CLEAN SOILS ENVIRONMENTAL

Clean Soils Environmental, Ltd.
33 Estes Street
Ipswich, MA 01938
978-356-1177
cleansoils.com

January 30, 2020

Ms. Shauna Little
Environmental Protection Agency
Office of Environmental Stewardship (OES)
Water Technical Unit
5 Post Office Square, Suite 110 (OES4-SMR)
Boston, MA 02109-3912

Via email to: NPDES.Generalpermits@epa.gov

Re: NPDES RGP NOI
Basement of Residence
1 Pine St. & 41 Central St.
Manchester-by-the-Sea, MA 01944
RTN 3-36076
CSE Project No. 2020.05

Dear Ms. Little,

On behalf of our client, Ms. Ellen Bachman, homeowner of 1 Pine Street, Clean Soils Environmental, Ltd. (CSE) has revised the attached Notice of Intent (NOI) application to request authorization under the National Pollutant Discharge Elimination System (NPDES) Remediation General Permit (RGP) for off-site discharge of remedial wastewater associated with a release of No. 2 Fuel Oil from a leaking aboveground storage tank (AST) at 1 Pine Street and groundwater impacts at the downgradient southerly abutting property located at 41 Central Street in Manchester-by-the-Sea, Massachusetts (the "Site").

In accordance with our January 14, 2020 correspondence (attached in **Appendix B**), provisional coverage for an emergency discharge was approved, upon initiation of discharge, for up to fourteen (14) days in accordance with Part 1.5.5 of the RGP under #MAG910902. As of January 30, 2020, no discharge under the RGP has been initiated. Instead, CSE managed wastewater collected from a sump system at 41 Central Street into an on-site frac tank during the installation of the water treatment system. Upon completion, CSE provided effluent sampling results to the Town of Manchester-by-the-Sea, MA (the "Town") and requested permission to discharge to the Town's sewer collection system in lieu of discharging to the Town's storm drain system per the RGP. CSE's request was approved on January 23, 2020 (attached in **Appendix B**). Monitoring has proceeded in accordance with the requirements specified in Part 4.4 of the RGP for short-term discharges.

At any point during the treatment operation, the Town reserves the right to instruct the treated effluent discharge be removed from the Town's sewer collection system and directed to the Town's storm drain system. Therefore, CSE is pursuing an extension to coverage under the RGP as documented in this NOI.

The revised NOI form is included as **Appendix A**. Thank you for your comments provided in your January 30, 2019 email, which are summarized here with CSE's responses:

Comment #1: NOI Format Part D.2. Since this is sump-related dewatering, please select the box for Activity Category VII rather than III. VII will require less overall monitoring requirements going forward.

- Response #1**:** Part D.2 has been revised to reflect "Activity Category VII".

Comment #2: NOI Format Part G.1. Discharges to saltwater under the RGP are required to certify eligibility for the NMFS criterion (you do so by checking the box for "NMFS Criterion"). You do not need to contact the services – EPA already completed consultation and determined that there is either no effect or that an RGP discharge is not likely to adversely affect the listed species. If you agree with EPA's determination, check the referenced box.

- Response #2**:** NOI Format Part G.1 has been revised by checking the box for "NMFS Criterion". Also, with regard to Part G.2, CSE assumes this discussion is sufficient documentation of ESA eligibility.

Comment #3: Please send an electronic copy (excel format) of the data required for Appendix V.

- Response #3**:** an electronic copy of the data required for Appendix V shall be submit directly via e-mail.

GENERAL SITE INFORMATION

The Site, 'Basement of Residence', consists of two (2) residential dwellings; the northern property and source of the release (1 Pine Street) is identified by the Town as Property ID 53 0 4 and consists of 0.196 acres of land improved with a single-family dwelling built about 1900; and the southern property impacted by the release (41 Central Street) is identified by the Town as Property ID 53 0 56, and consists of 0.128 acres of land improved with a single-family dwelling built about 1804, all located within Manchester-by-the-Sea, Massachusetts. Refer to the Property Location Map (**Figure 1**) for the general location of the Site.

Consultant and Operator	Owner
Clean Soils Environmental, Ltd. Attn: William H. Mitchell, Jr., LSP 33 Estes Street Ipswich, MA 01938 bill@cleansoils.com (978) 356-1177 Full Grade II Operator Grade IV Operator/In Training	Ellen J. Bachman Attn: Susan Bachman 1 Pine Street Manchester-by-the-Sea, MA 01944 978-578-6587

On Saturday morning January 4th 2020 at approximately 9:00am Scott Energy delivered 175 gallons of home heating fuel to the single-family occupancy at 1 Pine St. with no problem indicated during the delivery. On Saturday afternoon at approximately 3:30pm Scott Energy received a call from the resident at 1 Pine St indicating an unusually strong odor of home heating oil coming from the basement. At approximately 4:30pm a Scott Energy Technician arrived to find a small spill in the basement from an apparent leak in the bottom of the 275-gallon oil tank in the basement. The technician applied a tank patch and cleaned up the spill on the cement basement floor. On Monday morning January 6th 2020 at 10:30 am Scott Energy returned to 1 Pine St to investigate the spill after a delivery of oil. Based on the fuel level in the tank, the fuel capacity of the tank, and the 175 gallons that were delivered on Saturday, the spill involved a loss of approximately 100 gallons. Scott Energy notified Manchester Fire Department (MFD) of the spill at 10:47, and subsequently reported to the state. This Site is a Massachusetts Contingency Plan (MCP) waste disposal site identified as Massachusetts Department of Environmental Protection (MassDEP) Release Tracking Number (RTN) 3-36076.

According to assessment activities and MassDEP approved Immediate Response Actions (IRAs), the heating oil, or 'No. 2 Fuel Oil' released from the AST impacted soil and shallow groundwater at 1 Pine Street and migrated with groundwater along shallow fractured bedrock in a southern direction beneath the dwelling at 41 Central Street. The basement sump system at 41 Central Street, consisting of two (2) recovery sumps (SUMP-1 and SUMP-2), was modified to divert the effluent into a 10,000-gallon capacity frac tank (sedimentation tank) along the eastern exterior of the dwelling on January 13, 2020.

RECEIVING WATER INFORMATION

The receiving waterbody for the indirect discharge of groundwater from the Site is the Manchester Harbor, Segment MA93-19, Class SB (marine). The receiving water is not an Outstanding Resource Water, an Ocean Sanctuary, a territorial sea, or a Wild and Scenic River. There is one (1) approved Total Maximum Daily Load (TMDL) for pathogens (Fecal Coliform, EPA TMDL No. 50122, Bacteria TMDL (CN 155.0) approved 10/25/2012).

The seven-day-ten-year flow (7Q10) of the receiving water was established using the U.S. Geological Survey (USGS) StreamStats program and confirmed by Massachusetts Department of Environmental Protection (MassDEP) on January 21, 2020. The 7Q10 is 0.115 ft^3/s and no dilution factor (DF) is applied to this marine waterbody according to MassDEP. See e-mail correspondence included in **Appendix B**.

The waterbody quality data was collected in support of this NOI on January 17, 2020, the results of which are summarized in **Table 1**. Receiving water temperature was obtained in the field at 5.56° C. The receiving water sample (RW-1) was collected from the surface of Manchester Harbor located approximately 50 feet from the proposed discharge location, the stormwater outfall to Manchester Harbor (Outfall 001), as shown on **Figure 2**. The laboratory data report is provided in **Appendix F**.

The EPA suggested WQBEL Calculation spreadsheet was used to calculate the effluent criteria for the site. Groundwater and Receiving Water data were input, and the resulting criteria were tabulated. Copies of the "EnterData" and "SaltwaterResults" tabs from the excel file provided as an additional resource by EPA are included in **Appendix B**.

SOURCE WATER INFORMATION

To evaluate contaminated groundwater (source water) quality at the Property, one representative groundwater sample (SW-1) was collected from the untreated influent line connecting the sump system at 41 Central Street to the fac tank (sedimentation tank) as shown on **Figure 3**.

The groundwater sample was sent to a MassDEP-certified laboratory, New England Testing Laboratory, Inc., for analysis of constituents consistent with requirements of the 2017 NPDES RGP, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), total metals, total petroleum hydrocarbons, polychlorinated biphenyls (PCBs), ammonia, chloride, total residual chlorine, total suspended solids, total cyanide, hardness, and pH. The source water quality data was collected in support of this NOI on January 16, 2020, the results of which are summarized in **Table 2**. The laboratory data report is provided in **Appendix F**.

Table 1 indicates Total Residual of Chlorine exceeds the 2017 NPDES RGP Site-Specific Criteria. Typically, Chlorine is not found in groundwater. It is mainly found in surface water. However, treated domestic drinking water with chlorine could have been induced via upgradient discharges from wash water for automobile cleaning and discharges from lawn sprinkler systems. Total Suspended Solids and Total Petroleum Hydrocarbons exceeds the 2017 NPDES RGP Site-Specific Criteria, however the treated effluent is expected to reduce these concentrations. The remaining were all below this 2017 NPDES RGP Site-Specific Criteria.

DISCHARGE INFORMATION

This NOI for an RGP is being applied for groundwater discharge necessary during the IRAs and remedial activities associated with MassDEP RTN 3-36076. Site dewatering at the residentially occupied dwelling is necessary to avoid an imminent threat to human health related to noxious vapors volatizing from the petroleum hydrocarbon impacted groundwater into the indoor air of the living space. Furthermore, the sump recovery system helps prevent significant off-site migration of contaminated groundwater towards the nearby surface water of the Manchester Harbor.

The basement sump treatment system at 41 Central Street consists of two (2) recovery sumps (SUMP-1 and SUMP-2) which pump contaminated source water from the subsurface into a 10,000-gallon capacity frac tank (sedimentation tank) along the eastern exterior of the dwelling. The treatment system, provided by RECON Remediation & Construction Outfitters, LLC and installed by NRC Corporation, pumps water from the frac tank through at least one set of in-line canister bag filters, a HS-200 (Zeolite) filter vessel, and two (2) granular activated carbon (GAC) vessels. The treatment system may be modified, as necessary to include ion exchange, pH adjustment, etc. See **Appendix C** for additional details regarding the treatment system.

Treated water will be pumped along PVC piping constructed within the basement of 41 Central Street to a municipal storm-water drain located along Pine Street that ultimately discharges to the Manchester Harbor as one outfall as shown on **Figure 3**. The latitude and longitude of the discharge point (Outfall 001) is: 42°34'28.1"N, 70°46'27.3"W.

A Best Management Practices Plan (BMPP), which outlines the proposed discharge operations covered under the RGP, will be available at the Property and is not being submitted with this NOI as requested by EPA.

Only one discharge point, described above, will be necessary for dewatering activities. The estimated design flow capacity and maximum effluent flow is 30 gallons per minute (gpm), with an average effluent flow of 10 gpm. The basement sump system generates approximately 1,000 gallons per day and the treatment system is operated accordingly until the frac tank has been depleted. Therefore, the treatment system is not in continuous operation and is only operated manually by CSE. Discharge activities will only occur during site remediation, which is expected to occur between January to June 2020. The pH of onsite groundwater was measured at 6.8 (SU) and site activities are not anticipated to alter this pH.

If needed, modifications to the system will be made. Modifications to the system will be submitted for approval via a Notice of Change (NOC).

DETERMINATION OF ENDANGERED SPECIES ACT ELIGIBILITY

According to the guidelines outlined in Appendix I of the 2017 NPDES RGP, a preliminary determination for the action area associated with this project was established using the U.S. Fish and Wildlife Service (FWS) Information, Planning, and Conservation (IPAC) online system; a copy of the determination is attached in **Appendix D**. There are no endangered or candidate species and no critical habitats within the project area for this NOI.

There is one threatened species, the Northern Long-eared Bat (Myotis septentrionalis), on the list for this facility. However, no critical habitat has been designated for this species. Per the U.S. Fish and Wildlife Services, the Northern Long-eared Bat hibernates in caves and mines, swarming in surrounded wooded areas in autumn, and foraging in upland forests in late spring and summer. Based on the location and scope of this work in a densely developed area, it is unlikely that sump system treatment activities associated with the IRAs will adversely affect the Northern Long-eared Bat. EPA already completed consultation and determined that there is either no effect or that an RGP discharge is not likely to adversely affect the listed species. Therefore, this ESA determination is NMFS Criterion.

DOCUMENTATION OF NATIONAL HISTORIC PRESERVATION ACT REQUIREMENTS

Based on a review of the resources provided by the U.S. National Register of Historic Places and a review of the Massachusetts Cultural Resource Information System (MACRIS), several historic properties are located within 500 feet, including 41 Central St, historically known as 'Forster, Israel House' located within the Manchester Historic District and Manchester Village Historic District. It is CSE's opinion the discharges and discharge related activities do not have the potential to affect historic properties since the activities and BMPs do not require construction activities (e.g., the treatment system is established and contained in the residential dwelling basement) and based on a simple visual inspection, no historic properties are affected.

Based on the location of historic places relative to the facility and the scope of this work, it is unlikely that the sump treatment system activities associated with the IRAs for the release will adversely affect any historic places, and the discharge is considered to meet Criterion B. Documentation is included in **Appendix E**.

CLOSING

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

Sincerely,

Clean Soils Environmental, Ltd.

Kevin L. McAndrews Project Manager, Geologist	John Erik Strom Environmental Geologist	William H. Mitchell, Jr., LSP President, Geologist

Enclosures:

Table 1 – Summary of Receiving Water Quality Data
Table 2 – Summary of Source Water Quality Data
Figure 1 – Property Location Map
Figure 2 – Site Plan and Discharge Route
Figure 3 – Treatment System Schematic
Appendix A – Notice of Intent (NOI)
Appendix B – Effluent Limitations Documentation
Appendix C – Additional Treatment Information
Appendix D – Endangered Species Act Assessment
Appendix E – National Historic Preservation Act Review
Appendix F – Laboratory Data Reports

FIGURES & TABLES

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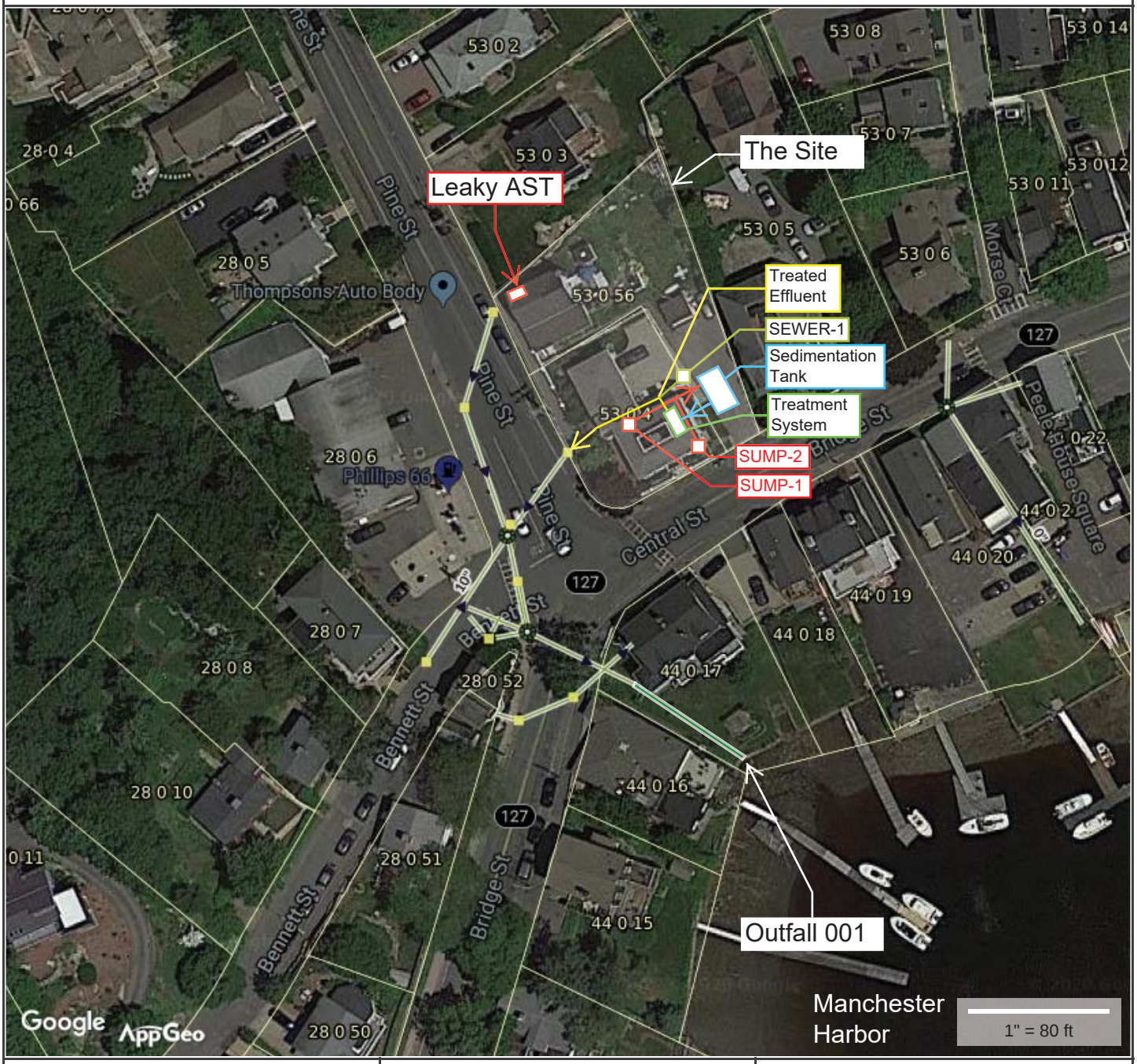
33 Estes Street
Ipswich, Massachusetts, 01938
(978) 356-1177 Fax: (978) 356-1849
www.cleansoils.com

