachlorobiphenyl	40		38-114	A

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 127,608.3
 Analytical Date: 08/04/19 14:55
 Analyst: WR

Extraction Method: EPA 608.3
 Extraction Date: 08/01/19 02:56
 Cleanup Method: EPA 3665A
 Cleanup Date: 08/01/19
 Cleanup Method: EPA 3660B
 Cleanup Date: 08/01/19

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1267157-1						
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	61		37-123	B
Decachlorobiphenyl	83		38-114	B
2,4,5,6-Tetrachloro-m-xylene	63		37-123	A
Decachlorobiphenyl	75		38-114	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

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: WG1267157-2									
Aroclor 1016	78		-		50-140	-		36	A
Aroclor 1260	83		-		8-140	-		38	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75				37-123	B
Decachlorobiphenyl	89				38-114	B
2,4,5,6-Tetrachloro-m-xylene	77				37-123	A
Decachlorobiphenyl	84				38-114	A

METALS

Project Name: POLAR PARK

Lab Number: L1933226

Project Number: 4325.03

Report Date: 08/06/19

SAMPLE RESULTS

Lab ID: L1933226-01

Date Collected: 07/26/19 10:00

Client ID: HA19-2(OW)

Date Received: 07/26/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Arsenic, Total	0.05242		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Chromium, Total	0.00378		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Copper, Total	0.00347		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Iron, Total	2.40		mg/l	0.050	--	1	07/29/19 20:55	07/30/19 13:16	EPA 3005A	19,200.7	AB
Lead, Total	0.00109		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	07/30/19 15:22	07/30/19 20:03	EPA 245.1	3,245.1	EA
Nickel, Total	0.00237		mg/l	0.00200	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Zinc, Total	0.01266		mg/l	0.01000	--	1	07/29/19 20:55	07/30/19 20:47	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	401		mg/l	0.660	NA	1	07/29/19 20:55	07/30/19 13:16	EPA 3005A	19,200.7	AB

General Chemistry - Mansfield Lab

Chromium, Trivalent	ND		mg/l	0.010	--	1		07/30/19 20:47	NA	107,-	
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Dissolved Metals - Mansfield Lab

Antimony, Dissolved	ND		mg/l	0.0040	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0494		mg/l	0.0010	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0010	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Iron, Dissolved	0.162		mg/l	0.050	--	1	07/30/19 15:30	07/30/19 22:05	EPA 3005A	19,200.7	AB
Lead, Dissolved	ND		mg/l	0.0010	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	07/31/19 11:07	07/31/19 19:59	EPA 245.1	3,245.1	EA



Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-01

Date Collected: 07/26/19 10:00

Client ID: HA19-2(OW)

Date Received: 07/26/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Nickel, Dissolved	ND		mg/l	0.0020	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	07/30/19 15:30	07/31/19 01:52	EPA 3005A	3,200.8	AM



Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**SAMPLE RESULTS**

Lab ID: L1933226-02

Date Collected: 07/26/19 11:20

Client ID: MIDDLE RIVER

Date Received: 07/26/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/l	0.00400	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Arsenic, Total	0.01716		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00066		mg/l	0.00020	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Chromium, Total	0.00563		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Copper, Total	0.01731		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Iron, Total	4.97		mg/l	0.050	--	1	07/29/19 20:55	07/30/19 13:20	EPA 3005A	19,200.7	AB
Lead, Total	0.02532		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	07/30/19 15:22	07/30/19 20:05	EPA 245.1	3,245.1	EA
Nickel, Total	0.00438		mg/l	0.00200	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Zinc, Total	0.05755		mg/l	0.01000	--	1	07/29/19 20:55	07/30/19 20:51	EPA 3005A	3,200.8	AM
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	56.6		mg/l	0.660	NA	1	07/29/19 20:55	07/30/19 13:20	EPA 3005A	19,200.7	AB



Project Name: POLAR PARK

Lab Number: L1933226

Project Number: 4325.03

Report Date: 08/06/19

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: WG1265972-1										
Iron, Total	ND		mg/l	0.050	--	1	07/29/19 20:55	07/30/19 10:58	19,200.7	AB

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: WG1265972-1										
Hardness	ND		mg/l	0.660	NA	1	07/29/19 20:55	07/30/19 10:58	19,200.7	AB

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: WG1265975-1										
Antimony, Total	ND		mg/l	0.00400	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	07/29/19 20:55	07/30/19 19:03	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Project Name: POLAR PARK

Lab Number: L1933226

Project Number: 4325.03

Report Date: 08/06/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01 Batch: WG1266359-1										
Iron, Dissolved	ND		mg/l	0.050	--	1	07/30/19 15:30	07/30/19 20:49	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01 Batch: WG1266361-1										
Antimony, Dissolved	ND		mg/l	0.0040	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0010	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Lead, Dissolved	ND		mg/l	0.0010	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	07/30/19 15:30	07/31/19 02:13	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	07/30/19 15:30	07/31/19 02:13	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: WG1266382-1										
Mercury, Total	ND		mg/l	0.00020	--	1	07/30/19 15:22	07/30/19 19:30	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1



Project Name: POLAR PARK

Lab Number: L1933226

Project Number: 4325.03

Report Date: 08/06/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01 Batch: WG1266803-1										
Mercury, Dissolved	ND		mg/l	0.00020	--	1	07/31/19 11:07	07/31/19 19:38	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1265972-2								
Iron, Total	104		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 Batch: WG1265972-2								
Hardness	100		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1265975-2								
Antimony, Total	92		-		85-115	-		
Arsenic, Total	102		-		85-115	-		
Cadmium, Total	106		-		85-115	-		
Chromium, Total	99		-		85-115	-		
Copper, Total	96		-		85-115	-		
Lead, Total	103		-		85-115	-		
Nickel, Total	103		-		85-115	-		
Selenium, Total	103		-		85-115	-		
Silver, Total	102		-		85-115	-		
Zinc, Total	101		-		85-115	-		
Dissolved Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1266359-2								
Iron, Dissolved	105		-		85-115	-		

Lab Control Sample Analysis Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1266361-2					
Antimony, Dissolved	91	-	85-115	-	
Arsenic, Dissolved	98	-	85-115	-	
Cadmium, Dissolved	101	-	85-115	-	
Chromium, Dissolved	99	-	85-115	-	
Copper, Dissolved	95	-	85-115	-	
Lead, Dissolved	102	-	85-115	-	
Nickel, Dissolved	103	-	85-115	-	
Selenium, Dissolved	107	-	85-115	-	
Silver, Dissolved	98	-	85-115	-	
Zinc, Dissolved	102	-	85-115	-	
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1266382-2					
Mercury, Total	99	-	85-115	-	
Dissolved Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1266803-2					
Mercury, Dissolved	112	-	85-115	-	

Matrix Spike Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

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: WG1265972-3			QC Sample: L1933079-01			Client ID: MS Sample			
Iron, Total	1.59	1	2.48	89		-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02			QC Batch ID: WG1265972-3			QC Sample: L1933079-01			Client ID: MS Sample			
Hardness	271	66.2	318	71	Q	-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02			QC Batch ID: WG1265972-7			QC Sample: L1932366-01			Client ID: MS Sample			
Iron, Total	41.8	1	39.1	0	Q	-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02			QC Batch ID: WG1265972-7			QC Sample: L1932366-01			Client ID: MS Sample			
Hardness	198	66.2	254	85		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02			QC Batch ID: WG1265975-3			QC Sample: L1933079-01			Client ID: MS Sample			
Antimony, Total	ND	0.5	0.4657	93		-	-		70-130	-		20
Arsenic, Total	0.01481	0.12	0.1272	94		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05102	100		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1915	96		-	-		70-130	-		20
Copper, Total	0.3476	0.25	0.5670	88		-	-		70-130	-		20
Lead, Total	0.02179	0.51	0.5344	100		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4697	94		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1118	93		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04714	94		-	-		70-130	-		20
Zinc, Total	0.6190	0.5	1.093	95		-	-		70-130	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

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): 01-02			QC Batch ID: WG1265975-5		QC Sample: L1932366-01		Client ID: MS Sample		
Antimony, Total	ND	0.5	0.3547	71	-	-	70-130	-	20
Arsenic, Total	0.01943	0.12	0.1217	85	-	-	70-130	-	20
Cadmium, Total	0.00036	0.051	0.05106	99	-	-	70-130	-	20
Chromium, Total	0.03955	0.2	0.2198	90	-	-	70-130	-	20
Copper, Total	0.03196	0.25	0.2541	89	-	-	70-130	-	20
Lead, Total	0.04701	0.51	0.5381	96	-	-	70-130	-	20
Nickel, Total	0.0348	0.5	0.5006	93	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.09829	82	-	-	70-130	-	20
Silver, Total	ND	0.05	0.04687	94	-	-	70-130	-	20
Zinc, Total	0.1324	0.5	0.5916	92	-	-	70-130	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01			QC Batch ID: WG1266359-3		QC Sample: L1932366-01		Client ID: MS Sample		
Iron, Dissolved	1.25	1	2.40	115	-	-	75-125	-	20

Matrix Spike Analysis **Batch Quality Control**

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1266361-3 QC Sample: L1932366-01 Client ID: MS Sample									
Antimony, Dissolved	ND	0.5	0.6026	120	-	-	70-130	-	20
Arsenic, Dissolved	0.0033	0.12	0.1351	110	-	-	70-130	-	20
Cadmium, Dissolved	ND	0.051	0.0564	110	-	-	70-130	-	20
Chromium, Dissolved	ND	0.2	0.2132	107	-	-	70-130	-	20
Copper, Dissolved	ND	0.25	0.2603	104	-	-	70-130	-	20
Lead, Dissolved	ND	0.51	0.5630	110	-	-	70-130	-	20
Nickel, Dissolved	0.0033	0.5	0.5399	107	-	-	70-130	-	20
Selenium, Dissolved	ND	0.12	0.1413	118	-	-	70-130	-	20
Silver, Dissolved	ND	0.05	0.0519	104	-	-	70-130	-	20
Zinc, Dissolved	ND	0.5	0.5618	112	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1266382-3 QC Sample: L1933582-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.00457	91	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1266382-5 QC Sample: L1933582-02 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.00472	94	-	-	70-130	-	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1266803-3 QC Sample: L1932366-02 Client ID: MS Sample									
Mercury, Dissolved	ND	0.005	0.00344	69	Q	-	75-125	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1265972-4 QC Sample: L1933079-01 Client ID: DUP Sample						
Iron, Total	1.59	1.55	mg/l	3		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1265972-8 QC Sample: L1932366-01 Client ID: DUP Sample						
Iron, Total	41.8	39.1	mg/l	7		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1265972-8 QC Sample: L1932366-01 Client ID: DUP Sample						
Hardness	198	194	mg/l	2		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1265975-4 QC Sample: L1933079-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.01481	0.01555	mg/l	5		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	0.3476	0.3461	mg/l	0		20
Lead, Total	0.02179	0.02179	mg/l	0		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	0.6190	0.6297	mg/l	2		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1265975-6 QC Sample: L1932366-01 Client ID: DUP Sample					
Arsenic, Total	0.01943	0.01782	mg/l	9	20
Cadmium, Total	0.00036	0.00028	mg/l	26	20
Chromium, Total	0.03955	0.03498	mg/l	12	20
Copper, Total	0.03196	0.02986	mg/l	7	20
Lead, Total	0.04701	0.04452	mg/l	5	20
Selenium, Total	ND	ND	mg/l	NC	20
Silver, Total	ND	ND	mg/l	NC	20
Zinc, Total	0.1324	0.1225	mg/l	8	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1266359-4 QC Sample: L1932366-01 Client ID: DUP Sample					
Iron, Dissolved	1.25	1.27	mg/l	2	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1266361-4 QC Sample: L1932366-01 Client ID: DUP Sample					
Arsenic, Dissolved	0.0033	0.0029	mg/l	11	20
Cadmium, Dissolved	ND	ND	mg/l	NC	20
Chromium, Dissolved	ND	ND	mg/l	NC	20
Copper, Dissolved	ND	ND	mg/l	NC	20
Lead, Dissolved	ND	ND	mg/l	NC	20
Selenium, Dissolved	ND	ND	mg/l	NC	20
Silver, Dissolved	ND	ND	mg/l	NC	20
Zinc, Dissolved	ND	ND	mg/l	NC	20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1266382-4 QC Sample: L1933582-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1266382-6 QC Sample: L1933582-02 Client ID: DUP Sample					
Mercury, Total	ND	0.00020	mg/l	NC	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1266803-4 QC Sample: L1932366-02 Client ID: DUP Sample					
Mercury, Dissolved	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

SAMPLE RESULTS

Lab ID: L1933226-01

Client ID: HA19-2(OW)

Sample Location: WORCESTER, MA

Date Collected: 07/26/19 10:00

Date Received: 07/26/19

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	140		mg/l	10	NA	2	-	07/29/19 13:50	121,2540D	DR
Cyanide, Total	ND		mg/l	0.005	--	1	07/29/19 16:45	07/30/19 11:43	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/26/19 23:38	121,4500CL-D	AS
pH (H)	7.5		SU	-	NA	1	-	07/26/19 22:58	121,4500H+-B	AS
Nitrogen, Ammonia	0.089		mg/l	0.075	--	1	07/27/19 14:42	07/29/19 20:30	121,4500NH3-BH	ML
Sulfate	100		mg/l	50	--	5	07/29/19 12:01	07/29/19 12:01	121,4500SO4-E	BR
TPH, SGT-HEM	ND		mg/l	4.00	--	1	07/30/19 16:00	07/30/19 21:25	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	07/30/19 05:52	07/30/19 10:45	4,420.1	BR
Chromium, Hexavalent	ND		mg/l	0.010	--	1	07/27/19 05:00	07/27/19 05:54	1,7196A	JW
Anions by Ion Chromatography - Westborough Lab										
Chloride	191.		mg/l	5.00	--	10	-	07/30/19 05:23	44,300.0	AT



Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

SAMPLE RESULTS

Lab ID: L1933226-02

Client ID: MIDDLE RIVER

Sample Location: WORCESTER, MA

Date Collected: 07/26/19 11:20

Date Received: 07/26/19

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										
pH (H)	7.5		SU	-	NA	1	-	07/26/19 22:58	121,4500H+-B	AS
Nitrogen, Ammonia	0.125		mg/l	0.075	--	1	07/27/19 14:42	07/29/19 20:31	121,4500NH3-BH	ML



Project Name: POLAR PARK

Lab Number: L1933226

Project Number: 4325.03

Report Date: 08/06/19

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: WG1265241-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	07/26/19 23:38	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1265285-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	07/27/19 05:00	07/27/19 05:49	1,7196A	JW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1265399-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	07/27/19 14:42	07/29/19 19:56	121,4500NH3-BH	ML
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1265722-1										
Sulfate	ND		mg/l	10	--	1	07/29/19 12:01	07/29/19 12:01	121,4500SO4-E	BR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1265749-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	07/29/19 13:50	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1265787-1										
Cyanide, Total	ND		mg/l	0.005	--	1	07/29/19 16:45	07/30/19 11:18	121,4500CN-CE	LH
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1266101-1										
Chloride	ND		mg/l	0.500	--	1	-	07/30/19 02:46	44,300.0	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1266135-1										
Phenolics, Total	ND		mg/l	0.030	--	1	07/30/19 05:52	07/30/19 10:42	4,420.1	BR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1266423-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	07/30/19 16:00	07/30/19 21:25	74,1664A	ML

