November 30, 2017

US Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP RGP Applications Coordinator
5 Post Office Square – Suite 100 (OEP06-01)
Boston, Massachusetts 02109-3912
Attn: Ms. Olga Vergara

RE: Former Chelsea Clock Temporary Dewatering
284 Everett Avenue
Chelsea, Massachusetts
Remediation General Permit - Notice of Intent
Release Tracking Number (RTN) 3-33665

Dear Ms. Vergara,

In accordance with the National Pollutant Discharge Elimination System (NPDES) Remediation General Permit for Dewatering Activities – Massachusetts General Permit, MAG910000, attached are the Notice of Intent (NOI) and applicable documentation as required by the US Environmental Protection Agency (USEPA) and Massachusetts Department of Environmental Protection (MassDEP) for construction site dewatering under the Remediation General Permit (RGP) for the property located at 248 Everett Avenue in Chelsea, Massachusetts (the Site).

Temporary dewatering is planned in support of remediation excavation activities and for the installation of subsurface utilities associated with redevelopment of the Site by Fairfield Chelsea Phase I, LLC. Remediation activities will be conducted as part of a Release Abatement Measure (RAM) completed under the Massachusetts Contingency Plan (MCP) for the disposal site identified as Release Tracking Number (RTN) 3-33665 and a portion of the disposal site identified as RTN 3-24968. The limits of the RAM Area/Dewatering Area are depicted on Figure 2.

Contact Information

Applicant:
Fairfield Chelsea Phase I LLC
1110 N. Glebe Road, Suite 650
Arlington, VA 22201
Attention: Mr. Matt Lynn
Tel: 571.830.8364

Representative of this Applicant:
The Vertex Companies, Inc.
400 Libbey Parkway
Weymouth, MA 02189
Attention: Ms. Patrice Plante
Tel: 781.952.6000

Existing Site Conditions

The Site is located at the intersection of Everett Avenue, Fifth Street, and Carter Street in Chelsea, Massachusetts and is identified by the City of Chelsea as Parcel ID 63-1 and encompasses approximately 20,965 square feet. The Massachusetts North American Vertical Datum (NAVD83) Universal Transverse Mercator (UTM) coordinates for the Site are Zone 19 at 4696166.86 meters north and 332019.56 meters east and the latitude and longitude of the Site are 42.39962 degrees north and -71.04111 degrees west. In November 2017, a former industrial building constructed circa 1898 (the "Clock building"), was demolished. The Site is currently undeveloped. The location of the Site is shown on Figure 1, Site features are shown on Figure 2, sample locations are shown on Figure 3, and approximate limits of the remedial excavation are show on Figure 4.

Release History

Based on the available information, the release of oil and hazardous materials (OHM) at the Site is related to historical urban fill and historical manufacturing operations associated with the Chelsea Clock Company. Based on the results of subsurface investigations completed at the Site, volatile organic compounds (VOCs) [including chlorinated VOCs (CVOCs)], heavy metals, polynuclear aromatic hydrocarbons (PAHs), extractable petroleum hydrocarbon (EPH) fractions, volatile petroleum hydrocarbon (VPH) fractions, and polychlorinated biphenyls (PCBs) were detected in soil at concentrations exceeding the applicable Massachusetts Contingency Plan (MCP) RCS-1 reportable concentrations (RCs). In addition, CVOCs, dissolved lead, and dissolved zinc were detected in groundwater at concentrations exceeding the applicable MCP RCGW-2 RCs.

Following the purchase of the Site by Fairfield Chelsea Phase I LLC, on June 5, 2016, VERTEX, on behalf of Fairfield Chelsea Phase I LLC, submitted a Release Notification Form (RNF) to the MassDEP for the 120-day reportable condition. The MassDEP assigned RTN 3-33665 to track the release. In July 2017, a Phase I Initial Site Investigation Report and Tier Classification was submitted to the MassDEP. The Site was classified as a Tier II Disposal Site.

The north and west Site boundaries for RTN 3-33665 slightly overlap the boundaries of RTN 3-24968 (refer to Figure 2). The area of RTN 3-24968 is also owned by Fairfield Chelsea Phase I and is part of a larger the redevelopment property. In June 2005, petroleum hydrocarbons and metals were identified in soil at concentrations exceeding applicable MCP RCs. The release was reported to the MassDEP and RTN 3-24968 was assigned. In June 2007, a Class C-2 Response Action Outcome (RAO) Statement for RTN 3-24968 was submitted to the MassDEP. The Class C-2 RAO included environmental investigation data regarding the extent of impacts at the property and a risk characterization. Copies of available documentation associated with Site RTNs are publicly available on the MassDEP Searchable Sites Database[1].

[1] http://public.dep.state.ma.us/SearchableSites2/Search.aspx

Construction, utility installation, and remediation activities, including dewatering activities, for the RAM Area is included in the RAM Plan submitted to MassDEP on November 6, 2017. A separate RAM Plan as well as a separate NPDES RGP NOI will be prepared for construction, remediation, and dewatering activities for the remainder of the redevelopment property owned by Fairfield Chelsea Phase I LLC.

During pre-purchase due diligence investigations, radium impacted building materials were identified within the former Clock Building. The decontamination of the radium impacted building materials was conducted under an approval issued by the Massachusetts Department of Public Health (MassDPH), Radiation Control Program (RCP) by Decontamination Decommissioning Environmental Services, LLC (DDES). Between the Fall 2016 and Spring 2017, subsurface investigations were completed at the Site to determine if radium impacts were present in soil or groundwater. During the investigation, soil samples were collected from 0 to 6 inches, 2 to 3 foot, and 9 foot intervals and were submitted to GEL Laboratories in Charlestown, South Carolina for gamma-radioactive soil analysis by US Department of Energy Method HASL 300, 4.5, 2.3/Ga-01-R. The results of the radiological investigation identified the presence radium^{226} (Ra-226) at concentrations between 0.519 pico Curries per gram (pCig) to 22.7 pCi/g on the north side of the former Clock building adjacent to the exterior ventilation system previously used for the manufacturing processes by the Chelsea Clock Company. The Massachusetts Department of Public Health (MassDPH) Radiation Control Program (RCP) cleanup action level for Ra-226 is 3.3 pCi/g.

Proposed Scope of Site Development

Current redevelopment plans for the Site and additional contiguous parcels of land owned by Fairfield Chelsea Phase I LLC include the construction of an approximately 146,000-square foot 6-story multi-use residential and retail building. The proposed redevelopment includes street-level parking, a swimming pool, a dog park, landscaped areas, walkways, stormwater controls, and new utilities.

However, prior to construction activities, up to 3,000 cubic yards of OHM impacted soil will be excavated from the Site. Remediation activities on the Site will be conducted in accordance with the November 6, 2017 RAM Plan. Additional volumes of soil will be excavated during utility installation.

National Historic Preservation Act Eligibility – Surrounding Historical Places

A search for historic properties within the Site vicinity and immediate surrounding areas was performed on the National Register of Historic Places website. No listings were found for the Site property or within the vicinity of the Site. However, the former Clock building is listed on the Massachusetts Cultural Resource Information System (MACRIS) as significant for its architecture, industry and invention. Available MACRIS documentation is provided in Appendix A. However, as noted above, the former Clock Building was demolished in November 2017, as approved by the Massachusetts Historical Commission during permitting activities under the Massachusetts Environmental Protection Act (MEPA).

Endangered Species Act Eligibility

The United States Fish and Wildlife database of Federally-Listed Endangered and Threatened Species in Suffolk County, Massachusetts lists the Northern Long-eared Bat, Piping Plover, and Red Knot as threatened. The Piping Plover is found on coastal beaches, the Red Knot is found on coastal beaches, rocky shores, sand and mud flats, and the Northern Long-eared Bat is found statewide in mines and caves in the winter and in forested habitats in the summer. Based on the Site's location in a mixed-use commercial-industrial-residential area and not on a coastal beach or rocky shore and the absence of mud flats, sand, caves, mines, and forested areas in the Site vicinity the threatened species are not expected to be encountered onsite. Therefore, the threatened species are not in proximity of the discharge area. Correspondence from the U.S. Fish and Wildlife Service (FWS) is attached in Appendix B.

Summary of Soil and Groundwater Analyses

Previous investigations indicate that soils underlying the Site consist of urban fill that is generally described as loose to dense, dark brown and gray coarse to fine sand with varying amounts of gravel, silt, ash, cinder, coal, wood, bricks and concrete. The urban fill generally ranges in thickness from 1 to 7+ feet. Underlying the urban fill is an organic deposit that is described as silty sand and peat. The thickness of the organic deposit ranges up to 9 feet. Beneath the organic deposit, the explorations encountered a thick marine sequence that consists of silty clay (locally known as the Boston Blue Clay) intermixed with horizons of fine sand and silt partings.

In general, analytical soil data indicates that the soil at the Site contains concentrations of VOCs, metals, EPH fractions, VPH fractions, PAHs, and, PCBs at concentrations exceeding applicable MCP RCs. In addition, analytical data indicates that groundwater at the Site contains concentrations of VOCs, lead, and zinc at concentrations exceeding applicable MCP RCs.

Two representative groundwater monitoring wells, VES-129-MW and VES-501-MW, were sampled for this NOI. Based on the results of groundwater sampling conducted for this NOI, elevated concentrations of TPH, cadmium, lead, silver, zinc, and CVOCs were detected in monitoring wells VES-129-MW and VES-501-MW.

As part of this NOI, groundwater samples were collected from three on-site groundwater monitoring wells to evaluate the potential presence of Ra-226 in groundwater. Monitoring wells VES-129-MW and VES-501-MW are located in proposed excavation areas and monitoring well VES-205-MW is located upgradient from the area of radium impacts and is considered to be background. Ra-226 was detected in the monitoring well VES-205-MW at a concentration of 3.45 pico Curries per liter (pCi/L), which is below the Federal and Massachusetts Maximum Contaminant Level (MCL) for drinking water of 5 pCi/l. Ra-226 was detected in groundwater samples VES-129-MW and VES-501-MW at concentrations of 0.92 and 3.27 pCi/l, respectively, which is below background and the MCL. As such, there is no reason to believe that radium impacted groundwater is present at the Site or that radium impacted effluent will be generated as part of the dewatering activities.

Construction Site Dewatering and Treatment

As mentioned, the proposed dewatering will be conducted in support of excavation for the installation of subsurface utilities associated with redevelopment of the Site, and as part of the Site remediation activities. To treat the dewatered material, a groundwater treatment system, will be used, likely consisting of a baffled frac tank, with a blower/compressor for air / oxidation, pH adjustment, filter skid, and Granular Activated Carbon (GAC), as shown in Figure 5. The anticipated pump rates are less than 100 gallons per minute (gpm). The treatment system will contain the appropriate sample ports for influent and effluent concentrations and a flow meter /totalizer to maintain the dewatering treatment system and the discharge. The dewatering treatment system is designed to meet the permit requirements for total suspended solids, pH, temperature, and other constituents (as required) in the effluent stream prior to discharge to the storm drain. Once operations begin, a licensed wastewater treatment plant operator will conduct system monitoring, as required.

The required sampling and testing of the dewatering effluent and flows will be reported as required by the permit. If necessary, adjustments to the treatment system and/or dewatering procedures, will be conducted to comply with the Permit Discharge Criteria.

Receiving Waters Information

The proposed discharge location for the Remediation General Permit (RGP) is the Island End River (IE-3), as shown on the "City of Chelsea, Massachusetts – Map of Existing Sewer and Drain System" included in Appendix C. The Island End River ultimately discharges to the Mystic River (MA71-03), which is classified as a SB (CSO) receiving water. As shown on the "Grading and Drainage Plans" included in Appendix D, effluent water will be discharged to existing catch basins located within the redevelopment project which connect to the Island End River / Mystic River.

Based on information generated using the USEPA's StreamStats database, a seven day-ten-year low flow (7Q10) for the receiving water was calculated to be 0.021 cubic feet per second (ft^3/s) or 0.0136 million gallons per day (MGD). Utilizing the formula provided in Appendix V of the RGP, a dilution factor (DF) of 1.04 was calculated for the effluent stream. Verbal confirmation was received via email from Cathy Vakalopoulos with the MassDEP for this DF. A copy of this correspondence is included in Appendix E.

Analytical Testing and Applicable Standards

USEPA uses two standards to evaluate and calculate the effluent discharge standards. These are the technology-based effluent limitation, (TBEL) and the water quality-based effluent limitation (WQBEL) and are published in the RGP. In order to identify the applicable criteria (TBEL or WQBEL), USEPA developed a calculator spreadsheet. The calculation evaluates the water quality of the receiving waters and the Site contaminants, the dewatering system effluent flow rate (100 GPM),

and stream flow rate to select analyte specific criteria. A copy of this spreadsheet was submitted as an attachment to the electronic submittal for this proposed discharge, and was utilized to prepare the table summarizing the analytical results of the influent and effluent water samples.

Analytical testing of water was performed to aid in the design required for the treatment system to meet applicable discharge parameters. VERTEX collected and analyzed representative samples of site groundwater representing treatment system influent levels, as well as a sample of the receiving water, which are summarized in the attached Table 1 – RGP Analytical Results. Laboratory analytical reports are included as Appendix F. The samples of the dewatering influent (referred to as VES-501-MW and VES-129-MW) were obtained from groundwater monitoring wells located within the excavation area of the Site and the receiving water sample (Isle. End R1) was obtained directly from the Island End River adjacent to the stormwater outfall. The samples were analyzed for the presence of analytes referenced in Table 2 – Chemical Specific Effluent Limitations and Monitor-Only Requirements outlined in the final RGP and compared to their applicable Technology Based Effluent Limitations (TBELs) and Water Quality Based Effluent Limitations (WQBELs).

The results of the analyses indicate that concentrations of Total Suspended Solids and cyanide were detected at levels exceeding the applicable effluent limitations in each of the two influent samples as well as the receiving water sample. Additionally, concentrations of Group I PAHs were identified in sample VES-129-MW as well as the receiving water sample at levels above the applicable TBEL and WQBELs. Additional exceedances were identified in sample VES-129-MW- for TPH and CVOCs.

Each of the influent samples were also determined to contain concentrations of total metals at levels above their applicable TBELs/WQBELs. These include arsenic, cadmium, copper, iron, lead, mercury, and/or zinc. Concentrations of copper, iron, and lead were also detected in the receiving water sample at levels above the applicable TBELs and WQBELs. The treatment system will be designed and operated in a manner which removes these contaminants to concentrations below allowable discharge levels.

A summary of the laboratory analytical data, the USEPA calculation sheets, and the laboratory analytical report are attached.

Best Management Practices Plan (BMPP)

BMPP will be developed by the treatment system operator prior to the start of work and maintained on-site during dewatering activities. Construction personnel will adhere to the procedures identified in the BMPP.

Summary and Conclusions

The purpose of this letter is to summarize site environmental conditions and groundwater data to support a NOI to discharge under the RGP, for discharge of dewatered groundwater which will be encountered during the subsurface utility installation work and remediation activities for the

property located at 248 Everett Avenue in Chelsea, Massachusetts. The groundwater testing results reported in this application have been provided to the site owner.

Based on the results of the above referenced groundwater analyses, treatment of construction dewatering will be necessary to meet the effluent limits. The treatment system is designed to meet the permit requirements for suspended solids, pH, and other constituents (as required) in the effluent stream prior to discharge to catch basins located within the redevelopment project which connect to the Island End River / Mystic River. In addition, should the effluent monitoring results identify concentrations of contaminants that are in excess of the limits established by the RGP, additional mitigative measures will be implemented to meet the allowable discharge limits.

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

Sincerely,

The Vertex Companies, Inc.

Patrice A. Plante
Project Manager

Robert Falotico
Senior Project Manager

Attachments:

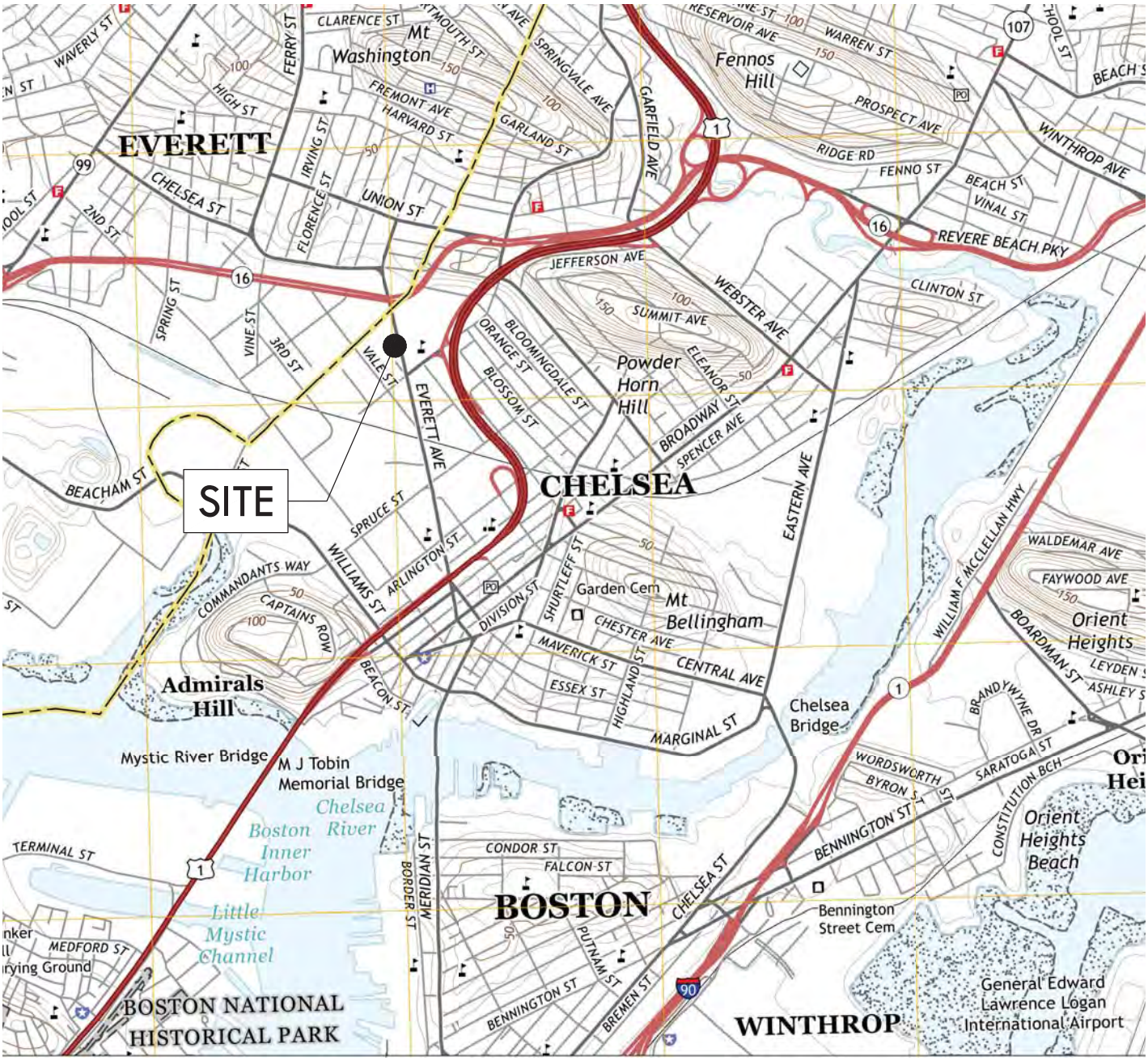
Figure 1: Site Locus
Figure 2: Site Schematic
Figure 3: Sample Plan
Figure 4: Excavation Plan
Figure 5: Treatment System Design

Table 1: RGP Analytical Results
Table 2: USEPA WQBEL Calculation Sheet

Appendix A: National Historic Preservation Act Eligibility Documentation
Appendix B: Endangered Species Act Eligibility Documentation
Appendix C: City of Chelsea, MA – Map of Existing Sewer & Drain System
Appendix D: Utility Site Plans
Appendix E: MassDEP Dilution Factor Correspondence
Appendix F: Laboratory Analytical Report
Appendix G: Notice of Intent

cc: Massachusetts Department of Environmental Protection
City of Chelsea Public Works

FIGURES



SCALE: 1" = 2000'

SOURCE: UNITED STATES GEOLOGICAL SURVEY MAP BOSTON, BOSTON NORTH QUADRANGLE, BOSTON NORTH, MA, 7.5 MINUTE SERIES (2015)

RAM AREA LOCUS MAP

FORMER CHELSEA CLOCK BUILDING
284 EVERETT AVENUE
CHELSEA, MASSACHUSETTS
RTN 3-33665

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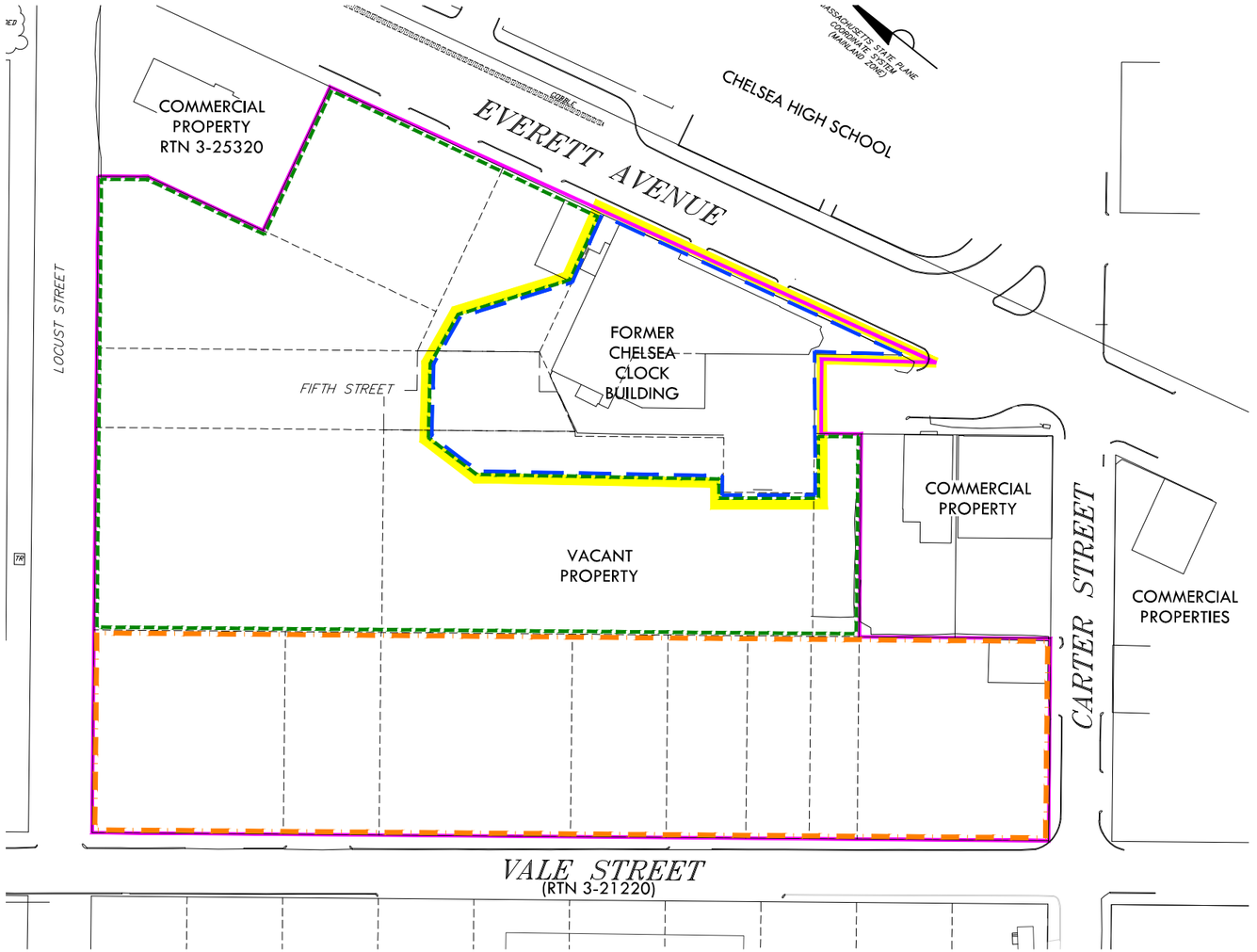
FIGURE 1

VERTEX®

LEGEND:

- DISPOSAL SITE BOUNDARY FOR RTN 3-33665
- DISPOSAL SITE BOUNDARY FOR RTN 3-24968
- DISPOSAL SITE BOUNDARY FOR RTN 3-17267
- PARCEL LINE
- FAIRFIELD REDEVELOPMENT AREA
- RAM AREA/DEWATERING AREA



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VERTEX

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FIGURE 2

SITE SCHEMATIC
FORMER CHELSEA CLOCK BUILDING
284 EVERETT AVENUE
CHELSEA, MASSACHUSETTS
RTN 3-33665

LEGEND:

- ◉ VES-127 — SOIL BORING
- ✥ VES-113-MW — MONITORING WELL
- ▲ VSG-01 — SOIL GAS POINT
- ● GZ-2 — HISTORICAL SAMPLE LOCATIONS
- — — — — — PARCEL LINE
- DISPOSAL SITE BOUNDARY FOR RTN 3-33665

EVERETT AVENUE

CHELSEA HIGH SCHOOL

FORMER BUILDING (DEMOLISHED)

FORMER CHELSEA CLOCK BUILDING

VES-701-MW
VES-306-MW
▲VSG-01
VES-305-MW
▲VSG-02
VES-202-MW
VES-133-MW
VES-137
VES-724-MW
VES-232
VES-627
VES-629
VES-628
VES-134
VES-135-MW
VES-231-MW
VES-601
VES-136-MW
VES-604
VES-602
VES-605
VES-633
VES-513
VES-603
VES-717
VES-514
VES-634
VES-609
VES-606
VES-501
VES-132
VES-130
VES-511
VES-233
VES-512
VES-517
VES-716
VES-632
VES-607
VES-720
VES-516
VES-515
VES-510
VES-234
VES-507
VES-630
VES-622
VES-715
VES-635
VES-608
VES-503
VES-719
VES-626
VES-518
VES-722
VES-728
VES-620
VES-615
VES-618
VES-623
VES-729
VES-718
VES-721
VES-725
VES-506
VES-714
VES-713
VES-625
VES-726
VES-621
VES-616
VES-712
VES-502
VES-708
VES-705
VES-727
VES-710
VES-706
VES-704
GZ-3
VES-636
VES-617
VES-711
VES-619
VES-505
VES-206-MW
VES-610
VES-613
VES-614
VES-631
VES-709
VES-612
VES-139
VES-504
VES-611
VES-139
GZ-2
VES-205-MW
VES-702-MW
VES-123-MW
VEX-703-MW

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FIGURE 3

SAMPLE PLAN
FORMER CHELSEA CLOCK BUILDING
284 EVERETT AVENUE
CHELSEA, MASSACHUSETTS

RTN 3-33665

LEGEND:

- ◉ VES-127 — SOIL BORING
- ⊕ VES-113-MW — MONITORING WELL
- ▲ VSG-01 — SOIL GAS POINT
- ● GZ-2 — HISTORICAL SAMPLE LOCATIONS
- PARCEL LINE
- DISPOSAL SITE BOUNDARY FOR RTN 3-33665
- METAL EXCAVATION LIMITS (APPROX.)
- RADIUM EXCAVATION LIMITS (APPROX.)
- EXCAVATION OVERLAP (APPROX.)
- AREA 3: CVOC EXCAVATION LIMITS 0-16' (APPROX.)