Figure 1

Property Location Map

1 Pine St, Manchester-by-the-Sea, MA 01944
Lat/Long: 42.575133, -70.774774
CSE Project No.: 2020.05

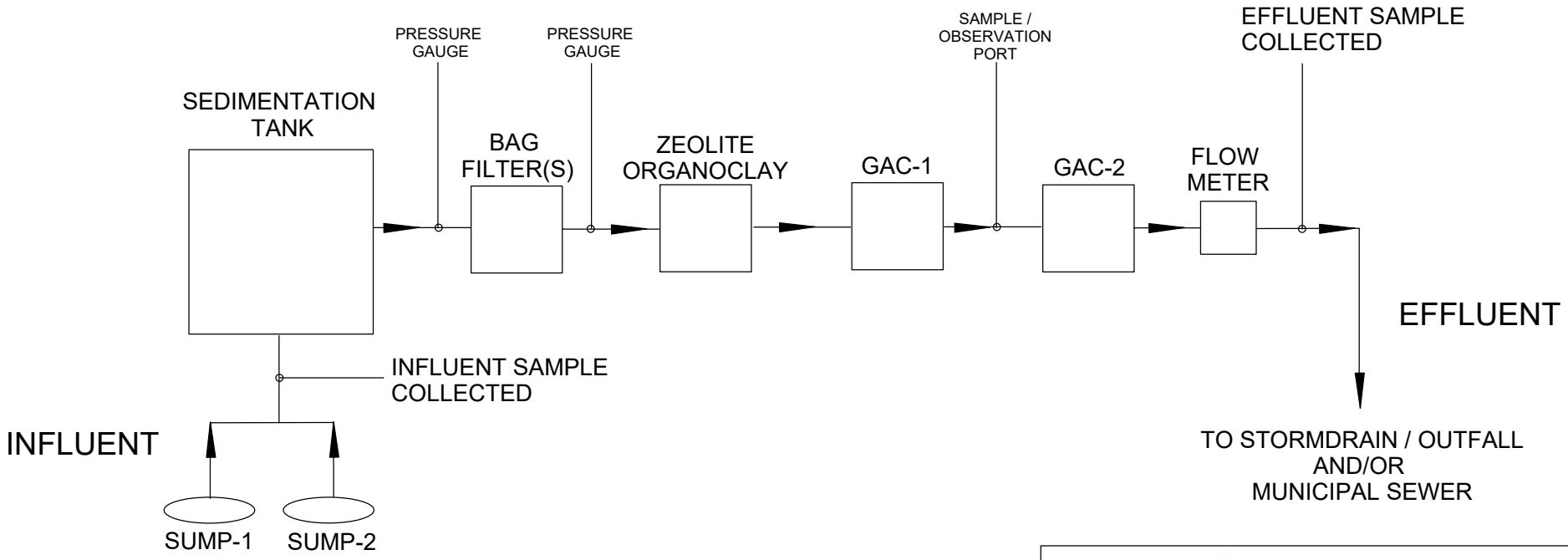


MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Manchester-by-the-Sea makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

FIGURE 2

Site Map and Discharge Route
1 Pine Street & 41 Central Street
Manchester-by-the-Sea, MA
MassDEP RTN 3-36076
CSE Project No.: 2020.05



PUMPED WATER FROM SUMPS AT 41 CENTRAL ST

LEGEND:

DIRECTION OF FLOW

GAC = GRANULAR ACTIVATED CARBON

Clean Soils Environmental, Ltd.
33 Estes Street
Ipswich, Massachusetts 01938
(978) 356-1177 Fax: (978) 356-1849
www.cleansoils.com

DATE: 01/22/2020	DRAWN BY: K. McAndrews
CSE PROJECT NO: 2020.05	CHECKED BY: W. Mitchell

TREATMENT SYSTEM SCHEMATIC

1 Pine St, Manchester-by-the-Sea, MA
Lat/Long: 42.575133, -70.774774
RTN 3-36076

Figure 3

Table 1

Receiving Water Laboratory Analytical Results

1 Pine St, Manchester-by-the-Sea, MA 01944

RTN 3-36076 | CSE Project No.: 2020.05

CHEMICAL	RW-1
General Chemistry	
pH (SU)	7.8
Salinity (ppt)	27.7
Ammonia (ug/l)	<0.1
Total Metals (ug/l)	
Antimony	<1
Arsenic	41.3
Cadmium	<1
Chromium	2.6
Iron	630
Zinc	46
Lead	15.3

ABBREVIATIONS:

ug/l: micrograms per liter

<1: Result not detected above reporting limit

SU: Standard Units

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Table 2
Source Water Laboratory Analytical Results
1 Pine St, Manchester-by-the-Sea, MA 01944
RTN 3-36076 | CSE Project No.: 2020.05

CHEMICAL	SW-1
Volatile Organics (ug/l)	
Total BTEX	17
SUM of Volatile Organic Compounds	17
Volatile Organics by SIM (ug/l)	
1,4-Dioxane	<500
Semivolatile Organics (ug/l)	
SUM of Semi-Volatile Organic Compounds	24
Semivolatile Organics By SIM (ug/l)	
SUM of Group I PAHs	<2
SUM of Group II PAHs	<2
SUM of Semi-Volatile Organic Compounds (SIM)	<2
Total Petroleum Hydrocarbons (ug/l)	
TPH, SGT-HEM	6800
Total Metals (ug/l)	
Antimony, Total	0.6
Arsenic, Total	5.9
Cadmium, Total	0.3
Chromium, Total	1.40
Copper, Total	<1
Iron, Total	790
Lead, Total	55.7
Mercury, Total	<0.2
Nickel, Total	<1
Selenium, Total	<5
Silver, Total	<0.5
Zinc, Total	6
Polychlorinated Biphenyls (ug/l)	
SUM of PCBs	<0.2
Other (ug/l)	
Chloride	336000
Chlorine, Total Residual	510
Chromium, Hexavalent	<10
Chromium, Trivalent	1.4
Cyanide, Total	<10
Ethanol	<10,000
Hardness	65600
Nitrogen, Ammonia	1.36
Ph (SU)	6.8
Phenolics, Total	ND
Total Suspended Solids	157000

ABBREVIATIONS:
- : Not analyzed
ug/l: micrograms per liter
NA: Not Applicable
<1: Result not detected above reporting limit
SU: Standard Units

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

APPENDIX A:
NOTICE OF INTENT (NOI)

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

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
BASEMENT OF RESIDENCE</td><td colspan="3">Site address: 1 Pine St. and 41 Central St.
Street:</td></tr>
<tr><td>City: Manchester-by-the-Sea</td><td>State: MA</td><td>Zip: 01944</td></tr>
<tr><td rowspan="4">2. Site owner
Ellen J. Bachman
c/o John Bachman

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Susan Bachman</td></tr>
<tr><td colspan="2">Telephone: 978-578-6587</td><td>Email:</td></tr>
<tr><td colspan="3">Mailing address: 1 Pine Street
Street:</td></tr>
<tr><td>City: Manchester-by-the-Sea</td><td>State: MA</td><td>Zip: 01944</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner

Clean Soils Environmental, Ltd.</td><td colspan="3">Contact Person: Bill Mitchell</td></tr>
<tr><td colspan="2">Telephone: 978-356-1177</td><td>Email: bill@cleansoils.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 33 Estes St.</td></tr>
<tr><td>City: Ipswich</td><td>State: MA</td><td>Zip: 01938</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:
MAG910902

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):
3-36076
☐ 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):
Manchester Harbor	MA93-19	Class 4A

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. Fecal Coliform (50122) - Bacteria TMDL (CN 155.0)

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.	0.115 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.	1:1

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ■ Yes ☐ No
If yes, indicate date confirmation received: Jan 21, 2020 via Ms. Cathy Vakalopoulos, MassDEP

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: No. 2 Fuel Oil	
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): Outfall 001 (Stormwater Outfall to Manchester Harbor)	Outfall location(s): (Latitude, Longitude) 42°34'28.1"N 70°46'27.3"W

Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify:

Discharge will enter municipal strom water drainage system via catch basin on Pine Street which discharges to Manchester Harbor.

☐ 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: Approved by the Town, See Appendix B.

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 - June 2020

Indicate if the discharge is expected to occur over a duration of: ■ less than 12 months ☐ 12 months or more ☐ is an emergency discharge

Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No

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

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

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

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✔	1	SM4500-N	.1	1.36	1.36	Report mg/L	---
Chloride		✔	1	SM4500CI	25,000	336,000	336,000	Report µg/l	---
Total Residual Chlorine		✔	1	SM4500-C	10	510	510	0.2 mg/L	
Total Suspended Solids		✔	1	SM2540-D	2000	157000	157000	30 mg/L	---
Antimony		✔	1	200.8	0.1	0.6	0.6	206 µg/L	---
Arsenic		✔	1	200.8	0.1	5.9	5.9	104 µg/L	
Cadmium		✔	1	200.8	0.1	0.3	0.3	10.2 µg/L	---
Chromium III		✔	1	SM3500-C	0.1	1.4	1.4	323 µg/L	---
Chromium VI	✔		1	SM3500-C	10	<10	<10	323 µg/L	---
Copper	✔		1	200.8	1	<1	<1	242 µg/L	---
Iron		✔	1	200.8	1	790	790	5,000 µg/L	
Lead		✔	1	200.8	0.1	55.7	55.7	160 µg/L	---
Mercury	✔		1	245.1	0.2	<0.2	<0.2	0.739 µg/L	---
Nickel	✔		1	200.8	1	<1	<1	1,450 µg/L	---
Selenium	✔		1	200.8	5	<5	<5	235.8 µg/L	---
Silver	✔		1	200.8	0.5	<0.5	<0.5	35.1 µg/L	---
Zinc		✔	1	200.8	1	6	6	420 µg/L	---
Cyanide	✔		1	SM4500-C	10	<10	<10	178 mg/L	---
B. Non-Halogenated VOCs									
Total BTEX		✔	1	624.1	1	17	17	100 µg/L	---
Benzene	✔		1	624.1	1	<1	<1	5.0 µg/L	---
1,4 Dioxane	✔		1	624.1	500	<500	<500	200 µg/L	---
Acetone	✔		1	624.1	5	<5	<5	7.97 mg/L	---
Phenol	✔		1	624.1	2	<2	<2	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	✔		1	624.1	1	<1	<1	4.4 µg/L	---
1,2 Dichlorobenzene	✔		1	624.1	1	<1	<1	600 µg/L	---
1,3 Dichlorobenzene	✔		1	624.1	1	<1	<1	320 µg/L	---
1,4 Dichlorobenzene	✔		1	624.1	1	<1	<1	5.0 µg/L	---
Total dichlorobenzene	✔		1	624.1	1	<1	<1	763 µg/L in NH	---
1,1 Dichloroethane	✔		1	624.1	1	<1	<1	70 µg/L	---
1,2 Dichloroethane	✔		1	624.1	1	<1	<1	5.0 µg/L	---
1,1 Dichloroethylene	✔		1	624.1	1	<1	<1	3.2 µg/L	---
Ethylene Dibromide	✔		1	624.1	1	<1	<1	0.05 µg/L	---
Methylene Chloride	✔		1	624.1	5	<5	<5	4.6 µg/L	---
1,1,1 Trichloroethane	✔		1	624.1	1	<1	<1	200 µg/L	---
1,1,2 Trichloroethane	✔		1	624.1	1	<1	<1	5.0 µg/L	---
Trichloroethylene	✔		1	624.1	1	<1	<1	5.0 µg/L	---
Tetrachloroethylene	✔		1	624.1	1	<1	<1	5.0 µg/L	---
cis-1,2 Dichloroethylene	✔		1	624.1	1	<1	<1	70 µg/L	---
Vinyl Chloride	✔		1	624.1	1	<1	<1	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✔		1	625.1	6	<6	<6	190 µg/L	---
Diethylhexyl phthalate		✔	1	625.1	6	24	24	101 µg/L	---
Total Group I PAHs	✔		1	625.1	2	<2	<2	1.0 µg/L	---
Benzo(a)anthracene	✔		1	625.1	2	<2	<2	As Total PAHs	---
Benzo(a)pyrene	✔		1	625.1	2	<2	<2		---
Benzo(b)fluoranthene	✔		1	625.1	2	<2	<2		---
Benzo(k)fluoranthene	✔		1	625.1	2	<2	<2		---
Chrysene	✔		1	625.1	2	<2	<2		---
Dibenzo(a,h)anthracene	✔		1	625.1	2	<2	<2		---
Indeno(1,2,3-cd)pyrene	✔		1	625.1	2	<2	<2		---

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs	✔		1	625.1	2	<2	<2	100 µg/L	---
Naphthalene	✔		1	625.1	2	<2	<2	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔		1	8082A	0.2	<0.2	<0.2	0.000064 µg/L	---
Pentachlorophenol	✔		1	625.1	5	<5	<5	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons		✔	1	EPA-8100	200	6800	6800	5.0 mg/L	---
Ethanol	✔		1	EPA-8100	10,000	<10,000	<10,000	Report mg/L	---
Methyl-tert-Butyl Ether	✔		1	624.1	1	<1	<1	70 µg/L	---
tert-Butyl Alcohol	✔		1	624.1	5	<5	<5	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		1	624.1	1	<1	<1	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:									
pH		✔	1	SM4500-H	-	6.8	6.8		

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:

HS-200 (Zeolite) Filter

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 residential sump system that will pump water to a frac tank, the water will then be pumped through at least one set of in-line canister bag filters, a HS-200 (Zeolite) Filter vessel, and granular activated carbon vessels. Treated water will be pumped to a storm-water drain shown on the attached figure that ultimately discharges to the Manchester Harbor as one outfall.

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: HS-200 (Zeolite) Filter

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: Bag Filters and GAC Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	30
Provide the proposed maximum effluent flow in gpm.	30
Provide the average effluent flow in gpm.	10
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	NA

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

F. Chemical and additive information

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

☐ Algaecides/biocides ☐ Antifoams ☐ Coagulants ☐ Corrosion/scale inhibitors ☐ Disinfectants ☐ Flocculants ☐ Neutralizing agents ☐ Oxidants ☐ Oxygen ☐ scavengers ☐ pH conditioners ☐ Bioremedial agents, including microbes ☐ Chlorine or chemicals containing chlorine ☐ Other; if so, specify:

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

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

G. Endangered Species Act eligibility determination

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

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

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

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

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

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

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

H. National Historic Preservation Act eligibility determination

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

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

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

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

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

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

I. Supplemental information

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

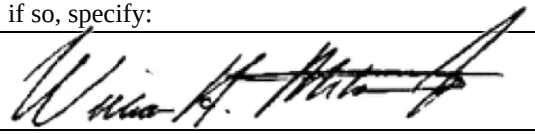
Refer to the NOI RGP Report, attached. This report includes site maps, locations of the influent sample point, discharge/outfall location, water classifications, potential environmental receptors, groundwater analytical tables and laboratory analytical reports, and supporting documentation for the ESA determination and historic sites within the vicinity of the facility this NOI RGP is applicable to.

Has the operator attached data, including any laboratory case narrative and chain of custody used to support the application? (check one): ■ Yes ☐ No

Has the operator attached the certification requirement for the Best Management Practices Plan (BMPP)? (check one): ■ Yes ☐ No

J. Certification requirement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

BMPP certification statement: A BMPP meeting the requirements of this general permit will be implemented at the site upon initiation of discharge	
Notification provided to the appropriate State, including a copy of this NOI, if required.	Check one: Yes ☐ No ■
Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐
Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐ NA ☐
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.	Check one: Yes ■ No ☐ NA ☐
Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	Check one: Yes ☐ No ☐ NA ■
Signature: 	Date: 1/27/2020
Print Name and Title: William H. Mitchell, Jr., LSP, President	

APPENDIX B:
EFFLUENT LIMITATIONS DOCUMENTATION

Gmail by Google

Kevin McAndrews <kevin@cleansoils.com>

Questions regarding emergency discharge - RGP Permit

Little, Shauna <Little.Shauna@epa.gov> Tue, Jan 14, 2020 at 1:06 PM
To: Kevin McAndrews <kevin@cleansoils.com>
Cc: Bill Mitchell <bill@cleansoils.com>, John Erik Strom <johnerik@cleansoils.com>

Kevin,

Thank you for providing information regarding the conditions at this site. Given the need to avoid imminent threat to human health, EPA agrees that the proposed discharge meets the definition of an emergency discharge under the Remediation General Permit (RGP). In accordance with Part 1.5.5 of the RGP, provisional coverage is authorized for up to fourteen (14) days upon the initiation of discharge, after which the RGP requires you either: 1) Receive written authorization to discharge from EPA, unless EPA notifies you that authorization has been delayed or denied; or 2) Submit a NOT to EPA.

This correspondence provides confirmation that the provisional coverage for an emergency discharge is effective immediately upon initiation of discharge under #MAG910902, under the terms of the RGP, which require:

1. A complete and accurate NOI is submitted in accordance with Part 3.3 within fourteen (14) days – If **discharges commence today 1/14/20**, please submit the NOI **by 1/27/20**.
2. Monitoring proceeds in accordance with the monitoring requirements specified in Part 4.4 of the RGP as for short-term discharges for the duration of provisional coverage – Item 4.4.1.c appears to apply in this case.

The monitoring requirements in the RGP for Activity Category I apply for the duration of provisional coverage and consist of sampling of **influent and effluent** for:

A. Inorganics (omit TRC and cyanide of they are not likely present);

B. Non-halogenated VOCs (omit 1,4-dioxane if it is not likely present);

D. Non-halogenated SVOCs (omit phthalates if they are not likely present);

F. Fuels Parameters (omit ethanol, mtbe and tame if they are not likely present); and

Flow and pH (field measurement is acceptable).

To ensure testing meets permit test method and minimum level requirements, please refer to this resource: https://www3.epa.gov/region1/npdes/remediation/AppendixVII_Resource.pdf

Please utilize BMPs (i.e., treatment system) in accordance with Parts 2.5.2 and 4.3.1 of the RGP.

Lastly, please do not hesitate to contact me if you have any questions.