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1265236-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1265241-2								
Chlorine, Total Residual	92		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1265285-2								
Chromium, Hexavalent	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1265399-2								
Nitrogen, Ammonia	92		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1265722-2								
Sulfate	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1265787-2								
Cyanide, Total	98		-		90-110	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG1266101-2								
Chloride	104		-		90-110	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1266135-2					
Phenolics, Total	86	-	70-130	-	
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1266423-2					
TPH	93	-	64-132	-	34

Matrix Spike Analysis **Batch Quality Control**

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1933226

Report Date: 08/06/19

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: WG1265241-4 QC Sample: L1933226-01 Client ID: HA19-2(OW)												
Chlorine, Total Residual	ND	0.25	0.26	104		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1265285-4 QC Sample: L1933226-01 Client ID: HA19-2(OW)												
Chromium, Hexavalent	ND	0.1	0.099	99		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1265399-4 QC Sample: L1932925-02 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.56	89		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1265722-4 QC Sample: L1932442-01 Client ID: MS Sample												
Sulfate	32	50	81	98		-	-		55-147	-		14
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1265787-4 QC Sample: L1932955-04 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.179	90		-	-		90-110	-		30
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1266101-3 QC Sample: L1933582-01 Client ID: MS Sample												
Chloride	1060	200	1210	74	Q	-	-		90-110	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1266135-4 QC Sample: L1933226-01 Client ID: HA19-2(OW)												
Phenolics, Total	ND	0.4	0.34	84		-	-		70-130	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1266423-4 QC Sample: L1932796-06 Client ID: MS Sample												
TPH	ND	20	15.6	78		-	-		64-132	-		34

Lab Duplicate Analysis

Batch Quality Control

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1265236-2 QC Sample: L1931592-03 Client ID: DUP Sample						
pH	2.9	3.0	SU	3		5
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1265241-3 QC Sample: L1933226-01 Client ID: HA19-2(OW)						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1265285-3 QC Sample: L1933226-01 Client ID: HA19-2(OW)						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1265399-3 QC Sample: L1932925-02 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1265722-3 QC Sample: L1932442-01 Client ID: DUP Sample						
Sulfate	32	31	mg/l	3		14
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1265749-2 QC Sample: L1933201-01 Client ID: DUP Sample						
Solids, Total Suspended	56	55	mg/l	2		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1265787-3 QC Sample: L1932955-02 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1266101-4 QC Sample: L1933582-01 Client ID: DUP Sample						
Chloride	1060	1070	mg/l	1		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1266135-3 QC Sample: L1933226-01 Client ID: HA19-2(OW)						
Phenolics, Total	ND	ND	mg/l	NC		20

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** POLAR PARK**Project Number:** 4325.03**Lab Number:** L1933226**Report Date:** 08/06/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1266423-3 QC Sample: L1933582-02 Client ID: DUP Sample					
TPH	ND	ND	mg/l	NC	34

Project Name: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1933226-01A	Vial Na2S2O3 preserved	A	NA		2.6	Y	Absent		504(14)
L1933226-01B	Vial Na2S2O3 preserved	A	NA		2.6	Y	Absent		504(14)
L1933226-01C	Vial Na2S2O3 preserved	A	NA		2.6	Y	Absent		504(14)
L1933226-01D	Vial Na2S2O3 preserved	A	NA		2.6	Y	Absent		504(14)
L1933226-01E	Vial Na2S2O3 preserved	A	NA		2.6	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1933226-01F	Vial Na2S2O3 preserved	A	NA		2.6	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1933226-01G	Vial Na2S2O3 preserved	A	NA		2.6	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1933226-01H	Vial Na2S2O3 preserved	A	NA		2.6	Y	Absent		624.1-RGP(7),624.1-SIM-RGP(7)
L1933226-01I	Vial HCl preserved	A	NA		2.6	Y	Absent		HOLD-SUB()
L1933226-01J	Vial HCl preserved	A	NA		2.6	Y	Absent		HOLD-SUB()
L1933226-01K	Vial HCl preserved	A	NA		2.6	Y	Absent		HOLD-SUB()
L1933226-01L	Plastic 250ml NaOH preserved	B	>12	>12	2.9	Y	Absent		TCN-4500(14)
L1933226-01M	Plastic 250ml HNO3 preserved	B	<2	<2	2.9	Y	Absent		AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)
L1933226-01N	Plastic 250ml HNO3 preserved	B	<2	<2	2.9	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1933226-01O	Plastic 500ml H2SO4 preserved	B	<2	<2	2.9	Y	Absent		NH3-4500(28)
L1933226-01P	Plastic 950ml unpreserved	B	7	7	2.9	Y	Absent		SO4-4500(28),CL-300(28),HEXCR-7196(1),TRC-4500(1),PH-4500(.01)
L1933226-01Q	Plastic 950ml unpreserved	B	7	7	2.9	Y	Absent		TSS-2540(7)
L1933226-01R	Amber 950ml H2SO4 preserved	B	<2	<2	2.9	Y	Absent		TPHENOL-420(28)

Project Name: POLAR PARK
Project Number: 4325.03

Serial_No:08061914:12
Lab Number: L1933226
Report Date: 08/06/19

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1933226-01S	Amber 1000ml HCl preserved	A	NA		2.6	Y	Absent		TPH-1664(28)
L1933226-01T	Amber 1000ml HCl preserved	A	NA		2.6	Y	Absent		TPH-1664(28)
L1933226-01U	Amber 1000ml Na2S2O3	A	7	7	2.6	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1933226-01V	Amber 1000ml Na2S2O3	A	7	7	2.6	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1933226-01W	Amber 1000ml Na2S2O3	A	7	7	2.6	Y	Absent		625.1-RGP(7),625.1-SIM-RGP(7)
L1933226-01X	Amber 1000ml Na2S2O3	A	7	7	2.6	Y	Absent		PCB-608.3(7)
L1933226-01Y	Amber 1000ml Na2S2O3	A	7	7	2.6	Y	Absent		PCB-608.3(7)
L1933226-01Z	Amber 1000ml Na2S2O3	A	7	7	2.6	Y	Absent		PCB-608.3(7)
L1933226-02A	Plastic 250ml HNO3 preserved	A	<2	<2	2.6	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1933226-02A1	Plastic 250ml HNO3 preserved	A	<2	<2	2.6	Y	Absent		CD-2008T(180),NI-2008T(180),ZN-2008T(180),CU-2008T(180),FE-UI(180),HARDU(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180)
L1933226-02B	Plastic 500ml H2SO4 preserved	A	<2	<2	2.6	Y	Absent		NH3-4500(28)
L1933226-02B1	Plastic 500ml H2SO4 preserved	A	<2	<2	2.6	Y	Absent		NH3-4500(28)
L1933226-02C	Plastic 60ml unpreserved	A	7	7	2.6	Y	Absent		PH-4500(.01)
L1933226-02C1	Plastic 60ml unpreserved	A	7	7	2.6	Y	Absent		PH-4500(.01)

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

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: POLAR PARK
Project Number: 4325.03

Lab Number: L1933226
Report Date: 08/06/19

- 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.

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.

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 Condensation Product".
- 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 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: POLAR PARK**Lab Number:** L1933226**Project Number:** 4325.03**Report Date:** 08/06/19

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 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

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.

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

PAGE 1 OF 1

Date Rec'd in Lab: 7/26/19

ALPHA Job #: L1933226

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: Sanborn Head
Address: 1 Technology Park Dr
Westford, MA 01886
Phone: 978-577-1003

Email: Kwalker@Sanbornhead.com

Additional Project Information:

*RGP metals include As, Cd, Cr, Cu, Ni, Pb, Se, Zn, Fe, Hg
HexCr, TrCr

- * NPDES RGP minimum levels must be met

Project Information

Project Name: Polar Park

Project Location: Worcester, MA

Project #: 4325.03

Project Manager: Kent Walker

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due:

Report Information - Data Deliverables

<input checked="" type="checkbox"/> ADEx	<input checked="" type="checkbox"/> EMAIL
--	---

Billing Information

<input checked="" type="checkbox"/> Same as Client info	PO #:
---	-------

Regulatory Requirements & Project Information Requirements

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

ANALYSIS		SAMPLE INFO	
VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 824 <input type="checkbox"/> 524.2		Filtration	
SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH		<input checked="" type="checkbox"/> Field	
METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15		<input type="checkbox"/> Lab to do	
METALS: <input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PP13		Preservation	
EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only		<input type="checkbox"/> Lab to do	
VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only			
<input type="checkbox"/> PCB <input type="checkbox"/> PEST			
TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint			
NPDES RGP Package			
Total + Dissolved Metals *			
pH, Sulfate, Hardness			
Ammonia, pH, Hardness			
Total Metals *			
E Hg and I			
Sample Comments			

TOTAL # BOTTLES

[illegible]

Container Type

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

Preservative

A = None
B = HCl
C = HNO₃
D = H₂SO₄
E = NaOH
F = MeOH
G = NaHSO₄
H = Na₂S₂O₃
I = Ascorbic Acid
J = NH₄Cl
K = Zn Acetate
O = Other

Container Type

Preservative

Relinquished By:

Date/Time

Received By:

Date/Time

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

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



ANALYTICAL REPORT

Lab Number:	L1935655
Client:	Sanborn, Head & Associates, Inc. 1 Technology Park Drive Westford, MA 01886
ATTN:	Kent Walker
Phone:	(978) 577-1003
Project Name:	POLAR PARK
Project Number:	4325.03
Report Date:	08/15/19

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

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

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



Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1935655
Report Date: 08/15/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1935655-01	HA19-6 (OW)	WATER	WORCESTER, MA	08/08/19 15:00	08/08/19

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1935655
Report Date: 08/15/19

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: POLAR PARK
Project Number: 4325.03

Lab Number: L1935655
Report Date: 08/15/19

Case Narrative (continued)

Dissolved Metals

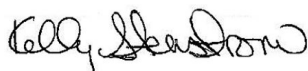
The WG1270623-2 LCS recovery, associated with L1935655-01, is above the acceptance criteria for selenium (124%); however, the associated sample is non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1270623-4 Laboratory Duplicate RPDs for chromium (51%) and copper (21%), performed on L1935655-01, are above the acceptance criteria; however, the sample and duplicate results are less than five times the reporting limit. Therefore, the RPDs are valid.

The WG1270616-4 Laboratory Duplicate RPD for iron (56%), performed on L1935655-01, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

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:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 08/15/19

METALS

Project Name: POLAR PARK**Lab Number:** L1935655**Project Number:** 4325.03**Report Date:** 08/15/19**SAMPLE RESULTS**

Lab ID: L1935655-01

Date Collected: 08/08/19 15:00

Client ID: HA19-6 (OW)

Date Received: 08/08/19

Sample Location: WORCESTER, MA

Field Prep: Refer to COC

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab											
Antimony, Dissolved	ND		mg/l	0.0040	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Arsenic, Dissolved	0.0022		mg/l	0.0010	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Chromium, Dissolved	0.0014		mg/l	0.0010	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Copper, Dissolved	0.0018		mg/l	0.0010	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Iron, Dissolved	0.599		mg/l	0.050	--	1	08/09/19 12:16	08/13/19 15:17	EPA 3005A	19,200.7	LC
Lead, Dissolved	0.0013		mg/l	0.0010	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/13/19 15:50	08/13/19 21:28	EPA 245.1	3,245.1	MG
Nickel, Dissolved	0.0056		mg/l	0.0020	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	08/09/19 12:16	08/12/19 16:57	EPA 3005A	3,200.8	AM



Project Name: POLAR PARK

Lab Number: L1935655

Project Number: 4325.03

Report Date: 08/15/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01 Batch: WG1270616-1										
Iron, Dissolved	ND		mg/l	0.050	--	1	08/09/19 12:16	08/13/19 15:08	19,200.7	LC

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01 Batch: WG1270623-1										
Antimony, Dissolved	ND		mg/l	0.0040	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Arsenic, Dissolved	ND		mg/l	0.0010	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Cadmium, Dissolved	ND		mg/l	0.0002	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Chromium, Dissolved	ND		mg/l	0.0010	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Copper, Dissolved	ND		mg/l	0.0010	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Lead, Dissolved	ND		mg/l	0.0010	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Nickel, Dissolved	ND		mg/l	0.0020	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Selenium, Dissolved	ND		mg/l	0.0050	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Silver, Dissolved	ND		mg/l	0.0004	--	1	08/09/19 12:16	08/12/19 16:23	3,200.8	AM
Zinc, Dissolved	ND		mg/l	0.0100	--	1	08/09/19 12:16	08/12/19 16:23	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
Dissolved Metals - Mansfield Lab for sample(s): 01 Batch: WG1271862-1										
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/13/19 15:50	08/13/19 21:25	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1935655

Report Date: 08/15/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1270616-2								
Iron, Dissolved	110		-		85-115	-		
Dissolved Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1270623-2								
Antimony, Dissolved	101		-		85-115	-		
Arsenic, Dissolved	109		-		85-115	-		
Cadmium, Dissolved	105		-		85-115	-		
Chromium, Dissolved	107		-		85-115	-		
Copper, Dissolved	106		-		85-115	-		
Lead, Dissolved	103		-		85-115	-		
Nickel, Dissolved	104		-		85-115	-		
Selenium, Dissolved	124	Q	-		85-115	-		
Silver, Dissolved	110		-		85-115	-		
Zinc, Dissolved	112		-		85-115	-		
Dissolved Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1271862-2								
Mercury, Dissolved	94		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1935655

Report Date: 08/15/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1270616-3 QC Sample: L1935655-01 Client ID: HA19-6 (OW)												
Iron, Dissolved	0.599	1	1.67	107		-	-		75-125	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1270623-3 QC Sample: L1935655-01 Client ID: HA19-6 (OW)												
Antimony, Dissolved	ND	0.5	0.5095	102		-	-		70-130	-		20
Arsenic, Dissolved	0.0022	0.12	0.1396	114		-	-		70-130	-		20
Cadmium, Dissolved	ND	0.051	0.0587	115		-	-		70-130	-		20
Chromium, Dissolved	0.0014	0.2	0.2078	103		-	-		70-130	-		20
Copper, Dissolved	0.0018	0.25	0.2449	97		-	-		70-130	-		20
Lead, Dissolved	0.0013	0.51	0.6027	118		-	-		70-130	-		20
Nickel, Dissolved	0.0056	0.5	0.4989	99		-	-		70-130	-		20
Selenium, Dissolved	ND	0.12	0.1412	118		-	-		70-130	-		20
Silver, Dissolved	ND	0.05	0.0546	109		-	-		70-130	-		20
Zinc, Dissolved	ND	0.5	0.5424	108		-	-		70-130	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1271862-3 QC Sample: L1935655-01 Client ID: HA19-6 (OW)												
Mercury, Dissolved	ND	0.005	0.00426	85		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: POLAR PARK

Project Number: 4325.03

Lab Number: L1935655

Report Date: 08/15/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1270616-4 QC Sample: L1935655-01 Client ID: HA19-6 (OW)						
Iron, Dissolved	0.599	1.06	mg/l	56	Q	20
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1270623-4 QC Sample: L1935655-01 Client ID: HA19-6 (OW)						
Antimony, Dissolved	ND	ND	mg/l	NC		20
Arsenic, Dissolved	0.0022	0.0026	mg/l	19		20
Cadmium, Dissolved	ND	ND	mg/l	NC		20
Chromium, Dissolved	0.0014	0.0023	mg/l	51	Q	20
Copper, Dissolved	0.0018	0.0022	mg/l	21	Q	20
Lead, Dissolved	0.0013	0.0014	mg/l	12		20
Nickel, Dissolved	0.0056	0.0057	mg/l	2		20
Selenium, Dissolved	ND	ND	mg/l	NC		20
Silver, Dissolved	ND	ND	mg/l	NC		20
Zinc, Dissolved	ND	ND	mg/l	NC		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1271862-4 QC Sample: L1935655-01 Client ID: HA19-6 (OW)						
Mercury, Dissolved	ND	ND	mg/l	NC		20

Project Name: POLAR PARK
Project Number: 4325.03

Serial_No:08151918:09
Lab Number: L1935655
Report Date: 08/15/19

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
---------------------	-----------------------

L1935655-01A	Plastic 250ml HNO3 preserved
--------------	------------------------------

Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal
A	<2	<2	2.6	Y	Absent

Frozen Date/Time

Analysis(*)

AG-2008S(180),CR-2008S(180),FE-RI(180),AS-2008S(180),PB-2008S(180),ZN-2008S(180),NI-2008S(180),SE-2008S(180),CD-2008S(180),CU-2008S(180),SB-2008S(180),HG-R(28)

Project Name: POLAR PARK
Project Number: 4325.03

Lab Number: L1935655
Report Date: 08/15/19

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: POLAR PARK
Project Number: 4325.03

Lab Number: L1935655
Report Date: 08/15/19

- 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.