EVERETT AVENUE

CHELSEA HIGH SCHOOL

FORMER BUILDING (DEMOLISHED)

FORMER CHELSEA CLOCK BUILDING

VES-306-MW ▲VSG-01 VES-305-MW ▲VSG-02 VES-701-MW VES-202-MW VES-133-MW VES-137 VES-724-MW VES-232 VES-627 VES-629 VES-628 VES-134 VES-135-MW VES-231-MW VES-136-MW VES-601 VES-604 VES-602 VES-605 VES-603 VES-633 VES-513 VES-514 VES-634 VES-609 VES-606 VES-501 VES-132 VES-130 VES-512 VES-511 VES-233 VES-517 VES-716 VES-607 VES-632 VES-715 VES-720 VES-635 VES-608 VES-503 VES-719 VES-618 VES-615 VES-714 VES-713 VES-616 VES-712 VES-502 GZ-3 VES-636 VES-617 VES-711 VES-710 VES-610 VES-709 VES-504 VES-139 VES-631 VES-702-MW VES-205-MW VES-123-MW VEX-703-MW VES-206-MW GZ-2 VES-611 VES-612 VES-139 VES-613 VES-614 VES-619 VES-505 VES-704 VES-706 VES-705 VES-708 VES-131-MW VES-718 VES-721 VES-725 VES-625 VES-508 VES-726 VES-727 VES-621 VES-506 VES-729 VES-623 VES-722 VES-728 VES-620 VES-622 VES-723 VES-129-MW VES-624 VES-509 VES-515 VES-516 VES-626 VES-518 VES-510 VES-507 VES-630 VES-234

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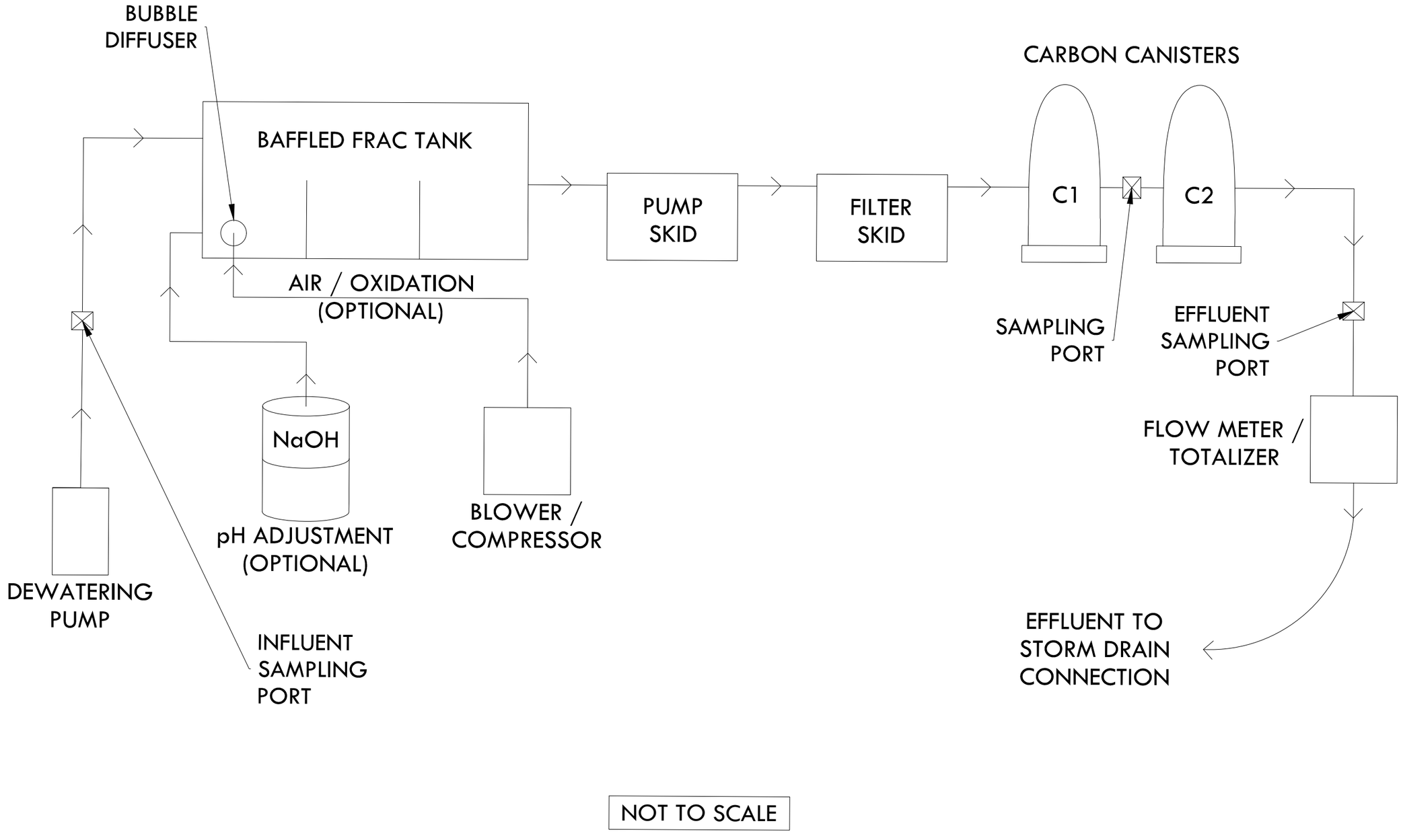
FIGURE 5

EXCAVATION PLAN
FORMER CHELSEA CLOCK BUILDING
284 EVERETT AVENUE
CHELSEA, MASSACHUSETTS

RTN 3-33665



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REVISIONS

TREATMENT SYSTEM DESIGN
FORMER CHELSEA CLOCK BUILDING
284 EVERETT AVENUE
CHELSEA, MASSACHUSETTS

File No.:	42088
Date:	NOVEMBER 2017
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FIGURE 5

TABLES

Table 1
RGP Analytical Results
Chelsea Clock
284 Everett Avenue
Chelsea, Massachusetts
VERTEX Project No. 42088

LOCATION		USEPA RGP Effluent Limitations		Units	VES-501 (MW)	VES-129 (MW)	ISLE. END R1
SAMPLING DATE					9/5/2017	9/5/2017	9/27/2017
LAB SAMPLE ID	CasNum				L1731154-01	L1731154-02	L1734514-01
Anions by Ion Chromatography		TBEL	WQBEL				
Chloride	16887-00-6	Report		ug/l	424,000	2,310,000	15,400,000
General Chemistry							
Chromium, Trivalent	16065-83-1	**323**	100	ug/l	ND(10)	49	ND(10)
Solids, Total Suspended	NONE	30,000		ug/l	**51,000**	**1,300,000**	**46,000**
Cyanide, Total	57-12-5	178,000	1.4	ug/l	**30**	**7**	**23**
Chlorine, Total Residual	NONE	200	**10.3**	ug/l	ND(20)	ND(20)	ND(20)
Nitrogen, Ammonia	7664-41-7	Report		ug/l	13,500	18,900	695
TPH, SGT-HEM	NONE	5,000		ug/l	ND(4000)	**8,800**	ND(4000)
pH (H)	12408-02-5	6.5-8.5		SU	7.03	7.07	6.93
Phenolics, Total	NONE	NC	NC	ug/l	ND(30)	ND(30)	ND(30)
Salinity	NONE	NC	NC	SU	1.3	1.3	---
Temperature	NONE	NC	NC	Celsius	20.9	23	21.75
Chromium, Hexavalent	18540-29-9	**323**	50	ug/l	ND(10)	ND(10)	ND(10)
Microextractables by GC							
1,2-Dibromoethane	106-93-4	NC	NC	ug/l	ND(0.01)	ND(0.01)	ND(0.01)
Polychlorinated Biphenyls by GC							
Aroclor 1016	12674-11-2	NC	NC	ug/l	ND(0.25)	ND(0.25)	ND(0.263)
Aroclor 1221	11104-28-2	NC	NC	ug/l	ND(0.25)	ND(0.25)	ND(0.263)
Aroclor 1232	11141-16-5	NC	NC	ug/l	ND(0.25)	ND(0.25)	ND(0.263)
Aroclor 1242	53469-21-9	NC	NC	ug/l	ND(0.25)	ND(0.25)	ND(0.263)
Aroclor 1248	12672-29-6	NC	NC	ug/l	ND(0.25)	ND(0.25)	ND(0.263)
Aroclor 1254	11097-69-1	NC	NC	ug/l	ND(0.25)	ND(0.25)	ND(0.263)
Aroclor 1260	11096-82-5	NC	NC	ug/l	ND(0.2)	ND(0.2)	ND(0.21)
Total PCBs	Multiple	0.000064		ug/L	ND(CS)	ND(CS)	ND(CS)
Semivolatile Organics by GC/MS							
Bis(2-ethylhexyl)phthalate	117-81-7	101	2.2	ug/l	ND(3)	ND(3)	ND(3)
Butyl benzyl phthalate	85-68-7	NC	NC	ug/l	ND(5)	ND(5)	ND(5)
Di-n-butylphthalate	84-74-2	NC	NC	ug/l	ND(5)	ND(5)	ND(5)
Di-n-octylphthalate	117-84-0	NC	NC	ug/l	ND(5)	ND(5)	ND(5)
Diethyl phthalate	84-66-2	NC	NC	ug/l	ND(5)	ND(5)	ND(5)
Dimethyl phthalate	131-11-3	NC	NC	ug/l	ND(5)	ND(5)	ND(5)
Phenol	108-95-2	**1,080**	300	ug/l	ND(5)	ND(5)	ND(5)
Total Phthalates	Multiple	190	---	ug/l	ND(CS)	ND(CS)	ND(CS)
Semivolatile Organics by GC/MS-SIM							
Acenaphthene	83-32-9	NC	NC	ug/l	0.5	1.1	0.57
Fluoranthene	206-44-0	NC	NC	ug/l	ND(0.1)	2.3	9.6
Naphthalene	91-20-3	20		ug/l	ND(0.1)	1.7	ND(0.5)
Benzo(a)anthracene	56-55-3	As Total Group I	0.0052	ug/l	ND(0.1)	**0.9**	**8.9**
Benzo(a)pyrene	50-32-8	As Total Group I	0.0052	ug/l	ND(0.1)	**0.85**	**14**
Benzo(b)fluoranthene	205-99-2	As Total Group I	0.0052	ug/l	ND(0.1)	**1**	**24**
Benzo(k)fluoranthene	207-08-9	As Total Group I	0.0052	ug/l	ND(0.1)	**0.39**	**8.4**
Chrysene	218-01-9	As Total Group I	0.0052	ug/l	ND(0.1)	**1.1**	**12**
Acenaphthylene	208-96-8	NC	NC	ug/l	ND(0.1)	0.21	0.7
Anthracene	120-12-7	NC	NC	ug/l	0.12	1	0.64
Benzo(ghi)perylene	191-24-2	NC	NC	ug/l	ND(0.1)	0.65	17
Fluorene	86-73-7	NC	NC	ug/l	ND(0.1)	1.4	ND(0.5)
Phenanthrene	85-01-8	NC	NC	ug/l	ND(0.1)	4.7	2.2
Dibenzo(a,h)anthracene	53-70-3	As Total Group I	0.0052	ug/l	ND(0.1)	**0.15**	**3.9**
Indeno(1,2,3-cd)pyrene	193-39-5	As Total Group I	0.0052	ug/l	ND(0.1)	**0.63**	**17**
Pyrene	129-00-0	NC	NC	ug/l	ND(0.1)	2.4	9.2
Pentachlorophenol	87-86-5	1		ug/l	ND(0.8)	ND(0.8)	ND(4)
Total Group I PAHs	Multiple	1	As Individual	ug/L	ND(0.1)	**5.02**	**88.2**
Total Group II PAHs	Multiple	100		ug/l	0.62	15.46	39.91

Table 1
RGP Analytical Results
Chelsea Clock
284 Everett Avenue
Chelsea, Massachusetts
VERTEX Project No. 42088

Total Hardness by SM 2340B							
Hardness	NONE	NC	NC	ug/l	542,000	512,000	4,340,000
Total Metals							
Antimony, Total	7440-36-0	**206**	640	ug/l	ND(4)	10.17	ND(40)
Arsenic, Total	7440-38-2	104	**50**	ug/l	3.3	**337.8**	ND(10)
Cadmium, Total	7440-43-9	**10.2**	12.2	ug/l	ND(0.2)	**42.44**	ND(2)
Chromium, Total	7440-47-3	NC	NC	ug/l	1.4	48.76	ND(10)
Copper, Total	7440-50-8	242	**3.7**	ug/l	**29.76**	**41,820**	**24.91**
Iron, Total	7439-89-6	**5,000**	NC	ug/l	**15,400**	**123,000**	**2,580**
Lead, Total	7439-92-1	160	**8.5**	ug/l	6.28	**6739**	**31.36**
Mercury, Total	7439-97-6	**0.739**	0.94	ug/l	ND(0.2)	**1.77**	ND(0.2)
Nickel, Total	7440-02-0	**1,450**	8.2	ug/l	2.64	144.1	ND(20)
Selenium, Total	7782-49-2	**235.8**	71	ug/l	ND(5)	7.55	ND(50)
Silver, Total	7440-22-4	**35.1**	1.9	ug/l	ND(0.4)	15.72	ND(4)
Zinc, Total	7440-66-6	**420**	81	ug/l	36.98	**27,190**	ND(100)
Chromium, Trivalent	NONE	**323**	100	ug/l	ND(10)	49	ND(10)
Volatile Organics by GC/MS							
Methylene chloride	75-09-2	4.6		ug/l	ND(15)	ND(15)	ND(3)
1,1-Dichloroethane	75-34-3	70		ug/l	ND(3.8)	8.2	ND(0.75)
Carbon tetrachloride	56-23-5	**4.4**	1.6	ug/l	ND(2.5)	ND(2.5)	ND(0.5)
1,1,2-Trichloroethane	79-00-5	5		ug/l	ND(3.8)	ND(3.8)	ND(0.75)
Tetrachloroethene	127-18-4	**5**	4.5	ug/l	ND(2.5)	ND(2.5)	ND(0.5)
1,2-Dichloroethane	107-06-2	5		ug/l	ND(2.5)	ND(2.5)	ND(0.5)
1,1,1-Trichloroethane	71-55-6	200		ug/l	ND(2.5)	ND(2.5)	ND(0.5)
Benzene	71-43-2	5		ug/l	ND(2.5)	ND(2.5)	ND(0.5)
Toluene	108-88-3	NC	NC	ug/l	ND(3.8)	ND(3.8)	ND(0.75)
Ethylbenzene	100-41-4	NC	NC	ug/l	ND(2.5)	ND(2.5)	ND(0.5)
Vinyl chloride	75-01-4	2		ug/l	ND(5)	**1400**	ND(1)
1,1-Dichloroethene	75-35-4	3.2		ug/l	ND(2.5)	ND(2.5)	ND(0.5)
Trichloroethene	79-01-6	5		ug/l	ND(2.5)	**5.7**	ND(0.5)
1,2-Dichlorobenzene	95-50-1	600		ug/l	ND(12)	ND(12)	ND(2.5)
1,3-Dichlorobenzene	541-73-1	320		ug/l	ND(12)	ND(12)	ND(2.5)
1,4-Dichlorobenzene	106-46-7	5		ug/l	ND(12)	ND(12)	ND(2.5)
Methyl tert butyl ether	1634-04-4	**70**	28	ug/l	5.4	ND(5)	ND(1)
p/m-Xylene	179601-23-1	NC	NC	ug/l	ND(5)	ND(5)	ND(1)
o-Xylene	95-47-6	NC	NC	ug/l	ND(5)	ND(5)	ND(1)
Xylenes, Total	1330-20-7	NC	NC	ug/l	ND(5)	ND(5)	ND(1)
cis-1,2-Dichloroethene	156-59-2	70		ug/l	ND(2.5)	**410**	ND(0.5)
Acetone	67-64-1	7,970		ug/l	ND(25)	ND(25)	8.4
Tert-Butyl Alcohol	75-65-0	120		ug/l	ND(50)	ND(50)	ND(10)
Tertiary-Amyl Methyl Ether	994-05-8	90		ug/l	ND(10)	ND(10)	ND(2)
Total BTEX	Multiple	100		ug/l	ND(CS)	ND(CS)	ND(CS)
Volatile Organics by GC/MS-SIM							
1,4-Dioxane	123-91-1	200		ug/l	ND(15)	ND(15)	ND(3)

Notes
CAS No = Chemical Abstract Service Number
ND = Not detected above the laboratory reporting limit shown in parenthesis
ug/L = micrograms per liter
mg CACO3/L = milligrams of calcium carbonate per liter
SU = Standard Units
umhos/cm = mcromhos per centimeter
SU = Standard Units
ł = Field measured
TBEL = Technology-Based Effluent Limitation
WQBEL = Water Quality-Based Effluent Limitation
* = Calculated WQBEL value

Enter number values in green boxes below

Enter values in the units specified

↓

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

Enter a dilution factor, if other than zero

↓

1.04

Enter values in the units specified

↓

542000	C_d = Enter influent hardness in **mg/L** $CaCO_3$
4340000	C_s = Enter receiving water hardness in **mg/L** $CaCO_3$

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

↓

6.93	pH in **Standard Units**
21.75	Temperature in **°C**
695	Ammonia in **mg/L**
4340	Hardness in **mg/L** $CaCO_3$
26	Salinity in **ppt**
0	Antimony in **µg/L**
0	Arsenic in **µg/L**
0	Cadmium in **µg/L**
0	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
24.91	Copper in **µg/L**
2580	Iron in **µg/L**
31.36	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
0	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

↓

0	TRC in **µg/L**
16200	Ammonia in **mg/L**
10.17	Antimony in **µg/L**
337.8	Arsenic in **µg/L**
42.44	Cadmium in **µg/L**
49	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
20295	Copper in **µg/L**
69200	Iron in **µg/L**
3373	Lead in **µg/L**
0	Mercury in **µg/L**
5	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
0	Zinc in **µg/L**
18.5	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
0	Tetrachloroethylene in **µg/L**
0	Total Phthalates in **µg/L**
0	Diethylhexylphthalate in **µg/L**
0	Benzo(a)anthracene in **µg/L**
0	Benzo(a)pyrene in **µg/L**
0	Benzo(b)fluoranthene in **µg/L**
0	Benzo(k)fluoranthene in **µg/L**
0	Chrysene in **µg/L**
0	Dibenzo(a,h)anthracene in **µg/L**
0	Indeno(1,2,3-cd)pyrene in **µg/L**
0	Methyl-tert butyl ether in **µg/L**

Notes:

Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved
Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry
Discharge flow is equal to the design flow or 1 MGD, whichever is less
Downstream 7Q10 an 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_R = 7Q10 in MGD

Q_P = Discharge flow, in MGD

II. Effluent Limitation Calculation Method

A. Calculate Water Quality Criterion:

Step 1. Downstream hardness, calculated as follows:

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

C_r = Downstream hardness in mg/L

Q_d = Discharge flow in MGD

C_d = Discharge hardness in mg/L

Q_s = Upstream flow (7Q10) in MGD

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

Q_r = Downstream receiving water flow in MGD

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

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

m_c = Pollutant-specific coefficient (m_a for silver)

b_c = Pollutant-specific coefficient (b_a for silver)

ln = Natural logarithm

h = Hardness calculated in Step 1

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

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

B. Calculate WQBEL:

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

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

C_r = Water quality criterion in µg/L

Q_d = Discharge flow in MGD

C_d = WQBEL in µg/L

Q_s = Upstream flow (7Q10) in MGD

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

Q_r = Downstream receiving water flow in MGD

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

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

C_r = Water quality criterion in µg/L

Q_d = Discharge flow in MGD

Q_r = Downstream receiving water flow in MGD

C. Determine if a WQBEL applies:

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

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

C_r = Downstream concentration in µg/L

Q_d = Discharge flow in MGD

C_d = Influent concentration in µg/L

Q_s = Upstream flow (7Q10) in MGD

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

Q_r = Downstream receiving water flow in MGD

The WQBEL applies if:

1) the projected downstream concentration calculated in accordance with 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	1.4					
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
Ammonia	**Report**	mg/L	---			
Chloride	**Report**	µg/L	---			
Total Residual Chlorine	0.2	mg/L	**15**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	882	µg/L		
Arsenic	104	µg/L	**14**	µg/L		
Cadmium	**10.2**	µg/L	481.9673	µg/L		
Chromium III	**323**	µg/L	326622.3	µg/L		
Chromium VI	**323**	µg/L	15.8	µg/L		
Copper	**242**	µg/L	49828.2	µg/L		
Iron	5000	µg/L	**1000**	µg/L		
Lead	**160**	µg/L	972506.98	µg/L		
Mercury	**0.739**	µg/L	1.25	µg/L		
Nickel	**1450**	µg/L	256680.4	µg/L		
Selenium	**235.8**	µg/L	6.9	µg/L		
Silver	**35.1**	µg/L	87190336.7	µg/L		
Zinc	**420**	µg/L	597043.1	µg/L		
Cyanide	178	mg/L	7.2	µg/L	5	µg/L
B. Non-Halogenated VOCs						
Total BTEX	**100**	µg/L	---			
Benzene	**5.0**	µg/L	---			
1,4 Dioxane	**200**	µg/L	---			
Acetone	**7970**	µg/L	---			
Phenol	**1,080**	µg/L	413	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**	µg/L	2.2	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	4.5	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	3.0	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	28	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

I. Dilution Factor Calculation Method

A. 7Q10

No flow assumed at critical low flow for saltwater unless otherwise approved by the State

B. Dilution Factor

No dilution assumed for saltwater, unless otherwise approved by the State

II. Effluent Limitation Calculation Method

A. Calculate Water Quality Criterion:

Step 1. Not applicable to saltwater

Step 2. Not applicable to saltwater

Step 3. Total recoverable water quality criteria for dissolved metals, calculated as follows:

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

B. Calculate WQBEL:

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

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

C_r = Water quality criterion in µg/L

Q_d = Discharge flow in MGD

C_d = WQBEL in µg/L

Q_s = Upstream flow (7Q10) in MGD

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

Q_r = Downstream receiving water flow in MGD

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

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

C_r = Water quality criterion in µg/L

Q_d = Discharge flow in MGD

Q_r = Downstream receiving water flow in MGD

C. Determine if a WQBEL applies:

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

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

C_r = Downstream concentration in µg/L

Q_d = Discharge flow in MGD

C_d = Influent concentration in µg/L

Q_s = Upstream flow (7Q10) in MGD

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

Q_r = Downstream receiving water flow in MGD

The WQBEL applies if:

1) the projected downstream concentration calculated in accordance with Step 1, above, and the discharge concentration of a parameter is 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 detected in or not sampled 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	1.4					
A. Inorganics	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
Ammonia	**Report**	mg/L	---			
Chloride	**Report**	µg/L	---			
Total Residual Chlorine	0.2	mg/L	**10.3**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	882	µg/L		
Arsenic	104	µg/L	**50**	µg/L		
Cadmium	**10.2**	µg/L	12.2	µg/L		
Chromium III	**323**	µg/L	137.8	µg/L		
Chromium VI	**323**	µg/L	69	µg/L		
Copper	242	µg/L	**3.7**	µg/L		
Iron	**5000**	µg/L	---	µg/L		
Lead	160	µg/L	**8.5**	µg/L		
Mercury	**0.739**	µg/L	1.52	µg/L		
Nickel	**1450**	µg/L	11.4	µg/L		
Selenium	**235.8**	µg/L	98	µg/L		
Silver	**35.1**	µg/L	3.1	µg/L		
Zinc	**420**	µg/L	118	µg/L		
Cyanide	178	mg/L	1.4	µg/L	5	µg/L
B. Non-Halogenated VOCs						
Total BTEX	**100**	µg/L	---			
Benzene	**5.0**	µg/L	---			
1,4 Dioxane	**200**	µg/L	---			
Acetone	**7.97**	mg/L	---			
Phenol	**1,080**	µg/L	413	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**		2.2	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	4.5	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	3.0	µg/L		

Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0052	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	28	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

Appendix A

National Historic Preservation Act Eligibility Documentation

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No:	CLS.341
Historic Name:	Chelsea Clock Company
Common Name:	
Address:	284 Everett Ave
City/Town:	Chelsea
Village/Neighborhood:	
Local No:	63
Year Constructed:	1895
Architect(s):	Giddings, J. E. and Son; Jones, William H. and Sons
Architectural Style(s):	Victorian Eclectic
Use(s):	Clock Factory
Significance:	Architecture; Industry; Invention
Area(s):	
Designation(s):	
Building Materials(s):	Wall: Brick; Metal, Undetermined Foundation: Brick

Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

CLS.341

FORM B - BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
MASSACHUSETTS ARCHIVES BUILDING
220 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS 02125

Assessor's #s	USGS Quad	Area(s)	Form Number
			341

Town CHELSEA

Place *(neighborhood or village)* Chelsea

Address 284 Everett Avenue

Historic Name Chelsea Clock Company

Uses: **Present** Clock manufacturing and repair
Original Same

Date of Construction 1895-96
Source Peter Stott, "Chelsea – Chelsea Clock," ms.

Style/Form Pilaster wall; slow-burning construction

Architect/Builder J. E. Giddings & Son, builder; 1942 extension, W. H. Jones & Son, architect

Exterior Material:

Foundation Brick
Wall/Trim Brick
Roof Flat

Outbuildings/Secondary Structures Concrete block warehouse at rear

Major Alterations *(with dates)* Extension on western side erected, and window frames on street front replaced, in 1942; concrete block warehouse, 1978

Condition Good

Moved ☒ **no** ☐ **yes** **Date**

Acreage Site, approx. ½ acre; building footprint, 10,372 sq. feet

Setting Commercial/residential/industrial; across the street from the new Chelsea High School

Recorded by Sara E. Wermiel

Organization Preservation consultant for MHC

Date *(month/year)* July-August 2000

Massachusetts Historical Commission
Massachusetts Archives Building
220 Morrissey Blvd.
Boston, MA 02125

Community: Chelsea

Property Address: 284 Everett Avenue

Form No.: 341

BUILDING FORM

ARCHITECTURAL DESCRIPTION *continued on next page*

Joseph Eastman chose a sparsely developed area in which to establish his clock factory in 1895-96, located several blocks from the railroad tracks and west of the commercial districts. Possibly cheap land (Eastman paid $1,000 cash for the site), rather than good transportation access, influenced his decision. Because Fifth Street, which intersects Everett Avenue at an angle to create Chelsea Clock Co.'s triangular lot, was unneeded to access any structures, the city closed it and Chelsea Clock added the land of the paper street to its site. In 1978, it added more land from the already closed street, creating an approximately ½ acre site.

The original building is two stories with a raised basement on a sloping lot (creating three stories at the rear) and measured roughly 145' along Everett Avenue and 41' deep, excluding the extensions at the Fifth Street side (1 on the sketch map). Presumably designed by its builder, J. E. Giddings & Son, the factory has a brick foundation, brick pilaster walls, a corbel brick cornice, and a flat roof. The interior is reportedly of slow-burning construction. Rather than filling the 10-foot bays with window openings, the designer put in two windows per bay with a pilaster between them. Thus, the Everett Street façade is notable for its numerous, narrow windows, which are in the recessed plane between the pilasters. The window openings are spanned on top with segmental arches (2 rows of header brick at the first and second floors, three at the raised basement) and are simply filled with window frames. The designed eschewed all decoration: there is no pattern in the brickwork or corbeling – save for the small cornice. Nevertheless, the frequent, closely spaced pilasters give verticality to this small building. The designer took advantage of the corner site by putting in a projecting bay with even narrower window, which create a tower effect. Here the company attached an Automatic Ship's Bell Clock – one of their premier products in the early twentieth century – which strikes the hour and half-hour (when it is working). Finally, the owners painted the firm's name in black and white sign along the top of the façade.

The windows on the Everett Street façade contrast with the prevalent tendency of the time toward larger openings, to admit as much natural light as possible. Those at the back of the building, along the former Fifth Street, are wider and thus more typical of factories of the day. The rear wall or the original building is flat and the window openings are spanned with segmental arches. Some of the windows have been bricked in entirely, filled with glass blocks, or partly bricked/blocked and filled with smaller windows.

☒ Recommended for listing in the National Register of Historic Places. *If checked, you must attach a completed National Register Criteria Statement form.*

Architectural Description continued

Behind the north end of the building is a two-story addition (roughly 42 ½' wide x 67 ½' long) erected to the designs of W. H. Jones & Son in 1942 (MDPS, 2 on the sketch map). This wing, which is not visible from the street, is made of brown-colored brick and has horizontal rectangular windows, with brick and metal lintels and brick header sills. It is built in a modern variant of slow-burning construction, with longitudinal steel girders and timber beams running across the width. At its rear is a substantial iron fire escape, which is accessed by doors rather than windows. Also attached to the end of this wing is an incinerator and chimney.

Along the south side of the wing, connected to the back of the original factory, is a new concrete block and brick storage building (built around 1978), with a door for vehicular access (3 on the sketch map).

Almost all the windows on the Everett Ave. façade have been replaced, but with brown metal frames that are unobtrusive. These may be the frames installed in 1942, when the original building was altered as well as expanded (MDPS). The architects' plans called for replacing all the front windows with "Anderson DH Victory" units. A few wooden, double-hung frames are probably what the building had originally. Also in 1942, the entrance was moved and new steps put in, and the architecturally incongruous (but generally unobtrusive) door and frame at the new entrance may also date from this time. The building has been used since it first went up by clock manufacturers. The alterations do not negatively affect the appearance of the building, and it is in good condition.

HISTORICAL NARRATIVE *continued on next page*

The Chelsea Clock Company has its origins in the E. Howard Clock Company of Roxbury. One of Edward Howard's apprentices, Joseph H. Eastman, had the idea of putting a watch escapement into a high-quality striking clock for home use, to replace the then-universal pendulum movement. Around 1879, Eastman established his own firm. Operating difficulties plagued him from the start, and he established several different firms: the Harvard Clock Company (1881-84), the Boston Clock Company (1885-94), and the Eastman Clock Company (1895-96). During the winter of 1895-96, Eastman moved the company to Chelsea after erecting the existing two-story brick building on Everett Avenue. From the start, the factory was powered by gas engines and electric motors rather than steam, so it lacks the brick engine shed and tall chimney characteristic of steam-powered factories (1911 SM).

Eastman ran into difficulties soon after the move and was unable to pay his creditors. The bank that held the mortgage foreclosed, and another clock manufacturer took over, who in turn sold his interest in the company to Charles H. Pearson, a rope manufacturer from Maine. Pearson reorganized the business as the Chelsea Clock Company.

Massachusetts Historical Commission
Massachusetts Archives Building
220 Morrissey Blvd.
Boston, MA 02125

Historical Narrative continued

Part of the company's subsequent success was its marine clocks, notably the ship bell clocks, which had a movement invented in the late 1890s by Walter K. Menns. This movement allowed the clocks to strike reliably while at sea. The company made the clocks for ships of all sizes, from warships to tugboats. The high quality of Chelsea Clock's products made them popular with the State Department, as gifts for foreign dignitaries; they could be found in the office of most U.S. presidents in this century. In the 1930s, at the request of the U.S. Navy, the plant superintendent, James Leone, developed the "marine movement" for a highly accurate mechanical clock. The U.S. Navy was a big customer of Chelsea Clocks for its ships. In the 1930s, the firm manufactured ship and home clocks and also time measuring instruments to record the flow of electricity and water. At this time, the company had 200 employees.

The company's high reputation was based not only on its innovations, but also on the solid construction of its clocks: plates are twice as thick as those of other ship clocks, to insure longer wear and to prevent corrosion, and all metal parts of the clocks' works are plated. Almost the entire manufacturing operation is carried out in the Chelsea plant, with heavier punch presses, screw and buffing machines in the basement; gear cutting equipment on the second floor; and final assembly and testing on the first. Today, Chelsea Clock Co. clocks are sold in through jewelers and marine products stores.

BIBLIOGRAPHY and/or REFERENCES

Andrew Demeter, Chelsea Clock company historian, source of name of builder and cost of land (interview August 2000).

Fire insurance maps for Chelsea, Massachusetts, made by the Sanborn Map Company, for 1889, 1894, 1911, 1950, 1954 and 1985 (available at the Massachusetts State Library).

Massachusetts Department of Public Safety, Inspection Plans, Mass. State Archives.

Stone, Orra, History of Massachusetts Industries (Boston: S. J. Clarke Pub. Co., 1930), 1637.

Stott, Peter, "Chelsea – Chelsea Clock Company," in "A Guide to the Industrial Archeology of Massachusetts: Middlesex, Norfolk, and Suffolk Counties, 1983" (ms. on file at the MHC), based on interviews with Richard Leavitt, president, and John J. McCarthy, manufacturing supervisor, Chelsea Clock Company; "Charles H. Pearson," Boston Evening Transcript February 11, 1928: 9; "Company history," 4-page typescript prepared in 1981.