Regards,

Shauna Little
Physical Scientist
USEPA New England
5 Post Office Square, Suite 100/OEP06-1
Boston, Massachusetts 02109-3912
Phone (617)918-1989

[Quoted text hidden]

MANCHESTER-BY-THE-SEA

DEPARTMENT OF PUBLIC WORKS
TOWN HALL, 10 CENTRAL STREET
Manchester-by-the-Sea, Massachusetts 01944-1399
Telephone (978) 526-1242 FAX (978) 526-2007

January 23, 2020

William H. Mitchell, Jr., LSP
President, Geologist
Clean Soils Environmental, Ltd.
33 Estes Street, Ipswich, MA 01938

Subject: 41 Central Street Manchester by the Sea, Massachusetts
Home Heating Oil Spill Remediation

Mr. Mitchell,

The Town has received your email dated January 22, 2020 (attached) regarding the remediation efforts for the home heating oil spill that has effected 41 Central Street Manchester by the Sea, Massachusetts. Your email indicates you have completed installation of the onsite water treatment system (schematic attached) and provided effluent sampling results (attached) from the treatment system. Your email requests permission to discharge to the Town's sewer collection system in lieu of discharging to the Town's storm drain system per the Remediation General Permit (RGP).

The Town approves the discharge of the treated effluent to the Town's sewer collection system with the following conditions:

- At no point shall untreated water be discharged to either the Town's storm drain system or sewer collection system. Any changes to the treatment system shall be reported to the Town prior to implementing the changes.

- Influent and effluent sampling shall be conducted in accordance with the requirements (frequency and testing parameters) of the RGP Section 4.4 (attached) and results shall be provided to the Town, via email to me, the day the results are provided to Clean Soils Environmental. The Town reserves the right to request additional testing as the Town deems necessary.

- Effluent flow (instantaneous and total cumulative) shall be reported to the Town twice per week on Tuesdays and Fridays for the duration of the remediation.

    - It is understood that the treatment system will discharge at a rate of approximately 10 gallons per minute which equates to approximately 14,400

gallons per day which is an acceptable flow rate to the Town. If flow rates noticeably increase from this rate, the Town will need to reevaluate accepting the flow into our sewer collection system and may require discharge to the storm drains.

  - During rain events anticipated to exceed 0.5" of total accumulation, additional flow monitoring will be required prior to the event and after the event. Flows will need to be monitored so the Town maintains compliance with our NPDES permit. Please note, a rain event of 1.0+" is anticipated for this coming weekend.

- At any point during the treatment operation, the Town reserves the right to instruct the treated effluent discharge be removed from the Town's sewer collection system and directed to the Town's storm drain system. Compliance will be required within 24-hours.
  - The Town would recommend pursuing an extension to coverage under the RGP beyond the initial 14 days currently authorized. Email from EPA (attached) indicates current coverage expires on January 27, 2020 at which point the NOI shall be submitted.

- As discussed onsite, the treated effluent will be discharged to the sewer service manhole located on the property of 41 Central St. At no point shall the treated effluent be discharged to a manhole in the traveled way. The Town reserves the right to inspect the system at any point.

Please let us know if you have any questions or concerns regarding these requirements.

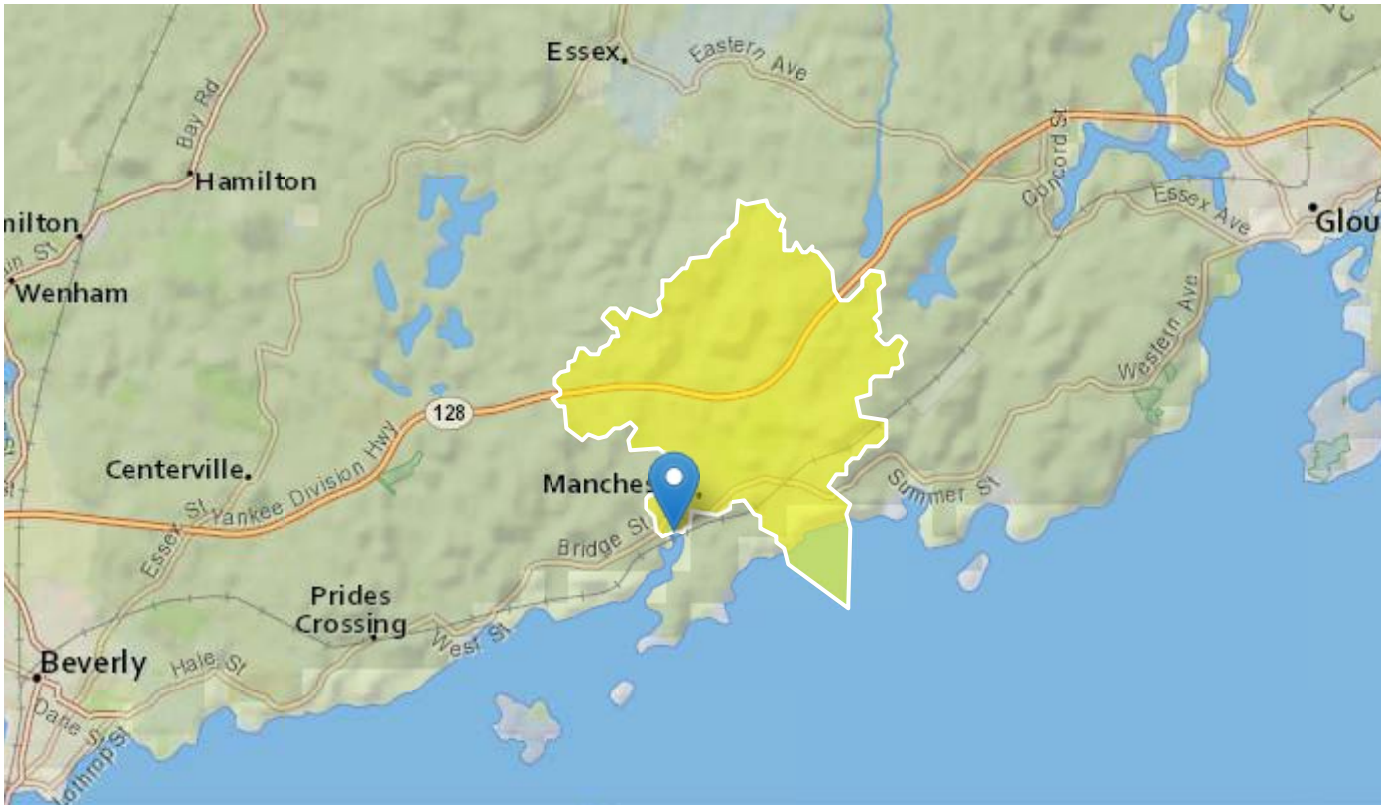
All the best,

Nathan Desrosiers, P.E.
Town Engineer & Facilities Manager
Manchester-by-the-Sea DPW

cc: Chuck Dam, MBTS Director of Public Works
Chris Bertoni, MBTS Conservation Agent
Greg Federspiel, MBTS Town Administrator
Robert Willwerth, MBTS WWTP

StreamStats Report

Region ID: MA
Workspace ID: MA20200117145709365000
Clicked Point (Latitude, Longitude): 42.57304, -70.77317
Time: 2020-01-17 09:57:26 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5.45	square miles
DRFTPERSTR	Area of stratified drift per unit of stream length	0.11	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless
BSLDEM250	Mean basin slope computed from 1:250K DEM	1.524	percent
PCTSNDGRV	Percentage of land surface underlain by sand and gravel deposits	12.46	percent
FOREST	Percentage of area covered by forest	70.89	percent

Parameter Code	Parameter Description	Value	Unit
BSLDEM10M	Mean basin slope computed from 10 m DEM	9.765	percent
ELEV	Mean Basin Elevation	84.5	feet
LC06STOR	Percentage of water bodies and wetlands determined from the NLCD 2006	14.71	percent

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.45	square miles	1.61	149
DRFTPERSTR	Stratified Drift per Stream Length	0.11	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1
BSLDEM250	Mean Basin Slope from 250K DEM	1.524	percent	0.32	24.6

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

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

Statistic	Value	Unit	PIl	PIu	SE	SEp
50 Percent Duration	5.38	ft^3/s	2.72	10.6	17.6	17.6
60 Percent Duration	3.74	ft^3/s	1.98	7	19.8	19.8
70 Percent Duration	2.13	ft^3/s	1.01	4.44	23.5	23.5
75 Percent Duration	1.62	ft^3/s	0.766	3.38	25.8	25.8
80 Percent Duration	1.12	ft^3/s	0.482	2.58	28.4	28.4
85 Percent Duration	0.792	ft^3/s	0.316	1.95	31.9	31.9
90 Percent Duration	0.522	ft^3/s	0.199	1.34	36.6	36.6
95 Percent Duration	0.291	ft^3/s	0.101	0.811	45.6	45.6
98 Percent Duration	0.188	ft^3/s	0.0566	0.59	60.3	60.3
99 Percent Duration	0.136	ft^3/s	0.0383	0.456	65.1	65.1

Flow-Duration Statistics Citations

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

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.45	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	1.524	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.11	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

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

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

Statistic	Value	Unit	PIl	PIu	SE	SEp
August 50 Percent Duration	0.878	ft^3/s	0.35	2.16	33.2	33.2

August Flow-Duration Statistics Citations

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

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.45	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	1.524	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.11	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

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

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

Statistic	Value	Unit	PIl	PIu	SE	SEp
7 Day 2 Year Low Flow	0.345	ft^3/s	0.116	0.993	49.5	49.5
7 Day 10 Year Low Flow	0.115	ft^3/s	0.0296	0.413	70.8	70.8

Low-Flow Statistics Citations

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

Probability Statistics Parameters[Perennial Flow Probability]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.45	square miles	0.01	1.99
PCTSNDGRV	Percent Underlain By Sand And Gravel	12.46	percent	0	100
FOREST	Percent Forest	70.89	percent	0	100
MAREGION	Massachusetts Region	0	dimensionless	0	1

Probability Statistics Disclaimers[Perennial Flow Probability]

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

Probability Statistics Flow Report[Perennial Flow Probability]

Statistic	Value	Unit
Probability Stream Flowing Perennially	0.951	dim

Probability Statistics Citations

Bent, G.C., and Steeves, P.A.,2006, A revised logistic regression equation and an automated procedure for mapping the probability of a stream flowing perennially in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2006–5031, 107 p. (http://pubs.usgs.gov/sir/2006/5031/pdfs/SIR_2006-5031rev.pdf)

Bankfull Statistics Parameters[Bankfull Statewide SIR2013 5155]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.45	square miles	0.6	329
BSLDEM10M	Mean Basin Slope from 10m DEM	9.765	percent	2.2	23.9

Bankfull Statistics Flow Report[Bankfull Statewide SIR2013 5155]

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

Statistic	Value	Unit	SEp
Bankfull Width	31	ft	21.3
Bankfull Depth	1.62	ft	19.8
Bankfull Area	49.7	ft^2	29
Bankfull Streamflow	170	ft^3/s	55

Bankfull Statistics Citations

Bent, G.C., and Waite, A.M.,2013, Equations for estimating bankfull channel geometry and discharge for streams in Massachusetts: U.S. Geological Survey Scientific Investigations Report 2013–5155, 62 p., (http://pubs.usgs.gov/sir/2013/5155/)

Peak-Flow Statistics Parameters[Peak Statewide 2016 5156]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5.45	square miles	0.16	512
ELEV	Mean Basin Elevation	84.5	feet	80.6	1948
LC06STOR	Percent Storage from NLCD2006	14.71	percent	0	32.3

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

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

Statistic	Value	Unit	PII	PIu	SEp

Statistic	Value	Unit	PIl	PIu	SEp
2 Year Peak Flood	117	ft^3/s	59.9	229	42.3
5 Year Peak Flood	191	ft^3/s	96.5	380	43.4
10 Year Peak Flood	249	ft^3/s	123	506	44.7
25 Year Peak Flood	332	ft^3/s	158	698	47.1
50 Year Peak Flood	400	ft^3/s	185	868	49.4
100 Year Peak Flood	472	ft^3/s	211	1060	51.8
200 Year Peak Flood	549	ft^3/s	238	1260	54.1
500 Year Peak Flood	659	ft^3/s	273	1590	57.6

Peak-Flow Statistics Citations

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

Application Version: 4.3.11

Gmail by Google

Kevin McAndrews <kevin@cleansoils.com>

Questions regarding emergency discharge - RGP Permit

Vakalopoulos, Catherine (DEP) <catherine.vakalopoulos@state.ma.us> Tue, Jan 21, 2020 at 5:50 PM
To: Kevin McAndrews <kevin@cleansoils.com>

Hi Kevin,

Yes, you are correct, for the RGP we do not apply a dilution factor to marine waters unless there is some sort of dilution study to back it up. Manchester Harbor is classified as SB (marine). I think you got the "4a" from the category it's listed in here: https://www.mass.gov/doc/final-massachusetts-year-2016-integrated-list-of-waters/download which means that there is at least one completed TMDL for that segment (page 128). The 7Q10 that StreamStats gave you is pretty low so even if this were a discharge to freshwater, I don't think you would have calculated much of a DF anyway.

Some additional info for the NOI: the segment ID is correct (MA93-19), 1 approved TMDL for pathogens, and this is not an Outstanding Resource Water.

I'd like to note that since this has been classified as an MCP site that you don't have to apply with MassDEP. In the future if you submit other NOIs for coverage under the NPDES RGP and the sites are not current MCP sites, then you will have to fill out a transmittal form and pay a $500 fee (unless fee exempt e.g. municipalities) to MassDEP. Instructions are located here: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent.

Please let me know if you have any additional questions.

Cathy

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

[Quoted text hidden]

Enter number values in green boxes below

Enter values in the units specified

↓

0	Q_R = Enter upstream flow in **MGD**	Freshwater: Q_R equal to the 7Q10; enter alternate Q_R if approved by the State; enter 0 if no dilution factor approved
0.0432	Q_P = Enter discharge flow in **MGD**	Saltwater (estuarine and marine): enter Q_R if approved by the State; enter 0 if no entry
0	Downstream 7Q10	Discharge flow is equal to the design flow or 1 MGD, whichever is less
		Only if approved by State as the entry for Q_R; leave 0 if no entry

Enter a dilution factor, if other than zero

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

Leave 0 if no entry

↓

0

Enter values in the units specified

↓

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

Freshwater only

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

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

↓

7.8	pH in **Standard Units**
5.56	Temperature in **°C**
0	Ammonia in **mg/L**
0	Hardness in **mg/L** $CaCO_3$
27.7	Salinity in **ppt**
0	Antimony in **µg/L**
41.3	Arsenic in **µg/L**
0	Cadmium in **µg/L**
2.6	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
0	Copper in **µg/L**
630	Iron in **µg/L**
15.3	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
46	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

if >1 sample, enter maximum

if >10 samples, may enter 95th percentile

Enter 0 if non-detect or testing not required

↓

510	TRC in **µg/L**
0.5	Ammonia in **mg/L**
0.6	Antimony in **µg/L**
5.9	Arsenic in **µg/L**
0.3	Cadmium in **µg/L**
1.4	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
0	Copper in **µg/L**
790	Iron in **µg/L**
55.7	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
6	Zinc in **µg/L**
0	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
0	Tetrachloroethylene in **µg/L**
24	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:

Dilution Factor	0.0					
	TBEL applies if bolded		WQBEL applies if bolded		Compliance Level applies if shown	
A. Inorganics						
Ammonia	**Report**	mg/L	---			
Chloride	**Report**	µg/L	---			
Total Residual Chlorine	0.2	mg/L	**7.5**	µg/L	50	µg/L
Total Suspended Solids	**30**	mg/L	---			
Antimony	**206**	µg/L	640	µg/L		
Arsenic	**104**	µg/L	36	µg/L		
Cadmium	**10.2**	µg/L	8.9	µg/L		
Chromium III	**323**	µg/L	100.0	µg/L		
Chromium VI	**323**	µg/L	50	µg/L		
Copper	**242**	µg/L	3.7	µg/L		
Iron	**5000**	µg/L	---	µg/L		
Lead	160	µg/L	**8.5**	µg/L		
Mercury	**0.739**	µg/L	1.11	µg/L		
Nickel	**1450**	µg/L	8.3	µg/L		
Selenium	**235.8**	µg/L	71	µg/L		
Silver	**35.1**	µg/L	2.2	µg/L		
Zinc	**420**	µg/L	86	µg/L		
Cyanide	**178**	mg/L	1.0	µg/L	---	µg/L
B. Non-Halogenated VOCs						
Total BTEX	**100**	µg/L	---			
Benzene	**5.0**	µg/L	---			
1,4 Dioxane	**200**	µg/L	---			
Acetone	**7.97**	mg/L	---			
Phenol	**1,080**	µg/L	300	µg/L		
C. Halogenated VOCs						
Carbon Tetrachloride	**4.4**		1.6	µg/L		
1,2 Dichlorobenzene	**600**	µg/L	---			
1,3 Dichlorobenzene	**320**	µg/L	---			
1,4 Dichlorobenzene	**5.0**	µg/L	---			
Total dichlorobenzene	**---**	µg/L	---			
1,1 Dichloroethane	**70**	µg/L	---			
1,2 Dichloroethane	**5.0**	µg/L	---			
1,1 Dichloroethylene	**3.2**	µg/L	---			
Ethylene Dibromide	**0.05**	µg/L	---			
Methylene Chloride	**4.6**	µg/L	---			
1,1,1 Trichloroethane	**200**	µg/L	---			
1,1,2 Trichloroethane	**5.0**	µg/L	---			
Trichloroethylene	**5.0**	µg/L	---			
Tetrachloroethylene	**5.0**	µg/L	3.3	µg/L		
cis-1,2 Dichloroethylene	**70**	µg/L	---			
Vinyl Chloride	**2.0**	µg/L	---			
D. Non-Halogenated SVOCs						
Total Phthalates	**190**	µg/L	---	µg/L		
Diethylhexyl phthalate	**101**	µg/L	2.2	µg/L		
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---			
Benzo(a)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(a)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(b)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Benzo(k)fluoranthene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Chrysene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Indeno(1,2,3-cd)pyrene	**1.0**	µg/L	0.0038	µg/L	---	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---			
Naphthalene	**20**	µg/L	---			
E. Halogenated SVOCs						
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---		0.5	µg/L
Pentachlorophenol	**1.0**	µg/L	---			
F. Fuels Parameters						
Total Petroleum Hydrocarbons	**5.0**	mg/L	---			
Ethanol	**Report**	mg/L	---			
Methyl-tert-Butyl Ether	**70**	µg/L	20	µg/L		
tert-Butyl Alcohol	**120**	µg/L	---			
tert-Amyl Methyl Ether	**90**	µg/L	---			

Waterbody Quality Assessment Report

Return to home page

2014 Waterbody Report for Manchester Harbor

On This Page

- Water Quality Assessment Status
- Causes of Impairment
- Probable Sources Contributing to Impairments
- TMDLs That Apply to This Waterbody

State: Massachusetts
Waterbody ID: MA93-19
Location: The waters landward of an imaginary line drawn between Gales Point and Chubb Point, Manchester excluding Cat Brook.
State Waterbody Type: Estuary
EPA Waterbody Type: Bays and Estuaries
Water Size: .333
Units: square miles
Watershed Name:

Waterbody History Report

Data are also available for these years:
2012 2010 2006

Water Quality Assessment Status for Reporting Year 2014

The overall status of this waterbody is Impaired.