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.

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 Condensation Product".
- 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 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: POLAR PARK**Lab Number:** L1935655**Project Number:** 4325.03**Report Date:** 08/15/19

REFERENCES

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

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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Certification Information

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

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

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.

PAGE 1 OF 1

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

PLEASE REPORT ALL DISSOLVED NPDES METALS

Date Due:

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

Filtration
☐ Field
☐ Lab to do

Preservation
☐ Lab to do

TOTAL # BOTTLES

SP5

8/8/19 1600

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

APPENDIX E

MUNICIPAL CORRESPONDENCE

MEMORANDUM

From: C. Disenhof & D. DeWolfe
File: 4325.02 and 4325.03
Date: August 27, 2019
Re: Communication with the City of Worcester

At approximately 10:00AM on August 27, 2019, I spoke to Deb Davis with the City of Worcester Department of Public Works & Parks (DPW) regarding requirements for notification to the City or permitting of construction dewatering projects that discharge to a stormwater system. This phone call and memorandum serve as our notification to the owner of the stormwater system to which treated groundwater from the Site may be discharged to under the National Pollution Discharge Elimination System (NPDES) Remediation General Permit (RGP).

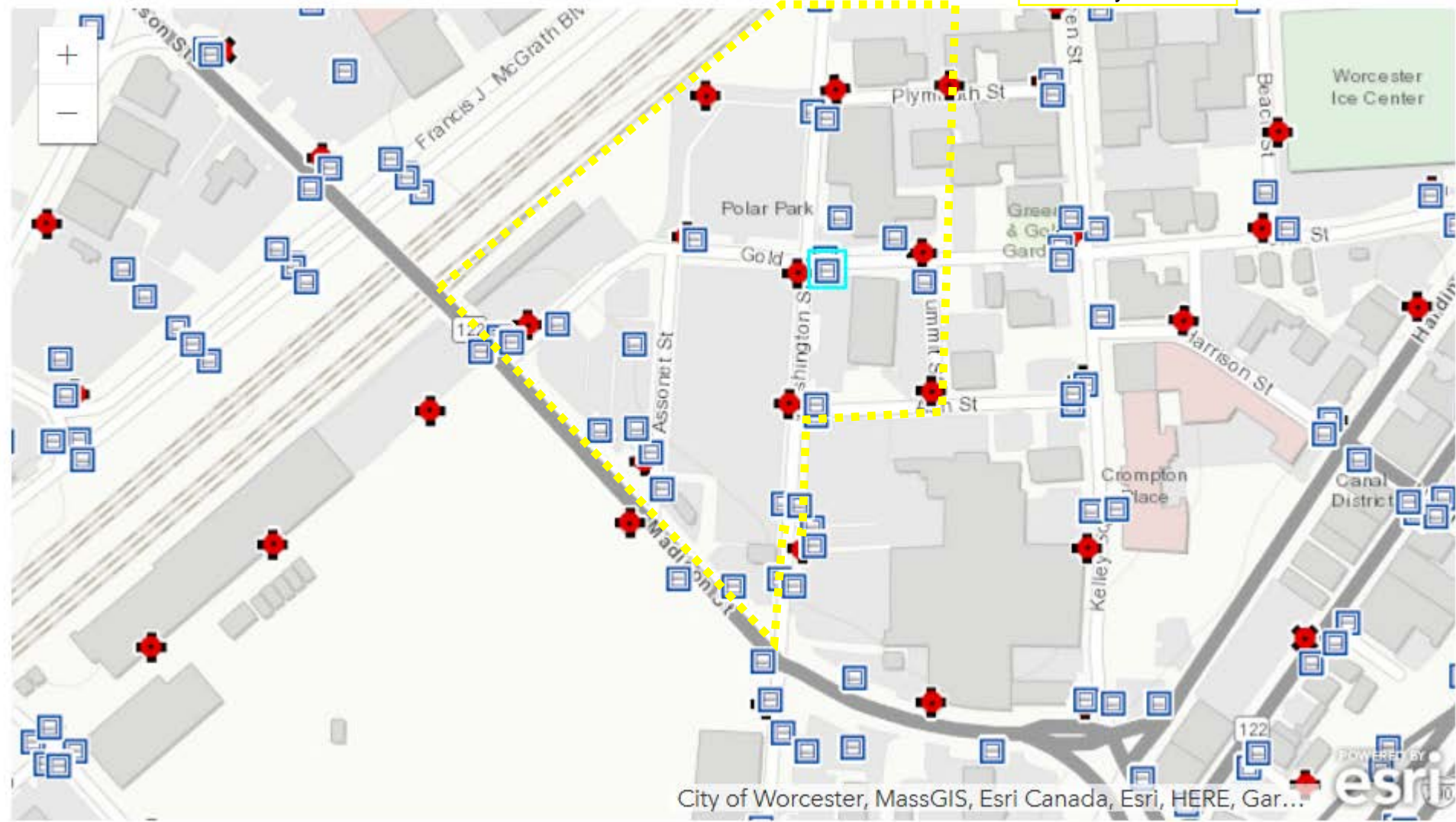
Deb requested a copy of the NPDES permit approval once completed, including the flow rate, treatment system and duration of the project. A copy of the RGP approval letter will be provided to the City upon US Environmental Protection Agency (EPA) approval.

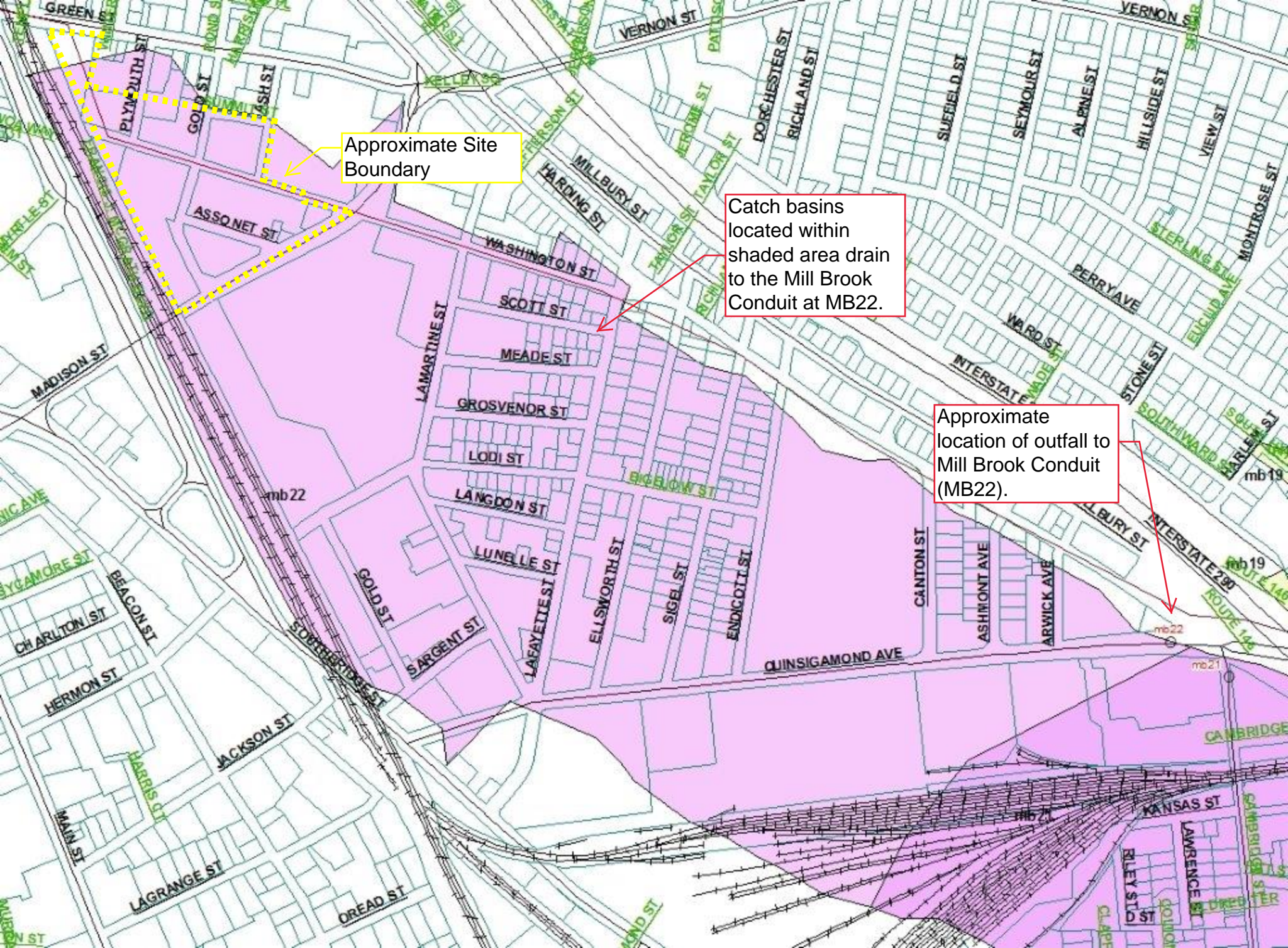
CRD: dmd

P:\4300s\4325.03\Source Files\RGP - Polar Park\App E - Municipal Correspondence\20190827 Memo - Municipal Stormwater Communication.docx

Locate Hydrants  and Catch Basins  in your neighborhood:

Approximate Site Boundary.





Approximate Site Boundary

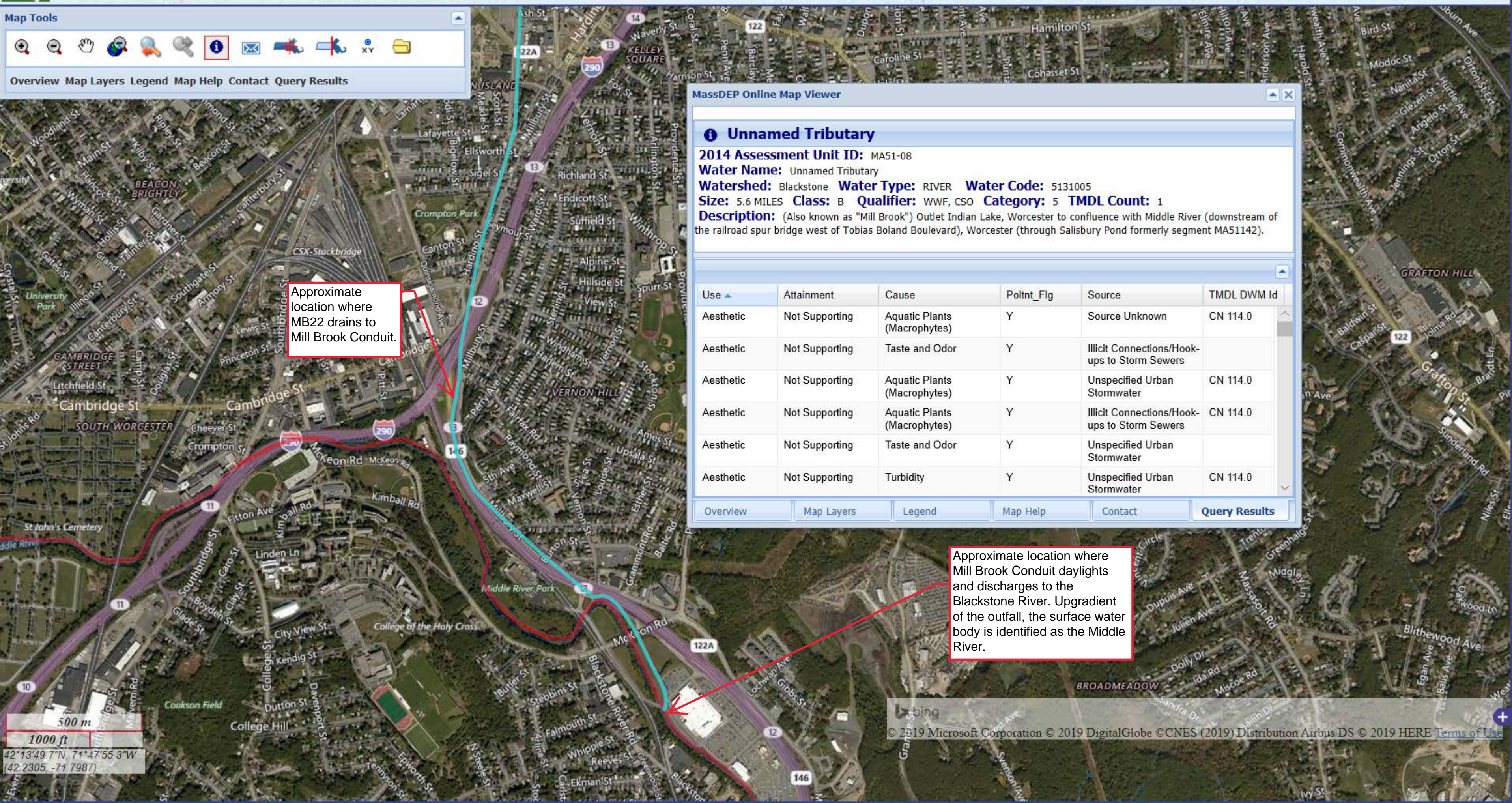
Catch basins located within shaded area drain to the Mill Brook Conduit at MB22.

Approximate location of outfall to Mill Brook Conduit (MB22).

Map Tools



Overview Map Layers Legend Map Help Contact Query Results



Approximate location where MB22 drains to Mill Brook Conduit.