Abbreviations Used in the Text: SM – Sanborn Map Company; MDPS – Mass. Dept. of Public Safety

CLS.341

Massachusetts Historical Commission
Massachusetts Archives Building
220 Morrissey Blvd.
Boston, MA 02125

Community: Chelsea

Property Address: 284 Everett Avenue
Form No.: 341

National Register of Historic Places Criteria Statement Form

Check all that apply:

☒ Individually eligible ☐ Eligible **only** in a historic district

☐ Contributing to a potential historic district ☐ Potential historic district

Criteria: ☒ **A** ☐ **B** ☒ **C** ☐ **D**

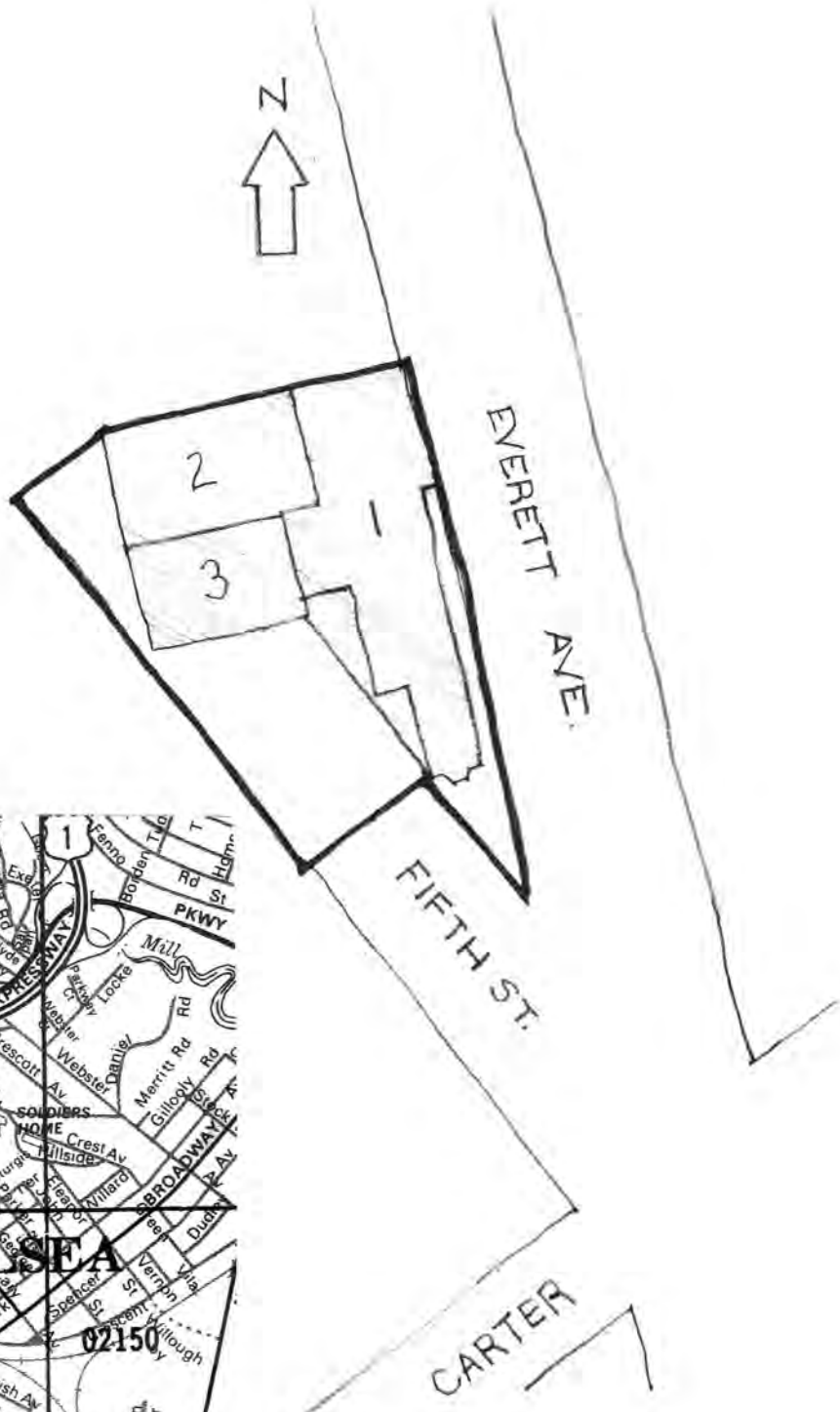
Criteria Considerations: ☐ **A** ☐ **B** ☐ **C** ☐ **D** ☐ **E** ☐ **F** ☐ **G**

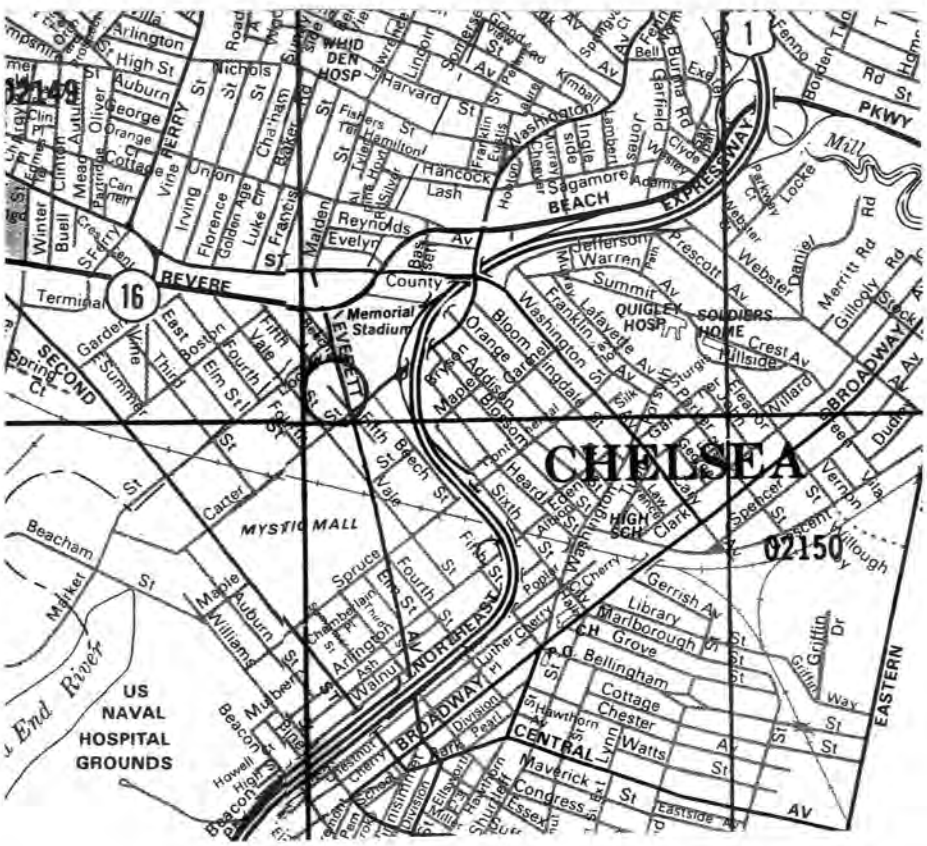
Statement of Significance by: Sara E. Wermiel, Preservation Consultant, August 2000
The criteria that are checked in the above sections must be justified here.

The Chelsea Clock Company factory is historically important as the site of a prominent and innovative clock-making firm, which also was and is an important in Chelsea's industrial history. The building that Chelsea Clock Co. occupies was developed as a clock factory in 1895-96 and has been used for this purpose ever since. The factory possesses historical and structural integrity, as well as integrity of setting, as the location where company manufactured its renowned products. The building is also a fine example of turn-of-the-century brick industrial construction in the Boston region, characterized by brick pilaster walls, arched window openings, a flat roof, and slow-burning interior frame. Its period of significance extends from its founding to the present, a little over a century (the firm continues to manufacture fine clocks).

CLS. 341

Chelsea Clock Company, 284 Everett Avenue, Chelsea, Mass.
Sketch Map (not to scale) **and Location Map**





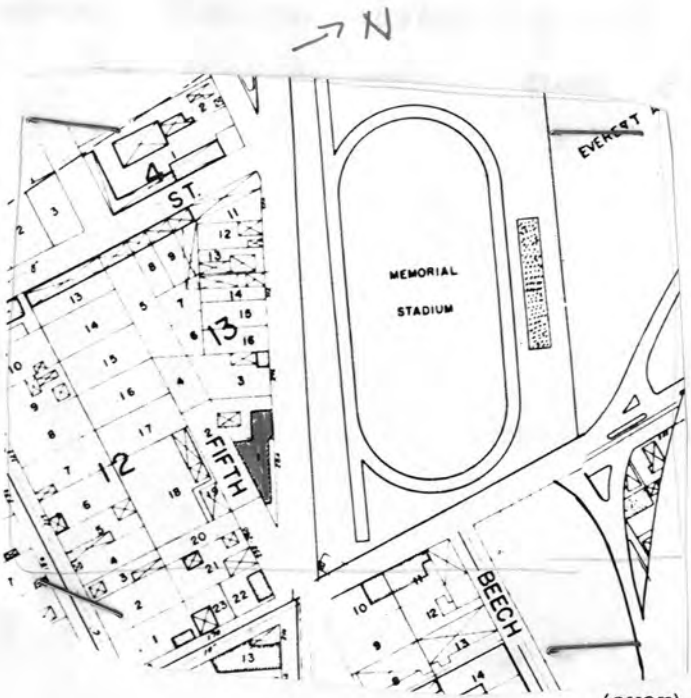
CLS. 341

FORM B - BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
Office of the Secretary, State House, Boston

In Area no.	Form no.
~~1604~~	63341

4. Map. Draw sketch of building location in relation to nearest cross streets and other buildings. Indicate north.



(over)

1. Town Chelsea

Address 284 Everett Avenue

Name Chelsea Clock-Bunker Ramo Corp.

Present use Clock Factory

Present owner

3. Description:

Date Established in ~~1886~~ 1896

Source Chelsea Record 9/13/57

Style

Architect W. H. Jones & Son

Exterior wall fabric Brick

Outbuildings (describe)

Other features

Altered Date

Moved Date

5. Lot size:

One acre or less X Over one acre

Approximate frontage 200 ft.

Approximate distance of building from street

varies 3 ft. to on line

6. Recorded by Carol Silverman

Organization Community Development Office

Date February 2, 1979

CLS.341

7. Original owner (if known) _____

Original use COMMERCIAL ; EASTMAN clock Co. 1896

Subsequent uses (if any) and dates _____

8. Themes (check as many as applicable)

Aboriginal	____	Conservation	____	Recreation	____
Agricultural	____	Education	____	Religion	____
Architectural	____	Exploration/ settlement	____	Science/ invention	____
The Arts	____	Industry	✓	Social/ humanitarian	____
Commerce	____	Military	____	Transportation	____
Communication	____	Political	____		
Community development	____				

9. Historical significance (include explanation of themes checked above)

Established AS the EASTMAN clock CO. in 1896 + Then KNOWN AS chelsEA clock Co., This business hAS AQUIRED an excellent reputation, noted for its production of ships' bell clocks, special radio clocks required by F.C.C. Rulings, weather instruments, recording Flow meter clocks + mechanical TIME FUSES for the NOSE of ANTI- aircraft shells.

The company is housED in a two story brick bldg. which features recessed, straight-sided archED windows. IN operation for the past 83 years, this is one of chelsEA's oldest industries.

10. Bibliography and/or references (such as local histories, deeds, assessor's records, early maps, etc.)

chelsEA City HALL. ENGINEERING DEPT.: ATLAS of chelsEA, 1896.
ASSESSORS office.

chelsEA RECORD. SEPT. 13, 1957.

Town: Chelsea

Property Address: 284 Everett Ave

Area(s): CLS

Form No.: 341

DEPARTMENT OF PUBLIC SAFETY
DIVISION OF INSPECTION
PLAN RECORD

CASE A RACK 2 APART. 15 No. 23471

BUILDING Chelsea Clock Co. alter

CITY OR TOWN Chelsea STREET 284 Everett Ave STORIES 2B

TO BE USED FOR mfg./assembly, stock CLASS

OWNER Chelsea Clock Co.

ARCHITECT W. H. Jones & Son

CERTIFICATE APPROVAL—SPECIFICATION REQUIREMENTS—REFERRED

DATE 6/5/42

INSPECTOR Ryan

FORM BU. 1-2M-9-41-7143

Appendix B

Endangered Species Act Eligibility Documentation

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

January 20, 2017

To Whom It May Concern:

This project was reviewed for the presence of federally listed or proposed, threatened or endangered species or critical habitat per instructions provided on the U.S. Fish and Wildlife Service's New England Field Office website:

http://www.fws.gov/newengland/EndangeredSpec-Consultation.htm (accessed January 2017)

Based on information currently available to us, no federally listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under section 7 of the Endangered Species Act is not required. No further Endangered Species Act coordination is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your cooperation. Please contact Maria Tur of this office at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

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

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

Location

Suffolk County, Massachusetts

Local office

New England Ecological Services Field Office

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

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

http://www.fws.gov/newengland

Endangered species

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

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

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

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

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

Listed species

[1] are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Red Knot Calidris canutus rufa No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1864	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service

[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

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

The birds listed below are USFWS Birds of Conservation Concern that might be affected by activities in this location. The list does not contain every bird you may find in this location, nor is it guaranteed that all of the birds on the list will be found on or near this location. To get a better idea of the specific locations where certain species have been reported and their level of occurrence, please refer to resources such as the E-bird data mapping tool (year-round bird sightings by birders and the general public) and Breeding Bird Survey (relative abundance maps for breeding birds). Although it is important to try to avoid and minimize impacts to all birds, special attention should be given to the birds on the list below. To get a list of all birds potentially present in your project area, visit the E-bird Explore Data Tool.

NAME	BREEDING SEASON
American Oystercatcher Haematopus palliatus https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31

Black Skimmer *Rynchops niger* https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Black-billed Cuckoo *Coccyzus erythropthalmus* https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus*	Breeds May 20 to Jul 31
Buff-breasted Sandpiper *Tryngites subruficollis*	Breeds elsewhere
Canada Warbler *Wilsonia canadensis*	Breeds May 20 to Aug 10
Cerulean Warbler *Dendroica cerulea* https://ecos.fws.gov/ecp/species/2974	Breeds Aug 20 to Jul 20
Dunlin *Calidris alpina arcticola*	Breeds elsewhere
Eastern Whip-poor-will *Caprimulgus vociferus*	Breeds May 1 to Aug 20
Evening Grosbeak *Coccothraustes vespertinus*	Breeds elsewhere
Hudsonian Godwit *Limosa haemastica*	Breeds elsewhere
Kentucky Warbler *Oporornis formosus*	Breeds Apr 20 to Aug 20
King Rail *Rallus elegans* https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Least Tern *Sterna antillarum*	Breeds Apr 20 to Sep 10
Lesser Yellowlegs *Tringa flavipes* https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-eared Owl *asio otus* https://ecos.fws.gov/ecp/species/3631	Breeds elsewhere
Nelson's Sparrow *Ammodramus nelsoni*	Breeds May 15 to Sep 5
Prairie Warbler *Dendroica discolor*	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea*	Breeds Apr 1 to Jul 31

Purple Sandpiper Calidris maritima	Breeds elsewhere
Red-headed Woodpecker Melanerpes erythrocephalus	Breeds May 10 to Sep 10
Red-throated Loon Gavia stellata	Breeds elsewhere
Rusty Blackbird Euphagus carolinus	Breeds elsewhere
Saltmarsh Sparrow Ammodramus caudacutus	Breeds May 15 to Sep 5
Seaside Sparrow Ammodramus maritimus	Breeds May 10 to Aug 20
Semipalmated Sandpiper Calidris pusilla	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Whimbrel Numenius phaeopus https://ecos.fws.gov/ecp/species/9483	Breeds elsewhere
Wood Thrush Hylocichla mustelina	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds.

Probability of Presence (■)

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

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

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week

of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

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

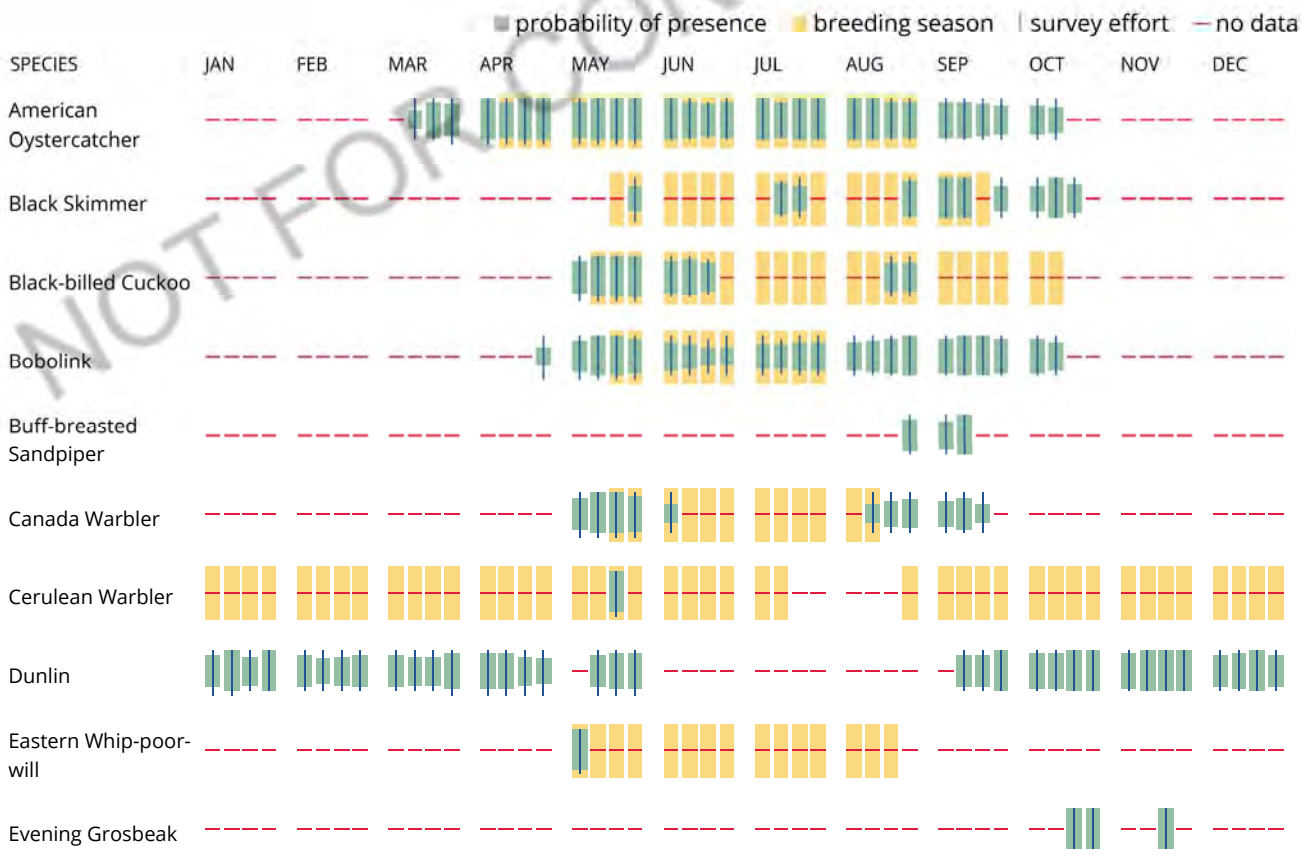
Breeding Season (▪)
Yellow bars denote when the bird breeds in the Bird Conservation Region(s) in which your project lies. If there are no yellow bars shown for a bird, it does not breed in your project area.

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

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

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

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information.



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

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Such measures are particularly important when birds are most likely to occur in the project area. To see when birds are most likely to occur in your project area, view the Probability of Presence Summary. Special attention should be made to look for nests and avoid nest destruction during the breeding season. The best

information about when birds are breeding can be found in Birds of North America (BNA) Online under the "Breeding Phenology" section of each species profile. Note that accessing this information may require a subscription. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

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

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) that might be affected by activities in your project location. These birds are of priority concern because it has been determined that without additional conservation actions, they are likely to become candidates for listing under the Endangered Species Act (ESA).

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets. The AKN list represents all birds reported to be occurring at some level throughout the year in the counties in which your project lies. That list is then narrowed to only the Birds of Conservation Concern for your project area.

Again, the Migratory Bird Resource list only includes species of particular priority concern, and is not representative of all birds that may occur in your project area. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

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

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

Probability of presence data is continuously being updated as new and better information becomes available.

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

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

Facilities

Wildlife refuges

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

THERE ARE NO REFUGES AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

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

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

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

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

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

Data exclusions

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

Data precautions

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

U.S. Fish & Wildlife Service

Key to the Northern Long-Eared Bat 4(d) Rule for Non-Federal Activities

A separate key is available for Federal Actions

This key will help you determine if your planned activity may cause prohibited take of northern long-eared bats as defined in the 4(d) rule under the Endangered Species Act and if a permit may be necessary. For more information about the northern long-eared bat and 4(d) rule go to www.fws.gov/midwest/endangered/nleb.

1. Will your activity **purposefully take** (see Definitions below) northern long-eared bats? For example, are you removing bats from a human structure or capturing bats for research?

Yes, my activity includes purposefully taking northern long-eared bats.

- ***Removing bats from human structures is not prohibited***; if you are removing bats from a human structure, you may proceed without a permit and you do not need to contact the U.S. Fish and Wildlife Service.

- ***Research that involves handling bats does require a permit*** after May 4, 2016; if you are conducting research that includes capturing and handling northern long-eared bats, you should contact the U.S. Fish and Wildlife Service to apply for a permit. www.fws.gov/endangered/regions

- ***Other purposeful take*** (see Definitions below) of northern long-eared bats is prohibited.

No, my activity does not include purposefully taking northern long-eared bats.
Continue to #2.

2. Is your activity located **outside the White-nose Syndrome Zone?** For the current White-nose Syndrome Zone map, please see www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf

Yes, my activity is located outside the white-nose syndrome zone.
Incidental take (see Definitions below) of northern long-eared bats is not prohibited in areas outside the White-nose Syndrome Zone. You may proceed with your activity, you do not need a permit and you do not need to contact the U.S. Fish and Wildlife Service.

No, my activity is located inside the white-nose syndrome zone.
Continue to #3

3. Will your activity take place **within a cave or mine where northern long-eared bats hibernate** (i.e., hibernaculum) **or could it alter the entrance or the environment (physical or other alteration) of** a hibernaculum?

Yes, my activity will take place within a northern long-eared bat hibernaculum or it could alter the entrance or the environment (physical or other alteration) of a hibernaculum.
All take (see Definitions below) of northern long-eared bats within hibernacula is prohibited, including actions that may change the nature of the hibernaculum's environment or entrance to it, even when the bats are not present. If your activity includes work in a hibernaculum or it could alter its entrance or environment, please contact the Service's Ecological Services Field Office located nearest the project area. To find contact information for the Ecological Services Field Offices, please see www.fws.gov/offices.

No, my activity will not take place within a northern long-eared bat hibernaculum or alter its entrance or environment.
Continue to #4

4. Will your action involve **tree removal** (see definition below)?

No, my activity does not include tree removal.
Incidental take (see Definitions below) from activities that do not involve tree removal and do not take place within hibernacula or would not alter the hibernaculum's entrance or environment (see Question #3), are not prohibited, and a permit is not necessary. You may proceed with your activity, you do not need a permit and you do not need to contact the U.S. Fish and Wildlife Service.

Yes - continue to #5

5. Is your activity the **removal of hazardous trees** for protection of human life or property?

Yes, my activity is removing hazardous trees.
Incidental take (see Definitions below) of northern long-eared bats as a result of hazardous tree removal to protect human life or property is not prohibited. You may proceed with your activity, you do not need a permit and you do not need to contact the U.S. Fish and Wildlife Service.

No, my activity is not removing hazardous trees.
Continue to #6

6. Will your tree removal activities include one or both of the following: **1) removing a northern long-eared bat known occupied maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31; or 2) removing any trees within 0.25 miles of a northern long-eared bat hibernaculum at any time of year?**

No
Incidental take (see Definitions below) from tree removal activities is not prohibited unless it results from removing a known occupied maternity roost tree or from tree removal activities within 150 feet of a known occupied maternity roost tree from June 1 through July 31 or results from tree removal activities within 0.25 mile of a hibernaculum at any time. You may proceed with your activity, you do not need a permit and you do not need to contact the U.S. Fish and Wildlife Service.

Yes
Incidental take (see Definitions below) of northern long-eared bats is prohibited if it occurs as a result of removing a known occupied maternity roost tree or removing trees within 150 feet of a known occupied maternity roost tree during the pup season from June 1 through July 31 or as a result of removing trees from within 0.25 mile of a hibernaculum at any time of year. This does not mean that you cannot conduct your activity. Please contact your nearest Ecological Services Field Office and we will work with you to determine if your activity can proceed without harming or killing northern long-eared bats or if you need to apply for a permit. To find contact information for the Ecological Services Field Offices, please see www.fws.gov/offices

How do I know if there is a maternity roost tree or hibernacula on my property or in my project area?
We acknowledge that it can be difficult to determine if a maternity roost tree or a hibernaculum is on your property or in your project area. Location information for both resources is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. Links to state Natural Heritage Inventory databases are available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

When looking for information on the presence of maternity roost trees or hibernacula within your project area, our expectation is that a project proponent will complete due diligence to determine available data. If information is not available, document your attempt to find the information and move forward with your project.

We do not require private landowners to conduct surveys on their lands. However, surveys can reduce uncertainties and facilitate project planning. Recommended survey methods are available at www.fws.gov/midwest/endangered/mammals/nleb.

Definitions

"Incidental take" is defined by the Endangered Species Act as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." For example, harvesting trees can kill bats that are roosting in the trees, but the purpose of the activity is not to kill bats.

"Known hibernacula" are defined as locations where one or more northern long-eared bats have been detected during hibernation or at the entrance during fall swarming or spring emergence. Given the challenges of surveying for northern long-eared bats in the winter, any hibernacula with northern long-eared bats observed at least once, will continue to be considered "known hibernacula" as long as the hibernacula remains suitable for northern long-eared bat.

"Known occupied maternity roost trees" is defined in the 4(d) rule as trees that have had female northern long-eared bats or juvenile bats tracked to them or the presence of female or juvenile bats is known as a result of other methods. Once documented, northern-long eared bats are known to continue to use the same roosting areas. Therefore, a tree will be considered to be a "known occupied maternity roost" as long as the tree and surrounding habitat remain suitable for northern long-eared bat. The incidental take prohibition for known occupied maternity roosts trees applies only during the during the pup season (June 1 through July 31).

"Purposeful take" is when the reason for the activity or action is to conduct some form of take. For instance, conducting a research project that includes collecting and putting bands on bats is a form of purposeful take. Intentionally killing or harming bats is also purposeful take and is prohibited.

"Take" is defined by the ESA as 'to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any endangered species. Purposeful take is when the reason for the activity or action is to conduct some form of take. For instance, conducting a research project that includes collecting and putting bands on bats is a form of purpose*f*ul take.

"Tree removal" is defined in the 4(d) rule as cutting down, harvesting, destroying, trimming, or manipulating in any other way the trees, saplings, snags, or any other form of woody vegetation likely to be used by northern long-eared bats.

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

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

Updated 02/05/2016

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

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

Updated 02/05/2016

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES IN MASSACHUSETTS

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

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

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

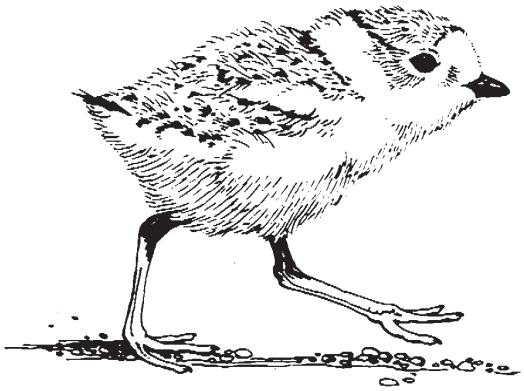
Updated 02/05/2016

The Atlantic coast piping plover

Small, stocky, sandy-colored birds, piping plovers resemble sandpipers. Adult plovers have yellow-orange legs, a black band across the forehead from eye to eye, and a black ring around the base of the neck. Plover chicks have been likened to tiny wind-up toys or cotton balls with legs. Like their parents, they run in short starts and stops. When still, adults and chicks blend into the pale background of open, sandy habitat on outer beaches where they feed and nest. The bird's name derives from its call – plaintive bell-like whistles often heard before the birds are seen.

Plovers in trouble

Piping plovers were common along the Atlantic coast during much of the 19th century, but commercial hunting for feathers to decorate hats nearly wiped them out. Following passage of the Migratory Bird Treaty Act in 1918, plovers recovered to a 20th century peak in the 1940s. Increased development and beach recreation after World War II caused the population decline that led to Endangered Species Act protection in 1986. Intensive protection has helped the population more than double in the last 20 years, but the most recent surveys place the Atlantic population at fewer than 2,000 pairs.



Plover life

Atlantic coast piping plovers breed on coastal beaches from Newfoundland and southeastern Quebec to North Carolina. After they establish nesting territories and conduct courtship rituals beginning in late March or early April, pairs form shallow depressions - nests - in the sand on the high beach close to the dunes. They sometimes line nests with small stones or fragments of shell. Plovers typically lay four eggs that hatch in about 25 days. The downy chicks are soon able to follow their parents in foraging for the marine worms, crustaceans and insects that they pluck from the sand and eat.

Both the eggs and piping plover chicks blend into the beach so thoroughly that they are almost impossible to see. When predators or intruders come close, the chicks squat motionless on the sand while the parents attempt to attract the attention of the intruders, often by feigning a broken wing. Surviving chicks are able to fly in about 30 days.

Storm tides, predators or intruding humans sometimes disrupt nests before the eggs hatch. When this happens, the plovers often lay another clutch of eggs. Chicks hatched from these late-nesting efforts may not fly until late August.

Piping plovers often gather in groups on undisturbed beaches before their southward migration. By mid-September, both adult and young plovers have departed for their wintering areas. These birds winter on the Atlantic coast from North Carolina south to Florida, along the Gulf coast, and in the Bahamas and West Indies.

Challenges

- Development – Commercial, residential and recreational development has decreased suitable coastal habitat for piping plovers to nest and feed.
- Disturbance – Human disturbance often curtails plover breeding success. Foot and vehicle traffic may crush nests or chicks. Excessive disturbance may cause plover parents to desert the nest, exposing eggs or chicks to the summer sun and predators. Interrupted feedings may stress juvenile birds during critical periods in their development.
- Predators – Pets, especially dogs and cats, may harass or kill the birds (see http://www.fws.gov/northeast/pdf/catseat.pdf). Animals such as raccoons, skunks and foxes, attracted by food left on the beach, also kill the birds.
- Weather – Storm tides may destroy nests.

Protecting the plover

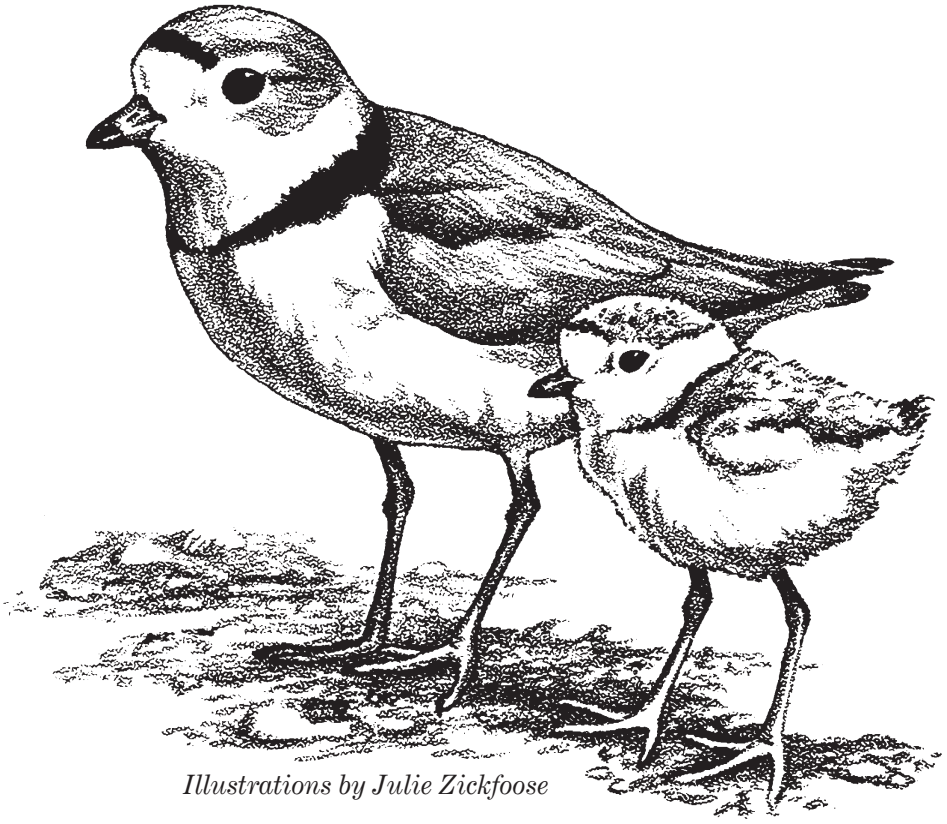
The piping plover is designated as threatened along the Atlantic coast, which means that the population would become endangered and face possible extinction without Endangered Species Act protection. Recovery efforts include conserving breeding and wintering habitat; and protecting breeding birds, eggs, and chicks from predators and from disturbance and death caused by human activities.