Description of this table

Designated Use	Designated Use Group	Status
Aesthetic	Aesthetic Value	Not Assessed
Fish Consumption	Aquatic Life Harvesting	Not Assessed
Fish, Other Aquatic Life And Wildlife	Fish, Shellfish, And Wildlife Protection And Propagation	Not Assessed
Primary Contact Recreation	Recreation	Not Assessed
Secondary Contact Recreation	Recreation	Not Assessed
Shellfish Harvesting	Aquatic Life Harvesting	Impaired

Causes of Impairment for Reporting Year 2014

Description of this table

Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
Fecal Coliform	Pathogens	Shellfish Harvesting	TMDL completed

Probable Sources Contributing to Impairment for Reporting Year 2014

Description of this table

Probable Source	Probable Source Group	Cause(s) of Impairment
Discharges From Municipal Separate Storm Sewer Systems (Ms4)	Urban-Related Runoff/Stormwater	Fecal Coliform

TMDLs That Apply to this waterbody

Description of this table

TMDL Document Name	TMDL Date	TMDL Pollutant Description	TMDL Pollutant Source Type	Cause(s) of Impairment Addressed
North Coastal Pathogen Tmdl	Oct-25-2012	Fecal Coliform	Point/Nonpoint Source	Pathogens; Pathogens; Fecal Coliform; Fecal Coliform
North Coastal Pathogen Tmdl	Oct-25-2012	Fecal Coliform	Point/Nonpoint Source	Pathogens; Fecal Coliform

APPENDIX C:
ADDITIONAL TREATMENT INFORMATION

10,000 gallon mini-frac

TRUE 10,000 gallon capacity

Compact design for site limitations on space

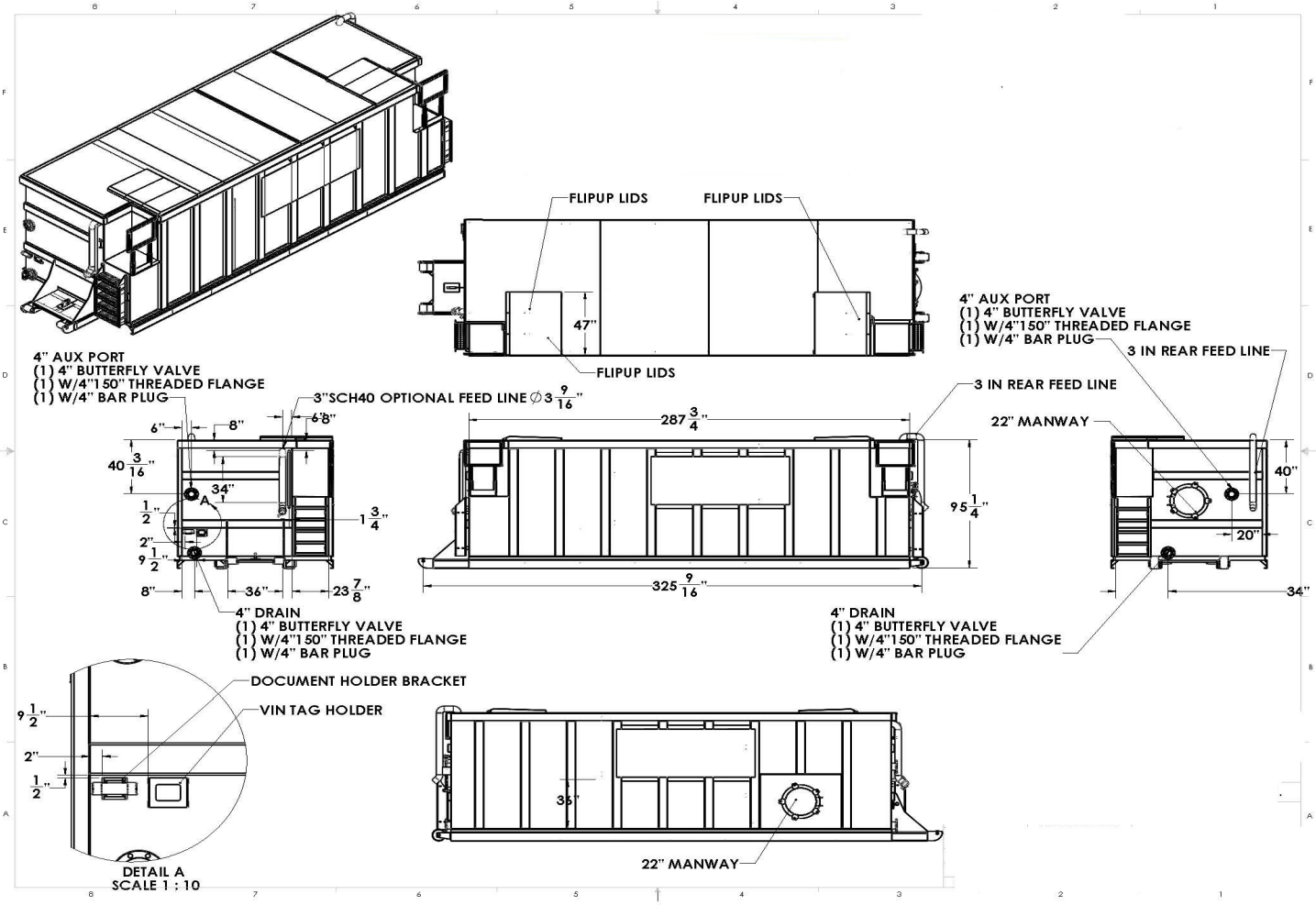
Lifting lugs for crane lift

"RECON Ready" fixed handrails

Equalization or sediment removal

Connections can be made from ground level—no more working at heights
Roll-off truck compatible

Closed top weir tank option



Model 82
Dual Capacity Bag Filter And Basket Strainer

Extra capacity at higher flow rates!

Rosedale dual capacity housings can serve as either basket strainers or bag filters. Covers are easily removed, without tools, and the basket or bag is quickly and easily cleaned or replaced. Rosedale's bag-sized pleated cartridges will provide even greater dirt-holding capacity (see page 134).
Low price, greater dirt holding capacity, and higher flow rates make the Model 82 a very cost-efficient choice!

Features

- Low pressure drops
- Permanently-piped housings
- Covers are O-ring sealed
- Carbon steel or stainless steel (304 or 316) housings
- Housings are electropolished to resist adhesion of dirt or scale
- Adjustable-height legs
- For flow rates to 440 gpm
- ASME code stamp available
- Large-area, heavy-duty baskets
- Dual stage straining/filtering

Options

- Higher pressure ratings
- Extra-length legs
- Heat jacketing
- Liquid displacers for easier servicing

Basket Data

(each basket, two baskets total)

Depth inches (nominal)	Diameter (inches)	Surface Area (sq. ft.)	Bag Size No.
15	6.7	2.3	1
30	6.7	4.4	2

Viscosity Factors

CPS NUMBER

1 (H_2O)	50	100	200	400	600	800	1000	2000
.65	.85	1.00	1.10	1.20	1.40	1.50	1.60	1.80

How To Order

Build an ordering code as shown in the example

Example: Housing: **82- 30- 4F- 1 -150- C -** Options: **B - S - BM- 200 -D - C**

MODEL 82 = **82**

HOUSING SIZE
15 inch = **15**
30 inch = **30**

PIPE SIZE, NPT & FLANGED
2-in. 150 or 300-lb ANSI flange* = **2F**
3-in. 150 or 300-lb ANSI flange* = **3F**
4-in. 150 or 300-lb ANSI flange* = **4F**
6-in. 150 or 300-lb ANSI flange* = **6F**
*Dependent on required pressure rating

OUTLET STYLE
Side = **1**

PRESSURE RATING[1]
150 psi (flanged) = **150**
300 psi (flanged) = **300**

HOUSING MATERIAL
Carbon steel = **C**
304 stainless steel = **S**
316 stainless steel = **S316**

COVER SEAL
Buna N = **B**
Ethylene Propylene = **E**
Viton® Fluoroelastomer = **V**
Teflon® Encapsulated Viton® = **TEV**
Teflon® (solid white) (6 Bolt Cover) = **TSW**

BASKET SEAL
Seal (required) = **S**

BASKET TYPE
Filter bag basket[2] = **PB**
Strainer basket = **P**
Filter bag basket, mesh lined[2] = **BM**
Strainer basket, mesh lined = **M**
Filter bag basket, heavy wire mesh = **HWM**

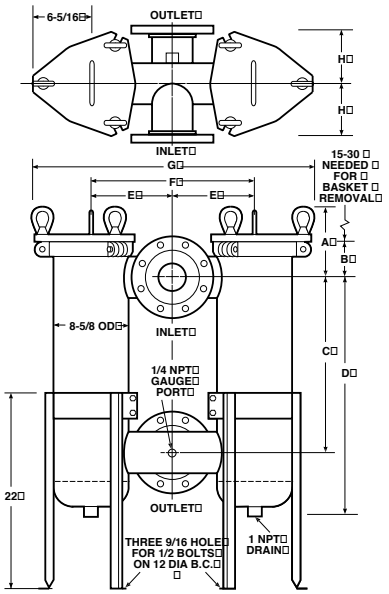
BASKET, MEDIA SIZE, no symbol if type B basket was selected
Type P perforation diameters 1/4, 3/16, 9/64, 3/32, 1/16
Type M and BM mesh sizes 20, 30, 40, 50, 60, 70, 80, 100, 150, 200 = **200**

DISPLACER
Displacer = **D**

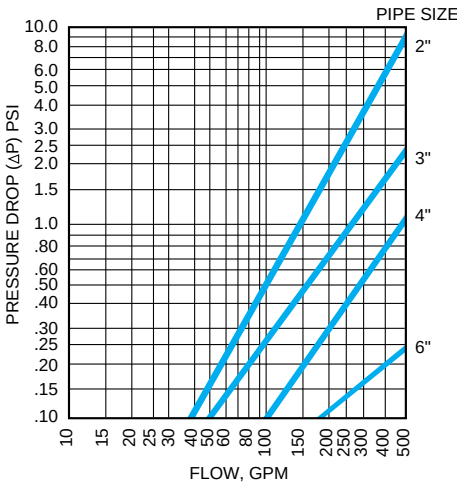
ASME CODE STAMP
Code = **C**

1. Higher pressures are available, consult factory.
2. Filter bags are specified separately. See pages 134.
3. Flanges provided with the housing match the pressure rating of the vessel. Housings rated 150 psi have 150 class flanges. Housings rated 300 psi have 300 class flanges.

Dimensions (IN)



Pipe Size	2	3	4	6
A	6-5/8	7-1/2	7-1/2	9
B	2-7/8	3-3/4	3-3/4	5-1/4
C (15 in)	14-1/2	14-1/2	14-1/2	14-1/2
(30 in)	29-1/2	29-1/2	29-1/2	29-1/2
D (15 in)	21-3/16	22-3/32	22-3/32	23-9/16
(30 in)	36-3/16	37-3/32	37-3/32	38-9/16
E	8	8	9	9
F	16	16	18	18
G	28-9/16	28-9/16	30-9/16	30-9/16
H	4-1/2	5-1/2	6-1/2	8



* Based on housing only. Fluid viscosity, filter bag used, and expected dirt loading should be considered when sizing a filter.

Dimensions are reference only and should not be used for hard plumbing. Consult factory for certified drawings.

Fulflo® Filter Bags

Fulflo® Filter Bags Provide High Quality, Consistent Filtration Performance

Fulflo® Filter Bags are ideal for virtually any process filtration application requiring the removal of solids. Parker's Fulflo® filter bags are manufactured and tested under the strictest quality control standards to assure consistent performance. Parker's Fulflo® filter bags perform at high flow rates and viscosities to 10,000 cps or higher.

Standard Fulflo® Filter Bags are available in 1µm to 800µm particle retention ratings.

Benefits

- Standard filter bags fit Fulfo® vessels and most major competitive models
- The "C" Style Fulflo® bag features a polypropylene Quik-Seal ring which effectively seals the bag into standard Parker bag vessels
- The "G" Style Fulflo® bag features a carbon steel snap ring for positive sealing in competitive vessels
- Fulflo® Quik-Seal™ option is available for all "G" style Fulflo® filter bag media
- Felt bags come standard with glazed surface treatment to effectively control migration of fibers into the filtered product
- Polypropylene felt (P) bags are suitable for incidental food contact per CFR Title 21

Applications

- Solvents
- Bulk Chemicals
- Coatings
- Coolants
- Petroleum Oils
- Inks
- Paints
- Adhesives
- Liquid Detergents
- Resins
- Prefilters for Finer Cartridges
- Parts Washing Systems
- Water

Fulflo® Filter Bags

Specifications

Maximum Recommended Operating Conditions:

Temperature:
Polyester: 275°F (136°C)
Polypropylene: 200°F (94°C)
Monofilament Nylon Mesh: 275°F (136°C)
Nomex®*: 425°F (220°C)
Multifilament Polyester Mesh: 275°F (136°C)

Flow Rate: (Per single length)
Standard Bag: 80 gpm (303 lpm)
Changeout ΔP: 35 psi (2.4 bar)
Pressure: 70 psid (4.8 bar)

Size:
C1: 7.5" X 17.5"
C2: 7.5" X 31.5"
G1: 7" X 17.5"
G2: 7" X 31.5"

Effective Removal Ratings:
0.5µm to 800µm

Bag Media Selection:

Monofilament Mesh: Single strand nylon with retention ratings from 100µm to 600µm

Glazed Felt: In polypropylene or polyester felts, the surface fibers are melt bonded to one another, reducing the possibility of fiber migration

Multifilament Mesh: Strong fabric woven from twisted strands. Particle retention ratings from 150µm to 800µm

High Temperature Nomex®

Standard Seal: (no seal option specified)
C = Plastic Quik-Seal™ Ring (polypropylene for P felt and polyester for PE felt)
G = Steel Snap Ring

Standard Bag Flow Factors

Rating (µm)	Flow Factors
1	*0.00083*
3	*0.00059*
5	*0.00044*
10	*0.00029*
25	*0.00017*
50	*0.00013*
75	*0.00008*
100	*0.00007*

Flow Rate and Pressure Drop Formulas

$$\text{Flow Rate (gpm)} = \frac{\text{Clean } \Delta P \times \text{Length Factor}}{\text{Viscosity} \times \text{Flow Factor}}$$

$$\text{Clean DP} = \frac{\text{Flow Rate} \times \text{Viscosity} \times \text{Flow Factor}}{\text{Length Factor}}$$

1. Clean ΔP is PSI differential at start.
2. Viscosity is centistokes. Use Conversion Tables for other units.
3. Flow Factor is ΔP/GPM at 1 cks for single legth bag.
4. Length Factors convert flow or ΔP from single length bags. Use length factor or 1 for single length and a factor of 2 for double length.

Ordering Information

Bag Style	Bag Size	Media	Micron	Seal Options	Other Options	Example
Polypropylene, Polyester Felt Bags						
C	*1* *2*	*P = Polypropylene* *PE = Polyester*	*1, 3, 5, 10, 25, 50, 100 (P)* *1, 3, 5, 10, 25, 50, 75, 100, 200, (PE)*	*F=Flex Band Seal*		*C2PE10* *C2P50-F*
G	*1* *2*	*P = Polypropylene* *PE = Polyester*	*1, 3, 5, 10, 25, 50, 100 (P)* *1, 3, 5, 10, 25, 50, 75, 100, 200, (PE)*	*Q = Top Sealing Plastic Ring*		*G2PE25* *G1P100-Q*
Polyester Multifiliament Bags						
C	*1* *2*	*PEMU = Polyester*	*150, 200, 250, 300, 400, 800*	*F = Flex Band Seal* *PE = Polyester Quik-Seal Ring*		*C2PEMU150-P*
G	*1* *2*	*PEMU = Polyester*	*150, 200, 250, 300, 400, 800*	*Q = Top Sealing Plastic Ring*	*H = Cotton Handle*	*G2PEMU400-H*
Nomex Felt Bags						
C	*1* *2*	*NOM = Nomex*	*25, 50, 100*	*F = Flex Band Seal (Required)*		*C2NOM50*
G	*1* *2*	*NOM = Nomex*	*25, 50, 100*		*H = Cotton Handle*	*G1NOM50*
Nylon Monofilament Bags						
C	*1* *2*	*MNO = Nylon*	*100, 200, 300, 400, 600*	*F = Flex Band Seal* *PE = Polyester Quik-Seal Ring*		*C2MNO200*
G	*1* *2*	*MNO = Nylon*	*100, 200, 300, 400, 600*	*Q = Top Sealing Plastic Ring*		*G2MNO200-Q*

Specifications are subject to change without notification.

ENGINEERING **YOUR** SUCCESS.