Approximate location where Mill Brook Conduit daylights and discharges to the Blackstone River. Upgradient of the outfall, the surface water body is identified as the Middle River.

MassDEP Online Map Viewer

 **Unnamed Tributary**

2014 Assessment Unit ID: MA51-08

Water Name: Unnamed Tributary

Watershed: Blackstone Water Type: RIVER Water Code: 5131005

Size: 5.6 MILES Class: B Qualifier: WWF, CSO Category: 5 TMDL Count: 1

Description: (Also known as "Mill Brook") Outlet Indian Lake, Worcester to confluence with Middle River (downstream of the railroad spur bridge west of Tobias Boland Boulevard), Worcester (through Salisbury Pond formerly segment MA51142).

Use	Attainment	Cause	Polntn_Flg	Source	TMDL DWM Id
Aesthetic	Not Supporting	Aquatic Plants (Macrophytes)	Y	Source Unknown	CN 114.0
Aesthetic	Not Supporting	Taste and Odor	Y	Illicit Connections/Hook-ups to Storm Sewers	
Aesthetic	Not Supporting	Aquatic Plants (Macrophytes)	Y	Unspecified Urban Stormwater	CN 114.0
Aesthetic	Not Supporting	Aquatic Plants (Macrophytes)	Y	Illicit Connections/Hook-ups to Storm Sewers	CN 114.0
Aesthetic	Not Supporting	Taste and Odor	Y	Unspecified Urban Stormwater	
Aesthetic	Not Supporting	Turbidity	Y	Unspecified Urban Stormwater	CN 114.0

Overview

Map Layers

Legend

Map Help

Contact

Query Results

APPENDIX F

PH CONDITIONER MATERIAL SAFETY DATA SHEET

Appendix F

Additional Information for pH Adjustment

Although pH concentrations measured at the Site have ranged from 6.6 to 7.1 S.U in the baseline RGP groundwater samples, the groundwater may require treatment for elevated pH. In addition, elevated pH may occur from planned site/construction activities (concrete work). The addition of sulfuric acid may be necessary to lower pH concentrations to meet the permit requirements.

A pH adjustment system that is capable of reducing an elevated pH will be implemented if necessary, to meet the permit requirements. The pH adjustment system is designed to reduce an elevated pH with sulfuric acid and includes an automatic metered acid feed system with a mix tank, acid feed pumps and setpoint controls that maintain the pH approved by the permit, usually set between 6.5 and 8.0. The pH is continuously monitored, and the sulfuric acid will only be added if the setpoints are exceeded. The SDS for sulfuric acid is provided in this Appendix. The sulfuric acid will be stored in 55-gallon drums with secondary containment systems in place (overpack drum).

The addition of sulfuric acid as a pH conditioner will not add pollutants in concentrations which exceed permit effluent limitations. The use of sulfuric acid as a pH conditioner will not result in the exceedance of applicable water quality standards. The addition of sulfuric acid as a pH conditioner will not add pollutants that would justify the application of permit conditions that are different from or absent in this permit. The addition of sulfuric acid to control and adjust pH is a standard treatment technique for temporary construction dewatering; it is not expected to exceed applicable permit limitations and water quality standards or alter conditions in the receiving water. No additional testing is considered necessary for use of this product or to demonstrate that use of this product will not adversely affect the receiving water.



Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Revision Date: 05/07/2018

Date of Issue: 05/31/2016

Version: 4.0

SECTION 1: IDENTIFICATION

Product Identifier

Product Form: Mixture

Product Name: Sulfuric Acid, 70-100%

Formula: H₂-O₄-S

Intended Use of the Product

Use Of The Substance/Mixture: Industrial use.

Name, Address, and Telephone of the Responsible Party

Manufacturer

CHEMTRADE LOGISTICS INC.

155 Gordon Baker Road

Suite 300

Toronto, Ontario M2H 3N5

For SDS Info: (416) 496-5856

www.chemtradelogistics.com

Emergency Telephone Number

Emergency Number :

Canada: CANUTEC +1-613-996-6666 / US: CHEMTREC +1-800-424-9300

INTERNATIONAL: +1-703-741-5970

Chemtrade Emergency Contact: (866) 416-4404

For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

GHS Classification

Met. Corr. 1 H290

Skin Corr. 1A H314

Eye Dam. 1 H318

Carc. 1A H350

Aquatic Acute 3 H402

Full text of hazard classes and H-statements : see section 16

Label Elements

GHS Labeling

Hazard Pictograms



Signal Word

: Danger

Hazard Statements

: H290 - May be corrosive to metals.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.
H350 - May cause cancer (Inhalation).
H402 - Harmful to aquatic life.

Precautionary Statements

: P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P234 - Keep only in original container.
P260 - Do not breathe vapors, mist, or spray.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P310 - Immediately call a POISON CENTER or doctor.
P321 - Specific treatment (see section 4 on this SDS).
P363 - Wash contaminated clothing before reuse.
P390 - Absorb spillage to prevent material damage.
P405 - Store locked up.
P406 - Store in corrosive resistant container with a resistant inner liner.
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Other Hazards

Exposure may aggravate pre-existing eye, skin, or respiratory conditions.

Unknown acute toxicity

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	%*	GHS Ingredient Classification
Sulfuric acid**	(CAS-No.) 7664-93-9	70 - 100	Met. Corr. 1, H290 Skin Corr. 1A, H314 Eye Dam. 1, H318 Carc. 1A, H350 Aquatic Acute 3, H402
Water	(CAS-No.) 7732-18-5	0.1 - 30	Not classified

Full text of H-phrases: see section 16

*Percentages are listed in weight by weight percentage (w/w%) for liquid and solid ingredients. Gas ingredients are listed in volume by volume percentage (v/v%).

**Strong inorganic acid aerosols/mists containing this substance are carcinogenic to humans via inhalation. Under normal conditions of use this route of exposure is not expected.

SECTION 4: FIRST AID MEASURES

Description of First-aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

Skin Contact: Remove contaminated clothing. Immediately flush skin with plenty of water for at least 30 minutes. Get immediate medical advice/attention. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

Most Important Symptoms and Effects Both Acute and Delayed

General: Corrosive to eyes, respiratory system and skin. May cause cancer.

Inhalation: May be corrosive to the respiratory tract.

Skin Contact: Causes severe irritation which will progress to chemical burns.

Eye Contact: Causes permanent damage to the cornea, iris, or conjunctiva.

Ingestion: May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Chronic Symptoms: Strong inorganic acid mists containing sulfuric acid are carcinogenic to humans. Prolonged inhalation of fumes or mists may cause erosion of the teeth.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Foam, carbon dioxide, dry chemical.

Unsuitable Extinguishing Media: Do not use water. Do not get water inside containers. Do not apply water stream directly at source of leak.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable.

Explosion Hazard: Product is not explosive.

Reactivity: May be corrosive to metals. Contact with metals may evolve flammable hydrogen gas. May react exothermically with water releasing heat. Adding an acid to a base or base to an acid may cause a violent reaction. This product may act as an oxidizer.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Toxic fumes are released.

Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

Reference to Other Sections

Refer to Section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not get in eyes, on skin, or on clothing. Do not breathe vapor, mist or spray. Do not handle until all safety precautions have been read and understood.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protective equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Ventilate area.

Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment.

Methods and Materials for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. As an immediate precautionary measure, isolate spill or leak area in all directions.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb spillage to prevent material damage. Cautiously neutralize spilled liquid. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Handle empty containers with care because they may still present a hazard. Do not get in eyes, on skin, or on clothing. Do not breathe vapors, mist, spray. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

Additional Hazards When Processed: May be corrosive to metals. May release corrosive vapors. NEVER pour water into this substance; when dissolving or diluting always add it slowly to the water.

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from extremely high or low temperatures and incompatible materials. Store in original container or corrosive resistant and/or lined container.

Incompatible Materials: Combustible materials. Reducing agents. Strong oxidizers. Strong bases. Metals. Water.

Specific End Use(s)

Industrial use.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Sulfuric acid (7664-93-9)		
Mexico	OEL TWA (mg/m ³)	1 mg/m ³
USA ACGIH	ACGIH TWA (mg/m ³)	0.2 mg/m ³ (thoracic particulate matter)
USA ACGIH	ACGIH chemical category	Suspected Human Carcinogen contained in strong inorganic acid mists
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³
USA IDLH	US IDLH (mg/m ³)	15 mg/m ³
Alberta	OEL STEL (mg/m ³)	3 mg/m ³
Alberta	OEL TWA (mg/m ³)	1 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.2 mg/m ³ (Thoracic, contained in strong inorganic acid mists)
Manitoba	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic particulate matter)
New Brunswick	OEL STEL (mg/m ³)	3 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	1 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic particulate matter)
Nova Scotia	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic particulate matter)
Nunavut	OEL STEL (mg/m ³)	0.6 mg/m ³ (thoracic fraction)
Nunavut	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
Northwest Territories	OEL STEL (mg/m ³)	0.6 mg/m ³ (thoracic fraction, strong acid mists only)
Northwest Territories	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction, strong acid mists only)
Ontario	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic)
Prince Edward Island	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic particulate matter)
Québec	VECD (mg/m ³)	3 mg/m ³
Québec	VEMP (mg/m ³)	1 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	0.6 mg/m ³ (thoracic fraction)
Saskatchewan	OEL TWA (mg/m ³)	0.2 mg/m ³ (thoracic fraction)
Yukon	OEL STEL (mg/m ³)	1 mg/m ³
Yukon	OEL TWA (mg/m ³)	1 mg/m ³

Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles. Face shield. Insufficient ventilation: wear respiratory protection.



Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Materials for Protective Clothing: Acid-resistant clothing.

Hand Protection: Wear protective gloves.

Eye Protection: Chemical safety goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Physical State	: Liquid
Appearance	: Clear, Colorless to Amber, Oily
Odor	: Pungent
Odor Threshold	: Not available
pH	: 0.3
Evaporation Rate	: Not available
Melting Point	: 10.56 °C (51.01 °F)
Freezing Point	: Not available
Boiling Point	: 290 °C (554 °F)
Flash Point	: Not applicable
Auto-ignition Temperature	: Not applicable
Decomposition Temperature	: Not available
Flammability (solid, gas)	: Not applicable
Lower Flammable Limit	: Not applicable
Upper Flammable Limit	: Not applicable
Vapor Pressure	: 0.00027 - 0.16 kPa at 25 °C (77 °F)
Relative Vapor Density at 20°C	: 3.4 (air = 1)
Relative Density	: Not available
Specific Gravity	: 1.84 g/l
Solubility	: Water: Miscible
Partition Coefficient: N-Octanol/Water	: Not available
Viscosity	: Not available

SECTION 10: STABILITY AND REACTIVITY

Reactivity: May be corrosive to metals. Contact with metals may evolve flammable hydrogen gas. May react exothermically with water releasing heat. Adding an acid to a base or base to an acid may cause a violent reaction. This product may act as an oxidizer.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Extremely high or low temperatures and incompatible materials.

Incompatible Materials: Combustible materials. Reducing agents. Strong bases. Strong oxidizers. Metals. Water.

Hazardous Decomposition Products: Thermal decomposition generates: Corrosive vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity (Oral): Not classified

Acute Toxicity (Dermal): Not classified

Acute Toxicity (Inhalation): Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.

pH: 0.3

Eye Damage/Irritation: Causes serious eye damage.

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

pH: 0.3

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: May cause cancer (Inhalation).

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Effects After Inhalation: May be corrosive to the respiratory tract.

Symptoms/Effects After Skin Contact: Causes severe irritation which will progress to chemical burns.

Symptoms/Effects After Eye Contact: Causes permanent damage to the cornea, iris, or conjunctiva.

Symptoms/Effects After Ingestion: May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic Symptoms: Strong inorganic acid mists containing sulfuric acid are carcinogenic to humans. Prolonged inhalation of fumes or mists may cause erosion of the teeth.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Water (7732-18-5)	
LD50 Oral Rat	> 90000 mg/kg
Sulfuric acid (7664-93-9)	
LD50 Oral Rat	2140 mg/kg
LC50 Inhalation Rat	510 mg/m ³ (Exposure time: 2 h)
Sulfuric acid (7664-93-9)	
IARC Group	1
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list.
Strong inorganic acid mists containing sulfuric acid	
National Toxicology Program (NTP) Status	Known Human Carcinogens.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecology - General: Harmful to aquatic life.

Sulfuric acid (7664-93-9)	
LC50 Fish 1	500 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [static])
LC50 Fish 2	42 mg/l (Exposure time: 96 h - Species: Gambusia affinis [static])

Persistence and Degradability

Sulfuric Acid, 70-100%	
Persistence and Degradability	Not established.

Bioaccumulative Potential

Sulfuric Acid, 70-100%	
Bioaccumulative Potential	Not established.
Sulfuric acid (7664-93-9)	
BCF Fish 1	(no bioaccumulation)

Mobility in Soil Not available

Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Additional Information: Container may remain hazardous when empty. Continue to observe all precautions.

Ecology - Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.





Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

TRANSPORTATION CLASSIFICATION	DOT	TDG	IMDG	IATA
Identification Number	UN1830	UN1830	UN1830	UN1830
Proper Shipping Name	SULFURIC ACID	SULFURIC ACID	SULPHURIC ACID	SULPHURIC ACID
Transport Hazard Class(es)	8	8	8	8
				
Packing Group	II	II	II	II
Environmental Hazards	Marine Pollutant : No	Marine Pollutant : No	Marine Pollutant : No	Marine Pollutant: N/A
Emergency Response	ERG Number : 137	ERAP Index: 3 000	EMS: F-A, S-B	ERG code (IATA): 8L
Additional Information	Not applicable	Not applicable	Not applicable	Not applicable

SECTION 15: REGULATORY INFORMATION

US Federal Regulations

Chemical Name (CAS No.)	CERCLA RQ	EPCRA 304 RQ	SARA 302 TPQ	SARA 313
Sulfuric acid (7664-93-9)	1000 lb	1000 lb	1000 lb	Yes

SARA 311/312

Sulfuric Acid, 70-100%
Immediate (acute) health hazard. Delayed (chronic) health hazard. Reactive hazard

US TSCA Flags Not present

US State Regulations

California Proposition 65

Chemical Name (CAS No.)	Carcinogenicity	Developmental Toxicity	Female Reproductive Toxicity	Male Reproductive Toxicity
Sulfuric acid (7664-93-9)	Yes	No	No	No
Strong inorganic acid mists containing sulfuric acid	Yes	No	No	No

State Right-To-Know Lists

Sulfuric acid (7664-93-9)
U.S. - Massachusetts - Right To Know List - Yes
U.S. - New Jersey - Right to Know Hazardous Substance List - Yes
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List - Yes
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances - No
U.S. - Pennsylvania - RTK (Right to Know) List - Yes

Canadian Regulations

Sulfuric acid (7664-93-9)
Listed on the Canadian DSL (Domestic Substances List)
Not listed on the Canadian NDSL (Non-Domestic Substances List)

International Inventories/Lists

Chemical Name (CAS No.)	Australia AICS	Turkey CICR	Korea ECL	EU EINECS	EU ELINCS	EU SVHC	EU NLP	Mexico INSQ
Sulfuric acid (7664-93-9)	Yes	No	Yes	Yes	No	No	No	No

Sulfuric Acid, 70-100%

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According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

Chemical Name (CAS No.)	China IECSC	Japan ENCS	Japan ISHL	Japan PDSC	Japan PRTR	Philippines PICCS	New Zealand NZIOC	US TSCA
Sulfuric acid (7664-93-9)	Yes	Yes	No	Yes	No	Yes	Yes	Yes

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision : 05/07/2018

Revision Summary

Section	Change	Date Changed
16	Data modified	05/07/2018

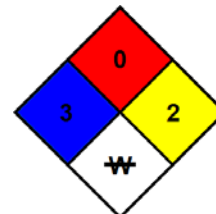
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Hazardous Products Regulations (HPR).