Other rare species that inhabit the beach ecosystem, including the endangered roseate tern, the threatened northeastern beach tiger beetle, the threatened seabeach amaranth, least terns, common terns, black skimmers and Wilson's plovers, benefit from piping plover protection.

You can help protect piping plovers
The Endangered Species Act provides penalties for killing, harassing or harming piping plovers.

- Respect all areas fenced or posted for protection of wildlife.
- Do not approach or linger near piping plovers or their nests
- If pets are permitted on beaches used by plovers, keep your pets leashed.
- Do not leave or bury trash or scraps of food on beaches – food attracts plover predators.

For more information about Atlantic coast piping plovers, see http://www.fws.gov/northeast/pipingplover.



Illustrations by Julie Zickfoose

For further information contact:
Office of Endangered Species
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587
413/253 8200

Federal Relay Service
for the deaf and hard-of-hearing
1 800/877 8339

U.S. Fish & Wildlife Service
1 800/344 WILD
http://www.fws.gov

August 2007

U.S. Fish & Wildlife Service

Rufa red knot

Calidris canutus rufa

Skilled aviator Rear Admiral Richard E. Byrd flew over both the North and South poles. But what this renowned man accomplished with the help of sled dogs, ships and airplanes, a little shorebird weighing less than a cup of coffee completes every year of its life. The red knot is truly a master of long-distance aviation.

On wingspans of 20 inches, some red knots fly more than 9,300 miles from south to north every spring and repeat the trip in reverse every autumn, making this bird one of the longest-distance migrants in the animal kingdom. About 9 inches long, red knots are about the size of a robin. Biologists have identified six subspecies, three of them living in the Western Hemisphere: *C.c. islandica*, *C.c. roselaari*, and *C.c. rufa*. This last, the red knot known as rufa, winters at the tip of South America in Tierra del Fuego, in northern Brazil, throughout the Caribbean, and along the U.S. coasts from Texas to North Carolina. The rufa red knot breeds in the tundra of the central Canadian Arctic from northern Hudson Bay to the southern Queen Elizabeth Islands.

Surveys of wintering knots along the coasts of southern Chile and Argentina and during spring migration in Delaware Bay on the U.S. coast indicated a serious population decline during the 2000. Biologists from the U.S. Fish and Wildlife Service, state natural resource agencies, and non-profit organizations all share a concern for the rufa red knot and are pooling efforts to identify what needs to be done to prevent further losses.

A red knot banded in May 1987 was seen on Delaware Bay in May 2000. During those 13 years, the bird had flown about 242,350 miles, a distance farther than from the earth to the moon.

Strength in numbers

Red knots winter and migrate in large flocks containing hundreds of birds. While we can guess at some of the benefits of traveling in large flocks, such as protection from predators, we can also see the downside - susceptibility to habitat change and loss, oil spills, toxins, red tides, diseases, collisions with wind turbines, storms, and hunting. Red knots were heavily hunted in the early 20th century, and may have never recovered in eastern North America. Knots are still hunted in parts of the Caribbean and South America.

Eating like a bird

For much of the year red knots eat small clams, mussels, snails and other invertebrates, swallowing their prey whole – shell and all. Migrating knots can complete nonstop flights of 1,500 miles and more, converging on critical stopover areas to rest and refuel along the way. In order to endure their long journeys, red knots undergo extensive physical changes. Flight muscles enlarge, while leg muscles shrink. Stomachs and gizzards decrease, while fat mass increases by more than 50 percent. Due to these physical changes, knots arriving from long migration flights are not able to feed maximally until their digestive systems regenerate, a process that may take several days. Thus, migrating birds require stopover habitats rich in easily digested foods – with thin or no shells – in order to gain enough weight to fuel the next flight. In spring, migrating knots seem to follow a northward "wave" in quality prey – by timing their stopovers with the spawning seasons of intertidal invertebrates, knots take advantage of readily digestible food resources like juvenile clams and mussels and horseshoe crab eggs. Red knots arrive at stopovers areas very thin, sometimes emaciated. They eat constantly to gain enough weight to continue their journeys, adding up to 10 percent of their body weight each day and nearly doubling their body weights during some stopovers.

Requirements for survival

The red knot's unique and impressive life history depends on suitable habitat, food, and weather conditions at far-flung sites across the Western Hemisphere, from the extreme south of Tierra del Fuego to the far north of the central Canadian Arctic. Further, red knots need to encounter these favorable habitat, food, and weather conditions within narrow seasonal windows as the birds hopscotch along migration stopovers between wintering and breeding areas. For example, the red knot population decline that occurred in the 2000s was caused primarily by reduced food availability from increased harvests of horseshoe crabs, exacerbated by small changes in the timing that red knots arrived at the Delaware Bay. Red knots may also be particularly vulnerable to global climate change, which is likely to affect the arctic tundra ecosystem where the knots breed; the quality and quantity of coastal habitats due to rising sea levels; the quantity and timing of invertebrate food resources throughout the bird's range; and the severity, timing, and location of storm and weather patterns.

Horseshoe crab harvests are now managed with explicit goals to stabilize and recover red knot populations; red knot number appear to have stabilized in the past few years, but at low levels relative to earlier decades. Red knots fascinate biologists, bird watchers and people who appreciate the complex beauty of the natural world. Together with these partners, the U.S. Fish and Wildlife Service is dedicated to working to conserve this extraordinary bird.

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300 Westgate Center Drive
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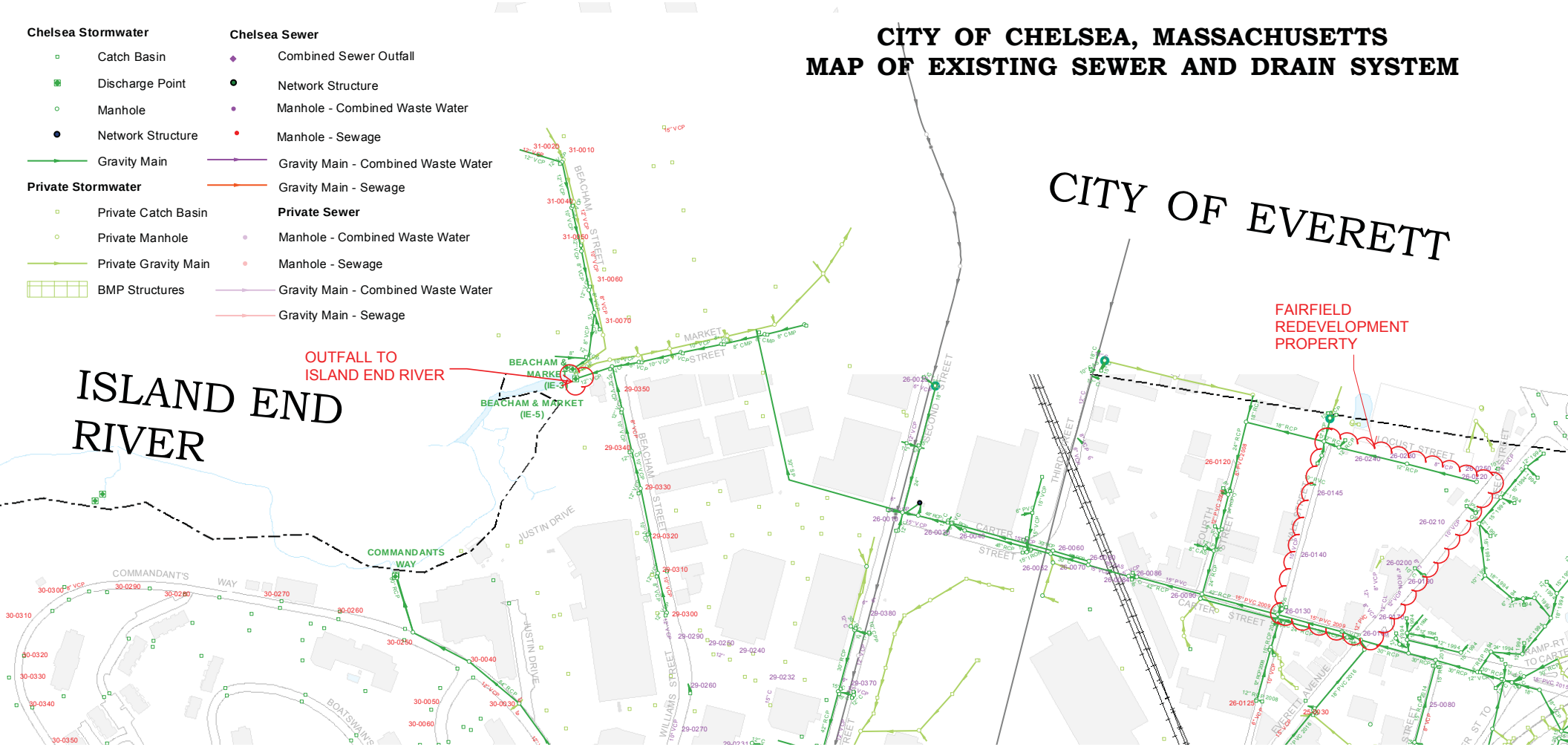
1 800/344 WILD
September 2013

Appendix C

City of Chelsea, MA – Map of Existing Sewer & Drain System

CITY OF CHELSEA, MASSACHUSETTS
MAP OF EXISTING SEWER AND DRAIN SYSTEM



Appendix D

Utility Site Plans

vhb.com
vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

0 10 20 40 Feet

= PROPOSED CATCHBASIN WITHIN ROW DISCHARGING TO MUNCIPAL DRAINAGE SYSTEM

= PROPOSED CATCHBASIN ON-SITE, DISCHARGING TO MUNCIPAL DRAINAGE SYSTEM

PROGRESS SET
For Review Only
September 13, 2017

CB-13 STC-450 R=5.17 I=-0.30 (OUT)

EXISTING CATCH BASIN TO BE ABANDONED; REFER TO WESTON AND SAMPSON PLANS FOR DETAIL

DRAINAGE CONNECTION TO BE COORDINATED WITH RECONSTRUCTION OF LOCUST AVENUE. CONNECTIONS TO PROPOSED LOCUST AVE INFRASTRUCTURE TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION (TYP.)

DMH5+56 R=3.8 I=-2.31 WAS CB I=-3.21 DMH5+05 I=-0.50 CB-13 I=-3.32 (OUT)

SEE INSET A FOR CONTINUATION

PROPOSED LOCUST STREET DRAINAGE RECONSTRUCTION; REFER TO WESTON & SAMPSON PLANS FOR DETAIL

GRAVITY BLOCK RETAINING WALL; CONSTRUCTION TO BE COORDINATED WITH ABUTTER

CONNECTION TO MUNCIPAL DRAINAGE

DMH-16 R=4.8 I=0.50 CB-15 I=-3.70 DMH5+56 I=-3.70 (OUT)

CB-15 STC-450 R=4.8 I=-0.80 (OUT)

DMH3+65 R=4.9 I=-3.29 CB-12 I=-3.79 DMH-16 I=-3.89 (OUT)

CB-12 STC-450 R=4.3 I=-3.50 (OUT)

CB-11 STC-450 R=4.3 I=-3.50 (OUT)

DMH2+41 R=4.4 I=-3.70 CB-11 I=-4.20 DMH3+65 I=-4.00 (OUT)

DRAINAGE CONNECTION TO BE COORDINATED WITH RECONSTRUCTION OF LOCUST AVENUE. CONNECTIONS TO PROPOSED LOCUST AVE INFRASTRUCTURE TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION (TYP)

RD INV=-4.5

DMH1+68 R=4.9 I=-4.50 RD-5 I=-4.48 DMH2+41 I=-4.60 (OUT)

GRAVITY BLOCK RETAINING WALL; CONSTRUCTION TO BE COORDINATED WITH ABUTTER

CB-16 R=3.8 I=0.60 (OUT)

95°33'29"

CB-3 R=5.0 I=1.50 (OUT)

DMH-2 R=4.6 I=1.10 CB-3 I=1.40 CB-2 I=1.00 (OUT)

CB-2 R=4.6 I=1.50 (OUT)

PROPOSED EVERETT AVE DRAINAGE RECONSTRUCTION; REFER TO WESTON AND SAMPSON PLANS FOR DETAIL

DMH 2+07 R=5.2 I=0.00 STUB 3 I=-1.92 DMH+37 I=-2.15 (OUT)

DRAIN CONNECTIONS TO BE COORDINATED WITH RECONSTRUCTION OF EVERETT AVENUE. CONNECTIONS TO PROPOSED EVERETT AVE INFRASTRUCTURE TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION (TYP).

STUB 3 I=0.20 WQU-1 I=0.20 (OUT)

DMH-1 R=4.6 I=1.00 CB-1 I=1.00 RD-- I=0.90 (OUT)

CONNECTION TO MUNCIPAL DRAINAGE

WQU-1 R=4.6 I=0.60 DMH-2 I=0.70 DMH-3 I=0.30 (OUT)

CB-1 R=4.4 I=2.10 (OUT)

EVERETT AVENUE

RETAIL
8,794 GSF
7,165 NSF
FFE = 6.6

RD INV=1.9

FLOOD GATE

PHASE I RESIDENTIAL
146,657 SF
6 STORIES
436 UNITS
FFE = 6.1

RD INV=2.0

ST IN I=-2.50 RD-2

ACCESS OPENING (TYP)

SUBSURFACE DETENTION SYSTEM #1
STORMTRAP SINGLE TRAP 4-0
UNITS OR EQUIVALENT (4,540 CF OF STORAGE = 106'L X 14'W X 4.0'H)
SYSTEM INVERT = -2.5

CB-4 R=4.5 I=1.50 (OUT)

ST OUT I=-2.50 (OUT)

EXISTING CARTER STREET DRAINAGE TO REMAIN

CONNECTION TO MUNCIPAL DRAINAGE

DMH-4 R=5.3 I=1.20 CB-4 I=-2.50 ST OUT I=-2.50 OVRFLOW I=-2.60 (OUT)

CB-5 R=4.7 I=1.70 (OUT)

DMH-5 R=5.1 I=-3.20 DMH-4 I=-3.30 (OUT)

WQU-2 STC-900 R=4.6 I=1.50 CB-5 I=-4.20 DMH-5 I=-4.30 (OUT)

DMH-6 R=4.8 I=-7.40 EX DMH I=-4.90 WQU-2 I=-7.30 (OUT)

DELIVERIES ONLY

MATCH LINE

LOCUST STREET

CARTER STREET

RD INV=1.4

RD INV=0.1

FLOOD GATE

CB-9 R=4.0 I=0.90 (OUT)

DMH-10 R=5.0 I=0.00 RD-3 I=-0.10 (OUT)

CB-6 STC-450 R=3.9 I=1.90 (OUT)

DMH-7 R=4.1 I=0.70 CB-6

DMH-9

Fairfield at Chelsea

Vale Street
Chelsea, Massachusetts

No.	Revision	Date	Apprvl
1	Issued for DPW Stormwater Approval	8/17/2017	CPN

Designed by JRM
Checked by CPN

Issued for
Local Approvals

Date
August 3, 2017

Not Approved for Construction

Drawing Title
Grading and Drainage Plan

Drawing Number
C-4.1

Sheet 5 of 12

Project Number
13332.01

DRAINAGE CONNECTION TO BE COORDINATED WITH RECONSTRUCTION OF LOCUST AVENUE. CONNECTIONS TO PROPOSED LOCUST AVE INFRASTRUCTURE TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION (TYP)

GRAVITY BLOCK RETAINING WALL: CONSTRUCTION TO BE COORDINATED WITH ABUTTER

MATCH LINE

LOCUST STREET

VALE STREET

FOURTH STREET

CARTER STREET

EXISTING CARTER STREET DRAINAGE TO REMAIN

CONNECTION TO MUNCIPAL DRAINAGE

FLOOD GATE

DELIVERIES ONLY

CONNECTION TO EXISTING CARTER STREET DRAINAGE TO BE FIELD VERIFIED (TYP)

DRAINAGE CONNECTION TO BE CONFIRMED WITH CITY

ACCESS OPENING (TYP)

SUBSURFACE DETENTION SYSTEM #2
STORMTRAP SINGLE TRAP 4-6 UNITS OR EQUIVALENT
(7,770 CF OF STORAGE - 90'L X 21.8'W X 5.0'H)
SYSTEM INVERT = -2.9

PHASE II RESIDENTIAL
114,337 SF
5 STORIES
256 UNITS
FFE = 5.8

EXIST CATCH BASINS ALONG PROPOSED 4TH AVE CURB LINE TO BE REPLACED WITH CURB INLET CATCH BASINS (TYP)

INV=-1.1
DRAINAGE CONNECTIONS TO FOURTH STREET INFRASTRUCTURE TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION (TYP)

INV=-0.9

INV=-0.7

MUNCIPAL DRAINAGE SYSTEM CONTINES EAST, DOWN CARTER STREET EVENTUALLY DISCHARGING TO ISLAND END RIVER AT MARKET AND BECHAM STREETS

= PROPOSED CATCHBASIN WITHIN ROW DISCHARGING TO MUNCIPAL DRANAGE SYSTEM

= PROPOSED CATCHBASIN ON-SITE, DISCHARGING TO MUNCIPAL DRAINAGE SYSTEM

0 10 20 40 Feet

vhb.com
vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

Fairfield at Chelsea

Vale Street
Chelsea, Massachusetts

No.	Revision	Date	Appvd.
1	Issued for DPW Stormwater Approval	8/17/2017	CPN

Designed by JRM | Checked by CPN

Issued for: Local Approvals | Date: August 3, 2017

Not Approved for Construction

Drawing Title: **Grading and Drainage Plan**

Drawing Number: **C-4.2**

Sheet 6 of 12

Project Number: 13332.01

Appendix E

MassDEP Dilution Factor Correspondence

Ben Sivonen--Vertex

From: Vakalopoulos, Catherine (DEP) <Catherine.Vakalopoulos@MassMail.State.MA.US>
Sent: Friday, October 06, 2017 6:23 PM
To: Elizabeth Phelps -- Vertex
Subject: RE: NPDES permit for Chelsea, MA

Hi Liz,
Your calculations are correct but you need to use the formula in Appendix V to calculate the dilution factor.
My DF calc is: (0.0136 + 0.36)/0.36 = 1.04
If this were for a discharge to an open marine harbor, no dilution would be granted unless there were modeling or dye study data showing dilution. In this case, Island End River is tidally influenced but it looks like there is some freshwater input and StreamStats is able to calculate a 7Q10. So you can go ahead and use the 1.04 DF (even though it's only a tiny amount of dilution).

As for the rest of the spreadsheet, EPA will review it when you submit the NOI.

Cathy

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

From: Elizabeth Phelps -- Vertex [mailto:ephelps@vertexeng.com]
Sent: Friday, October 06, 2017 10:45 AM
To: Vakalopoulos, Catherine (DEP)
Subject: NPDES permit for Chelsea, MA

Good morning Catherine,
I'm working on a NOI submittal for dewatering that will be required during remediation of a site in Chelsea, MA. Our discharge will be to the Island End River. From the information I found online, this waterbody is saltwater. Our treatment system will operate at a maximum of 250 gallons per minute.

I used the streamstats application to calculate the 7Q10, which is attached. From that I calculated the following:

0.021 f3/s
=0.0136 MGD

I attached the WBEL calculator spreadsheet with 0.136 MGD entered in the appropriate places. Can you please take a look at this to verify if it is correct?

Thanks, Liz

~~~~~~

Elizabeth M. Phelps
Assistant Project Manager
THE VERTEX COMPANIES, INC.
398 Libbey Industrial Pkwy | Weymouth, MA 02189 | USA
OFFICE 781.952.6000 | **DIRECT** 781.952.6065 | **MOBILE** 781.974.6283
Website | LinkedIn
~~~~~~

Appendix F

Laboratory Analytical Report

ANALYTICAL REPORT

Lab Number:	L1731154
Client:	Vertex Environmental Services, Inc. 400 Libbey Industrial Parkway Weymouth, MA 02189
ATTN:	Patty Plante
Phone:	(781) 952-6000
Project Name:	CHELSEA CLOCK
Project Number:	42088
Report Date:	09/21/17

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), NJ NELAP (MA935), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-14-00197).

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

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1731154-01	VES-501 (MW)	WATER	CHELSEA, MA	09/05/17 09:30	09/05/17
L1731154-02	VES-129 (MW)	WATER	CHELSEA, MA	09/05/17 11:50	09/05/17
L1731154-03	TRIP BLANK-504	WATER	CHELSEA, MA	08/31/17 00:00	09/05/17
L1731154-04	TRIP BLANK-8260	WATER	CHELSEA, MA	08/31/17 00:00	09/05/17

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

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. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated 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.

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 table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

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 Client Service Representative 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 Client Services at 800-624-9220 with any questions.

Project Name:	CHELSEA CLOCK	**Lab Number:**	L1731154
Project Number:	42088	**Report Date:**	09/21/17

Case Narrative (continued)

Report Revision

September 21, 2017: This report includes the results of the Hardness analysis performed on L1731154-01 and -02.

Report Submission

September 15, 2017: This final report includes the results of all requested analyses.

September 12, 2017: This is a preliminary report.

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

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

Volatile Organics

L1731154-01: The sample has elevated detection limits due to the dilution required by the sample matrix (foamy).

Volatile Organics by SIM

L1731154-01: The sample has elevated detection limits due to the dilution required by the sample matrix (foamy).

L1731154-02: The sample has elevated detection limits due to the dilution required by the elevated concentrations of non-target compounds in the 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: Michelle M. Morris

Title: Technical Director/Representative Date: 09/21/17

ORGANICS

VOLATILES

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 09/06/17 14:38
Analyst: NS

Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 504.1
Extraction Date: 09/06/17 13:00

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: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01 D
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA

Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 09/08/17 14:33
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	15	--	5
1,1-Dichloroethane	ND		ug/l	3.8	--	5
Carbon tetrachloride	ND		ug/l	2.5	--	5
1,1,2-Trichloroethane	ND		ug/l	3.8	--	5
Tetrachloroethene	ND		ug/l	2.5	--	5
1,2-Dichloroethane	ND		ug/l	2.5	--	5
1,1,1-Trichloroethane	ND		ug/l	2.5	--	5
Benzene	ND		ug/l	2.5	--	5
Toluene	ND		ug/l	3.8	--	5
Ethylbenzene	ND		ug/l	2.5	--	5
Vinyl chloride	ND		ug/l	5.0	--	5
1,1-Dichloroethene	ND		ug/l	2.5	--	5
Trichloroethene	ND		ug/l	2.5	--	5
1,2-Dichlorobenzene	ND		ug/l	12	--	5
1,3-Dichlorobenzene	ND		ug/l	12	--	5
1,4-Dichlorobenzene	ND		ug/l	12	--	5
Methyl tert butyl ether	5.4		ug/l	5.0	--	5
p/m-Xylene	ND		ug/l	5.0	--	5
o-Xylene	ND		ug/l	5.0	--	5
Xylenes, Total	ND		ug/l	5.0	--	5
cis-1,2-Dichloroethene	ND		ug/l	2.5	--	5
Acetone	ND		ug/l	25	--	5
Tert-Butyl Alcohol	ND		ug/l	50	--	5
Tertiary-Amyl Methyl Ether	ND		ug/l	10	--	5

Project Name: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01 D
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA

Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Volatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	92		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	98		70-130

Project Name: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01 D
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA

Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C-SIM(M)
Analytical Date: 09/08/17 14:33
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	15	--	5

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 09/06/17 14:54
Analyst: NS

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 504.1
Extraction Date: 09/06/17 13:00

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: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02 D2
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 09/11/17 17:23
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Vinyl chloride	1400		ug/l	50	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	99		70-130

Project Name: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02 D
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 09/08/17 15:04
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	15	--	5
1,1-Dichloroethane	8.2		ug/l	3.8	--	5
Carbon tetrachloride	ND		ug/l	2.5	--	5
1,1,2-Trichloroethane	ND		ug/l	3.8	--	5
Tetrachloroethene	ND		ug/l	2.5	--	5
1,2-Dichloroethane	ND		ug/l	2.5	--	5
1,1,1-Trichloroethane	ND		ug/l	2.5	--	5
Benzene	ND		ug/l	2.5	--	5
Toluene	ND		ug/l	3.8	--	5
Ethylbenzene	ND		ug/l	2.5	--	5
Vinyl chloride	1400	E	ug/l	5.0	--	5
1,1-Dichloroethene	ND		ug/l	2.5	--	5
Trichloroethene	5.7		ug/l	2.5	--	5
1,2-Dichlorobenzene	ND		ug/l	12	--	5
1,3-Dichlorobenzene	ND		ug/l	12	--	5
1,4-Dichlorobenzene	ND		ug/l	12	--	5
Methyl tert butyl ether	ND		ug/l	5.0	--	5
p/m-Xylene	ND		ug/l	5.0	--	5
o-Xylene	ND		ug/l	5.0	--	5
Xylenes, Total	ND		ug/l	5.0	--	5
cis-1,2-Dichloroethene	410		ug/l	2.5	--	5
Acetone	ND		ug/l	25	--	5
Tert-Butyl Alcohol	ND		ug/l	50	--	5
Tertiary-Amyl Methyl Ether	ND		ug/l	10	--	5

Project Name: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02 D
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Volatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	97		70-130

Project Name: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02 D
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C-SIM(M)
Analytical Date: 09/08/17 15:04
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	15	--	5

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-03
Client ID: TRIP BLANK-504
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 09/06/17 15:10
Analyst: NS

Date Collected: 08/31/17 00:00
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 504.1
Extraction Date: 09/06/17 13:00

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: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-04
Client ID: TRIP BLANK-8260
Sample Location: CHELSEA, MA

Date Collected: 08/31/17 00:00
Date Received: 09/05/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 09/08/17 14:02
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	2.5	--	1
1,3-Dichlorobenzene	ND		ug/l	2.5	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Acetone	ND		ug/l	5.0	--	1
Tert-Butyl Alcohol	ND		ug/l	10	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--	1

Project Name: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-04
Client ID: TRIP BLANK-8260
Sample Location: CHELSEA, MA
Date Collected: 08/31/17 00:00
Date Received: 09/05/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Volatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	99		70-130

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-04
Client ID: TRIP BLANK-8260
Sample Location: CHELSEA, MA

Date Collected: 08/31/17 00:00
Date Received: 09/05/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C-SIM(M)
Analytical Date: 09/08/17 14:02
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	--	1

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 09/06/17 13:23
Analyst: NS

Extraction Method: EPA 504.1
Extraction Date: 09/06/17 13:00

Parameter	Result	Qualifier	Units	RL	MDL	
Microextractables by GC - Westborough Lab for sample(s): 01-03 Batch: WG1038871-1						
1,2-Dibromoethane	ND		ug/l	0.010	--	A

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 09/11/17 08:43
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1040195-10					
Methylene chloride	ND		ug/l	3.0	--
1,1-Dichloroethane	ND		ug/l	0.75	--
Carbon tetrachloride	ND		ug/l	0.50	--
1,1,2-Trichloroethane	ND		ug/l	0.75	--
Tetrachloroethene	ND		ug/l	0.50	--
1,2-Dichloroethane	ND		ug/l	0.50	--
1,1,1-Trichloroethane	ND		ug/l	0.50	--
Benzene	ND		ug/l	0.50	--
Toluene	ND		ug/l	0.75	--
Ethylbenzene	ND		ug/l	0.50	--
Vinyl chloride	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	0.50	--
Trichloroethene	ND		ug/l	0.50	--
1,2-Dichlorobenzene	ND		ug/l	2.5	--
1,3-Dichlorobenzene	ND		ug/l	2.5	--
1,4-Dichlorobenzene	ND		ug/l	2.5	--
Methyl tert butyl ether	ND		ug/l	1.0	--
p/m-Xylene	ND		ug/l	1.0	--
o-Xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	0.50	--
Acetone	ND		ug/l	5.0	--
Tert-Butyl Alcohol	ND		ug/l	10	--
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 09/11/17 08:43
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1040195-10					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	92		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	96		70-130

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 09/08/17 06:54
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02,04 Batch: WG1040195-5					
Methylene chloride	ND		ug/l	3.0	--
1,1-Dichloroethane	ND		ug/l	0.75	--
Carbon tetrachloride	ND		ug/l	0.50	--
1,1,2-Trichloroethane	ND		ug/l	0.75	--
Tetrachloroethene	ND		ug/l	0.50	--
1,2-Dichloroethane	ND		ug/l	0.50	--
1,1,1-Trichloroethane	ND		ug/l	0.50	--
Benzene	ND		ug/l	0.50	--
Toluene	ND		ug/l	0.75	--
Ethylbenzene	ND		ug/l	0.50	--
Vinyl chloride	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	0.50	--
Trichloroethene	ND		ug/l	0.50	--
1,2-Dichlorobenzene	ND		ug/l	2.5	--
1,3-Dichlorobenzene	ND		ug/l	2.5	--
1,4-Dichlorobenzene	ND		ug/l	2.5	--
Methyl tert butyl ether	ND		ug/l	1.0	--
p/m-Xylene	ND		ug/l	1.0	--
o-Xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	0.50	--
Acetone	ND		ug/l	5.0	--
Tert-Butyl Alcohol	ND		ug/l	10	--
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 09/08/17 06:54
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02,04 Batch: WG1040195-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	99		70-130

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C-SIM(M)
Analytical Date: 09/08/17 06:54
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02,04 Batch: WG1040196-5					
1,4-Dioxane	ND		ug/l	3.0	--

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

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: WG1038871-2								
1,2-Dibromoethane	112		-		70-130	-			A

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02,04 Batch: WG1040195-3 WG1040195-4								
Methylene chloride	97		99		70-130	2		20
1,1-Dichloroethane	96		92		70-130	4		20
Carbon tetrachloride	91		95		63-132	4		20
1,1,2-Trichloroethane	93		96		70-130	3		20
Tetrachloroethene	99		100		70-130	1		20
1,2-Dichloroethane	89		92		70-130	3		20
1,1,1-Trichloroethane	96		94		67-130	2		20
Benzene	93		93		70-130	0		25
Toluene	92		95		70-130	3		25
Ethylbenzene	92		93		70-130	1		20
Vinyl chloride	91		94		55-140	3		20
1,1-Dichloroethene	97		100		61-145	3		25
Trichloroethene	92		93		70-130	1		25
1,2-Dichlorobenzene	94		99		70-130	5		20
1,3-Dichlorobenzene	93		100		70-130	7		20
1,4-Dichlorobenzene	92		97		70-130	5		20
Methyl tert butyl ether	100		100		63-130	0		20
p/m-Xylene	85		90		70-130	6		20
o-Xylene	90		90		70-130	0		20
cis-1,2-Dichloroethene	97		100		70-130	3		20
Acetone	100		99		58-148	1		20
Tert-Butyl Alcohol	104		106		70-130	2		20
Tertiary-Amyl Methyl Ether	100		99		66-130	1		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits

Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02,04 Batch: WG1040195-3 WG1040195-4