Hydrosil International LTD.
125 Prairie Lake Road - East Dundee, IL 60118
Phone: 847-844-0680
Emergency Phone: 847-844-0680
Fax: 847-844-0799

HS-200 Safety Data Sheet

Revision date : 2015

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 - Product Identifier

Product Name: HS-200

1.2 - Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Filtration

1.3 - Details of the supplier of the safety data sheet

Hydrosil International Ltd.
125 Prairie Lake Rd
East Dundee, IL 60118

T 847-844-0680 - F 847-844-0799
www.hydrosilintl.com

1.4 - Emergency telephone number

Emergency number : 1-847-844-0680

Section 2: Hazards Identification

2.1 - Classification of the substance or mixture

GHS-US classification
Eye Dam. 1 H318
STOT SE 3 H335

2.2 - Label Elements

GHS-US labeling
Hazard pictograms (GHS-US) :

Signal word (GHS-US) : Danger
Hazard statements (GHS-US) :

H318 - Causes serious eye damage
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) :

P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER/doctor/…
P312 - Call a POISON CENTER/doctor/…/if you feel unwell
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to ...

2.3 - Other Hazards

No additional information available

2.4 - Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1 - Substances

Not applicable

3.2 - Mixture

Name	Product Identifier	%	GHS-US Classification
Zeolite	(CAS No.) 1318-02-1	85.2 - 86.2	STOT SE 3, H335
Water	(CAS No.) 7732-18-5	8.4 - 11.4	Not classified
N,N,N-Trimethyl-1-hexadecanaminium chloride	(CAS No.) 112-02-7	3.4 - 5.4	Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 1, H400

SECTION 4: First aid measures

4.1 - Description of first aid measures

First-aid measures after inhalation : Remove person to fresh air. If not breathing, administer CPR or artificial respiration. Get immediate medical attention.
First-aid measures after skin contact : If skin reddening or irritation develops, seek medical attention.
First-aid measures after eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists get medical attention.
First-aid measures after ingestion : If the material is swallowed, get immediate medical attention or advice. DO NOT induce vomiting unless directed to do so by medical personnel.

4.2 - Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : May cause respiratory irritation.
Symptoms/injuries after skin contact : Causes skin irritation.
Symptoms/injuries after eye contact : Causes serious eye irritation.
Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3 - Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1 - Extinguishing media

Suitable extinguishing media : If involved with fire, flood with plenty of water.
Unsuitable extinguishing media : None.

5.2 - Special hazards arising from the substance or mixture

Fire hazard : None known.
Explosion hazard : None known.

5.3 - Advice for firefighters

Protection during firefighting : Firefighters should wear full protective gear.

SECTION 6: Accidental release measures

6.1 - Personal precautions, protective equipment and emergency procedures

General measures : Avoid contact with the skin and the eyes.
For non-emergency personnel : No additional information available
For emergency responders : No additional information available

6.2 - Environmental precautions

None.

6.3 - Methods and material for containment and cleaning up

For containment : If possible, stop flow of product.
Methods for cleaning up : Shovel or sweep up and put in a closed container for disposal.

6.4 - Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1 - Precautions for safe handling

Precautions for safe handling : Wet carbon/coal removes oxygen from air causing a severe hazard to workers inside carbon vessels or confined spaces.

7.2 - Conditions for safe storage, including any incompatibilities

Storage conditions : Protect containers from physical damage. Store in dry, cool, well-ventilated area.

7.3 - Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1 - Control parameters

No additional information available

8.2 - Exposure controls

Appropriate engineering controls : Local exhaust and general ventilation must be adequate to meet exposure standards.
Hand protection : Use impervious gloves.
Eye protection : Safety glasses.
Skin and body protection : Wear suitable working clothes.
Respiratory protection : If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection.

SECTION 9: Physical and chemical properties

9.1 - Information on basic physical and chemical properties

Physical state : Solid
Appearance : Irregular shaped.
Color : White
Odor : No data available
Odor threshold : No data available
pH : No data available
Relative evaporation rate (butyl acetate=1) : No data available
Melting point : No data available
Freezing point : No data available
Boiling point : No data available
Flash point : No data available
Self ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapor pressure : No data available
Relative vapor density at 20 °C : No data available
Relative density : 57-59 lb/ft3
Solubility : No data available
Log Pow : No data available
Log Kow : No data available
Viscosity, kinematics : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidizing properties : No data available
Explosive limits : No data available

9.1 - Other information

No additional information available

SECTION 10: Stability and Reactivity

10.1 - Reactivity

No additional information available

10.2 - Chemical stability

Stable under normal conditions.

10.3 - Possibility of hazardous reactions

Will not occur

10.4 - Conditions to avoid

None

10.5 - Incompatible materials

Strong oxidizing and reducing agents.

10.6 - Hazardous decomposition products

Organic chlorides, amines, hydrogen chloride may be produced.

SECTION 11: Toxicological information

11.1 - Information on toxicological effects

Acute toxicity : Not classified

Zeolite (1318-02-1)	
LD50 oral rat	5000 mg/kg
LD50 dermal rabbit	> 2000 mg/kg
LC50 inhalation rat (mg/l)	2.4 mg/l (Exposure time: 1 h)
ATE (oral)	5000 mg/kg

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Causes serious eye damage.
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified

Zeolite (1318-02-1)	
IARC group	3

Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : May cause respiratory irritation.
Specific target organ toxicity (repeated exposure) : Not classified
Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1 - Toxicity

Zeolite (1318-02-1)	
LC50 fishes 1	1800 mg/l (Exposure time: 96 h - Species: Brachydanio rerio [semi-static])
EC50 Daphnia 1	1000 - 1800 mg/l (Exposure time: 48 h - Species: Daphnia magna)
EC50 other aquatic organisms 1	18 mg/l (Exposure time: 96 h - Species: Desmodesmus subspicatus)
LC50 fish 2	3200 - 5600 mg/l (Exposure time: 96 h - Species: Oryzias latipes [semi-static])

12.2 - Persistence and degradability

No additional information available

12.3 - Bioaccumulative potential

No additional information available

12.4 - Mobility in soil

No additional information available

12.5 - Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1 - Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

In accordance with DOT / ADR / RID / ADNR / IMDG / ICAO / IATA

14.1 - UN number

Not applicable

14.2 - UN proper shipping name

Not applicable

SECTION 15: Regulatory information

15.1 - US Federal regulations

15.2 - US State regulations

No additional information available

SECTION 16: Other information

Full text of H-phrases:

Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Irrit. 2	skin corrosion/irritation Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H315	Causes skin irritation
H318	Causes serious eye damage
H335	May cause respiratory irritation
H400	Very toxic to aquatic life

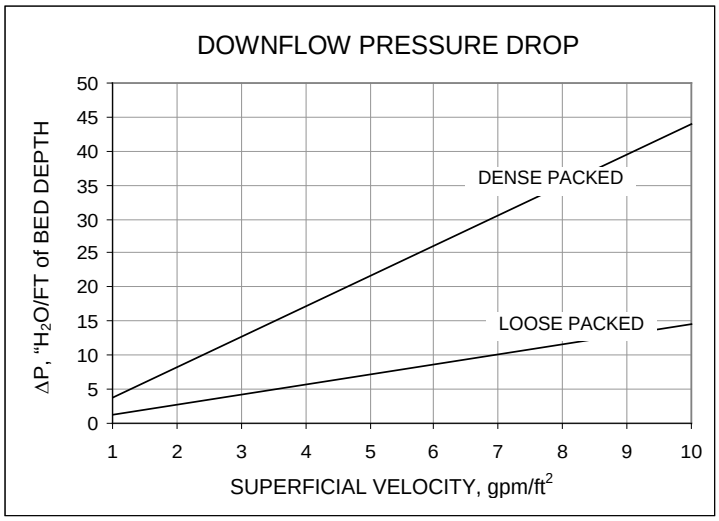
NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt
medical attention is given.
NFPA fire hazard : 0 - Materials that will not burn.
NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Carbon Filtration Systems, Inc.
68 Mill Street
Johnston, RI 02919
Tel: 401-946-7838
Fax: 401-946-9722
www.carbonfiltrationsystems.com

PRODUCT BULLETIN
COL – GL 60R (8 x 30)
Liquid Phase, Bituminous Coal Base Carbon

COL-GL60R (8 x 30) is a hard reactivated Bituminous Coal based activated carbon, which is recommended for point-of-use (POU) water treatment. ***COL-GL60R (8 x 30)*** efficiently removes chlorine, taste and odor compounds, and volatile organics, even with brief contact times typical of POU filtration.



TYPICAL PHYSICAL PROPERTIES / SPECIFICATIONS

Iodine Number	800
Bulk Density	28 - 30
Effective Size	0.8 – 1.0 mm
Abrasion No., min.	75
U.S. Standard Sieve Size	8 x 30
Larger than No. 8, max.	15%
Smaller than No. 30, max.	4%
Moisture as packed, max.	2%

STANDARD PACKAGING:

55lb or 27.5lb POLYLINED POLYPROPYLENE BAGS. 200lb FIBER DRUMS. 1100lb SUPERSACKS.

APPENDIX D:
ENDANGERED SPECIES ACT ASSESSMENT

TABLE 1
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 Redbellied 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 Longeared 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 Longeared 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 Redbellied Cooter	Endangered	Inland Ponds and Rivers	Taunton
	Red Knot[1]	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal Towns
	Northern Longeared 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 Longeared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

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 Longeared 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 Longeared 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 Longeared 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 Longeared 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 Longeared 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 Longeared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

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 Redbellied 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 Longeared 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 Longeared 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 Longeared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

Updated 02/05/2016

[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.

MassDEP - Bureau of Waste Site Cleanup

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

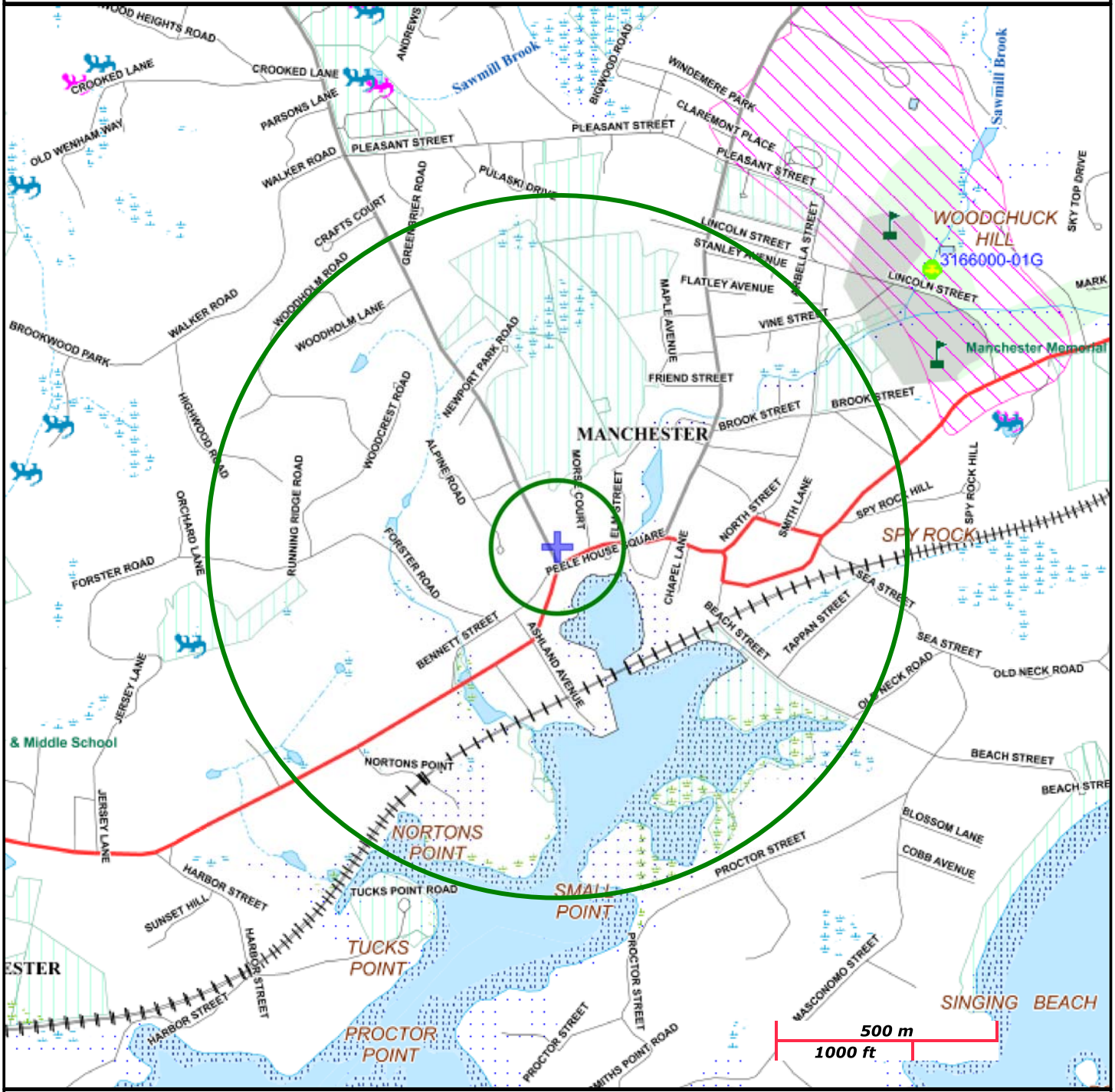
Site Information:

1 PINE ST MANCHESTER, MA

NAD83 UTM Meters:
4715166mN , 354348mE (Zone: 19)
January 14, 2020

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

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

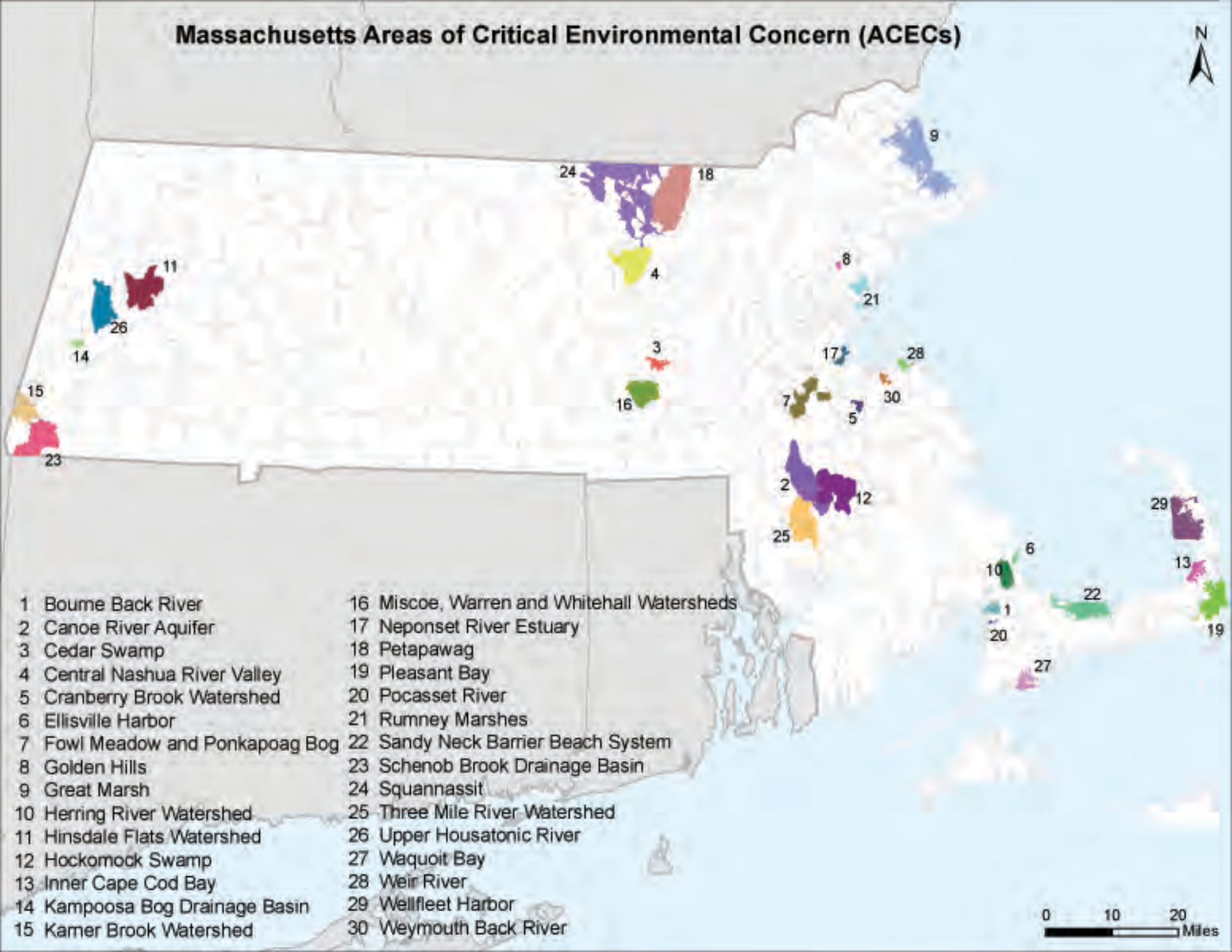
Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