GHS Full Text Phrases:

Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Carc. 1A	Carcinogenicity Category 1A
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Met. Corr. 1	Corrosive to metals Category 1
Skin Corr. 1A	Skin corrosion/irritation Category 1A
H290	May be corrosive to metals
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H350	May cause cancer
H402	Harmful to aquatic life

NFPA 704

NFPA Health Hazard : 3
NFPA Fire Hazard : 0
NFPA Reactivity Hazard : 2
NFPA Specific Hazards : W



HMIS Rating

Health : 3
Flammability : 0
Physical : 2
PPE See Section 8

Abbreviations and Acronyms

AICS – Australian Inventory of Chemical Substances
ACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
ATE - Acute Toxicity Estimate
BCF - Bioconcentration factor
BEI - Biological Exposure Indices (BEI)
CAS No. - Chemical Abstracts Service number
CERCLA RQ - Comprehensive Environmental Response, Compensation, and Liability Act - Reportable Quantity
CICR - Turkish Inventory and Control of Chemicals
DOT – 49 CFR – US Department of Transportation – Code of Federal Regulations Title 49 – Transportation.
EC50 - Median effective concentration
ECL - Korea Existing Chemicals List
EINECS - European Inventory of Existing Commercial Chemical Substances
ELINCS - European List of Notified Chemical Substances
EmS - IMDG Emergency Schedule Fire & Spillage
ENCS - Japanese Existing and New Chemical Substances Inventory

LC50 - Median Lethal Concentration
LD50 - Median Lethal Dose
LOAEL - Lowest Observed Adverse Effect Level
LOEC - Lowest-observed-effect Concentration
Log Pow - Octanol/water Partition Coefficient
NFPA 704 – National Fire Protection Association - Standard System for the Identification of the Hazards of Materials for Emergency Response
NIOSH - National Institute for Occupational Safety and Health
NLP - Europe No Longer Polymers List
NOAEL - No-Observed Adverse Effect Level
NOEC - No-Observed Effect Concentration
NZIOC - New Zealand Inventory of Chemicals
OEL - Occupational Exposure Limits
OSHA – Occupational Safety and Health Administration
PEL - Permissible Exposure Limits
PICCS - Philippine Inventory of Chemicals and Chemical Substances
PDSC - Japan Poisonous and Deleterious Substances Control Law
PPE – Personal Protective Equipment

Sulfuric Acid, 70-100%

Safety Data Sheet

According to U.S. Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations and according to Canada's Hazardous Products Regulation, February 11, 2015.

EPA – Environmental Protection Agency	PRTR - Japan Pollutant Release and Transfer Register
EPCRA 304 RQ – EPCRA 304 Extremely Hazardous Substance Emergency	REL - Recommended Exposure Limit
Planning and Community Right-to-Know-Act – Reportable Quantity	SADT - Self Accelerating Decomposition Temperature
ERAP Index – Emergency Response Assistance Plan Quantity Limit	SARA - Superfund Amendments and Reauthorization Act
ErC50 - EC50 in Terms of Reduction Growth Rate	SARA 302 - Section 302, 40 CFR Part 355
ERG code (IATA) - Emergency Response Drill Code as found in the International	SARA 311/312 - Sections 311 and 312, 40 CFR Part 370 Hazard Categories
Civil Aviation Organization (ICAO)	SARA 313 - Section 313, 40 CFR Part 372
ERG No. - Emergency Response Guide Number	SRCL - Specifically Regulated Carcinogen List
HCCL - Hazard Communication Carcinogen List	STEL - Short Term Exposure Limit
HMIS – Hazardous Materials Information System	SVHC – European Candidate List of Substance of Very High Concern
IARC - International Agency for Research on Cancer	TDG – Transport Canada Transport of Dangerous Goods Regulations
IATA - International Air Transport Association – Dangerous Goods Regulations	TLM - Median Tolerance Limit
IDLH - Immediately Dangerous to Life or Health	TLV - Threshold Limit Value
IECSC - Inventory of Existing Chemical Substances Produced or Imported in	TPQ - Threshold Planning Quantity
China	TSCA – United States Toxic Substances Control Act
IMDG - International Maritime Dangerous Goods Code	TWA - Time Weighted Average
INSQ - Mexican National Inventory of Chemical Substances	WEEL - Workplace Environmental Exposure Levels
ISHL - Japan Industrial Safety and Health Law	

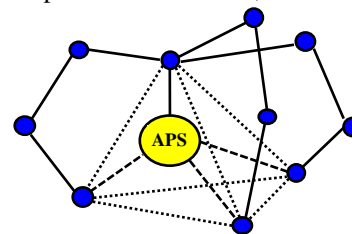
Handle product with due care and avoid unnecessary contact. This information is supplied under U.S. OSHA'S "Right to Know" (29 CFR 1910.1200) and Canada's WHMIS regulations. Although certain hazards are described herein, we cannot guarantee these are the only hazards that exist. The information contained herein is based on data available to us and is believed to be true and accurate but it is not offered as a product specification. No warranty, expressed or implied, regarding the accuracy of this data, the hazards connected with the use of the product, or the results to be obtained from the use thereof, is made and Chemtrade and its affiliates assume no responsibility. Chemtrade is a member of the CIAC (Chemistry Industry Association of Canada) and adheres to the codes and principles of Responsible Care™.



Chemtrade NA GHS SDS 2015

Applied Polymer Systems, Inc.

Safety Data Sheet



1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY

Product Name: APS 703d #3 Flocc Log®
Supplied: Applied Polymer Systems, Inc.
519 Industrial Drive
Woodstock, GA 30189
Tel. 678-494-5998
Fax. 678-494-5298
www.siltstop.com

2. HAZARD IDENTIFICATION

Placement of these materials on wet walking surface will create extreme slipping hazard.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Identification of the preparation: Anionic water-soluble Co-polymer gel

4. FIRST AID MEASURES

Inhalation: None
Skin contact: Contact with wet skin could cause dryness and chapping. Wash with water and soap. Use of gloves recommended.
Eye contact: Rinse thoroughly with plenty of water, also under the eyelids, seek medical attention in case of persistent irritation.
Ingestion: Consult a physician

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Water, water spray, foam, carbon dioxide, dry powder.
Special fire-fighting precautions: Flocc Logs that become wet render surfaces extremely slippery.
Protective equipment for firefighters: No special equipment required.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: No special precautions required.
Methods for cleaning up: Dry wipe as well as possible. Keep in suitable and closed containers for disposal.
After cleaning, flush away traces with water.

7. HANDLING AND STORAGE

Handling: Avoid contact with skin and eyes. Wash hands after handling.
Storage: Keep in a cool, dry place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Use dry handling areas only.

Personal protection equipment

Respiratory Protection: None
 Hand protection: Dry cloth, leather or rubber gloves.
 Eye Protection: Safety glasses with side shields. Do not wear contact lenses.
 Skin protection: No special protective clothing required.
 Hygiene measures: Wash hands before breaks and at end of work day.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form: Granular semi-solid gel
 Color: Blue
 Odor: None
 pH: 7.73
 Melting point: N/A
 Flash point: N/A
 Vapor density: N/A

10. STABILITY AND REACTIVITY

Stability: Product is stable, no hazardous polymerization will occur.
 Materials to avoid: Oxidizing agents may cause exothermic reactions.
 Hazardous decomposition products: Thermal decomposition may produce nitrogen oxides (NOx), carbon oxides.

11. TOXICOLOGICAL INFORMATION**Acute toxicity** (EPA-821-R-02-012)

LC 50 (Survival) / *Ceriodaphnia dubia* / 48h / 673 ppm
 NOAEC (Survival) / *Ceriodaphnia dubia* / 48h / 420 ppm
 LC 50 / *Oncorhynchus mykiss* / 96h / 2928 ppm

12. ECOLOGICAL INFORMATION**Chronic toxicity** (EPA-821-R-02-013)

IC 25 (Survival) / <i>P. promelas</i> / 7 day / 77.8 ppm	IC 25 (Survival) / <i>C. dubia</i> / 7 day / 78.7 ppm
NOEC (Survival) / <i>P. promelas</i> / 7 day / 52.5 ppm	NOEC (Survival) / <i>C. dubia</i> / 7 day / 52.7 ppm
IC 25 (Growth) / <i>P. promelas</i> / 7 day / 50.1 ppm	IC 25 (Reproduction) / <i>C. dubia</i> / 7 day / 66.8 ppm
NOEC (Growth) / <i>P. promelas</i> / 7 day / 52.5 ppm	NOEC (Reproduction) / <i>C. dubia</i> / 7 day / 52.5 ppm

Bioaccumulation: The product is not expected to bioaccumulate.
 Persistence / degradability: Not readily biodegradable: (~85% after 180 days).

13. DISPOSAL CONSIDERATIONS

Waste from residues/unused products.
 Any disposal practice must be in compliance with local, state and federal laws and regulations (contact local or state environmental agency for specific rules).

14. TRANSPORT INFORMATION

Not regulated by DOT, RCRA status-Not a hazardous waste

15. REGULATORY INFORMATION

TSCA Chemical Substances Inventory: All components of this product are either listed on the inventory or are exempt from listing.

SARA Section 311 / 312 Hazard Class: Not concerned
RCRA Status: Not RCRA hazardous

16. OTHER INFORMATION

NFPA and HMIS ratings:

NFPA	Health:	1	Flammability:	0	Reactivity:	0
HMIS	Health	1	Flammability	0	Reactivity	0

DATE EDITED: Nov 4th 2015

APPENDIX G

FEDERAL CORRESPONDENCE

MEMORANDUM

From: C. Disenhof
File: 4325.03
Date: August 12, 2019
Re: Northern Long-Eared Bat Endangered Species Determination

We determine that the Polar Park dewatering project in the vicinity of 37-40 Gold Street in Worcester, Massachusetts will have No Effect on the Northern Long-Eared Bat (NLEB) because:

- The Site has no suitable habitat for the NLEB, and therefore the NLEB is not present
- There are no maternity roost trees or hibernacula within ¼-mile of the Site (see attached Natural Heritage & Endangered Species Program (NHESP) map)
- Very few trees (<0.2 acres) will be removed from the Site, and no trees are known maternity roost trees, within 150 of a known maternity roost tree, or within 0.25 miles of a known hibernaculum

CRD: crd

Enclosures: NHESP No. Long-Eared Bat Locations

\\wesserv2\shdata\4300s\4325.03\Source Files\RGP\App F - Federal Correspondence\20190812 Memo - NLEB Determination.docx

PHONE MEMORANDUM

From: C. Disenhof
File: 4325.03
Date: August 12, 2019
Re: Phone Call Regarding Endangered Species Determination

At approximately 8:25 AM on August 12, 2019, I received a call from Maria Tur with the United States Fish and Wildlife Service (US FWS), following up on my inquiry about endangered species determinations for a Notice of Intent (NOI) for a Remediation General Permit (RGP). I explained that we had used the Information for Planning and Consultation (IPaC) tool at the FWS website to determine potential effects on the Northern Long-Eared Bat, which had come to a "may affect" determination. I asked about the next step for reaching a "no affect" or "not likely to adversely affect" determination for the Polar Park project, as the project is composed of parking lots and several buildings.

Ms. Tur stated that the EPA has left this determination to the contractor, and that if there is no suitable habitat on the Site and no trees are being removed, no communication with FWS is needed. A statement of "no affect" because of "no suitable habitat" should be documented in the NOI, and no further information needs to be sent to or received from the FWS.

CRD: crd

P:\4300s\4325.03\Source Files\RGP - Polar Park\App G - Federal Correspondence\20190812 Phone Memo - Conversation with USFWS.docx



United States Department of the Interior

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



In Reply Refer To:
Consultation Code: 05E1NE00-2019-SLI-2520
Event Code: 05E1NE00-2019-E-06518
Project Name: Polar Park

August 08, 2019

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List
-

Official Species List

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

This species list is provided by:

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

Project Summary

Consultation Code: 05E1NE00-2019-SLI-2520

Event Code: 05E1NE00-2019-E-06518

Project Name: Polar Park

Project Type: Water Withdrawal / Depletion

Project Description: Vicinity of 37-40 Gold Street, Worcester, MA

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/42.257553327176495N71.79997703625224W>



Counties: Worcester, MA

Endangered Species Act Species

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

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

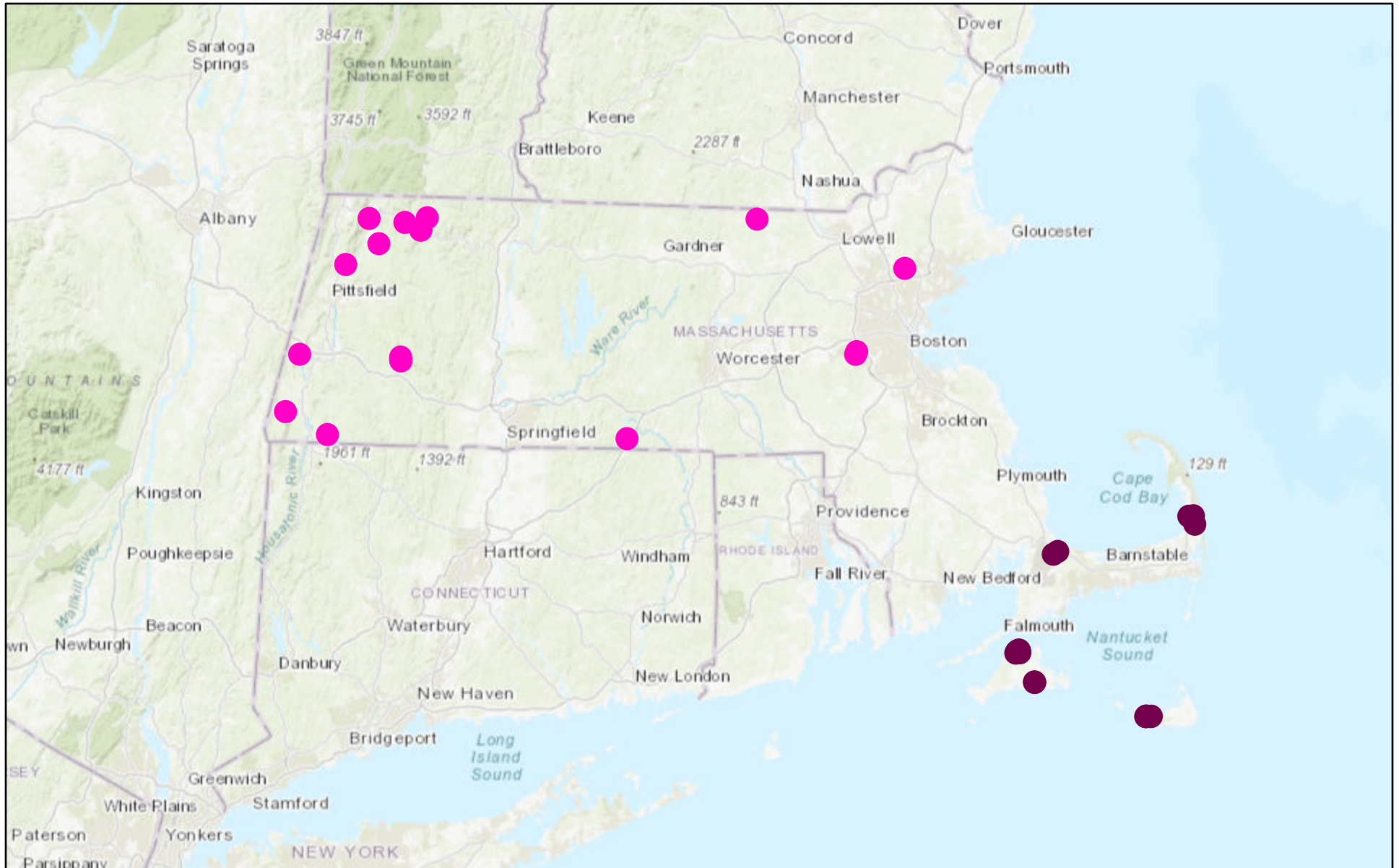
Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