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	90		93		70-130
Toluene-d8	101		100		70-130
4-Bromofluorobenzene	90		96		70-130
Dibromofluoromethane	100		100		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1040195-8 WG1040195-9								
Methylene chloride	93		100		70-130	7		20
1,1-Dichloroethane	92		100		70-130	8		20
Carbon tetrachloride	91		99		63-132	8		20
1,1,2-Trichloroethane	100		100		70-130	0		20
Tetrachloroethene	100		100		70-130	0		20
1,2-Dichloroethane	92		95		70-130	3		20
1,1,1-Trichloroethane	93		100		67-130	7		20
Benzene	92		96		70-130	4		25
Toluene	98		100		70-130	2		25
Ethylbenzene	95		97		70-130	2		20
Vinyl chloride	90		98		55-140	9		20
1,1-Dichloroethene	99		110		61-145	11		25
Trichloroethene	92		96		70-130	4		25
1,2-Dichlorobenzene	100		100		70-130	0		20
1,3-Dichlorobenzene	98		97		70-130	1		20
1,4-Dichlorobenzene	97		97		70-130	0		20
Methyl tert butyl ether	100		110		63-130	10		20
p/m-Xylene	90		95		70-130	5		20
o-Xylene	95		100		70-130	5		20
cis-1,2-Dichloroethene	96		100		70-130	4		20
Acetone	100		110		58-148	10		20
Tert-Butyl Alcohol	104		108		70-130	4		20
Tertiary-Amyl Methyl Ether	99		100		66-130	1		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1040195-8 WG1040195-9								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	90		93		70-130
Toluene-d8	100		100		70-130
4-Bromofluorobenzene	96		96		70-130
Dibromofluoromethane	102		102		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02,04 Batch: WG1040196-3 WG1040196-4								
1,4-Dioxane	130		110		70-130	17		25

Matrix Spike Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

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: WG1038871-3 QC Sample: L1731154-01 Client ID: VES-501 (MW)													
1,2-Dibromoethane	ND	0.258	0.309	120		-	-		65-135	-		20	A

SEMIVOLATILES

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 09/10/17 00:21
Analyst: PS

Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/05/17 23:57

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Phenol	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	37		21-120
Phenol-d6	26		10-120
Nitrobenzene-d5	72		23-120
2-Fluorobiphenyl	59		15-120
2,4,6-Tribromophenol	66		10-120
4-Terphenyl-d14	62		41-149

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 09/10/17 15:22
Analyst: KL

Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/06/17 00:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	0.50		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	0.12		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	0.80	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	27		21-120
Phenol-d6	22		10-120
Nitrobenzene-d5	61		23-120
2-Fluorobiphenyl	64		15-120
2,4,6-Tribromophenol	66		10-120
4-Terphenyl-d14	54		41-149

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 09/12/17 16:52
Analyst: ALS

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/05/17 23:57

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Phenol	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	**16**	Q	21-120
Phenol-d6	21		10-120
Nitrobenzene-d5	78		23-120
2-Fluorobiphenyl	64		15-120
2,4,6-Tribromophenol	21		10-120
4-Terphenyl-d14	71		41-149

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 09/10/17 15:50
Analyst: KL

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/06/17 00:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	1.1		ug/l	0.10	--	1
Fluoranthene	2.3		ug/l	0.10	--	1
Naphthalene	1.7		ug/l	0.10	--	1
Benzo(a)anthracene	0.90		ug/l	0.10	--	1
Benzo(a)pyrene	0.85		ug/l	0.10	--	1
Benzo(b)fluoranthene	1.0		ug/l	0.10	--	1
Benzo(k)fluoranthene	0.39		ug/l	0.10	--	1
Chrysene	1.1		ug/l	0.10	--	1
Acenaphthylene	0.21		ug/l	0.10	--	1
Anthracene	1.0		ug/l	0.10	--	1
Benzo(ghi)perylene	0.65		ug/l	0.10	--	1
Fluorene	1.4		ug/l	0.10	--	1
Phenanthrene	4.7		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	0.15		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	0.63		ug/l	0.10	--	1
Pyrene	2.4		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	**17**	Q	21-120
Phenol-d6	20		10-120
Nitrobenzene-d5	70		23-120
2-Fluorobiphenyl	71		15-120
2,4,6-Tribromophenol	37		10-120
4-Terphenyl-d14	62		41-149

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 09/07/17 13:56
Analyst: KL

Extraction Method: EPA 3510C
Extraction Date: 09/05/17 16:35

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-02 Batch: WG1038627-1					
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	0.80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	31		21-120
Phenol-d6	23		10-120
Nitrobenzene-d5	54		23-120
2-Fluorobiphenyl	55		15-120
2,4,6-Tribromophenol	43		10-120
4-Terphenyl-d14	46		41-149

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 09/06/17 13:10
Analyst: KR

Extraction Method: EPA 3510C
Extraction Date: 09/05/17 23:57

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1038716-1					
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--
Phenol	ND		ug/l	5.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	48		21-120
Phenol-d6	31		10-120
Nitrobenzene-d5	71		23-120
2-Fluorobiphenyl	59		15-120
2,4,6-Tribromophenol	66		10-120
4-Terphenyl-d14	77		41-149

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1038627-2 WG1038627-3								
Acenaphthene	44		43		37-111	2		40
Fluoranthene	48		48		40-140	0		40
Naphthalene	44		42		40-140	5		40
Benzo(a)anthracene	52		51		40-140	2		40
Benzo(a)pyrene	56		55		40-140	2		40
Benzo(b)fluoranthene	58		54		40-140	7		40
Benzo(k)fluoranthene	53		52		40-140	2		40
Chrysene	47		47		40-140	0		40
Acenaphthylene	54		51		40-140	6		40
Anthracene	47		47		40-140	0		40
Benzo(ghi)perylene	54		54		40-140	0		40
Fluorene	48		47		40-140	2		40
Phenanthrene	44		44		40-140	0		40
Dibenzo(a,h)anthracene	57		55		40-140	4		40
Indeno(1,2,3-cd)pyrene	57		55		40-140	4		40
Pyrene	48		48		26-127	0		40
Pentachlorophenol	45		44		9-103	2		40

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits

Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG1038627-2 WG1038627-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	30		30		21-120
Phenol-d6	22		21		10-120
Nitrobenzene-d5	48		45		23-120
2-Fluorobiphenyl	51		47		15-120
2,4,6-Tribromophenol	42		40		10-120
4-Terphenyl-d14	45		43		41-149

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1038716-2 WG1038716-3								
Bis(2-ethylhexyl)phthalate	87		102		40-140	16		30
Butyl benzyl phthalate	86		100		40-140	15		30
Di-n-butylphthalate	88		102		40-140	15		30
Di-n-octylphthalate	94		109		40-140	15		30
Diethyl phthalate	81		95		40-140	16		30
Dimethyl phthalate	81		93		40-140	14		30
Phenol	36		34		12-110	6		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	57		52		21-120
Phenol-d6	39		36		10-120
Nitrobenzene-d5	76		86		23-120
2-Fluorobiphenyl	67		75		15-120
2,4,6-Tribromophenol	75		87		10-120
4-Terphenyl-d14	79		90		41-149

PCBS

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 5,608
Analytical Date: 09/07/17 02:02
Analyst: HT

Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 608
Extraction Date: 09/06/17 00:10
Cleanup Method: EPA 3665A
Cleanup Date: 09/06/17
Cleanup Method: EPA 3660B
Cleanup Date: 09/06/17

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	69		30-150	A
Decachlorobiphenyl	33		30-150	A

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 5,608
Analytical Date: 09/07/17 02:14
Analyst: HT

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified
Extraction Method: EPA 608
Extraction Date: 09/06/17 00:10
Cleanup Method: EPA 3665A
Cleanup Date: 09/06/17
Cleanup Method: EPA 3660B
Cleanup Date: 09/06/17

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	71		30-150	A
Decachlorobiphenyl	45		30-150	A

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 5,608
Analytical Date: 09/05/17 17:37
Analyst: HT

Extraction Method: EPA 608
Extraction Date: 09/05/17 01:32
Cleanup Method: EPA 3665A
Cleanup Date: 09/05/17
Cleanup Method: EPA 3660B
Cleanup Date: 09/05/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-02 Batch: WG1038395-1						
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	73		30-150	A
Decachlorobiphenyl	66		30-150	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-02 Batch: WG1038395-2									
Aroclor 1016	76		-		30-150	-		30	A
Aroclor 1260	73		-		30-150	-		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77				30-150	A
Decachlorobiphenyl	68				30-150	A

Matrix Spike Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab	Associated sample(s): 01-02		QC Batch ID: WG1038395-3			QC Sample: L1706390-193			Client ID: MS Sample				
Aroclor 1016	ND	3.12	2.41	77		-	-		40-126	-		30	A
Aroclor 1260	ND	3.12	2.30	74		-	-		40-127	-		30	A

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78				30-150	A
Decachlorobiphenyl	70				30-150	A

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits	
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038395-4 QC Sample: L1706390-193 Client ID: DUP Sample							
Aroclor 1016	ND	ND	ug/l	NC		30	A
Aroclor 1221	ND	ND	ug/l	NC		30	A
Aroclor 1232	ND	ND	ug/l	NC		30	A
Aroclor 1242	ND	ND	ug/l	NC		30	A
Aroclor 1248	ND	ND	ug/l	NC		30	A
Aroclor 1254	ND	ND	ug/l	NC		30	A
Aroclor 1260	ND	ND	ug/l	NC		30	A

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	72		80		30-150	A
Decachlorobiphenyl	65		68		30-150	A

METALS

Project Name: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA
Matrix: Water

Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified

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	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Arsenic, Total	0.00330		mg/l	0.00100	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Cadmium, Total	ND		mg/l	0.00020	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Chromium, Total	0.00140		mg/l	0.00100	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Copper, Total	0.02976		mg/l	0.00100	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Iron, Total	15.4		mg/l	0.050	--	1	09/06/17 14:00	09/06/17 22:27	EPA 3005A	19,200.7	AB
Lead, Total	0.00628		mg/l	0.00050	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	--	1	09/07/17 12:14	09/07/17 22:07	EPA 245.1	3,245.1	EA
Nickel, Total	0.00264		mg/l	0.00200	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Selenium, Total	ND		mg/l	0.00500	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Zinc, Total	0.03698		mg/l	0.01000	--	1	09/06/17 14:00	09/07/17 11:26	EPA 3005A	3,200.8	BV
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	573		mg/l	0.660	NA	1	09/06/17 14:00	09/06/17 22:27	EPA 3005A	19,200.7	AB
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.010	--	1		09/07/17 11:26	NA	107,-	

Project Name: CHELSEA CLOCK
Lab Number: L1731154
Project Number: 42088
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA
Matrix: Water

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Antimony, Total	0.01017		mg/l	0.00400	--	1	09/06/17 14:00	09/07/17 11:30	EPA 3005A	3,200.8	BV
Arsenic, Total	0.3378		mg/l	0.00100	--	1	09/06/17 14:00	09/07/17 11:30	EPA 3005A	3,200.8	BV
Cadmium, Total	0.04244		mg/l	0.00020	--	1	09/06/17 14:00	09/07/17 11:30	EPA 3005A	3,200.8	BV
Chromium, Total	0.04876		mg/l	0.00100	--	1	09/06/17 14:00	09/07/17 11:30	EPA 3005A	3,200.8	BV
Copper, Total	41.82		mg/l	0.05000	--	50	09/06/17 14:00	09/07/17 13:35	EPA 3005A	3,200.8	BV
Iron, Total	123		mg/l	0.050	--	1	09/06/17 14:00	09/06/17 22:32	EPA 3005A	19,200.7	AB
Lead, Total	6.739		mg/l	0.00050	--	1	09/06/17 14:00	09/07/17 11:30	EPA 3005A	3,200.8	BV
Mercury, Total	0.00177		mg/l	0.00020	--	1	09/07/17 12:14	09/07/17 22:09	EPA 245.1	3,245.1	EA
Nickel, Total	0.1441		mg/l	0.00200	--	1	09/06/17 14:00	09/07/17 11:30	EPA 3005A	3,200.8	BV
Selenium, Total	0.00755		mg/l	0.00500	--	1	09/06/17 14:00	09/07/17 11:30	EPA 3005A	3,200.8	BV
Silver, Total	0.01572		mg/l	0.00040	--	1	09/06/17 14:00	09/07/17 11:30	EPA 3005A	3,200.8	BV
Zinc, Total	27.19		mg/l	0.5000	--	50	09/06/17 14:00	09/07/17 13:35	EPA 3005A	3,200.8	BV
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	512		mg/l	0.660	NA	1	09/06/17 14:00	09/06/17 22:32	EPA 3005A	19,200.7	AB
General Chemistry - Mansfield Lab											
Chromium, Trivalent	0.049		mg/l	0.010	--	1		09/07/17 11:30	NA	107,-	

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

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: WG1038963-1										
Antimony, Total	ND		mg/l	0.00400	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Arsenic, Total	ND		mg/l	0.00100	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Cadmium, Total	ND		mg/l	0.00020	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Chromium, Total	ND		mg/l	0.00100	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Copper, Total	ND		mg/l	0.00100	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Lead, Total	ND		mg/l	0.00050	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Nickel, Total	ND		mg/l	0.00200	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Selenium, Total	ND		mg/l	0.00500	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV
Zinc, Total	ND		mg/l	0.01000	--	1	09/06/17 14:00	09/07/17 10:25	3,200.8	BV

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: WG1038966-1										
Iron, Total	ND		mg/l	0.050	--	1	09/06/17 14:00	09/06/17 21:26	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: WG1038966-1										
Hardness	ND		mg/l	0.660	NA	1	09/06/17 14:00	09/06/17 21:26	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

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: WG1039351-1										
Mercury, Total	ND		mg/l	0.0002	--	1	09/07/17 12:14	09/07/17 21:35	3,245.1	EA

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK

Project Number: 42088

Lab Number: L1731154

Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1038963-2								
Antimony, Total	104		-		85-115	-		
Arsenic, Total	107		-		85-115	-		
Cadmium, Total	107		-		85-115	-		
Chromium, Total	104		-		85-115	-		
Copper, Total	102		-		85-115	-		
Lead, Total	102		-		85-115	-		
Nickel, Total	101		-		85-115	-		
Selenium, Total	103		-		85-115	-		
Silver, Total	102		-		85-115	-		
Zinc, Total	101		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1038966-2								
Iron, Total	107		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 Batch: WG1038966-2								
Hardness	104		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1039351-2								
Mercury, Total	102		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

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: WG1038963-3 QC Sample: L1731136-01 Client ID: MS Sample												
Antimony, Total	ND	0.5	0.5838	117		-	-		70-130	-		20
Arsenic, Total	ND	0.12	0.1277	106		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05780	113		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2221	111		-	-		70-130	-		20
Copper, Total	0.00144	0.25	0.2638	105		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5248	103		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.5278	106		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1150	96		-	-		70-130	-		20
Silver, Total	ND	0.05	0.05394	108		-	-		70-130	-		20
Zinc, Total	0.01619	0.5	0.5109	99		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1038966-3 QC Sample: L1731136-01 Client ID: MS Sample												
Iron, Total	ND	1	1.05	105		-	-		75-125	-		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1038966-3 QC Sample: L1731136-01 Client ID: MS Sample												
Hardness	101	66.2	164	95		-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1039351-3 QC Sample: L1730841-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.0049	97		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1039351-5 QC Sample: L1731010-02 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.0049	97		-	-		70-130	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1038963-4 QC Sample: L1731136-01 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	0.00144	0.00104	mg/l	**32**	Q	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	0.01619	0.01558	mg/l	4		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1038966-4 QC Sample: L1731136-01 Client ID: DUP Sample						
Iron, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1039351-4 QC Sample: L1730841-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1039351-6 QC Sample: L1731010-02 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20

INORGANICS
&
MISCELLANEOUS

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-01
Client ID: VES-501 (MW)
Sample Location: CHELSEA, MA
Matrix: Water
Date Collected: 09/05/17 09:30
Date Received: 09/05/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	51.		mg/l	10	NA	2	-	09/06/17 06:50	121,2540D	JT
Cyanide, Total	0.030		mg/l	0.005	--	1	09/06/17 13:40	09/07/17 10:47	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/05/17 21:29	121,4500CL-D	AS
Nitrogen, Ammonia	13.5		mg/l	0.075	--	1	09/06/17 12:00	09/06/17 22:26	121,4500NH3-BH	AT
TPH, SGT-HEM	ND		mg/l	4.00	--	1	09/06/17 17:00	09/06/17 21:45	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	09/08/17 12:11	09/08/17 15:03	4,420.1	AW
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/05/17 23:48	09/06/17 00:08	1,7196A	VB
Anions by Ion Chromatography - Westborough Lab										
Chloride	424.		mg/l	25.0	--	50	-	09/06/17 18:53	44,300.0	AU

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

SAMPLE RESULTS

Lab ID: L1731154-02
Client ID: VES-129 (MW)
Sample Location: CHELSEA, MA
Matrix: Water

Date Collected: 09/05/17 11:50
Date Received: 09/05/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	1300		mg/l	25	NA	5	-	09/06/17 06:50	121,2540D	JT
Cyanide, Total	0.007		mg/l	0.005	--	1	09/06/17 13:40	09/07/17 10:50	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/05/17 21:29	121,4500CL-D	AS
Nitrogen, Ammonia	18.9		mg/l	0.750	--	10	09/06/17 12:00	09/06/17 22:45	121,4500NH3-BH	AT
TPH, SGT-HEM	8.80		mg/l	4.00	--	1	09/06/17 17:00	09/06/17 21:45	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	09/08/17 12:11	09/08/17 15:08	4,420.1	AW
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/05/17 23:48	09/06/17 00:10	1,7196A	VB
Anions by Ion Chromatography - Westborough Lab										
Chloride	2310		mg/l	25.0	--	50	-	09/06/17 19:05	44,300.0	AU

Project Name: CHELSEA CLOCK
Project Number: 42088
Lab Number: L1731154
Report Date: 09/21/17

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1038694-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/05/17 21:29	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1038703-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/05/17 23:48	09/06/17 00:07	1,7196A	VB
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1038755-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/06/17 06:50	121,2540D	JT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1038857-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/06/17 12:00	09/06/17 21:50	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1038870-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/06/17 13:40	09/07/17 10:30	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1039054-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	09/06/17 17:00	09/06/17 21:45	74,1664A	ML
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-02 Batch: WG1039113-1										
Chloride	ND		mg/l	0.500	--	1	-	09/06/17 17:53	44,300.0	AU
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1039772-1										
Phenolics, Total	ND		mg/l	0.030	--	1	09/08/17 12:11	09/08/17 14:59	4,420.1	AW

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1038694-2								
Chlorine, Total Residual	109		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1038703-2								
Chromium, Hexavalent	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1038857-2								
Nitrogen, Ammonia	96		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1038870-2								
Cyanide, Total	93		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1039054-2								
TPH	85		-		64-132	-		34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 Batch: WG1039113-2								
Chloride	102		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1039772-2								
Phenolics, Total	101		-		70-130	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038694-4 QC Sample: L1731172-01 Client ID: MS Sample												
Chlorine, Total Residual	ND	0.248	ND	**0**	Q	-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038703-4 QC Sample: L1731154-01 Client ID: VES-501 (MW)												
Chromium, Hexavalent	ND	0.1	0.096	96		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038857-4 QC Sample: L1731014-03 Client ID: MS Sample												
Nitrogen, Ammonia	0.102	4	3.90	95		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038870-4 QC Sample: L1731098-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.198	99		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1039054-4 QC Sample: L1731121-01 Client ID: MS Sample												
TPH	10.6	20.4	31.7	104		-	-		64-132	-		34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1039113-3 QC Sample: L1731136-01 Client ID: MS Sample												
Chloride	30.1	4	33.0	**72**	Q	-	-		90-110	-		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1039772-4 QC Sample: L1731154-01 Client ID: VES-501 (MW)												
Phenolics, Total	ND	0.4	0.42	104		-	-		70-130	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038694-3 QC Sample: L1731154-01 Client ID: VES-501 (MW)						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038703-3 QC Sample: L1731154-02 Client ID: VES-129 (MW)						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038755-2 QC Sample: L1731154-02 Client ID: VES-129 (MW)						
Solids, Total Suspended	1300	1400	mg/l	7		29
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038857-3 QC Sample: L1731014-03 Client ID: DUP Sample						
Nitrogen, Ammonia	0.102	0.078	mg/l	**26**	Q	20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1038870-3 QC Sample: L1731098-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1039054-3 QC Sample: L1731121-01 Client ID: DUP Sample						
TPH	10.6	9.90	mg/l	7		34
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1039113-4 QC Sample: L1731136-01 Client ID: DUP Sample						
Chloride	30.1	30.0	mg/l	0		18
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1039772-3 QC Sample: L1731154-01 Client ID: VES-501 (MW)						
Phenolics, Total	ND	ND	mg/l	NC		20

Project Name: CHELSEA CLOCK
Project Number: 42088

Lab Number: L1731154
Report Date: 09/21/17

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1731154-01A	Vial HCl preserved	B	NA		5.0	Y	Absent		8260-SIM(14),8260(14)
L1731154-01B	Vial HCl preserved	B	NA		5.0	Y	Absent		8260-SIM(14),8260(14)
L1731154-01C	Vial HCl preserved	B	NA		5.0	Y	Absent		8260-SIM(14),8260(14)
L1731154-01D	Vial HCl preserved	B	N/A	N/A	5.0	Y	Absent		SUB-ETHANOL(14)
L1731154-01E	Vial HCl preserved	B	N/A	N/A	5.0	Y	Absent		SUB-ETHANOL(14)
L1731154-01F	Vial HCl preserved	B	N/A	N/A	5.0	Y	Absent		SUB-ETHANOL(14)
L1731154-01G	Vial Na2S2O3 preserved	B	NA		5.0	Y	Absent		504(14)
L1731154-01H	Vial Na2S2O3 preserved	B	NA		5.0	Y	Absent		504(14)
L1731154-01I	Plastic 250ml HNO3 preserved	B	<2	<2	5.0	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)
L1731154-01J	Plastic 950ml unpreserved	B	7	7	5.0	Y	Absent		CL-300(28),HEXCR-7196(1),TRC-4500(1)
L1731154-01K	Plastic 500ml H2SO4 preserved	B	<2	<2	5.0	Y	Absent		NH3-4500(28)
L1731154-01L	Plastic 250ml NaOH preserved	B	>12	>12	5.0	Y	Absent		TCN-4500(14)
L1731154-01M	Plastic 950ml unpreserved	B	7	7	5.0	Y	Absent		TSS-2540(7)
L1731154-01N	Amber 950ml H2SO4 preserved	B	<2	<2	5.0	Y	Absent		TPHENOL-420(28)
L1731154-01P	Amber 1000ml HCl preserved	B	NA		5.0	Y	Absent		TPH-1664(28)
L1731154-01Q	Amber 1000ml HCl preserved	B	NA		5.0	Y	Absent		TPH-1664(28)
L1731154-01R	Amber 1000ml unpreserved	B	7	7	5.0	Y	Absent		8270TCL(7),8270TCL-SIM(7)
L1731154-01S	Amber 1000ml unpreserved	B	7	7	5.0	Y	Absent		8270TCL(7),8270TCL-SIM(7)
L1731154-01T	Amber 1000ml Na2S2O3	B	7	7	5.0	Y	Absent		PCB-608(7)
L1731154-01U	Amber 1000ml Na2S2O3	B	7	7	5.0	Y	Absent		PCB-608(7)
L1731154-02A	Vial HCl preserved	B	NA		5.0	Y	Absent		8260-SIM(14),8260(14)

*Values in parentheses indicate holding time in days

Project Name: CHELSEA CLOCK
Project Number: 42088

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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1731154-02B	Vial HCl preserved	B	NA		5.0	Y	Absent		8260-SIM(14),8260(14)
L1731154-02C	Vial HCl preserved	B	NA		5.0	Y	Absent		8260-SIM(14),8260(14)
L1731154-02D	Vial HCl preserved	B	N/A	N/A	5.0	Y	Absent		SUB-ETHANOL(14)
L1731154-02E	Vial HCl preserved	B	N/A	N/A	5.0	Y	Absent		SUB-ETHANOL(14)
L1731154-02F	Vial HCl preserved	B	N/A	N/A	5.0	Y	Absent		SUB-ETHANOL(14)
L1731154-02G	Vial Na2S2O3 preserved	B	NA		5.0	Y	Absent		504(14)
L1731154-02H	Vial Na2S2O3 preserved	B	NA		5.0	Y	Absent		504(14)
L1731154-02I	Plastic 250ml HNO3 preserved	B	<2	<2	5.0	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)
L1731154-02J	Plastic 950ml unpreserved	B	7	7	5.0	Y	Absent		CL-300(28),HEXCR-7196(1),TRC-4500(1)
L1731154-02K	Plastic 500ml H2SO4 preserved	B	<2	<2	5.0	Y	Absent		NH3-4500(28)
L1731154-02L	Plastic 250ml NaOH preserved	B	>12	>12	5.0	Y	Absent		TCN-4500(14)
L1731154-02M	Plastic 950ml unpreserved	B	7	7	5.0	Y	Absent		TSS-2540(7)
L1731154-02N	Amber 950ml H2SO4 preserved	B	<2	<2	5.0	Y	Absent		TPHENOL-420(28)
L1731154-02P	Amber 1000ml HCl preserved	B	NA		5.0	Y	Absent		TPH-1664(28)
L1731154-02Q	Amber 1000ml HCl preserved	B	NA		5.0	Y	Absent		TPH-1664(28)
L1731154-02R	Amber 1000ml unpreserved	B	7	7	5.0	Y	Absent		8270TCL(7),8270TCL-SIM(7)
L1731154-02S	Amber 1000ml unpreserved	B	7	7	5.0	Y	Absent		8270TCL(7),8270TCL-SIM(7)
L1731154-02T	Amber 1000ml Na2S2O3	B	7	7	5.0	Y	Absent		PCB-608(7)
L1731154-02U	Amber 1000ml Na2S2O3	B	7	7	5.0	Y	Absent		PCB-608(7)
L1731154-03G	Vial Na2S2O3 preserved	B	NA		5.0	Y	Absent		504(14)
L1731154-03H	Vial Na2S2O3 preserved	B	NA		5.0	Y	Absent		504(14)
L1731154-04A	Vial HCl preserved	B	NA		5.0	Y	Absent		8260-SIM(14),8260(14)
L1731154-04B	Vial HCl preserved	B	NA		5.0	Y	Absent		8260-SIM(14),8260(14)

*Values in parentheses indicate holding time in days

Project Name:	CHELSEA CLOCK	**Lab Number:**	L1731154
Project Number:	42088	**Report Date:**	09/21/17

GLOSSARY

Acronyms

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).
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.
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.
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.
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

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.

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.

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

Report Format: Data Usability Report

Project Name:	CHELSEA CLOCK	**Lab Number:**	L1731154
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Data Qualifiers

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.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

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.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	CHELSEA CLOCK	**Lab Number:**	L1731154
Project Number:	42088	**Report Date:**	09/21/17

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.

5 Methods for the Organic Chemical Analysis of Municipal and Industrial Wastewater. Appendix A, Part 136, 40 CFR (Code of Federal Regulations).

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.

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: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
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: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, 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 624: Volatile Halocarbons & Aromatics,
EPA 608: 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: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

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

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, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

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

Serial_No:09211718:46

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ALPHA ANALYTICAL — World Class Chemistry

PAGE 1 OF 2

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

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

Date Rec'd in Lab: 09/05/17

ALPHA Job #: L1731154

Client Information

Client: VERTEX

Address: 400 Libbey Parkway, Weymouth MA 02189

Phone: 781-952-6000

Email: pplante@vertexeng.com

Additional Project Information:

NPDES RGP Parameters

Project Information

Project Name: Chelsea Clock

Project Location: Chelsea MA

Project #: 42088

Project Manager: Patty Plante

ALPHA Quote #:

Turn-Around Time

☒ Standard 5-day ☐ RUSH *(only confirmed if pre-approved!)*

Date Due:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ 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 NPDES RGP

ANALYSIS

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC: ☒ 8260 ☐ 624 ☐ 524.2 Low level	SVOC: ☒ ABN ☐ PAH Low level	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☒ PCB ☐ PEST 802A	TPH: ☐ Quant Only ☐ Fingerprint	TPH 1664	Total Metals 6020A	Total Suspended Solids	TCN	EDB	Hex Cr, TRC, Cl, Total Phenols (?)	Sample Comments	TOTAL # BOTTLES
31154-01	VES-501 (MW)	9/5/17	9:30	GW	ERW	X	X					X		X	X	X	X	X	X		
02	VES-129 (MW)	9/5/17	11:50	GW	ERW	X	X					X		X	X	X	X	X	X		
03	Trip blank - 504	8/31/17																X			
04	Trip blank - 8260	8/31/17				X															
Container Type						V	A					A		A	P	P	P	V	P		
Preservative						B	A					H		B	C	A	E	H	A		

SAMPLE INFO

Filtration ☐ Field ☐ Lab to do

Preservation ☐ Lab to do

Container Type	Preservative
P= Plastic	A= None
A= Amber glass	B= HCl
V= Vial	C= HNO_3
G= Glass	D= H_2SO_4
B= Bacteria cup	E= NaOH
C= Cube	F= MeOH
O= Other	G= $NaHSO_4$
E= Encore	H = $Na_2S_2O_3$
D= BOD Bottle	I= Ascorbic Acid
	J = NH_4Cl
	K= Zn Acetate
	O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	9/5/17 / 15:10	[signature] AAL	9/5/17 1515
[signature]	9/5/17 1817	[signature]	9/5/17 1817

Serial_No:09211718:46

CHAIN OF CUSTODY

PAGE 2 OF 2

ALPHA ANALYTICAL — World Class Chemistry

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

Date Rec'd in Lab: 09/05/17

ALPHA Job #: L1731154

Project Information

Project Name: Chelsea Clock
Project Location: Chelsea MA
Project #: 42088
Project Manager: Patty Plante
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ 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 NPDES RGP

Client Information

Client: VERTEX
Address: 400 Libbey Parkway, Weymouth MA 02189
Phone: 781-952-6000
Email: pplante@vertexeng.com

Turn-Around Time

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

Additional Project Information:

NPDES RGP Parameters

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint; Total Phenolics; Nitrogen, ammonia; Ethyl Alcohol

SAMPLE INFO — Filtration: ☐ Field ☐ Lab to do; Preservation: ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Total Phenolics	Nitrogen, ammonia	Ethyl Alcohol	Sample Comments	TOTAL # BOTTLES
31154-01	VES-501 (MW)	9/5/17	9:30	GW	ERW	X	X	X		
02	VES-129 (MW)	9/5/17	11:50	GW	ERW	X	X	X		

	Total Phenolics	Nitrogen, ammonia	Ethyl Alcohol
Container Type	A	P	V
Preservative	D	D	B

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

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

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	9/5/17 1510	[signature] AAL	9/5/17 1515
[signature]	9/5/17 1817	[signature]	9/5/17 1816

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

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

SUB UPS: **Lancaster/Eurofins, PA**

CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #:L1731154

Client Information

Client: Alpha Analytical Lab
Address: 8 Walkup Drive
Westborough, Ma 01581
Phone: 508-898-9220
Fax:
Email: subreports@alphalab.com

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name:
Project Location: MA
Project #:
Project Manager: Nichole Hunt
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Report Information — Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program *Criteria*

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

Please reference Alpha Job # **L1731154** on this report.