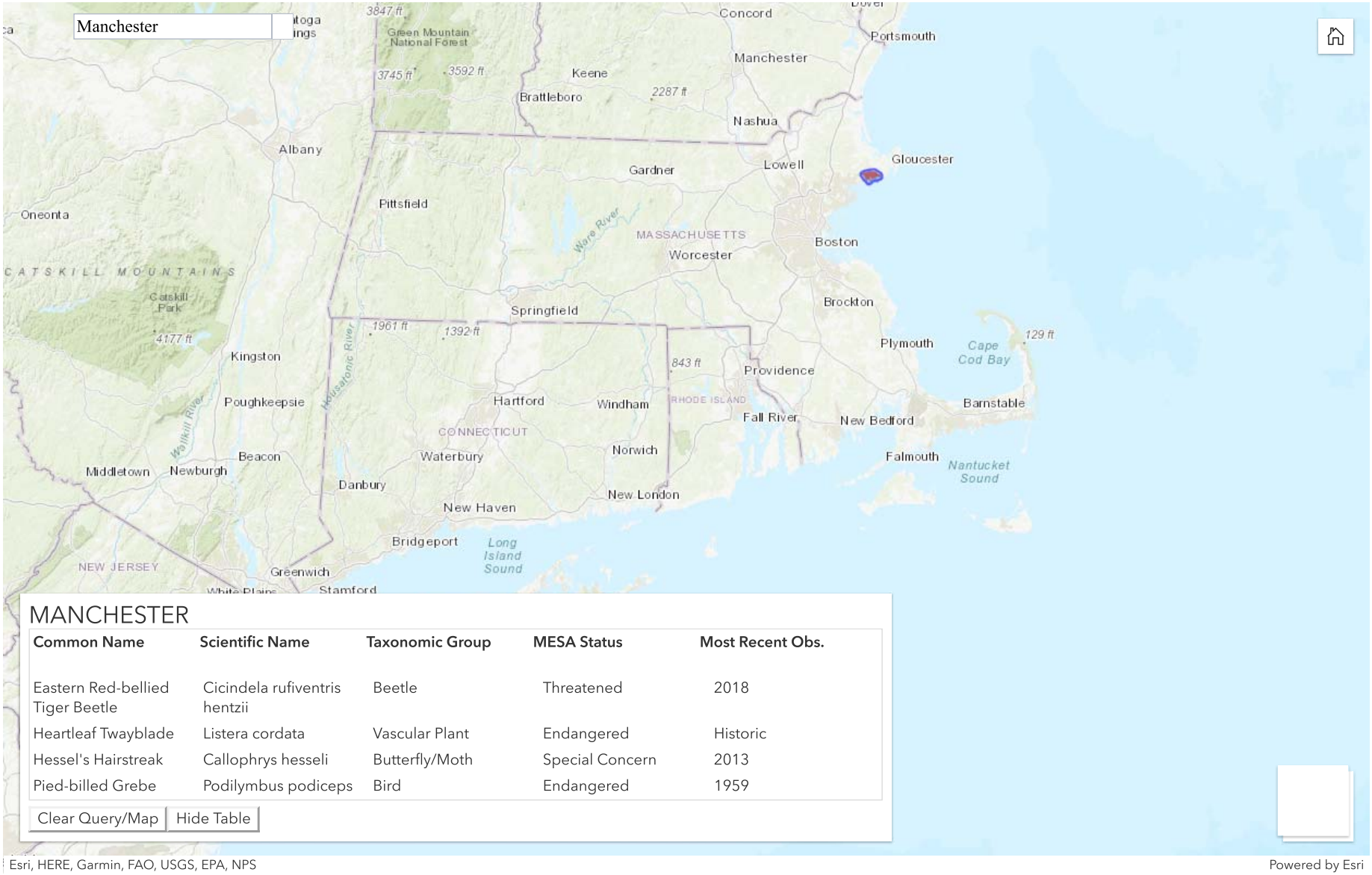
Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

Massachusetts Areas of Critical Environmental Concern (ACECs)



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



MANCHESTER

Common Name	Scientific Name	Taxonomic Group	MESA Status	Most Recent Obs.
Eastern Red-bellied Tiger Beetle	Cicindela rufiventris hentzii	Beetle	Threatened	2018
Heartleaf Twayblade	Listera cordata	Vascular Plant	Endangered	Historic
Hessel's Hairstreak	Callophrys hesseli	Butterfly/Moth	Special Concern	2013
Pied-billed Grebe	Podilymbus podiceps	Bird	Endangered	1959

Clear Query/Map | Hide Table

More information

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.

Project information

NAME

Residential Basement

LOCATION

Essex 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. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

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

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

---

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

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

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

Mammals

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

Flowering Plants

NAME	STATUS
Small Whorled Pogonia Isotria medeoloides No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1890	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 person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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

Additional information can be found using the following links:

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

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

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

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME

	SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. *"BREEDS ELSEWHERE" INDICATES THAT THE* BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Dunlin Calidris alpina arcticola This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

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

Purple Sandpiper Calidris maritima — Breeds elsewhere

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

Red-throated Loon Gavia stellata — Breeds elsewhere

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

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere

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

Semipalmated Sandpiper Calidris pusilla — Breeds elsewhere

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

Whimbrel Numenius phaeopus — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

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

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

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

Probability of Presence Summary

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

Probability of Presence (■)

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

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

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

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

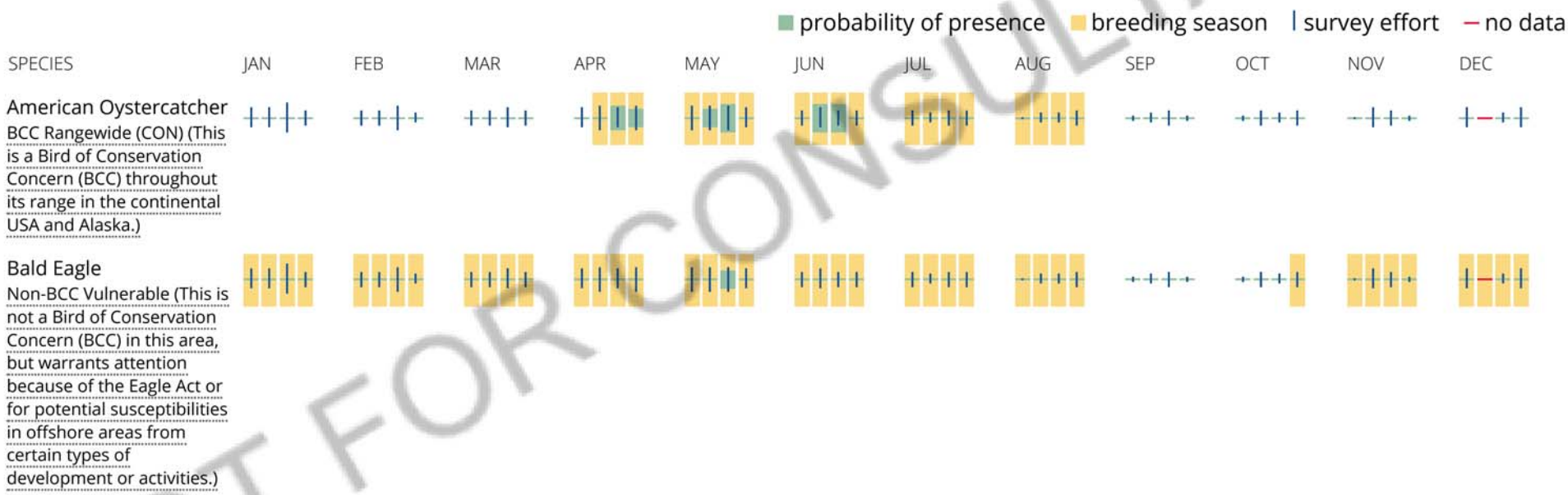
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

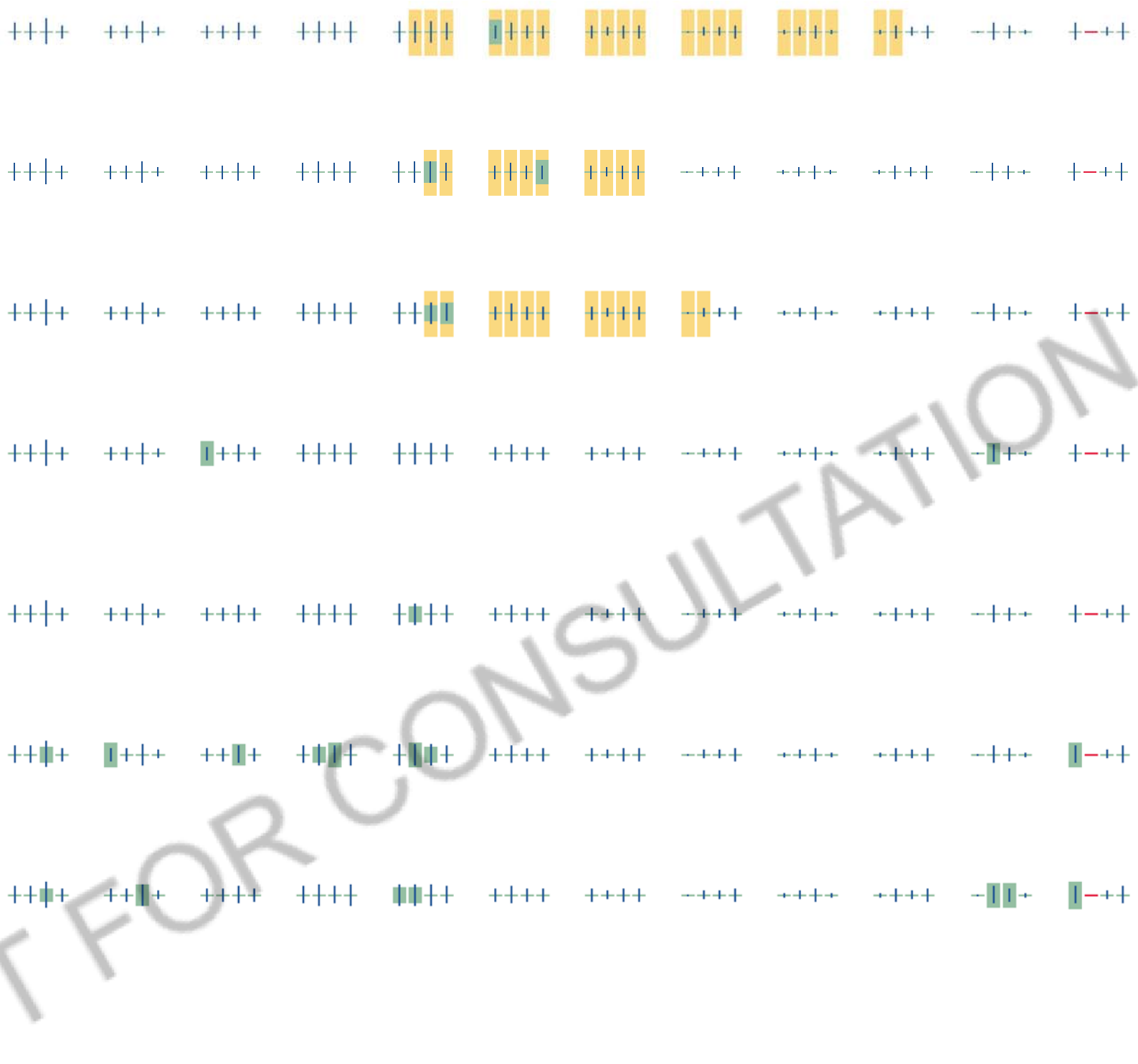
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

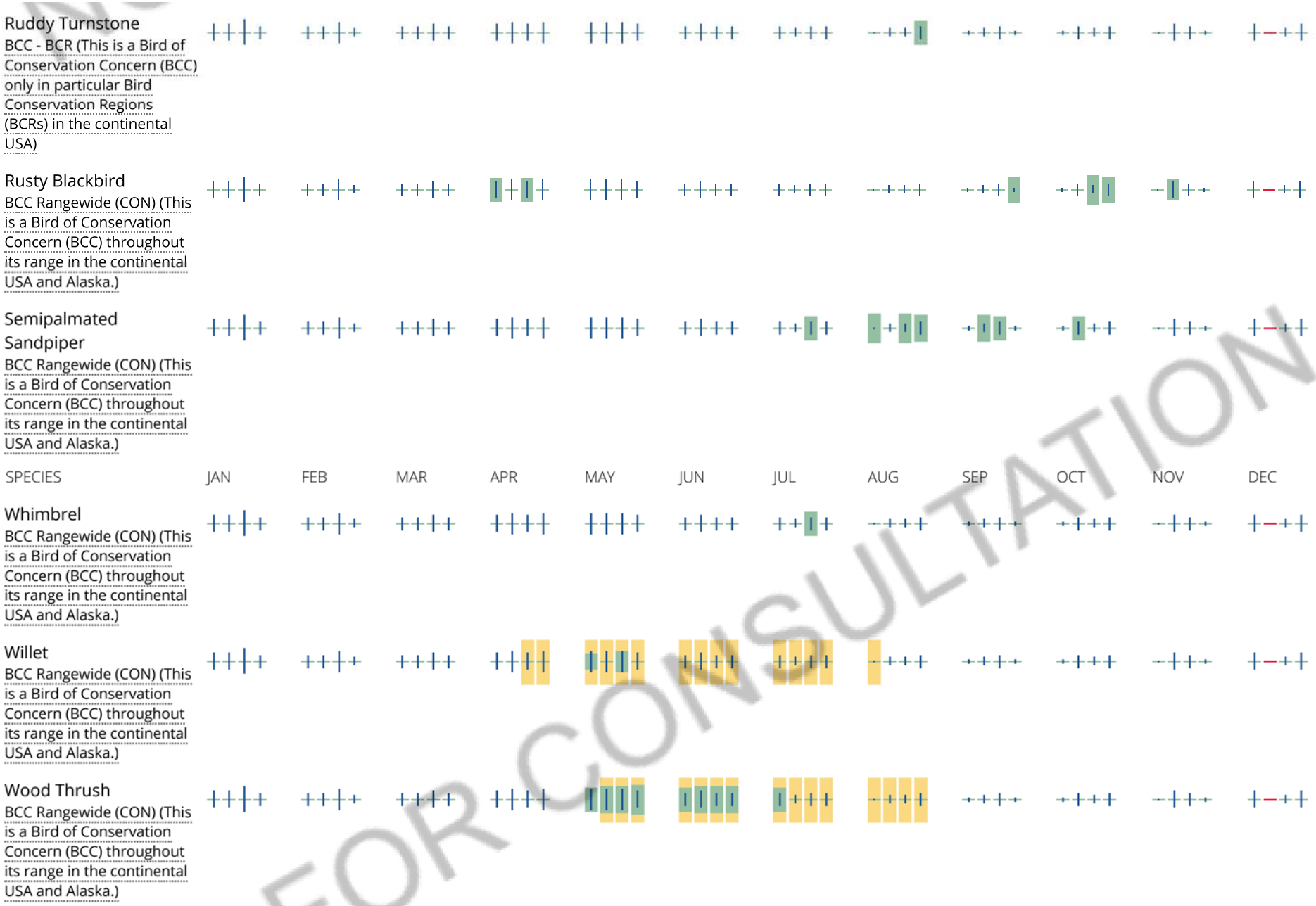
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

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

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







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

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

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

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

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

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

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

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

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

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

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

What are the levels of concern for migratory birds?

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

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

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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a

starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

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

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER

E1UBL

A full description for each wetland code can be found at the National Wetlands Inventory website

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.

APPENDIX E:
NATIONAL HISTORIC PRESERVATION ACT REVIEW

National Register of Historic Places

National Park Service
U.S. Department of the Interior

Public, non-restricted data depicting National Register spatial data processed by the Cultural Resources GIS facility. ...

Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No:	MAN.17
Historic Name:	Forster, Israel House
Common Name:	
Address:	41 Central St
City/Town:	Manchester
Village/Neighborhood:	Manchester Village
Local No:	13
Year Constructed:	1804
Architect(s):	
Architectural Style(s):	Federal
Use(s):	Single Family Dwelling House
Significance:	Architecture
Area(s):	MAN.A: Manchester Historic District MAN.B: Manchester Village Historic District
Designation(s):	Local Historic District (05/06/1975); Nat'l Register District (01/08/1990)
Building Materials(s):	Roof: Asphalt Shingle Wall: Wood; Wood Clapboard

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

LID - 576175
NRDIS - 11819[illegible]
Pi_MAN
USGS-MAP

Proposed H.D MAN.17

FORM B - BUILDING

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

In Area no.	Form no.
B & A	13

MANCHESTER 17

ess 41 CENTRAL

FORSTER HOUSE
LEACH HOUSE ("FORSTER-LEACH")

ent use RESIDENTIAL

ent owner JOHN BACHMAN

iption:

1804

urce DOCUMENTED BY HISTORICAL SOCIETY

FEDERAL; MONITOR ROOF & CAPTAIN'S WALK

Architect —

Exterior wall fabric CLAPBOARD

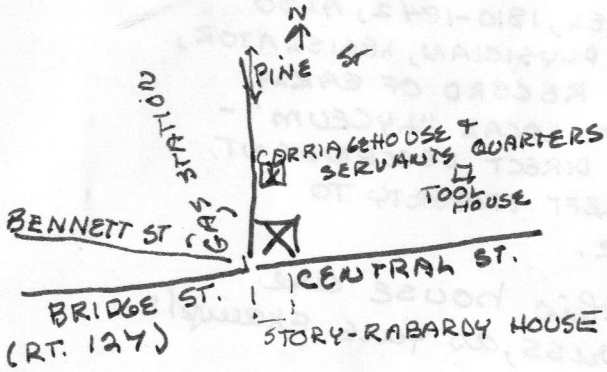
Outbuildings (describe) CARRIAGE HOUSE, w/ QUARTERS, MATCHING; TOOL HOUSE

Other features LOCAL LANDMARK; URN FINIAL FENCE PARTLY ORIGINAL; DOOR KNOCKER & HITCHING POSTS DATED 1804; LATTICE SHUTTERS ORIGINAL; FINE PROPORTIONS

Altered _____ Date _____

Moved _____ Date _____

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



5. Lot size:

One acre or less ☒ Over one acre ____

Approximate frontage 60'

Approximate distance of building from street 12' ±

6. Recorded by S. Gibson

Organization HIST. DIST. Study Com.

Date 11/74

RECEIVED
JAN 3 1975
MASS. HIST. COMM.

DO NOT WRITE IN THIS SPACE
USGS Quadrant _____
MHC Photo no. _____

(over)

MAN. 17

7. Original owner (if known) MAJOR ISRAEL FORSTER

Original use RESIDENCE

Subsequent uses (if any) and dates

8. Themes (check as many as applicable)

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

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

ORIGINAL OWNER FROM PROMINENT LOCAL EARLY FAMILY; BUILT FISHING SCHOONER, WHARF, & WAREHOUSE NEAR HIS GRISTMILL ON WATERFRONT - IMPORTANT IN LOCAL COMMERCE. TOWN SELECTMAN. FOUGHT IN WAR OF 1812. HIS DAUGHTER CHARLOTTE M. DR. EZEKIEL HEACH BY WHOSE NAME HOUSE IS NOW KNOWN. EZEKIEL, 1810-1842, ALSO FROM PROMINENT LOCAL FAMILY: PHYSICIAN, LEGISLATOR, SCHOLAR, MADE THE FIRST COLLECTED RECORD OF EARLY TOWN DOCUMENTS; CHARTER MEMBER LOCAL "LYCEUM" - FORERUNNER OF TOWN LIBRARY. HIS DIRECT DESCENDANT, FLORENCE HEACH (DECEASED 1973) LEFT PROPERTY TO MEMBER OF FAMILY, CURRENT OWNER.