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

NHESP No. Long-eared Bat Locations

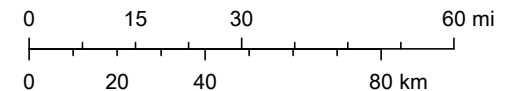


August 12, 2019

Statewide_NLEB_Symbology MA_Northern_Long_eared_Bat_Maternity_Roost_Trees

- Maternity Roost Tree
- Hibernaculum
- MA Northern Long-eared Bat Winter Hibernacula (with ¼ mile buffer)

1:2,311,162



Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

From: [Zachary Jylkka - NOAA Federal](#)
To: [Corinne Disenhof](#)
Subject: Re: Worcester, MA RGP
Date: Thursday, August 8, 2019 5:00:43 PM

Hi Corinne,

Thanks for the inquiry.

Please consult our ESA Section 7 Mapper to learn more about where we expect to find ESA-listed species or critical habitat under our office's jurisdiction:

<https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27>

We do not have any listed species or critical habitat in the immediate vicinity of Worcester.

Thanks,
Zach

On Thu, Aug 8, 2019 at 4:57 PM NMFS.GAR ESA.Section7 - NOAA Service Account <nmfs.gar.esa.section7@noaa.gov> wrote:

----- Forwarded message -----

From: **Corinne Disenhof** <cdisenhof@sanbornhead.com>
Date: Thu, Aug 8, 2019 at 3:57 PM
Subject: Worcester, MA RGP
To: Nmfs.gar.esa.section7@noaa.gov <Nmfs.gar.esa.section7@noaa.gov>

Good afternoon,

I am requesting information to be included as part of a Notice of Intent (NOI) for a Remediation General Permit (RGP). The NOI is for construction dewatering during excavation activities in the vicinity of 37-40 Gold Street in Worcester, Massachusetts. Effluent will be discharged to the Middle River via a drainage to an underground culvert ("Mill Brook") which confluent with the Middle River.

As part of the application to the USEPA for the RGP, we need to investigate whether this proposed temporary discharge has the potential to adversely affect any federally listed species in the reach of the Middle River located downstream of the discharge point.

The approximate discharge location is:

Latitude: 42.23402 Longitude: -71.79342

Thank you in advance for your assistance, and please let me know if you require further information.

Corinne Disenhof

--

Corinne Disenhof
Geotechnical Project Engineer

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--

Zach Jylkka
Fisheries Biologist
Protected Resources Division
Greater Atlantic Regional Fisheries Office
NOAA Fisheries
Gloucester, MA 01930
zachary.jylkka@noaa.gov
office: (978) 282-8467
Pronouns: (he/him/his)

For additional ESA Section 7 information and Critical Habitat guidance, please see:
www.greateratlantic.fisheries.noaa.gov/protected/section7

APPENDIX H

NATIONAL REGISTER OF HISTORICAL PLACES, WORCESTER, MASSACHUSETTS

Appendix G
National Register of Historic Places
Research Documentation
Worcester, Massachusetts

Ref#	Property Name	Name of Multiple Property Listing	Listed Date	Street & Number	City	State
80000595	Abbott Street School	Worcester MRA	3/5/1980	36 Abbott St.	Worcester	MASSACHUSETTS
80000584	Adams, Elwood, Store	Worcester MRA	3/5/1980	156 Main St.	Worcester	MASSACHUSETTS
80000483	Adriatic Mills	Worcester MRA	3/5/1980	3-35 Armory St.	Worcester	MASSACHUSETTS
89002392	Ahern, Catherine, Three-Decker	Worcester Three-Deckers TR	2/9/1990	215 Cambridge St.	Worcester	MASSACHUSETTS
80000544	Alexander, Arad, House	Worcester MRA	3/5/1980	53 Waverly St.	Worcester	MASSACHUSETTS
80000579	Allen, Charles, House	Worcester MRA	3/5/1980	65 Elm St.	Worcester	MASSACHUSETTS
68000018	American Antiquarian Society		11/24/1968	185 Salisbury St.	Worcester	MASSACHUSETTS
89002355	Anderson, Ludwig, Three-Decker	Worcester Three-Deckers TR	2/9/1990	4 Fairbanks St.	Worcester	MASSACHUSETTS
80000598	Armsby Block	Worcester MRA	3/5/1980	144-148 Main St.	Worcester	MASSACHUSETTS
80000542	Ash Street School	Worcester MRA	3/5/1980	Ash St.	Worcester	MASSACHUSETTS
80000489	Ashworth and Jones Factory	Worcester MRA	3/5/1980	1511 Main St.	Worcester	MASSACHUSETTS
88000429	Aurora Hotel	Worcester MRA	4/28/1988	652--660 Main St.	Worcester	MASSACHUSETTS
80000611	Babcock Block	Worcester MRA	3/5/1980	600 Main St.	Worcester	MASSACHUSETTS
89002445	Baker, Peter, Three-Decker	Worcester Three-Deckers TR	2/9/1990	90 Vernon St.	Worcester	MASSACHUSETTS
80000614	Bancroft Hotel	Worcester MRA	3/5/1980	50 Franklin St.	Worcester	MASSACHUSETTS
80000524	Bancroft Tower	Worcester MRA	3/5/1980	Bancroft Tower Rd.	Worcester	MASSACHUSETTS
80000569	Bannister, Emory, House	Worcester MRA	3/5/1980	3 Harvard St.	Worcester	MASSACHUSETTS
80000592	Barker, Richard, Octagon House	Worcester MRA	3/5/1980	312 Plantation St.	Worcester	MASSACHUSETTS
89002429	Battelle, Marion, Three-Decker	Worcester Three-Deckers TR	2/9/1990	13 Preston St.	Worcester	MASSACHUSETTS
80000538	Beacon Street Firehouse	Worcester MRA	3/5/1980	108 Beacon St.	Worcester	MASSACHUSETTS
89002377	Beaver Street Historic District	Worcester Three-Deckers TR	2/9/1990	31--39 Beaver St.	Worcester	MASSACHUSETTS
80000560	Bentley, George, House	Worcester MRA	3/5/1980	9 Earle St.	Worcester	MASSACHUSETTS
80000497	Bliss Building	Worcester MRA	3/5/1980	26 Old Lincoln St.	Worcester	MASSACHUSETTS
89002417	Blodgett, Lydia, Three-Decker	Worcester Three-Deckers TR	2/9/1990	167 Eastern Ave.	Worcester	MASSACHUSETTS
80000593	Bloomingdale Firehouse	Worcester MRA	3/5/1980	676 Franklin St.	Worcester	MASSACHUSETTS
80000562	Bloomingdale School	Worcester MRA	3/5/1980	327 Plantation St.	Worcester	MASSACHUSETTS
80000590	Borden-Pond House	Worcester MRA	3/5/1980	40 Laurel St.	Worcester	MASSACHUSETTS
89002414	Bostrom, Eric, Three-Decker	Worcester Three-Deckers TR	2/9/1990	152 Eastern Ave.	Worcester	MASSACHUSETTS
00001394	Boulevard Diner	Diners of Massachusetts MPS	11/22/2000	155 Shrewsbury St.	Worcester	MASSACHUSETTS
89002360	Bousquet, Henry, Three-Decker	Worcester Three-Deckers TR	2/9/1990	8/10 Fairmont Ave.	Worcester	MASSACHUSETTS
80000540	Boynton and Windsor	Worcester MRA	3/5/1980	718 and 720 Main St.	Worcester	MASSACHUSETTS
80000635	Brightside Apartments	Worcester MRA	3/5/1980	2 King St.	Worcester	MASSACHUSETTS
80000516	Brooks, John, House	Worcester MRA	3/5/1980	12 Nelson Pl.	Worcester	MASSACHUSETTS
80000487	Cambridge Street Firehouse	Worcester MRA	3/5/1980	534 Cambridge St.	Worcester	MASSACHUSETTS
80000484	Cambridge Street School	Worcester MRA	3/5/1980	510 Cambridge St.	Worcester	MASSACHUSETTS
89002415	Carlson, Eric, Three-Decker	Worcester Three-Deckers TR	2/9/1990	154 Eastern Ave.	Worcester	MASSACHUSETTS
80000625	Castle Street Row	Worcester MRA	3/5/1980	4-18 Castle St.	Worcester	MASSACHUSETTS
01000120	Castle Street Row--Boundary Increase	Worcester MRA	2/16/2001	20-24 Castle St.	Worcester	MASSACHUSETTS
80000604	Cathedral of St. Paul	Worcester MRA	3/5/1980	38 Chatham St.	Worcester	MASSACHUSETTS
03001206	Chadwick Square Diner	Diners of Massachusetts MPS	11/26/2003	95 rear Prescott St.	Worcester	MASSACHUSETTS
80000518	Chadwick-Brittan House	Worcester MRA	3/5/1980	309 Lincoln St.	Worcester	MASSACHUSETTS
80000596	Chamberlain, Charles, House	Worcester MRA	3/5/1980	373 Pleasant St.	Worcester	MASSACHUSETTS
80000519	Chamberlain-Flagg House	Worcester MRA	3/5/1980	2 Brookshire Dr.	Worcester	MASSACHUSETTS
80000547	Clark University	Worcester MRA	3/5/1980	Clark University Campus	Worcester	MASSACHUSETTS
80000571	Cobb, George, House	Worcester MRA	3/5/1980	24 William St.	Worcester	MASSACHUSETTS
80000610	Colton's Block	Worcester MRA	3/5/1980	588 Main St.	Worcester	MASSACHUSETTS
80000563	Copeland, Samuel, House	Worcester MRA	3/5/1980	31 Harvard St.	Worcester	MASSACHUSETTS
00001286	Corner Lunch	Diners of Massachusetts MPS	11/15/2000	133 Lamartine St.	Worcester	MASSACHUSETTS

Appendix G
National Register of Historic Places
Research Documentation
Worcester, Massachusetts

Ref#	Property Name	Name of Multiple Property Listing	Listed Date	Street & Number	City	State
89002383	Crabtree, Thomas, Three-Decker	Worcester Three-Deckers TR	2/9/1990	22 Haynes St.	Worcester	MASSACHUSETTS
80000552	Crawford, Elias, House	Worcester MRA	3/5/1980	3 Norwood St.	Worcester	MASSACHUSETTS
80000541	Crompton Loom Works	Worcester MRA	3/5/1980	132-142 Green St.	Worcester	MASSACHUSETTS
89002379	Crystal Street Historic District	Worcester Three-Deckers TR	2/9/1990	30--34 Crystal St.	Worcester	MASSACHUSETTS
80000526	Daniels, Frederick, House	Worcester MRA	3/5/1980	148 Lincoln St.	Worcester	MASSACHUSETTS
80000546	Dartmouth Street School	Worcester MRA	3/5/1980	13 Dartmouth St.	Worcester	MASSACHUSETTS
80000578	Davis, Isaac, House	Worcester MRA	3/5/1980	1 Oak St.	Worcester	MASSACHUSETTS
80000574	Davis, Joseph, House	Worcester MRA	3/5/1980	41 Elm St.	Worcester	MASSACHUSETTS
89002398	Davis, Rodney, Three-Decker	Worcester Three-Deckers TR	2/9/1990	62 Catharine St.	Worcester	MASSACHUSETTS
89002386	Davis, Wesley, Three-Decker	Worcester Three-Deckers TR	2/9/1990	7 Albert St.	Worcester	MASSACHUSETTS
09000618	Day Building		9/13/1978	300-310 Main St.	Worcester	MASSACHUSETTS
02001471	Dean, Frank L. and Mabel H., House		12/5/2002	10 Cedar St.	Worcester	MASSACHUSETTS
89002390	Dean, Mary, Three-Decker	Worcester Three-Deckers TR	2/9/1990	130 Belmont St.	Worcester	MASSACHUSETTS
89002396	Delsignore, Louis, Three-Decker	Worcester Three-Deckers TR	2/9/1990	12 Imperial Rd.	Worcester	MASSACHUSETTS
80000580	Dewey Francis, House	Worcester MRA	3/5/1980	71 Elm St.	Worcester	MASSACHUSETTS
02000155	Dodge Block and Sawyer Building, Bancroft Trust Building	Worcester MRA	3/15/2002	60 Franklin St.	Worcester	MASSACHUSETTS
89002427	Dodge, Helen, Three-Decker	Worcester Three-Deckers TR	2/9/1990	570 Pleasant St.	Worcester	MASSACHUSETTS
89002406	Doran, Thomas F., Three-Decker	Worcester Three-Deckers TR	2/9/1990	27 John St.	Worcester	MASSACHUSETTS
80000627	Dowley-Taylor House	Worcester MRA	3/5/1980	770 Main St.	Worcester	MASSACHUSETTS
80000621	Downing Street School	Worcester MRA	3/5/1980	92 Downing St.	Worcester	MASSACHUSETTS
89002384	Drew, Elvira, Three-Decker	Worcester Three-Deckers TR	2/9/1990	42 Abbott St.	Worcester	MASSACHUSETTS
89002425	Duke, Philip, Three-Decker	Worcester Three-Deckers TR	2/9/1990	7 Maxwell St.	Worcester	MASSACHUSETTS
89002430	Dworman, David, Three-Decker	Worcester Three-Deckers TR	2/9/1990	159 Providence St.	Worcester	MASSACHUSETTS
80000618	East Worcester School-Norcross Factory	Worcester MRA	3/5/1980	10 E. Worcester St.	Worcester	MASSACHUSETTS
80000589	Elizabeth Street School	Worcester MRA	3/5/1980	31 Elizabeth St.	Worcester	MASSACHUSETTS
70000096	Elm Park	Worcester MRA	7/1/1970	Elm Park	Worcester	MASSACHUSETTS
89002374	Elm Street Historic District	Worcester Three-Deckers TR	2/9/1990	132--148 Elm St.	Worcester	MASSACHUSETTS
80000536	Emmanuel Baptist	Worcester MRA	3/5/1980	717 Main St.	Worcester	MASSACHUSETTS
80000601	English High School	Worcester MRA	3/5/1980	20 Irving St.	Worcester	MASSACHUSETTS
80000608	Enterprise Building	Worcester MRA	3/5/1980	540 Main St.	Worcester	MASSACHUSETTS
89002438	Erikson, Knut, Three-Decker	Worcester Three-Deckers TR	2/9/1990	19 Stanton St.	Worcester	MASSACHUSETTS
89002357	Euclid Avenue--Montrose Street Historic District	Worcester Three-Deckers TR	2/9/1990	Along Euclid Ave. and Montrose St., between Vernon St. and Perry Ave.	Worcester	MASSACHUSETTS
80000594	Fairlawn	Worcester MRA	3/5/1980	189 May St.	Worcester	MASSACHUSETTS
89002372	Fay Street Historic District	Worcester Three-Deckers TR	2/9/1990	4--6 Fay St.	Worcester	MASSACHUSETTS
80000631	Fitch, C.H., House	Worcester MRA	3/5/1980	15 Oread St.	Worcester	MASSACHUSETTS
80000515	Flagg, Amos, House	Worcester MRA	3/5/1980	246 Burncoat St.	Worcester	MASSACHUSETTS
80000620	Flagg, Benjamin, House	Worcester MRA	3/5/1980	136 Plantation St.	Worcester	MASSACHUSETTS
89002362	Flagg, Levi, Three-Decker	Worcester Three-Deckers TR	2/9/1990	79 Florence St.	Worcester	MASSACHUSETTS
89002447	Fontaine, George, Three-Decker	Worcester Three-Deckers TR	2/9/1990	141 Vernon St.	Worcester	MASSACHUSETTS
80000636	Forbes, William Trowbridge, House	Worcester MRA	3/5/1980	23 Trowbridge Rd.	Worcester	MASSACHUSETTS
80000529	Forest Hill Cottage	Worcester MRA	3/5/1980	22 Windsor St.	Worcester	MASSACHUSETTS
80000482	Freeland Street School	Worcester MRA	3/5/1980	12 Freeland St.	Worcester	MASSACHUSETTS
89002387	Friberg, Andrew, Three-Decker	Worcester Three-Deckers TR	2/9/1990	26 Ames St.	Worcester	MASSACHUSETTS
75000303	G.A.R. Hall		3/13/1975	55 Pearl St.	Worcester	MASSACHUSETTS
80000523	Gabriel, George, House	Worcester MRA	3/5/1980	31 Lenox St.	Worcester	MASSACHUSETTS
80000561	Gale, George, House	Worcester MRA	3/5/1980	15 Elizabeth St.	Worcester	MASSACHUSETTS
89002356	Giguere, Thomas, Three-Decker	Worcester Three-Deckers TR	2/9/1990	18 Fairhaven Rd.	Worcester	MASSACHUSETTS