NPDES

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ETHANOL 1671	Sample Specific Comments	TOTAL # BOTTLES
	VES-501 (MW)	9/5/17	09:30	GW		x		3
	VES-129 (MW)	9/5/17	11:50	GW		x		3

Container Type	Vial		-	-	-	-	-	-	-	-	-	-
Preservative	HCL		-	-	-	-	-	-	-	-	-	-

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
AM	9/6/17		

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 01-01(I) (rev. 30-JUL-07)

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Alpha Analytical, Inc.
145 Flanders Road
Westborough MA 01581

Report Date: September 15, 2017

Project: L1731154

Account #: 09847
Group Number: 1847159
PO Number: L1731154
State of Sample Origin: MA

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Alpha Analytical, Inc.	Attn: Nichole Hunt
Electronic Copy To	Alpha Analytical, Inc.	Attn: Sublab Contact

Respectfully Submitted,

Bonnie Stadelmann

Bonnie Stadelmann
Senior Project Manager

(312) 590-3133

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

SAMPLE INFORMATION

Client Sample Description	Collection Information	ELLE#
VES-501 (MW) Groundwater Sample	09/05/2017 09:30	9195238
VES-129 (MW) Groundwater Sample	09/05/2017 11:50	9195239

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

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Analysis Report

Sample Description: VES-501 (MW) Groundwater Sample
L1731154

ELLE Sample # WW 9195238
ELLE Group # 1847159
Account # 09847

Project Name: L1731154

Collected: 09/05/2017 09:30

Submitted: 09/07/2017 09:45
Reported: 09/15/2017 09:53

Alpha Analytical, Inc.
145 Flanders Road
Westborough MA 01581

VS501

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC Miscellaneous	**EPA 1671 Rev A**		**ug/l**	**ug/l**	
02366	ethanol	64-17-5	N.D. D2	2,000	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02366	EPA 1671 VOCs	EPA 1671 Rev A	1	172510035A	09/12/2017 03:11	Tyler O Griffin	1

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Analysis Report

Sample Description: VES-129 (MW) Groundwater Sample
L1731154

ELLE Sample # WW 9195239
ELLE Group # 1847159
Account # 09847

Project Name: L1731154

Collected: 09/05/2017 11:50

Submitted: 09/07/2017 09:45
Reported: 09/15/2017 09:53

Alpha Analytical, Inc.
145 Flanders Road
Westborough MA 01581

VS129

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC Miscellaneous	**EPA 1671 Rev A**		**ug/l**	**ug/l**	
02366	ethanol	64-17-5	N.D. D2	2,000	1

Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02366	EPA 1671 VOCs	EPA 1671 Rev A	1	172510035A	09/12/2017 00:52	Tyler O Griffin	1

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Analysis Report

Quality Control Summary

Client Name: Alpha Analytical, Inc. Group Number: 1847159
Reported: 09/15/2017 09:53

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ
	ug/l	ug/l
Batch number: 172510035A	Sample number(s): 9195238-9195239	
ethanol	N.D.	2,000

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: 172510035A	Sample number(s): 9195238-9195239								
ethanol	4010	3889.41	4010	4089.98	97	102	70-132	5	30

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 172510035A	Sample number(s): 9195238-9195239 UNSPK: 9195239									
ethanol	N.D.	4010	4052.35	4010	4271.61	101	107	70-132	5	30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report. For dual column analyses, the surrogate (at least one surrogate for multi-surrogate tests) must be within the acceptance limits on at least one of the two columns.

Analysis Name: EPA 1671 VOCs
Batch number: 172510035A

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

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Analysis Report

Quality Control Summary

Client Name: Alpha Analytical, Inc. Group Number: 1847159
Reported: 09/15/2017 09:53

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report. For dual column analyses, the surrogate (at least one surrogate for multi-surrogate tests) must be within the acceptance limits on at least one of the two columns.

Analysis Name: EPA 1671 VOCs
Batch number: 172510035A

	Amyl Alcohol-D1	Amyl Alcohol-D2
9195238	116	110
9195239	124	114
Blank	121	101
LCS	122	100
LCSD	125	103
MS	122	104
MSD	108	95
Limits:	52-144	52-144

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

SUB UPS: **Lancaster/Eurofins, PA** 9847/1847159/9195238-39

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193

Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #:L1731154

Client Information

Client: Alpha Analytical Lab

Address: 8 Walkup Drive

Westborough, Ma 01581

Phone: 508-898-9220

Fax:

Email: subreports@alphalab.com

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name:

Project Location: MA

Project #:

Project Manager: Nichole Hunt

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Report Information — Data Deliverables

☐ FAX ☐ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program *Criteria*

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☐ Yes ☐ No Are MCP Analytical Methods Required?

☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

Please reference Alpha Job # **L1731154** on this report.

NPDES

ANALYSIS

SAMPLE HANDLING

Filtration
☐ Done
☐ Not Needed
☐ Lab to do

Preservation
☐ Lab to do

(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ETHANOL 1671	Sample Specific Comments	TOTAL # BOTTLES
	VES-501 (MW)	9/5/17	09:30	GW		x		3
	VES-129 (MW)	9/5/17	11:50	GW		x		3

Container Type	Vial		-	-	-	-	-	-	-	-	-	-	
Preservative	HCL		-	-	-	-	-	-	-	-	-	-	

EASE ANSWER QUESTIONS ABOVE!

S YOUR PROJECT A MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
AM	9/6/17		945 9/7/17

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 193658

Group Number(s): 1847159

Client: ALPHA

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	09/07/2017 9:45
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	MA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Wendy Wakeley (1669) at 12:39 on 09/07/2017

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-01	2.2	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	non-detect
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
J (or G, I, X)	Estimated value >= the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

ANALYTICAL REPORT

Lab Number:	L1734514
Client:	Vertex Environmental Services, Inc. 400 Libbey Industrial Parkway Weymouth, MA 02189
ATTN:	Patty Plante
Phone:	(781) 952-6000
Project Name:	CHELSEA CLOCK RGP
Project Number:	42088
Report Date:	10/12/17

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), NJ NELAP (MA935), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-14-00197).

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

Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
Report Date: 10/12/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1734514-01	ISLE. END R1	WATER	CHELSEA, MA	09/27/17 09:45	09/27/17
L1734514-02	TRIP BLANK	WATER	CHELSEA, MA	09/27/17 00:00	09/27/17

Project Name:	CHELSEA CLOCK RGP	**Lab Number:**	L1734514
Project Number:	42088	**Report Date:**	10/12/17

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. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated 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.

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 table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

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 Client Service Representative 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 Client Services at 800-624-9220 with any questions.

Project Name:	CHELSEA CLOCK RGP	**Lab Number:**	L1734514
Project Number:	42088	**Report Date:**	10/12/17

Case Narrative (continued)

Report Submission

October 12, 2017: This final report includes the results of all requested analyses.

October 10, 2017: This preliminary report contains the results of the Salinity analysis on sample L1734514-01.

October 04, 2017: This is a preliminary report.

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

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

Sample Receipt

L1734514-02: A sample identified as "TRIP BLANK" was received but not listed on the Chain of Custody. At the client's request, this sample was not analyzed.

Semivolatile Organics by SIM

L1734514-01: The sample has elevated detection limits due to the dilution required by the sample matrix.

Total Metals

L1734514-01: The sample has elevated detection limits for all elements by Method 200.8due to the dilution required by the sample matrix.

The WG1047053-3 MS recovery for hardness (0%), performed on L1734514-01, does not apply because the sample concentration is greater than four times the spike amount added.

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:  Kara Lindquist

Title: Technical Director/Representative Date: 10/12/17

ORGANICS

VOLATILES

Project Name: CHELSEA CLOCK RGP
Lab Number: L1734514
Project Number: 42088
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA

Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 10/04/17 07:38
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	2.5	--	1
1,3-Dichlorobenzene	ND		ug/l	2.5	--	1
1,4-Dichlorobenzene	ND		ug/l	2.5	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Acetone	8.4		ug/l	5.0	--	1
Tert-Butyl Alcohol	ND		ug/l	10	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--	1

Project Name: CHELSEA CLOCK RGP
Lab Number: L1734514
Project Number: 42088
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA
Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Volatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	118		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	101		70-130

Project Name: CHELSEA CLOCK RGP
Lab Number: L1734514
Project Number: 42088
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA

Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C-SIM(M)
Analytical Date: 10/04/17 06:51
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS-SIM - Westborough Lab						
1,4-Dioxane	ND		ug/l	3.0	--	1

Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 14,504.1
Analytical Date: 10/03/17 12:36
Analyst: NS

Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified
Extraction Method: EPA 504.1
Extraction Date: 10/03/17 09:14

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: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 14,504.1
Analytical Date: 10/03/17 10:56
Analyst: NS

Extraction Method: EPA 504.1
Extraction Date: 10/03/17 09:14

Parameter	Result	Qualifier	Units	RL	MDL	
Microextractables by GC - Westborough Lab for sample(s): 01 Batch: WG1048238-1						
1,2-Dibromoethane	ND		ug/l	0.010	--	A

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C-SIM(M)
Analytical Date: 10/04/17 06:17
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1048720-5					
1,4-Dioxane	ND		ug/l	3.0	--

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 10/04/17 05:59
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1048752-5					
Methylene chloride	ND		ug/l	3.0	--
1,1-Dichloroethane	ND		ug/l	0.75	--
Carbon tetrachloride	ND		ug/l	0.50	--
1,1,2-Trichloroethane	ND		ug/l	0.75	--
Tetrachloroethene	ND		ug/l	0.50	--
1,2-Dichloroethane	ND		ug/l	0.50	--
1,1,1-Trichloroethane	ND		ug/l	0.50	--
Benzene	ND		ug/l	0.50	--
Toluene	ND		ug/l	0.75	--
Ethylbenzene	ND		ug/l	0.50	--
Vinyl chloride	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	0.50	--
Trichloroethene	ND		ug/l	0.50	--
1,2-Dichlorobenzene	ND		ug/l	2.5	--
1,3-Dichlorobenzene	ND		ug/l	2.5	--
1,4-Dichlorobenzene	ND		ug/l	2.5	--
Methyl tert butyl ether	ND		ug/l	1.0	--
p/m-Xylene	ND		ug/l	1.0	--
o-Xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	0.50	--
Acetone	ND		ug/l	5.0	--
Tert-Butyl Alcohol	ND		ug/l	10	--
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 10/04/17 05:59
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1048752-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	102		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Microextractables by GC - Westborough Lab	Associated sample(s): 01		Batch: WG1048238-2						
1,2-Dibromoethane	110		-		80-120	-			A

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1048720-3 WG1048720-4								
1,4-Dioxane	100		100		70-130	0		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1048752-3 WG1048752-4								
Methylene chloride	93		90		70-130	3		20
1,1-Dichloroethane	97		96		70-130	1		20
Carbon tetrachloride	83		84		63-132	1		20
1,1,2-Trichloroethane	96		100		70-130	4		20
Tetrachloroethene	94		92		70-130	2		20
1,2-Dichloroethane	97		100		70-130	3		20
1,1,1-Trichloroethane	90		89		67-130	1		20
Benzene	93		92		70-130	1		25
Toluene	97		95		70-130	2		25
Ethylbenzene	98		96		70-130	2		20
Vinyl chloride	120		110		55-140	9		20
1,1-Dichloroethene	94		90		61-145	4		25
Trichloroethene	89		87		70-130	2		25
1,2-Dichlorobenzene	94		96		70-130	2		20
1,3-Dichlorobenzene	94		93		70-130	1		20
1,4-Dichlorobenzene	94		94		70-130	0		20
Methyl tert butyl ether	91		96		63-130	5		20
p/m-Xylene	95		90		70-130	5		20
o-Xylene	95		95		70-130	0		20
cis-1,2-Dichloroethene	91		90		70-130	1		20
Acetone	96		97		58-148	1		20
Tert-Butyl Alcohol	76		88		70-130	15		20
Tertiary-Amyl Methyl Ether	88		92		66-130	4		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1048752-3 WG1048752-4								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	105		105		70-130
Toluene-d8	106		104		70-130
4-Bromofluorobenzene	94		95		70-130
Dibromofluoromethane	98		99		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP

Project Number: 42088

Lab Number: L1734514

Report Date: 10/12/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*	*Column*
Microextractables by GC - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1048238-3	QC Sample: L1735107-01	Client ID: MS Sample									
1,2-Dibromoethane	ND	0.256	0.282	110		-	-		80-120	-		20	A
1,2-Dibromo-3-chloropropane	ND	0.256	0.303	118		-	-		80-120	-		20	A

SEMIVOLATILES

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 10/03/17 07:14
Analyst: ALS

Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/30/17 02:12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Phenol	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	48		21-120
Phenol-d6	42		10-120
Nitrobenzene-d5	78		23-120
2-Fluorobiphenyl	80		15-120
2,4,6-Tribromophenol	57		10-120
4-Terphenyl-d14	74		41-149

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01 D
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 10/04/17 11:44
Analyst: DV

Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 09/30/17 02:14

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	0.57		ug/l	0.50	--	5
Fluoranthene	9.6		ug/l	0.50	--	5
Naphthalene	ND		ug/l	0.50	--	5
Benzo(a)anthracene	8.9		ug/l	0.50	--	5
Benzo(a)pyrene	14		ug/l	0.50	--	5
Benzo(b)fluoranthene	24		ug/l	0.50	--	5
Benzo(k)fluoranthene	8.4		ug/l	0.50	--	5
Chrysene	12		ug/l	0.50	--	5
Acenaphthylene	0.70		ug/l	0.50	--	5
Anthracene	0.64		ug/l	0.50	--	5
Benzo(ghi)perylene	17		ug/l	0.50	--	5
Fluorene	ND		ug/l	0.50	--	5
Phenanthrene	2.2		ug/l	0.50	--	5
Dibenzo(a,h)anthracene	3.9		ug/l	0.50	--	5
Indeno(1,2,3-cd)pyrene	17		ug/l	0.50	--	5
Pyrene	9.2		ug/l	0.50	--	5
Pentachlorophenol	ND		ug/l	4.0	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	44		21-120
Phenol-d6	41		10-120
Nitrobenzene-d5	104		23-120
2-Fluorobiphenyl	120		15-120
2,4,6-Tribromophenol	55		10-120
4-Terphenyl-d14	87		41-149

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 09/29/17 22:33
Analyst: KR

Extraction Method: EPA 3510C
Extraction Date: 09/29/17 08:22

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1047019-1					
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--
Phenol	ND		ug/l	5.0	--
Tentatively Identified Compounds					
Total TIC Compounds	5.14	J	ug/l		
Unknown	5.14	J	ug/l		

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	36		21-120
Phenol-d6	24		10-120
Nitrobenzene-d5	64		23-120
2-Fluorobiphenyl	60		15-120
2,4,6-Tribromophenol	69		10-120
4-Terphenyl-d14	84		41-149

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 09/29/17 14:01
Analyst: DV

Extraction Method: EPA 3510C
Extraction Date: 09/29/17 08:25

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01 Batch: WG1047020-1					
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	0.80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	27		21-120
Phenol-d6	20		10-120
Nitrobenzene-d5	58		23-120
2-Fluorobiphenyl	81		15-120
2,4,6-Tribromophenol	79		10-120
4-Terphenyl-d14	84		41-149

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1047019-2 WG1047019-3								
Bis(2-ethylhexyl)phthalate	73		74		40-140	1		30
Butyl benzyl phthalate	82		90		40-140	9		30
Di-n-butylphthalate	74		79		40-140	7		30
Di-n-octylphthalate	77		82		40-140	6		30
Diethyl phthalate	76		80		40-140	5		30
Dimethyl phthalate	72		73		40-140	1		30
Phenol	32		35		12-110	9		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	46		48		21-120
Phenol-d6	32		33		10-120
Nitrobenzene-d5	78		80		23-120
2-Fluorobiphenyl	69		68		15-120
2,4,6-Tribromophenol	75		75		10-120
4-Terphenyl-d14	76		79		41-149

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1047020-2 WG1047020-3								
Acenaphthene	73		75		37-111	3		40
Fluoranthene	85		89		40-140	5		40
Naphthalene	70		74		40-140	6		40
Benzo(a)anthracene	84		89		40-140	6		40
Benzo(a)pyrene	96		99		40-140	3		40
Benzo(b)fluoranthene	99		103		40-140	4		40
Benzo(k)fluoranthene	97		98		40-140	1		40
Chrysene	78		82		40-140	5		40
Acenaphthylene	97		105		40-140	8		40
Anthracene	80		82		40-140	2		40
Benzo(ghi)perylene	94		98		40-140	4		40
Fluorene	90		92		40-140	2		40
Phenanthrene	74		77		40-140	4		40
Dibenzo(a,h)anthracene	109		112		40-140	3		40
Indeno(1,2,3-cd)pyrene	105		108		40-140	3		40
Pyrene	83		87		26-127	5		40
Pentachlorophenol	68		69		9-103	1		40

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1047020-2 WG1047020-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	41		43		21-120
Phenol-d6	31		33		10-120
Nitrobenzene-d5	76		81		23-120
2-Fluorobiphenyl	107		116		15-120
2,4,6-Tribromophenol	106		105		10-120
4-Terphenyl-d14	90		94		41-149

PCBS

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA

Matrix: Water
Analytical Method: 5,608
Analytical Date: 10/04/17 02:52
Analyst: JW

Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified
Extraction Method: EPA 608
Extraction Date: 10/02/17 10:03
Cleanup Method: EPA 3665A
Cleanup Date: 10/03/17
Cleanup Method: EPA 3660B
Cleanup Date: 10/03/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.263	--	1	A
Aroclor 1221	ND		ug/l	0.263	--	1	A
Aroclor 1232	ND		ug/l	0.263	--	1	A
Aroclor 1242	ND		ug/l	0.263	--	1	A
Aroclor 1248	ND		ug/l	0.263	--	1	A
Aroclor 1254	ND		ug/l	0.263	--	1	A
Aroclor 1260	ND		ug/l	0.210	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	71		30-150	A
Decachlorobiphenyl	69		30-150	A

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 5,608
Analytical Date: 10/04/17 01:38
Analyst: JW

Extraction Method: EPA 608
Extraction Date: 10/02/17 10:03
Cleanup Method: EPA 3665A
Cleanup Date: 10/03/17
Cleanup Method: EPA 3660B
Cleanup Date: 10/03/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01 Batch: WG1047823-1						
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	73		30-150	A
Decachlorobiphenyl	77		30-150	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1047823-2									
Aroclor 1016	88		-		30-150	-		30	A
Aroclor 1260	92		-		30-150	-		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	65				30-150	A
Decachlorobiphenyl	75				30-150	A

Matrix Spike Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP

Project Number: 42088

Lab Number: L1734514

Report Date: 10/12/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*	*Column*
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1047823-3 QC Sample: L1734466-01 Client ID: MS Sample													
Aroclor 1016	ND	3.12	2.88	92		-	-		40-126	-		30	A
Aroclor 1260	ND	3.12	2.48	79		-	-		40-127	-		30	A

Surrogate	*MS % Recovery*	*MS Qualifier*	*MSD % Recovery*	*MSD Qualifier*	*Acceptance Criteria*	*Column*
2,4,5,6-Tetrachloro-m-xylene	70				30-150	A
Decachlorobiphenyl	52				30-150	A

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
Report Date: 10/12/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits	
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1047823-4 QC Sample: L1734466-02 Client ID: DUP Sample							
Aroclor 1016	ND	ND	ug/l	NC		30	A
Aroclor 1221	ND	ND	ug/l	NC		30	A
Aroclor 1232	ND	ND	ug/l	NC		30	A
Aroclor 1242	ND	ND	ug/l	NC		30	A
Aroclor 1248	ND	ND	ug/l	NC		30	A
Aroclor 1254	ND	ND	ug/l	NC		30	A
Aroclor 1260	ND	ND	ug/l	NC		30	A

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	**11**	Q	72		30-150	A
Decachlorobiphenyl	**11**	Q	67		30-150	A

METALS

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA
Matrix: Water
Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified

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	0.04000	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Arsenic, Total	ND		mg/l	0.01000	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Cadmium, Total	ND		mg/l	0.00200	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Chromium, Total	ND		mg/l	0.01000	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Copper, Total	0.02491		mg/l	0.01000	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Iron, Total	2.58		mg/l	0.050	--	1	09/29/17 12:10	10/03/17 19:31	EPA 3005A	19,200.7	AB
Lead, Total	0.03136		mg/l	0.00500	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Mercury, Total	ND		mg/l	0.00020	--	1	09/28/17 12:04	10/02/17 16:17	EPA 245.1	3,245.1	MG
Nickel, Total	ND		mg/l	0.02000	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Selenium, Total	ND		mg/l	0.05000	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Silver, Total	ND		mg/l	0.00400	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Zinc, Total	ND		mg/l	0.1000	--	10	09/29/17 12:10	09/30/17 15:04	EPA 3005A	3,200.8	BV
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	4340		mg/l	0.660	NA	1	09/29/17 12:10	10/03/17 19:31	EPA 3005A	19,200.7	AB
General Chemistry - Mansfield Lab											
Chromium, Trivalent	ND		mg/l	0.010	--	1		09/30/17 15:04	NA	107,-	

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1046654-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/28/17 12:04	10/02/17 12:55	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1047046-1										
Antimony, Total	ND		mg/l	0.00400	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Arsenic, Total	ND		mg/l	0.00100	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Cadmium, Total	ND		mg/l	0.00020	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Chromium, Total	ND		mg/l	0.00100	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Copper, Total	ND		mg/l	0.00100	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Lead, Total	ND		mg/l	0.00050	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Nickel, Total	ND		mg/l	0.00200	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Selenium, Total	ND		mg/l	0.00500	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Silver, Total	ND		mg/l	0.00040	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV
Zinc, Total	ND		mg/l	0.01000	--	1	09/29/17 12:10	09/30/17 12:36	3,200.8	BV

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1047053-1										
Iron, Total	ND		mg/l	0.050	--	1	09/29/17 12:10	10/03/17 19:17	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 01 Batch: WG1047053-1										
Hardness	ND		mg/l	0.660	NA	1	09/29/17 12:10	10/03/17 19:17	19,200.7	AB

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1046654-2								
Mercury, Total	100		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1047046-2								
Antimony, Total	100		-		85-115	-		
Arsenic, Total	103		-		85-115	-		
Cadmium, Total	108		-		85-115	-		
Chromium, Total	106		-		85-115	-		
Copper, Total	104		-		85-115	-		
Lead, Total	102		-		85-115	-		
Nickel, Total	103		-		85-115	-		
Selenium, Total	107		-		85-115	-		
Silver, Total	101		-		85-115	-		
Zinc, Total	102		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1047053-2								
Iron, Total	103		-		85-115	-		
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1047053-2								
Hardness	103		-		85-115	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
Report Date: 10/12/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01	QC Batch ID: WG1046654-3		QC Sample: L1734129-01			Client ID: MS Sample						
Mercury, Total	ND	0.005	0.00493	99		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01	QC Batch ID: WG1046654-5		QC Sample: L1734188-01			Client ID: MS Sample						
Mercury, Total	ND	0.005	0.00490	98		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01	QC Batch ID: WG1047046-3		QC Sample: L1734514-01			Client ID: ISLE. END R1						
Antimony, Total	ND	0.5	0.5679	114		-	-		70-130	-		20
Arsenic, Total	ND	0.12	0.1262	105		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05959	117		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1956	98		-	-		70-130	-		20
Copper, Total	0.02491	0.25	0.2697	98		-	-		70-130	-		20
Lead, Total	0.03136	0.51	0.5454	101		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.5106	102		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1237	103		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04722	94		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5943	119		-	-		70-130	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery		MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1047046-5 QC Sample: L1734673-01 Client ID: MS Sample										
Antimony, Total	ND	0.5	0.4900	98		-	-	70-130	-	20
Arsenic, Total	ND	0.12	0.1234	103		-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.05409	106		-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2151	108		-	-	70-130	-	20
Copper, Total	0.0227	0.25	0.2812	103		-	-	70-130	-	20
Lead, Total	ND	0.51	0.5214	102		-	-	70-130	-	20
Nickel, Total	ND	0.5	0.5161	103		-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1266	106		-	-	70-130	-	20
Silver, Total	ND	0.05	0.05007	100		-	-	70-130	-	20
Zinc, Total	0.0339	0.5	0.5304	99		-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1047053-3 QC Sample: L1734514-01 Client ID: ISLE. END R1										
Iron, Total	2.58	1	3.34	76		-	-	75-125	-	20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1047053-3 QC Sample: L1734514-01 Client ID: ISLE. END R1										
Hardness	4340	66.2	4150	**0**	Q	-	-	75-125	-	20

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
Report Date: 10/12/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1046654-4 QC Sample: L1734129-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1046654-6 QC Sample: L1734188-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1047046-4 QC Sample: L1734514-01 Client ID: ISLE. END R1						
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	0.02491	0.02277	mg/l	9		20
Lead, Total	0.03136	0.02992	mg/l	5		20
Nickel, Total	ND	ND	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1047046-6 QC Sample: L1734673-01 Client ID: DUP Sample						
Lead, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1047053-4 QC Sample: L1734514-01 Client ID: ISLE. END R1						
Iron, Total	2.58	2.23	mg/l	15		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
Report Date: 10/12/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1047053-4 QC Sample: L1734514-01 Client ID: ISLE. END R1					
Hardness	4340	4190	mg/l	4	20

INORGANICS
&
MISCELLANEOUS

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

SAMPLE RESULTS

Lab ID: L1734514-01
Client ID: ISLE. END R1
Sample Location: CHELSEA, MA
Matrix: Water

Date Collected: 09/27/17 09:45
Date Received: 09/27/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
SALINITY	26		SU	2.0	--	1	-	10/09/17 16:31	121,2520B	AS
Solids, Total Suspended	46.		mg/l	5.0	NA	1	-	09/29/17 01:45	121,2540D	VB
Cyanide, Total	0.023		mg/l	0.005	--	1	09/28/17 10:30	09/28/17 14:12	121,4500CN-CE	LH
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/28/17 00:10	121,4500CL-D	AS
Nitrogen, Ammonia	0.695		mg/l	0.075	--	1	09/28/17 16:00	09/28/17 20:51	121,4500NH3-BH	AT
TPH, SGT-HEM	ND		mg/l	4.00	--	1	09/28/17 17:30	09/28/17 22:30	74,1664A	ML
Phenolics, Total	ND		mg/l	0.030	--	1	09/29/17 11:35	09/29/17 16:08	4,420.1	AW
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/28/17 01:09	09/28/17 01:14	1,7196A	UN
Anions by Ion Chromatography - Westborough Lab										
Chloride	15400		mg/l	250	--	500	-	09/29/17 21:53	44,300.0	JC

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1046384-1										
Chlorine, Total Residual	ND		mg/l	0.02	--	1	-	09/28/17 00:10	121,4500CL-D	AS
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1046399-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/28/17 01:09	09/28/17 01:12	1,7196A	UN
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1046546-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/28/17 10:30	09/28/17 13:32	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1046714-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/28/17 16:00	09/28/17 20:24	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1046810-1										
TPH, SGT-HEM	ND		mg/l	4.00	--	1	09/28/17 17:30	09/28/17 22:30	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1046897-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/29/17 01:45	121,2540D	VB
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1047064-1										
Phenolics, Total	ND		mg/l	0.030	--	1	09/29/17 11:35	09/29/17 16:05	4,420.1	AW
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1047675-1										
Chloride	ND		mg/l	0.500	--	1	-	09/30/17 00:41	44,300.0	JC

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1046384-2								
Chlorine, Total Residual	109		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1046399-2								
Chromium, Hexavalent	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1046546-2								
Cyanide, Total	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1046714-2								
Nitrogen, Ammonia	82		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1046810-2								
TPH	80		-		64-132	-		34
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1047064-2								
Phenolics, Total	104		-		70-130	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG1047675-2								
Chloride	98		-		90-110	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1050444-1					
SALINITY	100	-		-	

Matrix Spike Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088
Lab Number: L1734514
Report Date: 10/12/17

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: WG1046384-4 QC Sample: L1734514-01 Client ID: ISLE. END R1												
Chlorine, Total Residual	ND	0.248	0.27	109		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046399-4 QC Sample: L1734514-01 Client ID: ISLE. END R1												
Chromium, Hexavalent	ND	0.1	0.092	92		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046546-4 QC Sample: L1734466-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.198	99		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046714-4 QC Sample: L1734582-01 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.83	96		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046810-4 QC Sample: L1734514-01 Client ID: ISLE. END R1												
TPH	ND	20	15.5	78		-	-		64-132	-		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1047064-4 QC Sample: L1734514-01 Client ID: ISLE. END R1												
Phenolics, Total	ND	0.4	0.42	106		-	-		70-130	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1047675-3 WG1047675-4 QC Sample: L1734815-01 Client ID: MS Sample												
Chloride	79.7	20	102	**111**	Q	101	106		90-110	1		18

Lab Duplicate Analysis
Batch Quality Control

Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
Report Date: 10/12/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046384-3 QC Sample: L1734514-01 Client ID: ISLE. END R1						
Chlorine, Total Residual	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046399-3 QC Sample: L1734514-01 Client ID: ISLE. END R1						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046546-3 QC Sample: L1734466-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046714-3 QC Sample: L1734582-01 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046810-3 QC Sample: L1734469-01 Client ID: DUP Sample						
TPH	ND	ND	mg/l	NC		34
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1046897-2 QC Sample: L1734516-01 Client ID: DUP Sample						
Solids, Total Suspended	950	1000	mg/l	5		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1047064-3 QC Sample: L1734514-01 Client ID: ISLE. END R1						
Phenolics, Total	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1050444-2 QC Sample: L1734514-01 Client ID: ISLE. END R1						
SALINITY	26	26	SU	0		

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Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
Report Date: 10/12/17

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	***Custody Seal***
A	Absent

Container Information

Container ID	***Container Type***	***Cooler***	***Initial pH***	***Final pH***	***Temp deg C***	***Pres***	***Seal***	***Frozen Date/Time***	***Analysis(*)***
L1734514-01A	Vial HCl preserved	A	NA		2.9	Y	Absent		8260-SIM(14),8260(14)
L1734514-01B	Vial HCl preserved	A	NA		2.9	Y	Absent		8260-SIM(14),8260(14)
L1734514-01C	Vial HCl preserved	A	NA		2.9	Y	Absent		8260-SIM(14),8260(14)
L1734514-01D	Vial HCl preserved	A	N/A	N/A	2.9	Y	Absent		SUB-ETHANOL(14)
L1734514-01E	Vial HCl preserved	A	N/A	N/A	2.9	Y	Absent		SUB-ETHANOL(14)
L1734514-01F	Vial HCl preserved	A	N/A	N/A	2.9	Y	Absent		SUB-ETHANOL(14)
L1734514-01G	Vial Na2S2O3 preserved	A	NA		2.9	Y	Absent		504(14)
L1734514-01H	Vial Na2S2O3 preserved	A	NA		2.9	Y	Absent		504(14)
L1734514-01I	Plastic 500ml HNO3 preserved	A	<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)
L1734514-01J	Plastic 250ml NaOH preserved	A	>12	>12	2.9	Y	Absent		TCN-4500(14)
L1734514-01K	Plastic 500ml H2SO4 preserved	A	<2	<2	2.9	Y	Absent		NH3-4500(28)
L1734514-01L	Amber 950ml H2SO4 preserved	A	<2	<2	2.9	Y	Absent		TPHENOL-420(28)
L1734514-01M	Amber 1000ml HCl preserved	A	NA		2.9	Y	Absent		TPH-1664(28)
L1734514-01N	Amber 1000ml HCl preserved	A	NA		2.9	Y	Absent		TPH-1664(28)
L1734514-01O	Plastic 950ml unpreserved	A	7	7	2.9	Y	Absent		CL-300(28),HEXCR-7196(1),TRC-4500(1)
L1734514-01P	Plastic 950ml unpreserved	A	7	7	2.9	Y	Absent		TSS-2540(7)
L1734514-01Q	Amber 1000ml Na2S2O3	A	7	7	2.9	Y	Absent		PCB-608(7)
L1734514-01R	Amber 1000ml Na2S2O3	A	7	7	2.9	Y	Absent		PCB-608(7)
L1734514-01S	Amber 1000ml unpreserved	A	7	7	2.9	Y	Absent		SALINITY(28),8270TCL(7),8270TCL-SIM(7)
L1734514-01T	Amber 1000ml unpreserved	A	7	7	2.9	Y	Absent		8270TCL(7),8270TCL-SIM(7)
L1734514-02A	Vial HCl preserved	A	NA		2.9	Y	Absent		HOLD-8260(14)

*Values in parentheses indicate holding time in days

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Project Name: CHELSEA CLOCK RGP
Project Number: 42088

Lab Number: L1734514
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Container Information

Container ID	*Container Type*	*Cooler*	*Initial pH*	*Final pH*	*Temp deg C*	*Pres*	*Seal*	*Frozen Date/Time*	*Analysis(*)*
L1734514-02B	Vial HCl preserved	A	NA		2.9	Y	Absent		HOLD-8260(14)
L1734514-02C	Vial Na2S2O3 preserved	A	NA		2.9	Y	Absent		HOLD-504/8011(14)
L1734514-02D	Vial Na2S2O3 preserved	A	NA		2.9	Y	Absent		HOLD-504/8011(14)

*Values in parentheses indicate holding time in days

Project Name:	CHELSEA CLOCK RGP	**Lab Number:**	L1734514
Project Number:	42088	**Report Date:**	10/12/17

GLOSSARY

Acronyms

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).
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.
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.
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.
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

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.