Plans and proportions of this house are documented in Library of Congress, as fine example of its era.

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

HISTORICAL SOCIETY RECORDS
325TH ANNIVERSARY BOOKLET, P. 35

MAN.17

INVENTORY FORM CONTINUATION SHEET

Town: MANCHESTER

Property Address: 41 CENTRAL ST

Area(s): A&B

Form No.: 17

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

APPENDIX F:
LABORATORY DATA REPORTS

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0A16042
Client Project: 2020.05 - 1 Pine St, Manchester By The Sea, MA

Report Date: 20-January-2020

Prepared for:

Bill Mitchell
Clean Soils Environmental
33 Estes Street
Ipswich, MA 01938

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 01/16/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0A16042. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0A16042-01	SW-1	Water	01/16/2020	01/16/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

SW-1 (Lab Number: 0A16042-01)

Analysis	Method
Acid Base/Neutral Extractables	EPA 625.1
Ammonia	SM4500-NH3-D (11)
Antimony	EPA 200.8
Arsenic	EPA 200.8
Cadmium	EPA 200.8
Calcium	SM3120-B (11)
Chloride	SM4500CI-B (11)
Chromium	EPA 200.8
Copper	EPA 200.8
Cyanide	SM4500-CN-E (11)
Hexavalent Chromium	SM3500-Cr-B (11)
Hydrocarbon Fingerprint	EPA-8100-mod
Iron	EPA 200.8
Lead	EPA 200.8
Magnesium	SM3120-B (11)
Mercury	EPA 245.1
Methanol and Ethanol	EPA-8100-mod
Nickel	EPA 200.8
PCBs	EPA 8082A
pH	SM4500-H-B (11)
Selenium	EPA 200.8
Silver	EPA 200.8
Total Residual Chlorine	SM4500-CI-G (11)
Total Suspended Solids	SM2540-D (11)
Trivalent Chromium	Calculation
Volatile Organic Compounds	EPA 624.1
Zinc	EPA 200.8

Method References

40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, Office of Federal Register National Archives and Records Administration

Methods for the Determination of Metals in Environmental Samples EPA-600/R-94/111, USEPA, 1994

Method for Determining Diesel Range Organics, Method 4.1.25, Maine Health and Environmental Testing Laboratory

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: Calculation

Sample: SW-1

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Trivalent Chromium	**0.00136**		0.000100	mg/L	01/17/20 13:28	01/17/20 15:35

Results: General Chemistry

Sample: SW-1

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Ammonia	**0.5**		0.1	mg/L	01/16/20	01/16/20
Chloride	**336**		25	mg/L	01/17/20	01/17/20
Cyanide	ND		0.010	mg/L	01/17/20	01/17/20
Hexavalent chromium	ND		0.01	mg/L	01/16/20 18:30	01/16/20 18:30
pH	**6.8**		0.1	SU	01/16/20 16:55	01/16/20 16:55
Total Residual Chlorine	**0.51**		0.01	mg/L	01/16/20 17:15	01/16/20 17:15
Total Suspended Solids	**157**		2	mg/L	01/17/20	01/17/20

Results: Total Metals

Sample: SW-1

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Hardness	**65.6**		0.125	mg/L	01/17/20	01/17/20
Antimony	**0.0006**		0.0001	mg/L	01/17/20	01/17/20
Arsenic	**0.0059**		0.0001	mg/L	01/17/20	01/17/20
Cadmium	**0.0003**		0.0001	mg/L	01/17/20	01/17/20
Calcium	**19.8**		0.05	mg/L	01/17/20	01/17/20
Chromium	**0.0014**		0.0001	mg/L	01/17/20	01/17/20
Copper	ND		0.001	mg/l	01/17/20	01/17/20
Iron	**0.790**		0.001	mg/l	01/17/20	01/17/20
Magnesium	**3.90**		0.05	mg/L	01/17/20	01/17/20
Mercury	ND		0.0002	mg/L	01/17/20	01/17/20
Nickel	ND		0.001	mg/l	01/17/20	01/17/20
Selenium	ND		0.005	mg/L	01/17/20	01/17/20
Silver	ND		0.0005	mg/L	01/17/20	01/17/20
Zinc	**0.006**		0.001	mg/l	01/17/20	01/17/20
Lead	**0.0557**		0.0001	mg/L	01/17/20	01/17/20

Results: Volatile Organic Compounds

Sample: SW-1

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Benzene	ND		1	ug/l	01/16/20	01/16/20
Carbon tetrachloride	ND		1	ug/l	01/16/20	01/16/20
1,2-Dichlorobenzene	ND		1	ug/l	01/16/20	01/16/20
1,3-Dichlorobenzene	ND		1	ug/l	01/16/20	01/16/20
1,4-Dichlorobenzene	ND		1	ug/l	01/16/20	01/16/20
1,1-Dichloroethane	ND		1	ug/l	01/16/20	01/16/20
1,2-Dichloroethane	ND		1	ug/l	01/16/20	01/16/20
Methylene chloride	ND		5	ug/l	01/16/20	01/16/20
Tetrachloroethene	ND		1	ug/l	01/16/20	01/16/20
Toluene	ND		1	ug/l	01/16/20	01/16/20
1,1,2-Trichloroethane	ND		1	ug/l	01/16/20	01/16/20
1,1,1-Trichloroethane	ND		1	ug/l	01/16/20	01/16/20
Trichloroethene	ND		1	ug/l	01/16/20	01/16/20
Vinyl chloride	ND		1	ug/l	01/16/20	01/16/20
cis-1,2-Dichloroethene	ND		1	ug/l	01/16/20	01/16/20
Acetone	ND		5	ug/l	01/16/20	01/16/20
tert-Butyl alcohol	ND		5	ug/l	01/16/20	01/16/20
Methyl t-butyl ether (MTBE)	ND		1	ug/l	01/16/20	01/16/20
1,2-Dibromoethane (EDB)	ND		1	ug/l	01/16/20	01/16/20
Total xylenes	**7**		1	ug/l	01/16/20	01/16/20
1,4-Dioxane	ND		500	ug/l	01/16/20	01/16/20
o-Xylene	**5**		1	ug/l	01/16/20	01/16/20
m&p-Xylene	**3**		2	ug/l	01/16/20	01/16/20
tert-Amyl methyl ether	ND		1	ug/l	01/16/20	01/16/20
Ethylbenzene	**2**		1	ug/l	01/16/20	01/16/20

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*97.5%*	*70-130*	01/16/20	01/16/20
1,2-Dichloroethane-d4	*103%*	*70-130*	01/16/20	01/16/20
Toluene-d8	*101%*	*70-130*	01/16/20	01/16/20

Results: Semivolatile organic compounds

Sample: SW-1

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Ethanol	ND		10	mg/L	01/17/20	01/17/20

Results: Base/Neutral & Acid Extractables

Sample: SW-1

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
2,4,6-Trichlorophenol	ND		2	ug/l	01/17/20	01/17/20
2,4-Dichlorophenol	ND		2	ug/l	01/17/20	01/17/20
2,4-Dimethylphenol	ND		10	ug/l	01/17/20	01/17/20
2,4-Dinitrophenol	ND		5	ug/l	01/17/20	01/17/20
2-Chlorophenol	ND		2	ug/l	01/17/20	01/17/20
4,6-Dinitro-2-methylphenol	ND		5	ug/l	01/17/20	01/17/20
4-Chloro-3-methylphenol	ND		2	ug/l	01/17/20	01/17/20
4-Nitrophenol	ND		5	ug/l	01/17/20	01/17/20
Acenaphthene	ND		2	ug/l	01/17/20	01/17/20
Acenaphthylene	ND		2	ug/l	01/17/20	01/17/20
Anthracene	ND		2	ug/l	01/17/20	01/17/20
Benzo(a)anthracene	ND		2	ug/l	01/17/20	01/17/20
Benzo(a)pyrene	ND		2	ug/l	01/17/20	01/17/20
Benzo(b)fluoranthene	ND		2	ug/l	01/17/20	01/17/20
Benzo(g,h,i)perylene	ND		2	ug/l	01/17/20	01/17/20
Benzo(k)fluoranthene	ND		2	ug/l	01/17/20	01/17/20
Bis(2-ethylhexyl)phthalate	ND		6	ug/l	01/17/20	01/17/20
Butyl benzyl phthalate	ND		2	ug/l	01/17/20	01/17/20
Chrysene	ND		2	ug/l	01/17/20	01/17/20
Di(n)octyl phthalate	**20**		3	ug/l	01/17/20	01/17/20
Dibenz(a,h)anthracene	ND		2	ug/l	01/17/20	01/17/20
Diethyl phthalate	ND		2	ug/l	01/17/20	01/17/20
Dimethyl phthalate	ND		2	ug/l	01/17/20	01/17/20
Di-n-butylphthalate	**4**		3	ug/l	01/17/20	01/17/20
Fluoranthene	ND		2	ug/l	01/17/20	01/17/20
Fluorene	ND		2	ug/l	01/17/20	01/17/20
Indeno(1,2,3-cd)pyrene	ND		2	ug/l	01/17/20	01/17/20
Naphthalene	ND		2	ug/l	01/17/20	01/17/20
Pentachlorophenol	ND		5	ug/l	01/17/20	01/17/20
Phenanthrene	ND		2	ug/l	01/17/20	01/17/20
Pyrene	ND		2	ug/l	01/17/20	01/17/20
4-Methylphenol	ND		4	ug/l	01/17/20	01/17/20
2-Methylphenol	ND		2	ug/l	01/17/20	01/17/20
m&p-Cresol	ND		4	ug/l	01/17/20	01/17/20
3-Methyl phenol	ND		4	ug/l	01/17/20	01/17/20
2,4,5-Trichlorophenol	ND		2	ug/l	01/17/20	01/17/20
2,6-Dichlorophenol	ND		2	ug/l	01/17/20	01/17/20

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*64.7%*	*30-118*	01/17/20	01/17/20
p-Terphenyl-d14	*78.2%*	*38-130*	01/17/20	01/17/20
2-Fluorobiphenyl	*64.9%*	*30-119*	01/17/20	01/17/20
Phenol-d6	*17.2%*	*10-115*	01/17/20	01/17/20
2,4,6-Tribromophenol	*75.9%*	*15-130*	01/17/20	01/17/20

Results: Base/Neutral & Acid Extractables (Continued)

Sample: SW-1 (Continued)

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
2-Fluorophenol	*23.5%*		*10-115*		01/17/20	01/17/20

Results: Polychlorinated Biphenyls (PCBs)

Sample: SW-1

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		0.2	ug/l	01/16/20	01/17/20
Aroclor-1221	ND		0.4	ug/l	01/16/20	01/17/20
Aroclor-1232	ND		0.2	ug/l	01/16/20	01/17/20
Aroclor-1242	ND		0.2	ug/l	01/16/20	01/17/20
Aroclor-1248	ND		0.2	ug/l	01/16/20	01/17/20
Aroclor-1254	ND		0.2	ug/l	01/16/20	01/17/20
Aroclor-1260	ND		0.2	ug/l	01/16/20	01/17/20
Aroclor-1262	ND		0.2	ug/l	01/16/20	01/17/20
Aroclor-1268	ND		0.2	ug/l	01/16/20	01/17/20
PCBs (Total)	ND		0.2	ug/l	01/16/20	01/17/20

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*51.7%*	*30-107*	01/16/20	01/17/20
Decachlorobiphenyl (DCBP)	*53.2%*	*30-140*	01/16/20	01/17/20

Results: Hydrocarbon Fingerprint

Sample: SW-1

Lab Number: 0A16042-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Gasoline	ND		200	ug/l	01/17/20	01/17/20
Fuel oil #2/Diesel	**6800**		200	ug/l	01/17/20	01/17/20
Fuel oil #4	ND		200	ug/l	01/17/20	01/17/20
Fuel oil #6	ND		200	ug/l	01/17/20	01/17/20
Kerosene	ND		200	ug/l	01/17/20	01/17/20
Motor oil	ND		200	ug/l	01/17/20	01/17/20
Hydraulic fluid	ND		200	ug/l	01/17/20	01/17/20
Coal tar	ND		200	ug/l	01/17/20	01/17/20
Wood creosote	ND		200	ug/l	01/17/20	01/17/20
Asphalt	ND		200	ug/l	01/17/20	01/17/20
Total Petroleum Hydrocarbons	**6800**		200	ug/l	01/17/20	01/17/20

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0581 - Ammonia										
Blank (B0A0581-BLK1)					Prepared & Analyzed: 01/16/20					
Ammonia	ND		0.1	mg/L						
Blank (B0A0581-BLK2)					Prepared & Analyzed: 01/16/20					
Ammonia	ND		0.1	mg/L						
LCS (B0A0581-BS1)					Prepared & Analyzed: 01/16/20					
Ammonia	1.0		0.1	mg/L	1.00		101	90-110		
LCS (B0A0581-BS2)					Prepared & Analyzed: 01/16/20					
Ammonia	0.9		0.1	mg/L	1.00		94.3	90-110		
Duplicate (B0A0581-DUP1)		**Source: 0A09031-01**			Prepared & Analyzed: 01/16/20					
Ammonia	0.7		0.1	mg/L		0.7			4.72	20
Matrix Spike (B0A0581-MS1)		**Source: 0A09031-01**			Prepared & Analyzed: 01/16/20					
Ammonia	1.8		0.1	mg/L	1.00	0.7	111	80-120		
Batch: B0A0598 - Hexavalent Chrome										
Blank (B0A0598-BLK1)					Prepared & Analyzed: 01/16/20					
Hexavalent chromium	ND		0.01	mg/L						
Blank (B0A0598-BLK2)					Prepared & Analyzed: 01/16/20					
Hexavalent chromium	ND		0.01	mg/L						
LCS (B0A0598-BS1)					Prepared & Analyzed: 01/16/20					
Hexavalent chromium	0.52		0.01	mg/L	0.500		104	90-110		

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0598 - Hexavalent Chrome (Continued)										
LCS (B0A0598-BS2)					Prepared & Analyzed: 01/16/20					
Hexavalent chromium	0.10		0.01	mg/L	0.100		103	90-110		
LCS (B0A0598-BS3)					Prepared & Analyzed: 01/16/20					
Hexavalent chromium	0.52		0.01	mg/L	0.500		104	90-110		
Duplicate (B0A0598-DUP1)		**Source: 0A16042-01**			Prepared & Analyzed: 01/16/20					
Hexavalent chromium	ND		0.01	mg/L		ND				20
Matrix Spike (B0A0598-MS1)		**Source: 0A16042-01**			Prepared & Analyzed: 01/16/20					
Hexavalent chromium	0.50		0.01	mg/L	0.500	ND	101	80-120		
Batch: B0A0604 - pH										
LCS (B0A0604-BS1)					Prepared & Analyzed: 01/16/20					
pH	7.0		0.1	SU				90-110		
LCS (B0A0604-BS2)					Prepared & Analyzed: 01/16/20					
pH	7.0		0.1	SU				90-110		
Duplicate (B0A0604-DUP1)		**Source: 0A16003-01**			Prepared & Analyzed: 01/16/20					
pH	6.9		0.1	SU		6.9			0.289	20
Batch: B0A0624 - Cyanide										
Blank (B0A0624-BLK1)					Prepared & Analyzed: 01/17/20					
Cyanide	ND		0.010	mg/L						

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0624 - Cyanide (Continued)										
Blank (B0A0624-BLK2)					Prepared & Analyzed: 01/17/20					
Cyanide	ND		0.010	mg/L						
LCS (B0A0624-BS1)					Prepared & Analyzed: 01/17/20					
Cyanide	0.090		0.010	mg/L	0.100		90.0	90-110		
LCS (B0A0624-BS2)					Prepared & Analyzed: 01/17/20					
Cyanide	0.096		0.010	mg/L	0.100		96.0	90-110		
LCS (B0A0624-BS3)					Prepared & Analyzed: 01/17/20					
Cyanide	0.090		0.010	mg/L	0.100		90.0	90-110		
Duplicate (B0A0624-DUP1)		**Source: 0A16008-01**			Prepared & Analyzed: 01/17/20					
Cyanide	ND		0.010	mg/L		ND				200
Matrix Spike (B0A0624-MS1)		**Source: 0A16008-01**			Prepared & Analyzed: 01/17/20					
Cyanide	0.098		0.010	mg/L	0.100	ND	98.0	80-120		
Batch: B0A0637 - TSS										
Blank (B0A0637-BLK1)					Prepared & Analyzed: 01/17/20					
Total Suspended Solids	ND		2	mg/L						
LCS (B0A0637-BS1)					Prepared & Analyzed: 01/17/20					
Total Suspended Solids	962		10	mg/L	1000		96.2	90-110		
Duplicate (B0A0637-DUP1)		**Source: 0A14055-01**			Prepared & Analyzed: 01/17/20					
Total Suspended Solids	222		11	mg/L		259			15.2	20

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0640 - Residual chlorine										
Blank (B0A0640-BLK1)					Prepared & Analyzed: 01/16/20					
Total Residual Chlorine	ND		0.01	mg/L						
Blank (B0A0640-BLK2)					Prepared & Analyzed: 01/16/20					
Total Residual Chlorine	ND		0.01	mg/L						
LCS (B0A0640-BS1)					Prepared & Analyzed: 01/16/20					
Total Residual Chlorine	0.48		0.01	mg/L	0.500		95.0	90-110		
LCS (B0A0640-BS2)					Prepared & Analyzed: 01/16/20					
Total Residual Chlorine	0.52		0.01	mg/L	0.500		104	90-110		
Duplicate (B0A0640-DUP1)		**Source: 0A16042-01**			Prepared & Analyzed: 01/16/20					
Total Residual Chlorine	0.48		0.01	mg/L		0.51			5.62	20
Matrix Spike (B0A0640-MS1)		**Source: 0A16042-01**			Prepared & Analyzed: 01/16/20					
Total Residual Chlorine	0.60		0.01	mg/L	0.500	0.51	17.2	80-120		
Batch: B0A0642 - Chloride										
Blank (B0A0642-BLK1)					Prepared & Analyzed: 01/17/20					
Chloride	ND		1	mg/L						
LCS (B0A0642-BS1)					Prepared & Analyzed: 01/17/20					
Chloride	60		1	mg/L	60.6		99.1	90-110		
Duplicate (B0A0642-DUP1)		**Source: 0A16042-01**			Prepared & Analyzed: 01/17/20					
Chloride	312		25	mg/L		336			7.41	20