Appendix G
National Register of Historic Places
Research Documentation
Worcester, Massachusetts

Ref#	Property Name	Name of Multiple Property Listing	Listed Date	Street & Number	City	State
00001342	Gilman Block		11/20/2000	207-219 Main St.	Worcester	MASSACHUSETTS
80000555	Goddard House	Worcester MRA	3/5/1980	12 Catherine St.	Worcester	MASSACHUSETTS
80000525	Goddard, Harry, House	Worcester MRA	3/5/1980	190 Salisbury St.	Worcester	MASSACHUSETTS
07001202	Goldberg Building	Worcester MRA	11/19/2007	97-103 Water St.	Worcester	MASSACHUSETTS
80000564	Goulding, Henry, House	Worcester MRA	3/5/1980	26 Harvard St.	Worcester	MASSACHUSETTS
80000566	Goulding, W.H., House	Worcester MRA	3/5/1980	4 Dix St.	Worcester	MASSACHUSETTS
80000545	Grafton Street School	Worcester MRA	3/5/1980	311 Grafton St.	Worcester	MASSACHUSETTS
80000522	Green Hill Park Shelter	Worcester MRA	3/5/1980	Green Hill Parkway	Worcester	MASSACHUSETTS
80000511	Greendale Branch Library	Worcester MRA	3/5/1980	470 W. Boylston St.	Worcester	MASSACHUSETTS
76000949	Greendale Village Improvement Society Building	Worcester MRA	11/7/1976	480 W. Boylston St.	Worcester	MASSACHUSETTS
89002388	Gullberg, Evert, Three-Decker	Worcester Three-Deckers TR	2/9/1990	18 Ashton St.	Worcester	MASSACHUSETTS
11000068	Hadley Furniture Company Building		3/1/2011	651-659 Main St	Worcester	MASSACHUSETTS
89002433	Hadley, Gilbert, Three-Decker	Worcester Three-Deckers TR	2/9/1990	31 Russell St.	Worcester	MASSACHUSETTS
89002423	Hall, Charles A., Three-Decker	Worcester Three-Deckers TR	2/9/1990	68 Mason St.	Worcester	MASSACHUSETTS
80000531	Hammond Heights	Worcester MRA	3/5/1980	Properties along Germain, Haviland, Highland, and Westland Sts. and Institute Rd.	Worcester	MASSACHUSETTS
80000632	Hammond Organ Factory	Worcester MRA	3/5/1980	9 May St.	Worcester	MASSACHUSETTS
80000543	Harding-Winter Street Manufacturing District	Worcester MRA	3/5/1980	28-88 Winter St.	Worcester	MASSACHUSETTS
80000602	Harris-Merrick House	Worcester MRA	3/5/1980	41 Fruit St.	Worcester	MASSACHUSETTS
80000572	Hastins, John, Cottage	Worcester MRA	3/5/1980	31 William St.	Worcester	MASSACHUSETTS
80000514	Higgins Armory Museum	Worcester MRA	3/5/1980	100 Barber Ave.	Worcester	MASSACHUSETTS
80000496	Higgins, Aldus Chapin, House	Worcester MRA	3/5/1980	1 John Wing Rd.	Worcester	MASSACHUSETTS
89002420	Hirst, Samuel, Three-Decker	Worcester Three-Deckers TR	2/9/1990	90 Lovell St.	Worcester	MASSACHUSETTS
80000582	Hobbs, Marcus, House	Worcester MRA	3/5/1980	16 William St.	Worcester	MASSACHUSETTS
80000576	Hogg, William, House	Worcester MRA	3/5/1980	54 Elm St.	Worcester	MASSACHUSETTS
80000491	Holy Cross College	Worcester MRA	3/5/1980	Holy Cross College Campus	Worcester	MASSACHUSETTS
88000721	Holy Name of Jesus Complex	Worcester MRA	6/9/1988	Illinois St.	Worcester	MASSACHUSETTS
97001560	Hope Cemetery		12/22/1997	119 Webster St.	Worcester	MASSACHUSETTS
89002371	Houghton Street Historic District	Worcester Three-Deckers TR	2/9/1990	Houghton St. between Palm and Dorchester Sts.	Worcester	MASSACHUSETTS
89002451	Hunt, Daniel, Three-Decker	Worcester Three-Deckers TR	2/9/1990	9 Wyman St.	Worcester	MASSACHUSETTS
89002412	Hunt, David, Three-Decker	Worcester Three-Deckers TR	2/9/1990	26 Louise St.	Worcester	MASSACHUSETTS
80000535	I00F Building	Worcester MRA	3/5/1980	674 Main St.	Worcester	MASSACHUSETTS
80000510	Indian Hill-North Village	Worcester MRA	3/5/1980	properties along Ararat St. and Delaval, Heroult, Marconi, Watt, and Westinghouse Rds.	Worcester	MASSACHUSETTS
89002369	Ingleside Avenue Historic District	Worcester Three-Deckers TR	2/9/1990	218--220 and 226--228 Ingleside Ave.	Worcester	MASSACHUSETTS
89002363	Ingraham, Harry B., Three-Decker	Worcester Three-Deckers TR	2/9/1990	19 Freeland St.	Worcester	MASSACHUSETTS
80000554	Institutional District	Worcester MRA	3/5/1980	Properties on Lincoln and Wheaton Squares and on Salisbury and Tuckerman Sts.	Worcester	MASSACHUSETTS
89002389	Johnson, Edwin, Three-Decker	Worcester Three-Deckers TR	2/9/1990	183 Austin St.	Worcester	MASSACHUSETTS
89002416	Johnson, John and Edward, Three-Decker	Worcester Three-Deckers TR	2/9/1990	31 Louise St.	Worcester	MASSACHUSETTS
89002408	Johnson, John, Three-Decker	Worcester Three-Deckers TR	2/9/1990	140 Eastern Ave.	Worcester	MASSACHUSETTS
89002437	Johnson, Paul, Three-Decker	Worcester Three-Deckers TR	2/9/1990	7 Stanton St.	Worcester	MASSACHUSETTS
80000533	Junction Shop and Herman Street District	Worcester MRA	3/5/1980	Properties on Jackson, Herman, and Beacon Sts.	Worcester	MASSACHUSETTS
89002411	Kaller, Erick, Three-Decker	Worcester Three-Deckers TR	2/9/1990	146 Eastern Ave.	Worcester	MASSACHUSETTS
89002413	Kaller, Erick, Three-Decker	Worcester Three-Deckers TR	2/9/1990	148 Eastern Ave.	Worcester	MASSACHUSETTS
80000575	Katz and Leavitt Apartment House	Worcester MRA	3/5/1980	53 Elm St.	Worcester	MASSACHUSETTS
80000520	Knollwood	Worcester MRA	3/5/1980	425 Salisbury St.	Worcester	MASSACHUSETTS
80000628	Knowles, Lucius, House	Worcester MRA	3/5/1980	838 Main St.	Worcester	MASSACHUSETTS
80000492	Larchmont	Worcester MRA	3/5/1980	36 Butler St.	Worcester	MASSACHUSETTS
89002443	Larson, Swan, Three-Decker	Worcester Three-Deckers TR	2/9/1990	12 Summerhill Ave.	Worcester	MASSACHUSETTS
80000623	Legg, John, House	Worcester MRA	3/5/1980	5 Claremont St.	Worcester	MASSACHUSETTS

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89002446	Levenson, Morris, Three-Decker	Worcester Three-Deckers TR	2/9/1990	38 Plantation St.	Worcester	MASSACHUSETTS
74002046	Liberty Farm	Worcester MRA	9/13/1974	116 Mower St.	Worcester	MASSACHUSETTS
80000570	Lincoln Estate-Elm Park Historic District	Worcester MRA	3/5/1980	Properties along Cedar, Fruit, Oak, Sever, West, and William Sts.	Worcester	MASSACHUSETTS
80000573	Lincoln, Gov. Levi, House	Worcester MRA	3/5/1980	4 Avalon Pl.	Worcester	MASSACHUSETTS
80000613	Lower Pleasant Street District	Worcester MRA	3/5/1980	418-426 Main St. and 9-49 Pleasant St.	Worcester	MASSACHUSETTS
89002403	Lumb, Thomas, Three-Decker	Worcester Three-Deckers TR	2/9/1990	80 Dewey St.	Worcester	MASSACHUSETTS
89002448	Lumb, Thomas, Three-Decker	Worcester Three-Deckers TR	2/9/1990	44 Winfield St.	Worcester	MASSACHUSETTS
89002399	Lundberg, Charles, Three-Decker	Worcester Three-Deckers TR	2/9/1990	67 Catharine St.	Worcester	MASSACHUSETTS
89002434	Magnuson, Charles, Three-Decker	Worcester Three-Deckers TR	2/9/1990	56/58 Olga Ave.	Worcester	MASSACHUSETTS
84000096	Malvern Road School	Worcester MRA	10/4/1984	Malvern Rd. and Southbridge St.	Worcester	MASSACHUSETTS
80000567	Marble, Jerome, House	Worcester MRA	3/5/1980	23 Harvard St.	Worcester	MASSACHUSETTS
89002435	Mark, John, Three-Decker	Worcester Three-Deckers TR	2/9/1990	24 Sigel St.	Worcester	MASSACHUSETTS
80000583	Marsh, Alexander, House	Worcester MRA	3/5/1980	57 Elm St.	Worcester	MASSACHUSETTS
80000537	Masonic Temple	Worcester MRA	3/5/1980	Ionic Ave.	Worcester	MASSACHUSETTS
71000356	Massachusetts Avenue Historic District	Worcester MRA	12/16/1971	Between Salisbury St. and Drury Lane	Worcester	MASSACHUSETTS
89002380	Massad, Anthony, Three-Decker	Worcester Three-Deckers TR	2/9/1990	14 Harlow St.	Worcester	MASSACHUSETTS
80000622	May Street Historic District	Worcester MRA	3/5/1980	Properties from 29 to 46 May St.	Worcester	MASSACHUSETTS
89002395	McCafferty, Elizabeth, Three-Decker	Worcester Three-Deckers TR	2/9/1990	45 Canterbury St.	Worcester	MASSACHUSETTS
89002442	McCarron, Andrew, Three-Decker	Worcester Three-Deckers TR	2/9/1990	3 Pitt St.	Worcester	MASSACHUSETTS
89002366	McDermott, John B., Three-Decker	Worcester Three-Deckers TR	2/9/1990	21 Freeland St.	Worcester	MASSACHUSETTS
80000517	McFarland, William, House	Worcester MRA	3/5/1980	525 Salisbury St.	Worcester	MASSACHUSETTS
89002407	McGrath, Patrick, Three-Decker	Worcester Three-Deckers TR	2/9/1990	50 Dorchester St.	Worcester	MASSACHUSETTS
89002439	McGuinness, Patrick, Three-Decker	Worcester Three-Deckers TR	2/9/1990	25 Suffield St.	Worcester	MASSACHUSETTS
89002436	McPartland, Frank, Three-Decker	Worcester Three-Deckers TR	2/9/1990	61 Paine St.	Worcester	MASSACHUSETTS
89002428	McPartland, James, Three-Decker	Worcester Three-Deckers TR	2/9/1990	17 Pond St.	Worcester	MASSACHUSETTS
72000152	Mechanics Hall		11/9/1972	321 Main St.	Worcester	MASSACHUSETTS
80000577	Mechanics' Hall District	Worcester MRA	3/5/1980	Properties between 282 and 343 Main St.	Worcester	MASSACHUSETTS
80000581	Merrill Double House	Worcester MRA	3/5/1980	18-20 West St.	Worcester	MASSACHUSETTS
80000527	Miles, Charles, House	Worcester MRA	3/5/1980	131 Lincoln St.	Worcester	MASSACHUSETTS
03001178	Miss Worcester Diner	Diners of Massachusetts MPS	11/21/2003	302 Southbridge St.	Worcester	MASSACHUSETTS
80000616	Mission Chapel	Worcester MRA	3/5/1980	205 Summer St.	Worcester	MASSACHUSETTS
80000521	Montvale	Worcester MRA	3/5/1980	Properties along Monadnock, Sagamore, Waconah, and Whitman Rds., and Salisbury St.	Worcester	MASSACHUSETTS
80000557	Moore, Jesse, House	Worcester MRA	3/5/1980	25 Catherine St.	Worcester	MASSACHUSETTS
89002432	Munroe, Sarah, Three-Decker	Worcester Three-Deckers TR	2/9/1990	11 Rodney St.	Worcester	MASSACHUSETTS
89002404	Murphy, Patrick, Three-Decker		2/9/1990	31 Jefferson St.	Worcester	MASSACHUSETTS
89002391	Nelson, Christina, Three-Decker	Worcester Three-Deckers TR	2/9/1990	45 Butler St.	Worcester	MASSACHUSETTS
80000508	Newton, Charles, House	Worcester MRA	3/5/1980	24 Brattle St.	Worcester	MASSACHUSETTS
09000142	Newton, S.D., House	Worcester MRA	3/5/1980	8 Sycamore St.	Worcester	MASSACHUSETTS
80000624	Norcross Brothers Houses	Worcester MRA	3/5/1980	16, 18 Claremont St.	Worcester	MASSACHUSETTS
80000512	North Worcester Aid Society	Worcester MRA	3/5/1980	58 Holden St.	Worcester	MASSACHUSETTS
89002441	O'Brien, Richard, Three-Decker	Worcester Three-Deckers TR	2/9/1990	43 Suffolk St.	Worcester	MASSACHUSETTS
89002419	O'Connor, James, Three-Decker	Worcester Three-Deckers TR	2/9/1990	23 Endicott St.	Worcester	MASSACHUSETTS
89002393	O'Connor, James--John Trybowski Three-Decker	Worcester Three-Deckers TR	2/9/1990	21 Canton St.	Worcester	MASSACHUSETTS
80000513	Odd Fellows' Home	Worcester MRA	3/5/1980	40 Randolph Rd.	Worcester	MASSACHUSETTS
80000585	Old State Mutual Building	Worcester MRA	3/5/1980	240 Main St.	Worcester	MASSACHUSETTS
100002161	Osgood Bradley Building		3/5/2018	18 Grafton St.	Worcester	MASSACHUSETTS
80000605	Oxford-Crown Extension District	Worcester MRA	3/5/1980	Properties along Ashland, Austin, Chatham, Congress, Crown, and Pleasant Sts.	Worcester	MASSACHUSETTS
76000954	Oxford-Crown Historic District	Worcester MRA	5/6/1976	Roughly bounded by Chatham, Congress, Crown, Pleasant, Oxford Sts. and Oxford Pl.	Worcester	MASSACHUSETTS