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.

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

Report Format: Data Usability Report

Project Name:	CHELSEA CLOCK RGP	**Lab Number:**	L1734514
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Data Qualifiers

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.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

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.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

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Project Number:	42088	**Report Date:**	10/12/17

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.

5 Methods for the Organic Chemical Analysis of Municipal and Industrial Wastewater. Appendix A, Part 136, 40 CFR (Code of Federal Regulations).

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.

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: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
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: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, 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 624: Volatile Halocarbons & Aromatics,
EPA 608: 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: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

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

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, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

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

Serial_No:10121719:29

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

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

Date Rec'd in Lab: 9/27/17

ALPHA Job #: L1734514

Client Information

Client: VERTEX
Address: 400 Libbey PKWY Weymouth MA
Phone: 781-952-6000
Email: PPlante@vertexeng.com

Project Information

Project Name: Chelsea Clock RGP
Project Location: Chelsea MA
Project #: 420??
Project Manager: P. Plante
ALPHA Quote #:

Turn-Around Time

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

Additional Project Information:
NPDES RGP Receiving water

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ 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: VOC: ☒ 8260 ☐ 624 ☐ 524.2 SIM; SVOC: ☒ ABN ☒ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST; TPH: ☒ Quant Only ☐ Fingerprint; Clo??; TPhenol, Hex Cr, TRC-4500; Cl, TSS, Hardness; Total RGP Metals; NH3, TCN, Sb-ethanol; SO4

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	Clo??	TPhenol, Hex Cr, TRC	Cl, TSS, Hardness	Total RGP Metals	NH3, TCN, Sb-ethanol	SO4	Sample Comments	Total # Bottles
34514-01	ISLE. END R1	9/27	9:45	SW	BS	X	X					X	X	X	X	X	X	X	X		20

	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	Clo??	TPhenol, Hex Cr, TRC	Cl, TSS, Hardness	Total RGP Metals	NH3, TCN, Sb-ethanol	SO4
Container Type	V	A					A	A	A/P	P	P	P	V	
Preservative	B	A					O	B	O	O	C	D	O	

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

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

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	9/27/17 12:40	[signature] AAL	9/27/17 12:40
AAL	9/27/17 1840	[signature]	9/27/17 1840

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

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

RS

SUB UPS: Test America- TN

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #:L1734514

Client Information

Client: Alpha Analytical Lab
Address: 8 Walkup Drive
Westborough, Ma 01581
Phone: 508-898-9220
Fax:
Email: subreports@alphalab.com

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name:
Project Location: MA
Project #:
Project Manager: Melissa Gulli
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: 10/13/17 Time:

Other Project Specific Requirements/Comments/Detection Limits:
Please reference Alpha Job # **L1734514** on this report.

Report Information Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Ethanol	TOTAL # BOTTLES
	ISLE. END R1	9/27/17	09:45	W		X	3

Container Type	V		-	-	-	-	-	-	-	-	-	-
Preservative	B		-	-	-	-	-	-	-	-	-	-

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

FORM NO: 01-01(I) (rev. 30-JUL-07)

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-137800-1
Client Project/Site: L1734514

For:
Alpha Analytical Inc
145 Flanders Road
Westborough, Massachusetts 01581-1019

Attn: Melissa Gulli

Authorized for release by:
10/12/2017 4:57:39 PM

Ken Hayes, Project Manager II
(615)301-5035
ken.hayes@testamericainc.com

Table of Contents

Sample Summary

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-137800-1	ISLE. END R1	Water	09/27/17 09:45	09/30/17 10:10

Case Narrative

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

Job ID: 490-137800-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-137800-1

Comments
No additional comments.

Receipt
The sample was received on 9/30/2017 10:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3º C.

GC Semi VOA
Method 1671A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-464769.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

Client Sample ID: ISLE. END R1
Date Collected: 09/27/17 09:45
Date Received: 09/30/17 10:10

Lab Sample ID: 490-137800-1
Matrix: Water

Method: 1671A - Ethanol (GC/FID)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			10/02/17 13:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*99*		*70 - 130*		*10/02/17 13:42*	*1*

QC Sample Results

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

Method: 1671A - Ethanol (GC/FID)

Lab Sample ID: MB 490-464769/5
Matrix: Water
Analysis Batch: 464769

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		2000	500	ug/L			10/02/17 13:23	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*90*		*70 - 130*		*10/02/17 13:23*	*1*

Lab Sample ID: LCS 490-464769/6
Matrix: Water
Analysis Batch: 464769

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Ethanol			50200	54110		ug/L		108	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Isopropyl acetate (Surr)	*91*		*70 - 130*

Lab Sample ID: LCSD 490-464769/7
Matrix: Water
Analysis Batch: 464769

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethanol			50200	46140		ug/L		92	70 - 130	16	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Isopropyl acetate (Surr)	*93*		*70 - 130*

QC Association Summary

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

GC VOA

Analysis Batch: 464769

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-137800-1	ISLE. END R1	Total/NA	Water	1671A	
MB 490-464769/5	Method Blank	Total/NA	Water	1671A	
LCS 490-464769/6	Lab Control Sample	Total/NA	Water	1671A	
LCSD 490-464769/7	Lab Control Sample Dup	Total/NA	Water	1671A	

Lab Chronicle

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

Client Sample ID: ISLE. END R1
Date Collected: 09/27/17 09:45
Date Received: 09/30/17 10:10

Lab Sample ID: 490-137800-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	1671A		1			464769	10/02/17 13:42	NMB	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

Method	Method Description	Protocol	Laboratory
1671A	Ethanol (GC/FID)	EPA	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Accreditation/Certification Summary

Client: Alpha Analytical Inc
Project/Site: L1734514

TestAmerica Job ID: 490-137800-1

Laboratory: TestAmerica Nashville

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2938	10-31-18

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol

Maine	State Program	1	TN00032	11-03-17

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
1671A		Water	Ethanol

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-137800 Chain of Custody

Cooler Received/Opened On 9/30/2017 @1010

Time Samples Removed From Cooler 17:50 Time Samples Placed In Storage 18:13 (2 Hour Window)

1. Tracking # 9297 (last 4 digits, FedEx) Courier: FedEx

IR Gun ID_31470366 pH Strip Lot N/A Chlorine Strip Lot N/A

2. Temperature of rep. sample or temp blank when opened: 4.3 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...(NA)

4. Were custody seals on outside of cooler? (YES)..NO...NA

If yes, how many and where: 1 Front

5. Were the seals intact, signed, and dated correctly? (YES)...NO...NA

6. Were custody papers inside cooler? (YES)...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) KH

7. Were custody seals on containers: YES (NO) and Intact YES...NO...(NA)

Were these signed and dated correctly? YES...NO...(NA)

8. Packing mat'l used? (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES)...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES)...NO...NA

12. Did all container labels and tags agree with custody papers? (YES)...NO...NA

13a. Were VOA vials received? (YES)...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...(NO)...NA

● ⬅ Larger than this.

14. Was there a Trip Blank in this cooler? YES...(NO)...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) KJ

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...(NA)

b. Did the bottle labels indicate that the correct preservatives were used (YES)...NO...NA

16. Was residual chlorine present? YES...NO...(NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) KJ

17. Were custody papers properly filled out (ink, signed, etc)? (YES)...NO...NA

18. Did you sign the custody papers in the appropriate place? (YES)...NO...NA

19. Were correct containers used for the analysis requested? (YES)...NO...NA

20. Was sufficient amount of sample sent in each container? (YES)...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) KJ

I certify that I attached a label with the unique LIMS number to each container (intial) KJ

21. Were there Non-Conformance issues at login? YES...(NO) Was a NCM generated? YES...(NO)...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

RS

SUB UPS: Test America- TN

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

Westborough, MA
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA
TEL: 508-822-9300
FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #:L1734514

Client Information

Client: Alpha Analytical Lab
Address: 8 Walkup Drive
Westborough, Ma 01581
Phone: 508-898-9220
Fax:
Email: subreports@alphalab.com
☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name:
Project Location: MA
Project #:
Project Manager: Melissa Gulli
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: 10/13/17 Time:

Report Information Data Deliverables

☐ FAX ☐ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:
Please reference Alpha Job # **L1734514** on this report.

ANALYSIS

Loc: 490
137800

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Ethanol	Sample Specific Comments	TOTAL # BOTTLES
	ISLE. END R1	9/27/17	09:45	W		X		3
	NO CUSTODY SEALS							
	RECEIVED AT AT O.I/CT O.I/C							
	BKD 9-29-17							
	1 COOLER VRSP							
	1ZE306540995 41297							

PLEASE ANSWER QUESTIONS ABOVE!

Container Type	V
Preservative	B

IS YOUR PROJECT MA MCP or CT RCP?

FORM NO: 01-01(I) (rev. 30-JUL-07)

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	9/28/17	[signature]	9-29-17 10:00
[signature]	9-29-17 13:00	Keith Dawson TAN 4.3	09-30-2017 1040

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

Login Sample Receipt Checklist

Client: Alpha Analytical Inc

Job Number: 490-137800-1

Login Number: 137800
List Number: 1
Creator: Dawson, Keith M

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
F 843.766.1178

gel.com

September 26, 2017

Mr. Matt Norton
DDES LLC
345 North Ave. 2nd Floor
Wakefield, Massachusetts 01880

Re: Chelsea Clock
Work Order: 432696

Dear Mr. Norton:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 13, 2017. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4453.

Sincerely,

Kaitlyn Stone for
Edith Kent
Project Manager

Purchase Order: 1031
Enclosures

Table of Contents

Case Narrative

Case Narrative
for
DDES LLC
SDG: 432696

September 26, 2017

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on September 13, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

Laboratory ID	Client ID
432696001	VES-501
432696002	VES-205 BKG
432696003	VES-129

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.

Kaitlyn Stone for
Edith Kent
Project Manager

Chain of Custody and Supporting Documentation

Page: 1 of 1
Project #:
GEL Quote #:
COC Number (1):
PO Number: 1031

GEL Chain of Custody and Analytical Request

See www.gel.com for GEL's Sample Acceptance SOP

GEL Work Order Number: 432696

GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Phone: (843) 556-8171
Fax: (843) 766-1178

Client Name: DDES — Phone #: 978-273-0281
Project/Site Name: Chelsea Clock — Fax #: 978-278-3397
Address: 284 Everett Ave Chelsea, MA 02150
Collected by: Will Valentine — Send Results: Gary Nadeau, Matt Norton

Sample Analysis Requested (5) (Fill in the number of containers for each test)

Sample ID (* For composites - indicate start and stop date/time)	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (2)	Field Filtered (3)	Sample Matrix (4)	Should this sample be considered: Radioactive	Should this sample be considered: TSCA Regulated	Total number of containers	Radium-226	TCLP Metals										<-- Preservative Type (6)
VES-501	7/8/2017	9:00	G	N	GW	N	N	1	X											
VES-205 BKG	7/8/2017	10:00	G	N	GW	N	N	1	X											
VES-129	7/8/2017	10:30	G	N	GW	N	N	1	X											

Comments
Note: extra sample is required for sample specific QC

TAT Requested: Normal: X Rush: Specify: (Subject to Surcharge) Fax Results: (Yes) / No

Circle Deliverable: C of A / QC Summary / Level 1 / Level 2 / Level 3 / Level 4

Remarks: *Are there any known hazards applicable to these samples? If so, please list the hazard.*

Sample Collection Time Zone: (Eastern) Pacific Central Other _____ Mountain

Chain of Custody Signatures

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1	[signature]	9/8/17	12:00	P. Nent	9-13-17	9:20
2						
3						

Sample Shipping and Delivery Details

GEL PM:
Method of Shipment: Fed EX — Date Shipped:
Airbill #:
Airbill #:

1.) Chain of Custody Number = Client Determined
2.) QC Codes: **N** = Normal Sample, **TB** = Trip Blank, **FD** = Field Duplicate, **EB** = Equipment Blank, **MS** = Matrix Spike Sample, **MSD** = Matrix Spike Duplicate Sample, **G** = Grab, **C** = Composite
3.) Field Filtered: For liquid matrices, indicate with a - **Y** - for yes the sample was field filtered or - **N** - for sample was not field filtered.
4.) Matrix Codes: **DW**=Drinking Water, **GW**=Groundwater, **SW**=Surface Water, **WW**=Waste Water, **W**=Water, ML=Misc Liquid, **SO**=Soil, **SD**=Sediment, **SL**=Sludge, **SS**=Solid Waste, **O**=Oil, **F**=Filter, **P**=Wipe, **U**=Urine, **F**=Fecal, **N**=Na
5.) Sample Analysis Requested: Analytical method requested (i.e. **8260B**, **6010B/7470A**) and number of containers provided for each (i.e. *8260B* - **3**, *6010B/7470A* - 1).
6.) Preservative Type: **HA** = Hydrochloric Acid, **NI** = Nitric Acid, **SH** = Sodium Hydroxide, **SA** = Sulfuric Acid, **AA** = Ascorbic Acid, **HX** = Hexane, **ST** = Sodium Thiosulfate, If no preservative is added = leave field blank

For Lab Receiving Use Only
Custody Seal Intact? *YES* *NO*
Cooler Temp: *C*

WHITE = LABORATORY **YELLOW = FILE** **PINK = CLIENT**

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: DES	**SDG/AR/COC/Work Order:** 432696
Received By: P. Klent	**Date Received:** 9.13.17
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 7702 1482 8826

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
COC/Samples marked or classified as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM / mR/Hr **Classified as: Rad 1 Rad 2 Rad 3**
Is package, COC, and/or Samples marked HAZ?		✓	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

	Sample Receipt Criteria	Yes	NA	No	**Comments/Qualifiers (Required for Non-Conforming Items)**
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	✓			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		✓		Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: 21
4	Daily check performed and passed on IR temperature gun?	✓			**Temperature Device Serial #:** IR4-17 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	✓			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?			✓	If Yes, Are Encores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes No___ N/A (If unknown, select No) VOA vials free of headspace? Yes No___ N/A Sample ID's and containers affected:
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?	✓			
13	COC form is properly signed in relinquished/received sections?	✓			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials EMR Date 9/13/17 Page 1 of 1

GL-CHL-SR-001 Rev 5

Laboratory Certifications

List of current GEL Certifications as of 26 September 2017

State	Certification
Alaska	UST−0110
Arkansas	88−0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−15−00283, P330−15−00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA170010
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122018−1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R−158
Oklahoma	9904
Pennsylvania NELAP	68−00485
Puerto Rico	SC00012
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−17−12
Utah NELAP	SC000122017−23
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
DDES LLC (DDES)
SDG #: 432696

Product: **Lucas Cell, Ra226, Liquid**
Analytical Method: EPA 903.1 Modified
Analytical Procedure: GL-RAD-A-008 REV# 14
Analytical Batch: 1700449

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
432696001	VES-501
432696002	VES-205 BKG
432696003	VES-129
1203874522	Method Blank (MB)
1203874523	432696001(VES-501) Sample Duplicate (DUP)
1203874524	432696001(VES-501) Matrix Spike (MS)
1203874525	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Miscellaneous Information

Additional Comments
The matrix spike, 1203874524 (VES-501MS), aliquot was reduced to conserve sample volume.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

DDES001 DDES LLC

Client SDG: 432696 GEL Work Order: 432696

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria
** Analyte is a Tracer compound
U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Heather McCarty **Name: Heather McCarty**

Date: 06 OCT 2017 **Title: Analyst II**

Sample Data Summary

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 6, 2017

Company :	DDES LLC
Address :	345 North Ave. 2nd Floor
	Wakefield, Massachusetts 01880
Contact:	Mr. Matt Norton
Project:	Chelsea Clock

Client Sample ID:	VES-501	Project:	DDES00316
Sample ID:	432696001	Client ID:	DDES001
Matrix:	Ground Water		
Collect Date:	08-JUL-17 09:00		
Receive Date:	13-SEP-17		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226		3.27	+/-0.635	0.456	1.00	pCi/L			MXH8	09/24/17	0855	1700449	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 903.1 Modified	

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 6, 2017

Company :	DDES LLC
Address :	345 North Ave. 2nd Floor
	Wakefield, Massachusetts 01880
Contact:	Mr. Matt Norton
Project:	Chelsea Clock

Client Sample ID:	VES-205 BKG	Project:	DDES00316
Sample ID:	432696002	Client ID:	DDES001
Matrix:	Ground Water		
Collect Date:	08-JUL-17 10:00		
Receive Date:	13-SEP-17		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226		3.45	+/-0.623	0.220	1.00	pCi/L			MXH8	09/24/17	0855	1700449	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 903.1 Modified	

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 6, 2017

Company : DDES LLC
Address : 345 North Ave. 2nd Floor

Wakefield, Massachusetts 01880
Contact: Mr. Matt Norton
Project: Chelsea Clock

Client Sample ID:	VES-129	Project:	DDES00316
Sample ID:	432696003	Client ID:	DDES001
Matrix:	Ground Water		
Collect Date:	08-JUL-17 10:30		
Receive Date:	13-SEP-17		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226		0.920	+/-0.397	0.441	1.00	pCi/L			MXH8	09/24/17	0930	1700449	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 903.1 Modified	

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: October 6, 2017

DDES LLC
345 North Ave. 2nd Floor
Wakefield, Massachusetts

Contact: **Mr. Matt Norton**

Workorder: **432696**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Ra-226											
Batch 1700449											
QC1203874523 432696001 DUP											
Radium-226		3.27		3.08	pCi/L	6.21		(0%-20%)	MXH8	09/24/17	09:30
	Uncertainty	+/-0.635		+/-0.642							
QC1203874525 LCS											
Radium-226	26.0			25.4	pCi/L		98	(75%-125%)		09/24/17	09:30
	Uncertainty			+/-1.81							
QC1203874522 MB											
Radium-226			U	0.321	pCi/L					09/24/17	09:30
	Uncertainty			+/-0.321							
QC1203874524 432696001 MS											
Radium-226	130	3.27		102	pCi/L		75.9	(75%-125%)		09/24/17	09:30
	Uncertainty	+/-0.635		+/-8.05							

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).
The Qualifiers in this report are defined as follows:

**	Analyte is a Tracer compound
<	Result is less than value reported
>	Result is greater than value reported
BD	Results are either below the MDC or tracer recovery is low
FA	Failed analysis.
H	Analytical holding time was exceeded
J	Value is estimated
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
M	M if above MDC and less than LLD
M	REMP Result > MDC/CL and < RDL
N/A	RPD or %Recovery limits do not apply.
N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected

QC Summary

Workorder: **432696**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

UI Gamma Spectroscopy--Uncertain identification

UJ Gamma Spectroscopy--Uncertain identification

UL Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y Other specific qualifiers were required to properly define the results. Consult case narrative.

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Lucas Cell Raw Data

Batch 1700449 Check-list

This check-list was completed on 26-SEP-17 by Elizabeth Krouse
This batch was reviewed by Elizabeth Krouse on 26-SEP-17 and Lyndsey Pace on 26-SEP-17.

Batch ID: 1700449 **Product:** LUC26RAL **Description:** Lucas Cell Radium 226 GL-RAD-A-008

#	Criteria	Yes	No	Comments
Preparation Information				
1	Was the preservation correct for this analysis?	Yes		
Internal Checklist Information				
2	Are instrument source checks within limits?	Yes		
3	Is aux data correct?		No	
4	Has an Aliquot Correction been completed for this batch?		No	
5	Have sample historical results been reviewed for this batch?	Yes		
Technical Information				
6	Were all the samples prepared/analyzed within the required holding time period?	Yes		
Quality Control (QC) Information				
7	Was the method blank (MB) within the acceptance criteria?	Yes		
8	Were the laboratory control sample (LCS/LCSD) recoveries within the acceptance limits?	Yes		
9	Were the matrix spike (MS/MSD) recoveries within the acceptance limits?	Yes		
10	Were the relative percent differences and/or error (RPD/RER) between the sample and its duplicate within acceptable limits?	Yes		
11	Has the method required detection limit been met?	Yes		
Miscellaneous Information				
12	Are sample-specific MDA/MDC calculated and reported?	Yes		

Radium-226 Queue Sheet

14-SEP-17

GEL Laboratories, Radiochemistry Division

Batch #: 1700449 Analyst: MXH8 First Client Due Date: 10/11/2017 Internal Due Date: 10/07/2017

Spike Isotope: Radium-226 Spike Code: 1715B Expiration Date: 1/25/18 Vol: 0.1 End Initial/Degas Date/Time: 9/20/17 0940

LCS Isotope: Radium-226 LCS Code: 1715B Expiration Date: 1/25/18 Vol: 0.1 End LN De-em Date: 9/24/17

Bkg Count Time: 30 (Min) Sample Count Time: 30 (Min) Start Count Date: 9/24/17

Prep Date: 9/20/17 Pipet ID: 2766983 Balance ID: 2525244 Initials: TP Witness: n/a

Sample I	Client Description	Type	Hazard Code	Matrix	Min CRDL	Client	Position (Label)	Aliquot (mL or g)	End LN De-em Time	Start Count Time	Cell #	Det #	Bkg counts	Total Counts
432696001-1	VES-501	SAMPLE		GROUND WA11	pCi/L	DDES001	1	500	0550	0855	706	7	8	124
432696002-1	VES-205 BKG	SAMPLE		GROUND WA11	pCi/L	DDES001	2	500	0550	0855	805	8	1	121
432696003-1	VES-129	SAMPLE		GROUND WA11	pCi/L	DDES001	3	500	0615	0930	103	1	5	37
1203874522-1	MB for batch 1700449	MB		GROUND WA11	pCi/L	QC ACCOUNT	4	500	0615	0930	204	2	8	18
1203874523-1	VES-501(432696001DUP)	DUP		GROUND WA11	pCi/L	QC ACCOUNT	5	500	0615	0930	301	3	1	91
1203874524-1	VES-501(432696001MS)	MS		GROUND WA11	pCi/L	QC ACCOUNT	6	100	0615	0930	405	4	2	1021
1203874525-1	LCS for batch 1700449	LCS		GROUND WA11	pCi/L	QC ACCOUNT	7	500	0615	0930	504	5	4	774

Comments: _____

Data Reviewed By: _____ 9/24/17

RA1700449

Radium-226 Liquid

Filename : RA226.XLS
File type : Excel
Version # : 1.3.2

Batch : 1700449
Analyst : MXH8
Prep Date : 9/20/2017
Ra-226 Method Uncertainty : 0.073648

Procedure Code : LUC26RAL
Parmname : Radium-226
Required MDA : 1 pCi/L
Halflife of Ra-226 : 1600 years
Ra-226 Abundance : 1.00
Halflife of Rn-222: 3.8235 days

Batch counted on : LUCAS CELL DETECTOR
BKG Count time : 30 min

Sample Characteristics					Count Raw Data							
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Cell Number	Counting Time (min.)	Gross Counts	Gross CPM	Background Counts	Background CPM	Background Count Time (min.)	Cell Efficiency (cpm/dpm)
1	432696001.1	0.5000	2.0256E-05	7/8/2017 9:00	706	30	124	4.133	8	0.267	30	2.1770
2	432696002.1	0.5000	2.0256E-05	7/8/2017 10:00	805	30	121	4.033	1	0.033	30	2.1340
3	432696003.1	0.5000	2.0256E-05	7/8/2017 10:30	103	30	33	1.100	5	0.167	30	1.8650
4	1203874522.1	0.5000	2.0256E-05	9/20/2017 0:00	204	30	18	0.600	8	0.267	30	1.9110
5	1203874523.1	0.5000	2.0256E-05	7/8/2017 9:00	301	30	91	3.033	1	0.033	30	1.7940
6	1203874524.1	0.1000	1.1370E-05	7/8/2017 9:00	405	30	621	20.700	2	0.067	30	1.8630
7	1203874525.1	0.5000	2.0256E-05	9/20/2017 0:00	504	30	774	25.800	4	0.133	30	1.8550

Pipet, 0.1 ml Stdev : +/-	0.000200	ml
Pipet, 0.5 ml Stdev : +/-	0.001000	ml
Pipet, 1 ml Stdev : +/-	0.002000	ml

Analytical SOP: GL-RAD-A-008
Instrument SOP: GL-RAD-I-007

Cell Efficiency Error (%)	Cell Calibration Date	Cell Calibration Due Date	De-Gas Date/Time	Rn-222 Ingrow End Date/Time	Count Start Date/Time	Rn-222 Corrections			
						De-Gas to Ingrowth	Ingrowth to Count	During Count	Ra-226 Decay
4.400%	10/26/2016	10/31/2017	9/20/2017 9:40	9/24/2017 5:50	9/24/2017 8:55	0.502	0.977	1.002	1.000
3.500%	3/17/2017	3/31/2018	9/20/2017 9:40	9/24/2017 5:50	9/24/2017 8:55	0.502	0.977	1.002	1.000
3.700%	4/20/2017	4/30/2018	9/20/2017 9:40	9/24/2017 6:15	9/24/2017 9:30	0.503	0.976	1.002	1.000
7.000%	8/2/2017	7/31/2018	9/20/2017 9:40	9/24/2017 6:15	9/24/2017 9:30	0.503	0.976	1.002	1.000
5.400%	3/31/2017	3/31/2018	9/20/2017 9:40	9/24/2017 6:15	9/24/2017 9:30	0.503	0.976	1.002	1.000
3.500%	3/1/2017	2/28/2018	9/20/2017 9:40	9/24/2017 6:15	9/24/2017 9:30	0.503	0.976	1.002	1.000
9.300%	5/25/2017	5/31/2018	9/20/2017 9:40	9/24/2017 6:15	9/24/2017 9:30	0.503	0.976	1.002	1.000

RA1700449

Notes:
1 - Results are decay corrected to Sample Date/Time
2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1715-B
Spike Exp Date : 1/25/2018
Spike Activity (dpm/ml): 288.13
Spike Volume Added: 0.10

LCS S/N : 1715-B
LCS Exp Date : 1/25/2018
LCS Activity (dpm/ml): 288.13
LCS Volume Added: 0.10

Results

Pos.	Decision Level pCi/L	Critical Level pCi/L	Required MDA pCi/L	MDA pCi/L	Sample Act. Conc. pCi/L	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty pCi/L	2 SIGMA Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
1	0.2629	0.1856	1	0.4559	**3.2722**	10.84%	3.8667	0.3830	0.6352	0.8404		SAMPLE				
2	0.0948	0.0669	1	0.2202	**3.4533**	9.85%	4.0000	0.3682	0.6230	0.8323		SAMPLE				
3	0.2422	0.1710	1	0.4405	**0.9203**	22.32%	0.9333	0.2055	0.3971	0.4240		SAMPLE				
4	0.2989	0.2110	1	0.5183	**0.3207**	51.47%	0.3333	0.1700	0.3205	0.3268		MB				
5	0.1126	0.0795	1	0.2615	**3.0751**	11.95%	3.0000	0.3197	0.6423	0.8459	432696001.1	DUP	6.2%			
6	0.7666	0.5412	1	1.5760	**101.8314**	5.34%	20.6333	0.8320	8.0481	18.1561	432696001.1	MS			129.8003	75.9%
7	0.2177	0.1537	1	0.4066	**25.4415**	9.98%	25.6667	0.9298	1.8063	6.1852		LCS			25.9578	98.0%

Continuing Calibration Data

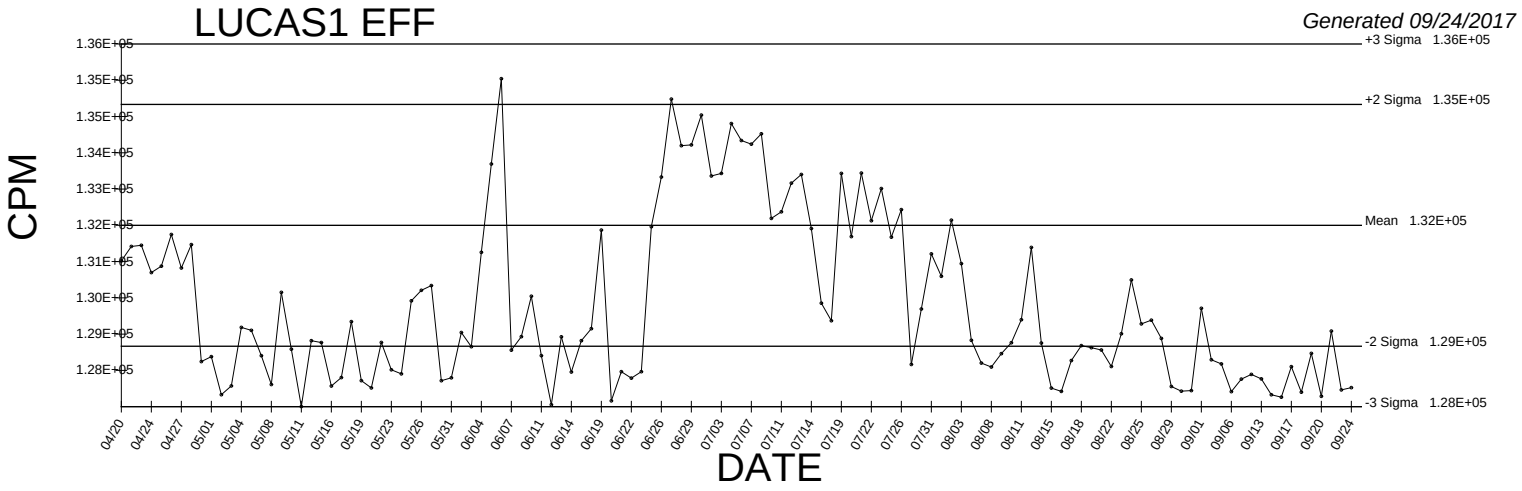
Ludlum Alpha Scintillation Counter Checks for 24-SEP-2017