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76000948	Paine, Timothy, House	Worcester MRA	4/30/1976	140 Lincoln St.	Worcester	MASSACHUSETTS
80000607	Park Building	Worcester MRA	3/5/1980	507 Main St.	Worcester	MASSACHUSETTS
89002367	Perry Avenue Historic District	Worcester Three-Deckers TR	2/9/1990	49--55 Perry Ave.	Worcester	MASSACHUSETTS
89002358	Petterson, Lars--Adolph Carlson Three-Decker	Worcester Three-Deckers TR	2/9/1990	76 Fairhaven Rd.	Worcester	MASSACHUSETTS
89002368	Petterson, Lars--Fred Gurney Three-Decker	Worcester Three-Deckers TR	2/9/1990	2 Harlow St.	Worcester	MASSACHUSETTS
89002359	Petterson, Lars--Silas Archer Three-Decker	Worcester Three-Deckers TR	2/9/1990	80 Fairhaven Rd.	Worcester	MASSACHUSETTS
89002376	Petterson,Lars--James Reidy Three-Decker	Worcester Three-Deckers TR	2/9/1990	4 Harlow St.	Worcester	MASSACHUSETTS
80000551	Pilgrim Congregational Church	Worcester MRA	3/5/1980	909 Main St.	Worcester	MASSACHUSETTS
80000597	Pleasant Street Firehouse	Worcester MRA	3/5/1980	408 Pleasant St.	Worcester	MASSACHUSETTS
10001122	Poli's Palace Theater		1/10/2011	2 Southbridge St	Worcester	MASSACHUSETTS
80000558	Prentiss, Addison, House	Worcester MRA	3/5/1980	3 Channing Way	Worcester	MASSACHUSETTS
80000553	Providence Street Firehouse	Worcester MRA	3/5/1980	98 Providence St.	Worcester	MASSACHUSETTS
89002381	Providence Street Historic District	Worcester Three-Deckers TR	2/9/1990	127--145 Providence St.	Worcester	MASSACHUSETTS
89002444	Provost, Arthur, Three-Decker	Worcester Three-Deckers TR	2/9/1990	30 Thorne St.	Worcester	MASSACHUSETTS
80000565	Putnam, Otis, House	Worcester MRA	3/5/1980	25 Harvard St.	Worcester	MASSACHUSETTS
80000494	Quinsigamond Branch Library	Worcester MRA	3/5/1980	812 Millbury St.	Worcester	MASSACHUSETTS
80000495	Quinsigamond Firehouse	Worcester MRA	3/5/1980	837 Millbury St.	Worcester	MASSACHUSETTS
80000568	Raymond, Tilley, House	Worcester MRA	3/5/1980	12 George St.	Worcester	MASSACHUSETTS
89002422	Reed, Frank, Three-Decker	Worcester Three-Deckers TR	2/9/1990	913/915 Main St.	Worcester	MASSACHUSETTS
80000507	Rice, Ezra, House	Worcester MRA	3/5/1980	1133 W. Boylston St.	Worcester	MASSACHUSETTS
85002783	Richmond, Willard, Apartment Block	Worcester MRA	11/7/1985	43 Austin St.	Worcester	MASSACHUSETTS
89002431	Ridyard, Albert, Three-Decker	Worcester Three-Deckers TR	2/9/1990	5 Mount Pleasant St.	Worcester	MASSACHUSETTS
89002402	Ridyard, B. E., Three-Decker	Worcester Three-Deckers TR	2/9/1990	29 Dewey St.	Worcester	MASSACHUSETTS
89002405	Riordan, John, Three-Decker	Worcester Three-Deckers TR	2/9/1990	8 Dix St.	Worcester	MASSACHUSETTS
89002397	Roynane, Catharine, Three-Decker	Worcester Three-Deckers TR	2/9/1990	18 Ingalls St.	Worcester	MASSACHUSETTS
80000556	Ruggles, Draper, House	Worcester MRA	3/5/1980	21 Catherine St.	Worcester	MASSACHUSETTS
85002782	Russell, The	Worcester MRA	11/7/1985	49 Austin St.	Worcester	MASSACHUSETTS
80000587	Salisbury Factory Building	Worcester MRA	3/5/1980	25 Union St.	Worcester	MASSACHUSETTS
80000588	Salisbury Factory Building	Worcester MRA	3/5/1980	49-51 Union St.	Worcester	MASSACHUSETTS
75000837	Salisbury House	Worcester MRA	6/10/1975	61 Harvard St.	Worcester	MASSACHUSETTS
75000838	Salisbury Mansion and Store	Worcester MRA	5/30/1975	30, 40 Highland St.	Worcester	MASSACHUSETTS
80000634	Schofield, James, House	Worcester MRA	3/5/1980	3 Mt. Pleasant St.	Worcester	MASSACHUSETTS
90000729	Shaarai Torah Synagogue	Worcester MRA	5/7/1990	32 Providence St.	Worcester	MASSACHUSETTS
80000626	Shattuck, Moody, House	Worcester MRA	3/5/1980	768 Main St.	Worcester	MASSACHUSETTS
89002400	Shea, Bridget, Three-Decker	Worcester Three-Deckers TR	2/9/1990	21 Jefferson St.	Worcester	MASSACHUSETTS
89002440	Simpson, Clara, Three-Decker	Worcester Three-Deckers TR	2/9/1990	69 Piedmont St.	Worcester	MASSACHUSETTS
80000609	Slater Building	Worcester MRA	3/5/1980	390 Main St.	Worcester	MASSACHUSETTS
89002409	Smith, Ellen M., Three-Decker	Worcester Three-Deckers TR	2/9/1990	22 Kilby St.	Worcester	MASSACHUSETTS
80000629	Smith, Elliot, House	Worcester MRA	3/5/1980	839 Main St.	Worcester	MASSACHUSETTS
80000509	Smith-Thaxter-Merrifield House	Worcester MRA	3/5/1980	158 Holden St.	Worcester	MASSACHUSETTS
80000528	Soho Cottage	Worcester MRA	3/5/1980	21 Windsor St.	Worcester	MASSACHUSETTS
80000550	South Unitarian	Worcester MRA	3/5/1980	888 Main St.	Worcester	MASSACHUSETTS
80000486	South Worcester Branch Library	Worcester MRA	3/5/1980	705 Southbridge St.	Worcester	MASSACHUSETTS
80000534	Southbridge-Sargent Manufacturing District	Worcester MRA	3/5/1980	Southbridge, Sargent, and Gold Sts.	Worcester	MASSACHUSETTS
80000619	St. John's Catholic Church	Worcester MRA	3/5/1980	40 Temple St.	Worcester	MASSACHUSETTS
80000481	St. Marks	Worcester MRA	3/5/1980	Freeland St.	Worcester	MASSACHUSETTS
80000485	St. Matthews	Worcester MRA	3/5/1980	693 Southbridge St.	Worcester	MASSACHUSETTS
80000548	St. Peters Catholic Church	Worcester MRA	3/5/1980	935 Main St.	Worcester	MASSACHUSETTS

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80000633	Stark, Edward, House	Worcester MRA	3/5/1980	21 Oread St.	Worcester	MASSACHUSETTS
80000479	Stearns Tavern	Worcester MRA	3/5/1980	651 Park Ave.	Worcester	MASSACHUSETTS
80000615	Stevens' Building	Worcester MRA	3/5/1980	24-44 Southbridge St.	Worcester	MASSACHUSETTS
80000532	Stevens, Daniel, House	Worcester MRA	3/5/1980	7 Sycamore St.	Worcester	MASSACHUSETTS
89002449	Stoliker, Edna, Three-Decker	Worcester Three-Deckers TR	2/9/1990	41 Plantation St.	Worcester	MASSACHUSETTS
89002450	Stone, Edward, Three-Decker	Worcester Three-Deckers TR	2/9/1990	8 Wyman St.	Worcester	MASSACHUSETTS
80000591	Sturtevant, Leonard, House	Worcester MRA	3/5/1980	84 Mulberry St.	Worcester	MASSACHUSETTS
80000559	Swift, D. Wheeler, House	Worcester MRA	3/5/1980	22 Oak Ave.	Worcester	MASSACHUSETTS
11000019	Thule--Plummer Buildings		2/18/2011	180 and 184 Main St	Worcester	MASSACHUSETTS
80000600	Tower, Horatio, House	Worcester MRA	3/5/1980	71 Pleasant St.	Worcester	MASSACHUSETTS
89002394	Troupes, John, Three-Decker	Worcester Three-Deckers TR	2/9/1990	25 Canton St.	Worcester	MASSACHUSETTS
11000161	U.S. Post Office and Courthouse		4/8/2011	595 Main St	Worcester	MASSACHUSETTS
80000599	Union Congregational Church	Worcester MRA	3/5/1980	5 Chestnut St.	Worcester	MASSACHUSETTS
80000617	Union Station	Worcester MRA	3/5/1980	Washington Sq.	Worcester	MASSACHUSETTS
80000493	Upsala Street School	Worcester MRA	3/5/1980	36 Upsala St.	Worcester	MASSACHUSETTS
89002331	Vendome, The, and the St. Ives	Worcester MRA	2/9/1990	17--19 and 21--23 Chandler St.	Worcester	MASSACHUSETTS
89002361	View Street Historic District	Worcester Three-Deckers TR	2/9/1990	7--17 and 8--16 View Street	Worcester	MASSACHUSETTS
80000586	Waldo Street Police Station	Worcester MRA	3/5/1980	Waldo St.	Worcester	MASSACHUSETTS
80000488	Ward Street School-Millbury Street	Worcester MRA	3/5/1980	389 Millbury St.	Worcester	MASSACHUSETTS
80000439	Washburn and Moen North Works District	Worcester MRA	3/5/1980	Properties on Grove St.	Worcester	MASSACHUSETTS
80000606	WCIS Bank	Worcester MRA	3/5/1980	365 Main St.	Worcester	MASSACHUSETTS
80000480	Webster Street Firehouse	Worcester MRA	3/5/1980	40 Webster St.	Worcester	MASSACHUSETTS
80000539	Wellington Street Apartment House District	Worcester MRA	3/5/1980	Properties along Jacques Ave., and Wellington and Irving Sts.	Worcester	MASSACHUSETTS
89002426	Wescott, John, Three-Decker	Worcester Three-Deckers TR	2/9/1990	454 Pleasant St.	Worcester	MASSACHUSETTS
80000603	Wesson, Franklin, House	Worcester MRA	3/5/1980	8 Claremont St.	Worcester	MASSACHUSETTS
77000653	Whitcomb House		11/9/1977	51 Harvard St.	Worcester	MASSACHUSETTS
80000499	Whitcomb Mansion	Worcester MRA	3/5/1980	51 Harvard St.	Worcester	MASSACHUSETTS
80000490	Whittall Mills	Worcester MRA	3/5/1980	properties off Brussels St.	Worcester	MASSACHUSETTS
89002365	Woodford Street Historic District		2/9/1990	35--39 and 38--40 Woodford St.	Worcester	MASSACHUSETTS
80000630	Woodland Street Firehouse	Worcester MRA	3/5/1980	36 Woodland St.	Worcester	MASSACHUSETTS
80000549	Woodland Street Historic District	Worcester MRA	3/5/1980	Properties along Hawthorne, Loudon, Norwood, and Woodland Sts.	Worcester	MASSACHUSETTS
80000478	Worcester Academy	Worcester MRA	3/5/1980	Worcester Academy Campus	Worcester	MASSACHUSETTS
80000530	Worcester Asylum and related buildings	Worcester MRA	3/5/1980	305 Belmont St.	Worcester	MASSACHUSETTS
00001343	Worcester Bleach and Dye Works		11/8/2000	60 Fremont St.	Worcester	MASSACHUSETTS
78001405	Worcester City Hall and Common	Worcester MRA	3/29/1978	455 Main St.	Worcester	MASSACHUSETTS
84000097	Worcester Corset Company Factory	Worcester MRA	10/4/1984	30 Wyman St.	Worcester	MASSACHUSETTS
78000472	Worcester Five Cents Savings Bank		9/13/1978	316 Main St.	Worcester	MASSACHUSETTS
80000612	Worcester Market Building	Worcester MRA	3/5/1980	831 Main St.	Worcester	MASSACHUSETTS
100001262	Worcester State Hospital Farmhouse		7/3/2017	361 Plantation St.	Worcester	MASSACHUSETTS
89002401	Zemaitis, Anthony, Three-Decker	Worcester Three-Deckers TR	2/9/1990	35 Dartmouth St.	Worcester	MASSACHUSETTS

Notes:
Sanborn, Head & Associates, Inc. (Sanborn Head) conducted a review of the National Register of Historic Places within Worcester, Massachusetts. The search returned 279 results within Worcester. The Site is not listed on the National Register of Historic Places. The Ash Street School is adjacent to the Site to the east, however, due to the depth of groundwater and discharge to a municipal sewer system, Site activities are not anticipated to impact the historical property.