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LUCAS1	EFF	06:00	1	1.28E+05	128013	-2.69		
LUCAS2	EFF	06:00	1	1.30E+05	129967	0.79		
LUCAS3	EFF	06:00	1	1.40E+05	140022	0.42		
LUCAS4	EFF	06:00	1	1.32E+05	131764	0.12		
LUCAS5	EFF	06:00	1	1.34E+05	133829	-0.83		
LUCAS6	EFF	06:00	1	1.41E+05	140821	0.75		
LUCAS7	EFF	06:00	1	1.41E+05	141111	-0.98		
LUCAS8	EFF	06:00	1	1.37E+05	137069	-0.66		

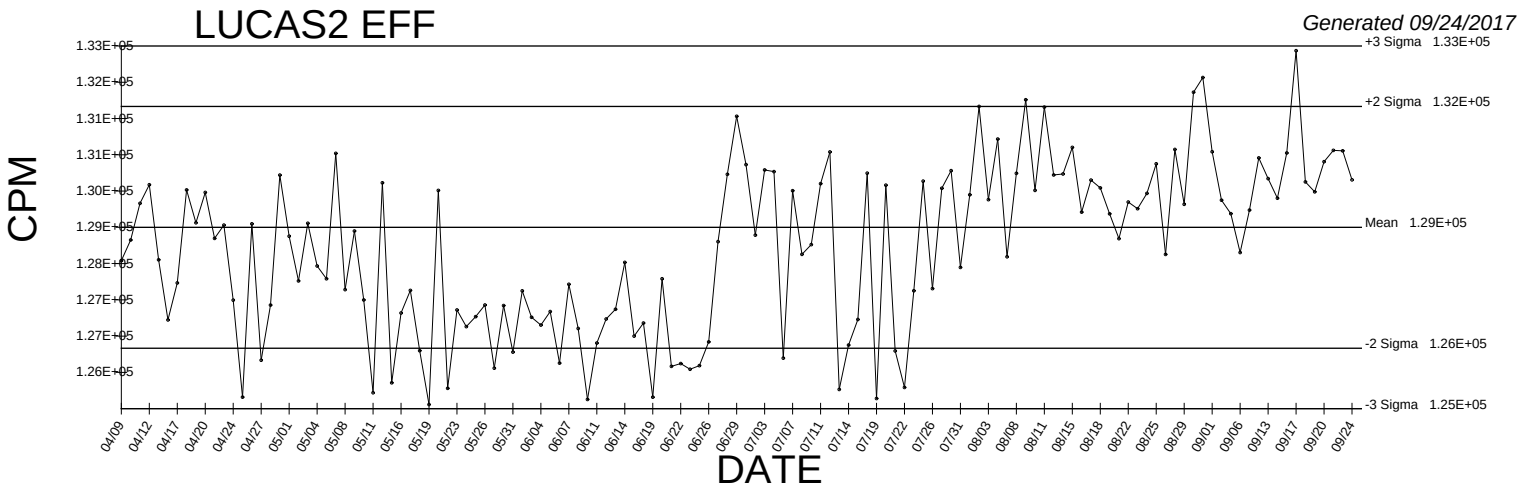
Reviewed by: Lyndsey Pace **Date:** 25-SEP-17

GEL Laboratories LLC

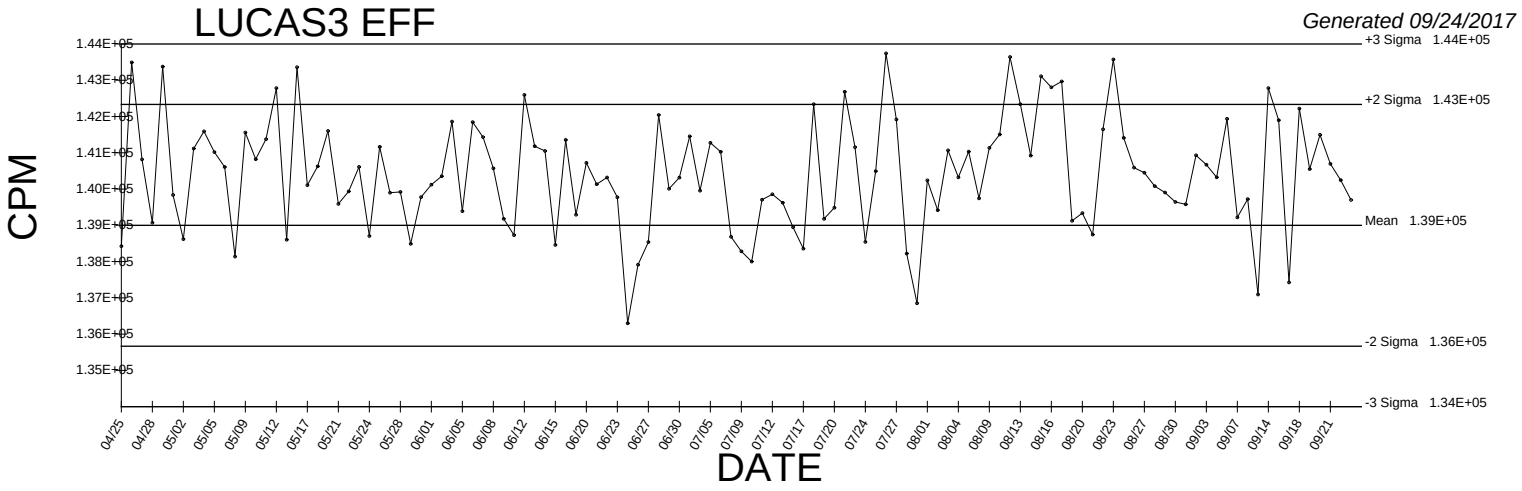
Efficiency Data



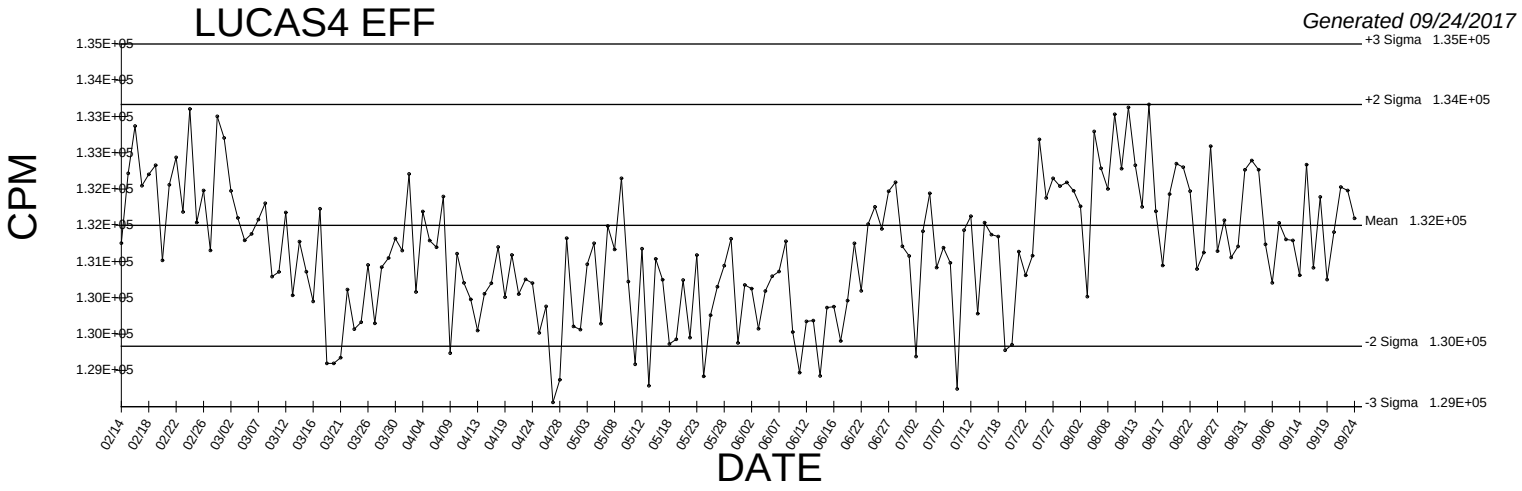
● Denotes Outlier



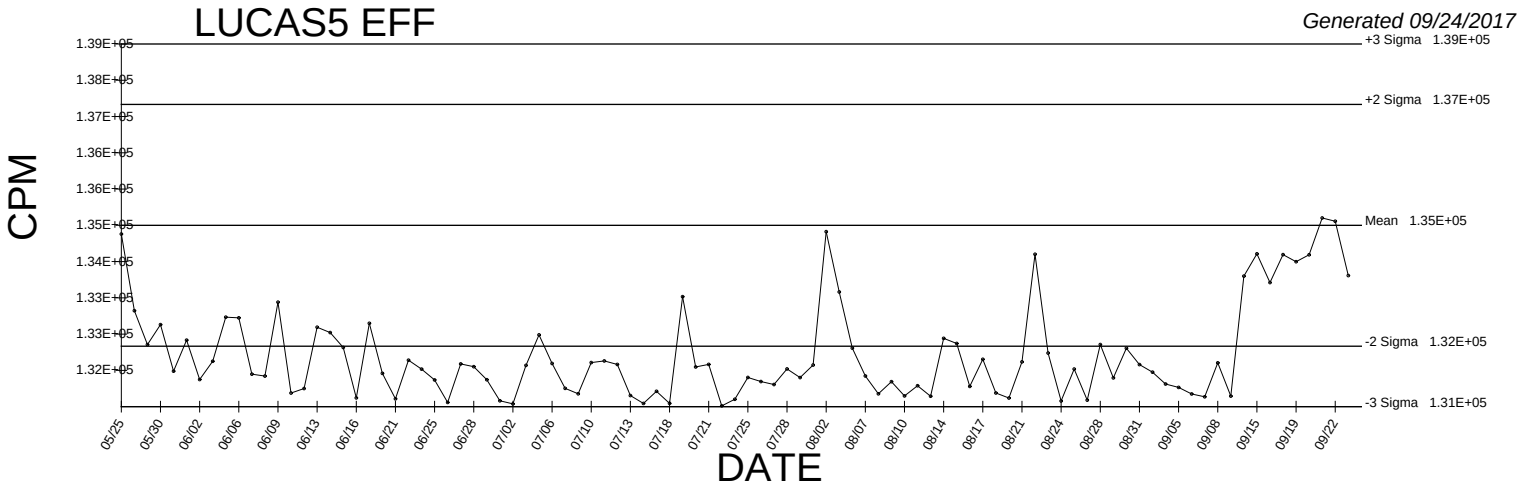
● Denotes Outlier



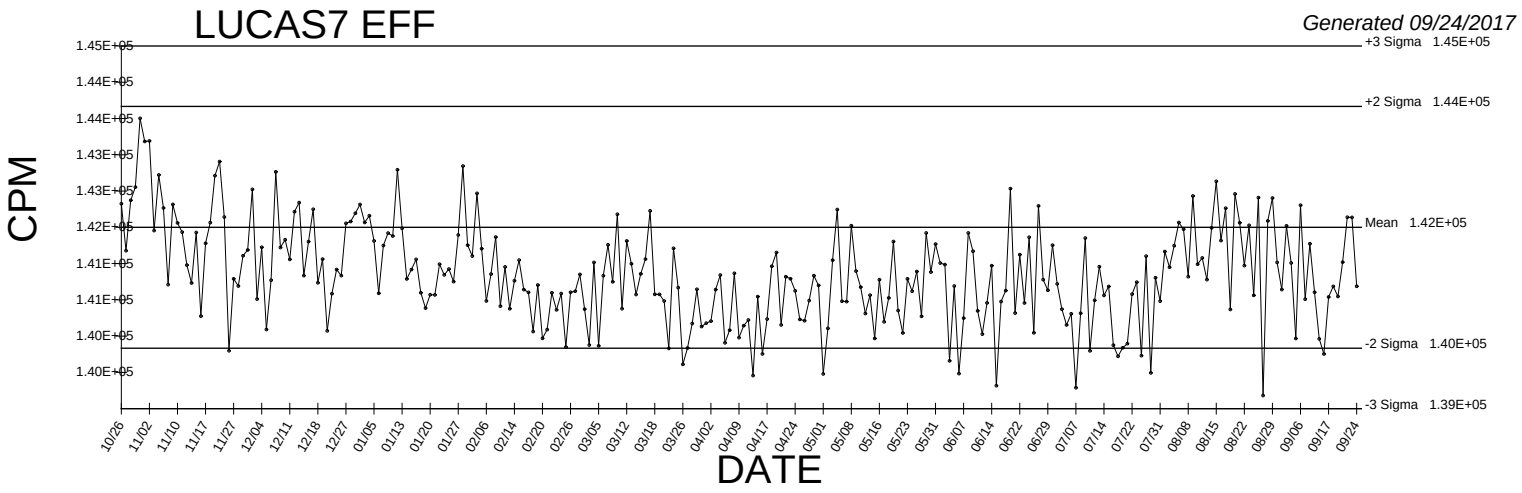
● Denotes Outlier



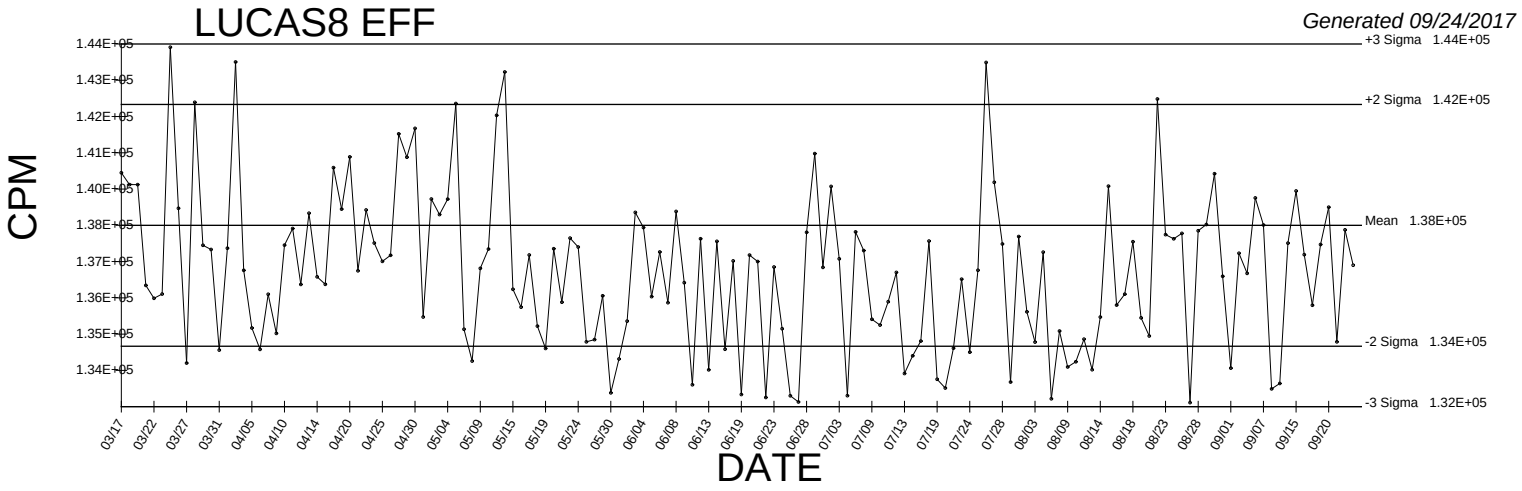
● Denotes Outlier



● Denotes Outlier



● Denotes Outlier



● Denotes Outlier

RAD Standards Traceability

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

1715

98367

Ra-226 5 mL Liquid in Flame Sealed Vial

Customer: GEL Laboratories, LLC
P.O. No.: GEL 1408580, Item 7 Product Code: 8226

This standard radionuclide source was prepared gravimetrically from a master solution calibrated by Eckert & Ziegler Analytics, using a germanium gamma spectrometer system. Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty* , % Type u_A	u_B	U	Reference Date (12:00 PM EST)
Ra-226	5.844E+05	3.676E+04	1.0	2.1	4.7	09/09/2014

***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:
Impurities: γ-impurities (other than decay products)<0.1%.
5.02193 g 0.1M HCl solution with approximately 30 µg/g Ba carrier.

Source Prepared by: R. Ormsby
R. Ormsby, Radiochemist

QC Approved: L. Tk
L. Tkavadze, Nuclear Metrologist

Date: 9 Sep 14

RECEIVED 9/10/14

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Standard Traceability Log Rad

Source Material Info	
Parent Code:	1715
Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCl
Reference Date:	09/09/2014
Ampoule Mass (g):	5.02193 g
Uncertainty:	+/- 2.35 %
LogBook No:	GL-CED-297-008

A Solution Material Info			
Isotope:	Radium-226		
Prepared By:	Gregory Ramsay		
Prep Date:	07/06/2016		
Verification Date:	02/08/2017		
Expiration Date:	02/08/2018		
Primary Code:	1715-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	4.9865 g		
Density(g/mL):	0.9967	Balance ID:	C31514

Calculations Converting parent activity to dpm/mL|dpm/g

(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / (Ampoule Mass(g) *(Dilution Vol)) = Parent Activity (dpm/mL)
(Mass of parent(g)) * (Parm Activity (Bq)) * (conversion dpm to Bq) / Density / (Ampoule Mass (g) * (Dilution Vol)) = Parent Activity (dpm/g)
(4.9865 g) * (36760 Bq) * (60 dpm/Bq) / (5.02193 g * 100 mL) = 21900.3937 dpm/mL
(4.9865 g) * (36760 Bq) * (60 dpm/Bq) / (0.9967 g/mL)/ (5.02193 g * 100 mL) = 21972.4854 dpm/g

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
07/06/2016	Gregory Ramsay	2.6261	200	1715-B	288.51 dpm/ml	01/25/2017	01/25/2018
02/08/2017	Gregory Ramsay	21.96	250	1715-C	1930.063 dpm/ml	02/08/2017	02/08/2018

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Ra-226 Standard 1715-B

v1.0.2

Instrument	Yellow
Analyst	GXR1
Verification Prep Date	1/25/2017

Standard Information	
Isotope	Ra-226
Serial Number	1715-B
Isotope Halflife	1.6000E+03 Y
Reference Date	9/9/2014
Ref. Act. (DPM/mL)	288.51
Amount of Std. (mL)	0.2
Standard Prep Date	7/6/2016

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	1/27/2017	780.76	92.60	19.60
2	1/27/2017	779.41	90.50	19.60
3	1/27/2017	780.84	92.00	19.60

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	73.00	1.293836	282.11	56.42
2	70.90	1.293836	273.99	54.80
3	72.40	1.293836	279.79	55.96

	dpm/mL
Mean Value =	278.63
Stdev =	4.180072377
Certificate Value* =	**288.2**
Two sigma =	8.360
10 % of Mean =	27.863
Rule A (Pass/Fail)	**Pass**
% Recovery	96.67%
Rule B (Pass/Fail)	**Pass**
Expiration Date	**1/25/2018**

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

*** Certificate Value is decay corrected to Count Date.**

The analyst prepared three standard verification sources for Ra-226 source 1715-B by transferring 0.2 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCYellow for Ra-226 source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 1/25/2017 using Ra-226 source 0299-H.

Standard results for each verification source was calculated as follows:

Source dpm/mL = (A - B)/(C)(D)

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

1/31/17

1/30/17

Runlogs

Instrument Run Log

Instrument Type: LUCAS CELL DETECTOR **Batch ID: 1700449**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
432696001	SAMPLE	MXH8	LUCAS7	SEP-24-17 08:55:00	DONE	Lucas Cell	26-OCT-16 00:00
432696002	SAMPLE	MXH8	LUCAS8	SEP-24-17 08:55:00	DONE	Lucas Cell	17-MAR-17 00:00
432696003	SAMPLE	MXH8	LUCAS1	SEP-24-17 09:30:00	DONE	Lucas Cell	20-APR-17 00:00
1203874522	MB	MXH8	LUCAS2	SEP-24-17 09:30:00	DONE	Lucas Cell	02-AUG-17 00:00
1203874523	DUP	MXH8	LUCAS3	SEP-24-17 09:30:00	DONE	Lucas Cell	31-MAR-17 00:00
1203874524	MS	MXH8	LUCAS4	SEP-24-17 09:30:00	DONE	Lucas Cell	01-MAR-17 00:00
1203874525	LCS	MXH8	LUCAS5	SEP-24-17 09:30:00	DONE	Lucas Cell	25-MAY-17 00:00

Appendix G

Notice of Intent

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

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Chelsea Clock</td><td colspan="3">Site address:
Street: 284 Everett Avenue</td></tr>
<tr><td>City: Chelsea</td><td>State: MA</td><td>Zip: 02150</td></tr>
<tr><td rowspan="4">2. Site owner
Fairfield Chelsea Phase I LLC

Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Matt Lynn</td></tr>
<tr><td colspan="2">Telephone: 703.474.8407</td><td>Email: mlynn@ffres.com</td></tr>
<tr><td colspan="3">Mailing address: 1110 N. Glebe Road, Suite 650
Street:</td></tr>
<tr><td>City: Arlington</td><td>State: VA</td><td>Zip: 22201</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
Northeast Remediation
401 2nd Street
Everett, MA 02149
617-389-9188</td><td colspan="3">Contact Person: Patrice Plante - The Vertex Companies, Inc.</td></tr>
<tr><td colspan="2">Telephone: 781.952.6000</td><td>Email: pplante@vertexeng.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 400 Libbey Parkway</td></tr>
<tr><td>City: Weymouth</td><td>State: MA</td><td>Zip: 02189</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:
N/A

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):
■ MA Chapter 21e; list RTN(s):
3-33665, 3-24968
☐ NH Groundwater Management Permit or Groundwater Release Detection Permit:
☐ CERCLA
☐ UIC Program
☐ POTW Pretreatment
☐ CWA Section 404</td></tr>
</table>

B. Receiving water information:

1. Name of receiving water(s):	Waterbody identification of receiving water(s):	Classification of receiving water(s):
Mystic River	MA71-03	SB (CSO)

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

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

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

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. Category 5 (ammonia, fecal coliform, foam/flocs/scum/oil slicks, other, DO, PCBs in fish tissue, pet. hydrocarbons, sediment screening value, taste/odor

4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire.	0.021 Ft^3/S
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	1.04

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ■ Yes ☐ No
If yes, indicate date confirmation received: October 6, 2017. Correspondence attached.

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

C. Source water information:

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

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

2. Source water contaminants: Cyanide, TPH, PAHs, Cadmium, Copper, Iron, Lead, Mercury, Zinc, Silver, Vinyl Chloride, TCE, cis-1,2-DCE	
a. For source waters that are contaminated groundwater or contaminated surface water, indicate are any contaminants present that are not included in the RGP? (check one): ☐ Yes ■ No If yes, indicate the contaminant(s) and the maximum concentration present in accordance with the instructions in Appendix VIII.	b. For a source water that is a surface water other than the receiving water, potable water or other, indicate any contaminants present at the maximum concentration in accordance with the instructions in Appendix VIII? (check one): ☐ Yes ☐ No
3. Has the source water been previously chlorinated or otherwise contains residual chlorine? (check one): ☐ Yes ■ No	

D. Discharge information

1.The discharge(s) is a(n) (check any that apply): ☐ Existing discharge ■ New discharge ☐ New source	
Outfall(s): IE-3 (Island End River)	Outfall location(s): (Latitude, Longitude) 42°23'39.82" N ° 71 02'58.86" W
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Discharge to the City of Chelsea, MA catch basin(s) and eventually Island End River. The storm water system is not combined with sewer and is solely sto ☐ A private storm sewer system ■ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): ■ Yes ☐ No Has the operator has received permission from the owner to use such system for discharges? (check one): ■ Yes ☐ No, if so, explain, with an estimated timeframe for obtaining permission: Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ■ No	
Provide the expected start and end dates of discharge(s) (month/year): January 2018 to August 2019 Indicate if the discharge is expected to occur over a duration of: ☐ less than 12 months ■ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No	

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

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

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

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✔	2	4500NH3	75	18900	16200	Report mg/L	---
Chloride		✔	2	44,300.0	25000	2310000	1367000	Report µg/l	---
Total Residual Chlorine	✔		2	121,4500C	20	<20	<20	0.2 mg/L	10.3
Total Suspended Solids		✔	2	121,2540D	10000	1300000	675500	30 mg/L	---
Antimony		✔	2	6020A	4	10.17	5.8	206 µg/L	
Arsenic		✔	2	6010C	10	337.8	170.55	104 µg/L	50
Cadmium		✔	2	6010C	.2	42.44	21.22	10.2 µg/L	
Chromium III		✔	2	6010C	10	49	24.5	323 µg/L	
Chromium VI	✔		2	6010C	10	<10	<10	323 µg/L	
Copper		✔	2	3,200.8	1	41820	20924.88	242 µg/L	3.7
Iron		✔	2	19,200.7	50	123000	69200	5,000 µg/L	
Lead		✔	2	6010C	6.28	6739	3372.64	160 µg/L	8.5
Mercury		✔	2	7471A	0.2	1.77	0.885	0.739 µg/L	
Nickel		✔	2	6020A	2	144.1	73.37	1,450 µg/L	
Selenium		✔	2	6010C	5	7.55	3.775	235.8 µg/L	
Silver		✔	2	6020A	0.4	15.72	7.86	35.1 µg/L	3.1
Zinc		✔	2	3,200.8	10	27190	13613.49	420 µg/L	118
Cyanide		✔	2	121,4500C	5	30	18.5	178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX	✔		2	8260C	2.5-10	<2.5-10	<2.5-10	100 µg/L	---
Benzene	✔		2	8260C	2.5	<2.5	<2.5	5.0 µg/L	---
1,4 Dioxane	✔		2	8260C	15	<15	<15	200 µg/L	---
Acetone		✔	2	8260C	25	8.4	4.2	7.97 mg/L	---
Phenol	✔		2	8270D	5	<5	<5	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	✔		2	8260C	2.5	<2.5	<2.5	4.4 µg/L	
1,2 Dichlorobenzene	✔		2	8260C	12	<12	<12	600 µg/L	---
1,3 Dichlorobenzene	✔		2	8260C	12	<12	<12	320 µg/L	---
1,4 Dichlorobenzene	✔		2	8260C	12	<12	<12	5.0 µg/L	---
Total dichlorobenzene	✔		2	8260C	12	<12	<12	763 µg/L in NH	---
1,1 Dichloroethane		✔	2	8260C	3.8	8.2	4.1	70 µg/L	---
1,2 Dichloroethane		✔	2	8260C	2.5	<2.5	<2.5	5.0 µg/L	---
1,1 Dichloroethylene		✔	2	8260C	2.5	<2.5	<2.5	3.2 µg/L	---
Ethylene Dibromide	✔		2	8260C	2.5	<2.5	<2.5	0.05 µg/L	---
Methylene Chloride	✔		2	8260C	15	<3.8	<3.8	4.6 µg/L	---
1,1,1 Trichloroethane	✔		2	8260C	2.5	<2.5	<2.5	200 µg/L	---
1,1,2 Trichloroethane	✔		2	8260C	3.8	<3.8	<3.8	5.0 µg/L	---
Trichloroethylene		✔	2	8260C	2.5	5.7	2.85	5.0 µg/L	---
Tetrachloroethylene		✔	2	8260C	2.5	<2.5	<2.5	5.0 µg/L	
cis-1,2 Dichloroethylene		✔	2	8260C	2.5	410	205	70 µg/L	---
Vinyl Chloride		✔	2	8260C	5	1400	700	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates		✔	2	8270D	5	<5	<5	190 µg/L	
Diethylhexyl phthalate	✔		2	8270D	3	<3	<3	101 µg/L	
Total Group I PAHs		✔	2	EPA-04-1	0.1	5.02	2.51	1.0 µg/L	---
Benzo(a)anthracene		✔	2	EPA-04-1	0.1	0.9	0.45	As Total PAHs	0.0052
Benzo(a)pyrene		✔	2	EPA-04-1	0.1	0.85	0.425		0.0052
Benzo(b)fluoranthene		✔	2	EPA-04-1	0.1	1	0.5		0.0052
Benzo(k)fluoranthene		✔	2	EPA-04-1	0.1	0.39	0.195		0.0052
Chrysene		✔	2	EPA-04-1	0.1	1.1	0.55		0.0052
Dibenzo(a,h)anthracene		✔	2	EPA-04-1	0.1	0.15	0.075		0.0052
Indeno(1,2,3-cd)pyrene		✔	2	EPA-04-1	0.1	0.63	0.315		0.0052

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs		✔	2	EPA-04-1	0.5	15.46	8.04	100 µg/L	---
Naphthalene		✔	2	EPA-04-1	0.1	1.7	0.85	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs		✔	2	8082A	0.25	<0.25	<0.25	0.000064 µg/L	---
Pentachlorophenol	✔		2	8082A	0.8	<0.8	<0.8	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons		✔	2	EPH-04-1	4000	8800	4400	5.0 mg/L	---
Ethanol	✔		2	8260C	2000	<2000	<2000	Report mg/L	---
Methyl-tert-Butyl Ether		✔	2	8260C	5	5.4	2.7	70 µg/L	
tert-Butyl Alcohol	✔		2	8260C	50	<50	<50	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		2	8260C	10	<10	<10	90 µg/L in MA 140 µg/L in NH	---
Other (i.e., pH, temperature, hardness, salinity, LC_{50}, additional pollutants present); if so, specify:									
1,2-Dibromoethane	✔		2	14,504.1	0.010	<0.010	<0.010		
pH		✔	2	Field		7.07	7.05		
Temperature		✔	2	Field		23	21.95		
Salinity		✔	2	Fied		1.3	1.3		
Radium (pCi/l)		✔	2	903.1 M	0.397-0.623	3.45	2.546		

E. Treatment system information

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

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

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

cation exchange to be used as needed based on effluent sampling analytical results.

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.

The treatment system will consist of a construction dewatering pump that will pump water to a baffled frac tank with bubbler for aeration and optional pH adjustment, the water will go through a pump skid, filter skid, and granular activated carbon vessels. Untreated water may be stored in holding tanks to provide adequate storage while waiting for discharge. Treated water will be pumped to a storm water drain located in Vale Street which is connected to a subsurface drainage structure that discharges to the Island End River outfall. The maximum combined design flow capacity will not exceed 150 gallons per minute (gpm).

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

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

■ Chemical feed tank ☐ Air stripping unit ■ Bag filter ☐ Other; if so, specify: In-line setting tank

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

☐ Chlorination ☐ De-chlorination

3. Provide the **design flow capacity** in gallons per minute (gpm) of the most limiting component. Indicate the most limiting component: sedimentation removal Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	50 gpm
Provide the proposed maximum effluent flow in gpm.	50 gpm
Provide the average effluent flow in gpm.	25 gpm
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	N/A

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

F. Chemical and additive information

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

☐ Algaecides/biocides ☐ Antifoams ■ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ■ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ■ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:
To be implemented as necessary, dependent on final treatment system design.

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

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

G. Endangered Species Act eligibility determination

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

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

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

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

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

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

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

H. National Historic Preservation Act eligibility determination

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

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

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

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

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

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

I. Supplemental information

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

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 the 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.	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: Scott R. Maranto	Date: FEB. 20, 2018
Print Name and Title: SCOTT R. MARANTO Vice President	