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0642 - Chloride (Continued)										
Matrix Spike (B0A0642-MS1)			**Source: 0A16042-01**		Prepared & Analyzed: 01/17/20					
Chloride	409		25	mg/L	60.6	336	119	80-120		

Quality Control
(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0635 - Metals Digestion Waters										
Blank (B0A0635-BLK1)					Prepared & Analyzed: 01/17/20					
Zinc	ND		0.001	mg/l						
Silver	ND		0.0001	mg/L						
Antimony	ND		0.0001	mg/L						
Calcium	ND		0.05	mg/L						
Copper	ND		0.001	mg/l						
Nickel	ND		0.001	mg/l						
Iron	ND		0.001	mg/l						
Cadmium	ND		0.0001	mg/L						
Arsenic	ND		0.0001	mg/L						
Magnesium	ND		0.05	mg/L						
Chromium	ND		0.0001	mg/L						
Selenium	ND		0.005	mg/L						
Lead	ND		0.0001	mg/L						
LCS (B0A0635-BS1)					Prepared & Analyzed: 01/17/20					
Magnesium	10.6		0.05	mg/L	10.0		106	85-115		
Calcium	11.1		0.05	mg/L	10.0		111	85-115		
LCS (B0A0635-BS2)					Prepared & Analyzed: 01/17/20					
Nickel	0.190		0.001	mg/l	0.200		94.9	85-115		
Iron	0.179		0.001	mg/l	0.200		89.3	85-115		
Arsenic	0.0184		0.0001	mg/L	0.0200		91.8	85-115		
Silver	0.0171		0.0001	mg/L	0.0200		85.6	85-115		
Antimony	0.0186		0.0001	mg/L	0.0200		92.9	85-115		
Zinc	0.204		0.001	mg/l	0.200		102	85-115		
Copper	0.188		0.001	mg/l	0.200		94.1	85-115		
Cadmium	0.0180		0.0001	mg/L	0.0200		89.8	85-115		
Chromium	0.0201		0.0001	mg/L	0.0200		101	85-115		
Selenium	0.017		0.005	mg/L	0.0200		86.1	85-115		
Lead	0.0194		0.0001	mg/L	0.0200		97.0	85-115		

Quality Control
(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0644 - Metals Cold-Vapor Mercury										
Blank (B0A0644-BLK1)					Prepared & Analyzed: 01/17/20					
Mercury	ND		0.0002	mg/L						
LCS (B0A0644-BS1)					Prepared & Analyzed: 01/17/20					
Mercury	0.0010		0.0002	mg/L	0.00100		96.8	85-115		

Quality Control
(Continued)

Volatile Organic Compounds

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0631 - Purge-Trap										
Blank (B0A0631-BLK1)					Prepared & Analyzed: 01/16/20					
Benzene	ND		1	ug/l						
Carbon tetrachloride	ND		1	ug/l						
1,2-Dichlorobenzene	ND		1	ug/l						
1,3-Dichlorobenzene	ND		1	ug/l						
1,4-Dichlorobenzene	ND		1	ug/l						
1,1-Dichloroethane	ND		1	ug/l						
1,2-Dichloroethane	ND		1	ug/l						
Methylene chloride	ND		5	ug/l						
Tetrachloroethene	ND		1	ug/l						
Toluene	ND		1	ug/l						
1,1,2-Trichloroethane	ND		1	ug/l						
1,1,1-Trichloroethane	ND		1	ug/l						
Trichloroethene	ND		1	ug/l						
Vinyl chloride	ND		1	ug/l						
cis-1,2-Dichloroethene	ND		1	ug/l						
Acetone	ND		5	ug/l						
tert-Butyl alcohol	ND		5	ug/l						
Methyl t-butyl ether (MTBE)	ND		1	ug/l						
1,2-Dibromoethane (EDB)	ND		1	ug/l						
Total xylenes	ND		1	ug/l						
1,4-Dioxane	ND		500	ug/l						
o-Xylene	ND		1	ug/l						
m&p-Xylene	ND		2	ug/l						
tert-Amyl methyl ether	ND		1	ug/l						
Ethylbenzene	ND		1	ug/l						
Surrogate: 4-Bromofluorobenzene			*46.0*	ug/l	*50.0*		*92.0*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.4*	ug/l	*50.0*		*98.7*	*70-130*		
Surrogate: Toluene-d8			*49.1*	ug/l	*50.0*		*98.1*	*70-130*		

Quality Control
(Continued)

Volatile Organic Compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0631 - Purge-Trap (Continued)										
LCS (B0A0631-BS1)					Prepared & Analyzed: 01/16/20					
Benzene	19			ug/l	20.0		97.0	65-135		
Carbon tetrachloride	19			ug/l	20.0		96.8	70-130		
1,2-Dichlorobenzene	20			ug/l	20.0		100	65-135		
1,3-Dichlorobenzene	20			ug/l	20.0		98.6	70-130		
1,4-Dichlorobenzene	20			ug/l	20.0		100	65-135		
1,1-Dichloroethane	19			ug/l	20.0		96.5	70-130		
1,2-Dichloroethane	20			ug/l	20.0		99.4	70-130		
Methylene chloride	20			ug/l	20.0		101	60-140		
Tetrachloroethene	19			ug/l	20.0		96.4	70-130		
Toluene	19			ug/l	20.0		96.4	70-130		
1,1,2-Trichloroethane	20			ug/l	20.0		98.3	70-130		
1,1,1-Trichloroethane	20			ug/l	20.0		97.8	70-130		
Trichloroethene	19			ug/l	20.0		95.8	65-135		
Vinyl chloride	19			ug/l	20.0		94.6	5-195		
cis-1,2-Dichloroethene	20			ug/l	20.0		99.2	70-130		
Acetone	21			ug/l	20.0		106	34-193		
tert-Butyl alcohol	19			ug/l	20.0		96.2	26-177		
Methyl t-butyl ether (MTBE)	20			ug/l	20.0		102	70-130		
1,2-Dibromoethane (EDB)	20			ug/l	20.0		101	70-130		
Total xylenes	ND		1	ug/l				70-130		
1,4-Dioxane	0			ug/l	20.0			70-130		
o-Xylene	17			ug/l	20.0		85.6	70-130		
m&p-Xylene	40			ug/l	40.0		101	70-130		
tert-Amyl methyl ether	20			ug/l	20.0		101	70-130		
Ethylbenzene	20			ug/l	20.0		102	60-140		
Surrogate: 4-Bromofluorobenzene			*50.3*	ug/l	*50.0*		*101*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*50.9*	ug/l	*50.0*		*102*	*70-130*		
Surrogate: Toluene-d8			*50.1*	ug/l	*50.0*		*100*	*70-130*		

Quality Control
(Continued)

Semivolatile organic compounds

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0595 - EPA 3580A										
Blank (B0A0595-BLK1)					Prepared & Analyzed: 01/17/20					
Ethanol	ND		10	mg/L						

Quality Control
(Continued)

Base/Neutral & Acid Extractables

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0601 - Sep-Funnel-extraction										
Blank (B0A0601-BLK1)					Prepared & Analyzed: 01/17/20					
2,4,6-Trichlorophenol	ND		2	ug/l						
2,4-Dichlorophenol	ND		2	ug/l						
2,4-Dimethylphenol	ND		10	ug/l						
2,4-Dinitrophenol	ND		5	ug/l						
2-Chlorophenol	ND		2	ug/l						
4,6-Dinitro-2-methylphenol	ND		5	ug/l						
4-Chloro-3-methylphenol	ND		2	ug/l						
4-Nitrophenol	ND		5	ug/l						
Acenaphthene	ND		2	ug/l						
Acenaphthylene	ND		2	ug/l						
Anthracene	ND		2	ug/l						
Benzo(a)anthracene	ND		2	ug/l						
Benzo(a)pyrene	ND		2	ug/l						
Benzo(b)fluoranthene	ND		2	ug/l						
Benzo(g,h,i)perylene	ND		2	ug/l						
Benzo(k)fluoranthene	ND		2	ug/l						
Bis(2-ethylhexyl)phthalate	ND		6	ug/l						
Butyl benzyl phthalate	ND		2	ug/l						
Chrysene	ND		2	ug/l						
Di(n)octyl phthalate	ND		3	ug/l						
Dibenz(a,h)anthracene	ND		2	ug/l						
Diethyl phthalate	ND		2	ug/l						
Dimethyl phthalate	ND		2	ug/l						
Di-n-butylphthalate	ND		3	ug/l						
Fluoranthene	ND		2	ug/l						
Fluorene	ND		2	ug/l						
Indeno(1,2,3-cd)pyrene	ND		2	ug/l						
Naphthalene	ND		2	ug/l						
Pentachlorophenol	ND		5	ug/l						
Phenanthrene	ND		2	ug/l						
Pyrene	ND		2	ug/l						
4-Methylphenol	ND		4	ug/l						
2-Methylphenol	ND		2	ug/l						
m&p-Cresol	ND		4	ug/l						
3-Methyl phenol	ND		4	ug/l						
2,4,5-Trichlorophenol	ND		2	ug/l						
2,6-Dichlorophenol	ND		2	ug/l						
Surrogate: Nitrobenzene-d5			*26.8*	ug/l	*50.0*		*53.7*	*30-118*		
Surrogate: p-Terphenyl-d14			*35.4*	ug/l	*50.0*		*70.9*	*38-130*		
Surrogate: 2-Fluorobiphenyl			*27.1*	ug/l	*50.0*		*54.2*	*30-119*		
Surrogate: Phenol-d6			*9.05*	ug/l	*50.0*		*18.1*	*10-115*		
Surrogate: 2,4,6-Tribromophenol			*28.2*	ug/l	*50.0*		*56.5*	*15-130*		
Surrogate: 2-Fluorophenol			*12.1*	ug/l	*50.0*		*24.2*	*10-115*		

Base/Neutral & Acid Extractables (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0601 - Sep-Funnel-extraction (Continued)										
LCS (B0A0601-BS1)					Prepared & Analyzed: 01/17/20					
2,4,6-Trichlorophenol	42		2	ug/l	50.0		84.0	52-129		
2,4-Dichlorophenol	42		2	ug/l	50.0		83.8	53-122		
2,4-Dimethylphenol	36		10	ug/l	50.0		71.9	42-120		
2,4-Dinitrophenol	49		5	ug/l	50.0		97.4	5-173		
2-Chlorophenol	37		2	ug/l	50.0		74.0	36-120		
4,6-Dinitro-2-methylphenol	53		5	ug/l	50.0		106	53-130		
4-Chloro-3-methylphenol	42		2	ug/l	50.0		84.1	41-128		
4-Nitrophenol	18		5	ug/l	50.0		36.7	13-129		
Acenaphthene	41		2	ug/l	50.0		81.3	60-132		
Acenaphthylene	44		2	ug/l	50.0		87.2	54-126		
Anthracene	45		2	ug/l	50.0		89.8	43-120		
Benzo(a)anthracene	45		2	ug/l	50.0		89.7	42-133		
Benzo(a)pyrene	50		2	ug/l	50.0		99.8	32-148		
Benzo(b)fluoranthene	47		2	ug/l	50.0		94.9	42-140		
Benzo(g,h,i)perylene	49		2	ug/l	50.0		97.7	5-195		
Benzo(k)fluoranthene	49		2	ug/l	50.0		97.8	25-146		
Bis(2-ethylhexyl)phthalate	47		6	ug/l	50.0		94.4	29-137		
Butyl benzyl phthalate	47		2	ug/l	50.0		94.4	5-152		
Chrysene	48		2	ug/l	50.0		96.2	44-140		
Di(n)octyl phthalate	47		3	ug/l	50.0		95.0	19-132		
Dibenz(a,h)anthracene	50		2	ug/l	50.0		100	5-200		
Diethyl phthalate	43		2	ug/l	50.0		86.6	5-120		
Dimethyl phthalate	43		2	ug/l	50.0		86.6	5-120		
Di-n-butylphthalate	46		3	ug/l	50.0		91.7	8-120		
Fluoranthene	47		2	ug/l	50.0		93.8	43-121		
Fluorene	45		2	ug/l	50.0		89.7	70-120		
Indeno(1,2,3-cd)pyrene	52		2	ug/l	50.0		104	5-151		
Naphthalene	41		2	ug/l	50.0		82.5	36-120		
Pentachlorophenol	48		5	ug/l	50.0		95.7	38-152		
Phenanthrene	46		2	ug/l	50.0		91.7	65-120		
Pyrene	46		2	ug/l	50.0		92.5	70-120		
Surrogate: Nitrobenzene-d5			*41.1*	ug/l	*50.0*		*82.1*	*30-118*		
Surrogate: p-Terphenyl-d14			*44.9*	ug/l	*50.0*		*89.7*	*38-130*		
Surrogate: 2-Fluorobiphenyl			*38.7*	ug/l	*50.0*		*77.3*	*30-119*		
Surrogate: Phenol-d6			*13.3*	ug/l	*50.0*		*26.6*	*10-115*		
Surrogate: 2,4,6-Tribromophenol			*44.9*	ug/l	*50.0*		*89.8*	*15-130*		
Surrogate: 2-Fluorophenol			*18.8*	ug/l	*50.0*		*37.7*	*10-115*		

Quality Control
(Continued)

Polychlorinated Biphenyls (PCBs)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0568 - Sep-Funnel-extraction										
Blank (B0A0568-BLK1)					Prepared: 01/16/20 Analyzed: 01/17/20					
Aroclor-1016	ND		0.2	ug/l						
Aroclor-1221	ND		0.4	ug/l						
Aroclor-1232	ND		0.2	ug/l						
Aroclor-1242	ND		0.2	ug/l						
Aroclor-1248	ND		0.2	ug/l						
Aroclor-1254	ND		0.2	ug/l						
Aroclor-1260	ND		0.2	ug/l						
Aroclor-1262	ND		0.2	ug/l						
Aroclor-1268	ND		0.2	ug/l						
PCBs (Total)	ND		0.2	ug/l						
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*0.0334*	ug/l	*0.0800*		*41.8*	*30-107*		
Surrogate: Decachlorobiphenyl (DCBP)			*0.0414*	ug/l	*0.0800*		*51.7*	*30-140*		
LCS (B0A0568-BS1)					Prepared: 01/16/20 Analyzed: 01/17/20					
Aroclor-1016	0.7		0.2	ug/l	1.00		69.4	40-124		
Aroclor-1260	0.7		0.2	ug/l	1.00		68.1	48-123		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*0.0363*	ug/l	*0.0800*		*45.4*	*30-107*		
Surrogate: Decachlorobiphenyl (DCBP)			*0.0485*	ug/l	*0.0800*		*60.7*	*30-140*		

Quality Control
(Continued)

Hydrocarbon Fingerprint

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0600 - Sep-Funnel-extraction										
Blank (B0A0600-BLK1)					Prepared & Analyzed: 01/17/20					
Gasoline	ND		200	ug/l						
Fuel oil #2/Diesel	ND		200	ug/l						
Fuel oil #4	ND		200	ug/l						
Fuel oil #6	ND		200	ug/l						
Kerosene	ND		200	ug/l						
Motor oil	ND		200	ug/l						
Hydraulic fluid	ND		200	ug/l						
Coal tar	ND		200	ug/l						
Wood creosote	ND		200	ug/l						
Asphalt	ND		200	ug/l						
Total Petroleum Hydrocarbons	ND		200	ug/l						
LCS (B0A0600-BS1)					Prepared & Analyzed: 01/17/20					
Total Petroleum Hydrocarbons	7040		200	ug/l	10000		70.4	40-105		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

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New England Testing Laboratory
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

Chain of Custody Record

Project No.	Project Name/Location
2020.05	1 Pine St, Manchester-by-the-Sea, MA
Client:	Clean Soils Environmental, Ltd. 33 Estes St. Ipswich, MA 01938
Report To:	kevin@cleansoils.com
Invoice To:	denise@cleansoils.com

Date	Time	COMP	GRAB	Sample I.D.	Matrix: Aqueous	Soil	Other	No. of Containers	Preservative	Tests**: Ammonia (NH3)	Chloride	Total Residual Chlorine	Total Suspended Solids	Total Metals (See Notes)	Total Cyanide >12	VOCs - Non-Halogenated	VOCs - Halogenated	SVOCs - Non-Halogenated	SVOCs - Halogenated	Fuels Parameters	Hardness	pH	
01.16.2020	10:00		X	SW-1	X			11	HCl, HNO3, H2SO4, non	X	X	X	X	X	X	X	X	X	X	X	X	X	22

Sampled By:	Date/Time	Received By:	Date/Time	Laboratory Remarks:
JES	01.16.2020 10:00		1/16/2020 800	
Relinquished By:	**Date/Time**	**Received By:**	**Date/Time**	**Temp. Received:**
	1/16/2020 1500		1/16/20 1500	4

Special Instructions:
NPDES Permit Parameters:
(Use EPA 2017 RGP Approved Testing Methods)
Total Metals (Sb, As, Cd, CR-111, Cr-VI, Cu, Fe, Pb, Hg, Ni, Se, Ag, Zn)
Fuels Parameters - Include TPH Fingerprint
Halogenated SVOCs - Include PCBs

Turnaround Time [Business Days]: 1

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New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 0A20002
Client Project: 2020.05 - 1 Pine St, Manchester By The Sea, MA

Report Date: 27-January-2020

Prepared for:

Bill Mitchell
Clean Soils Environmental
33 Estes Street
Ipswich, MA 01938

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 01/20/20. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 0A20002. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
0A20002-01	RW-1	Water	01/17/2020	01/20/2020

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

RW-1 (Lab Number: 0A20002-01)

Analysis	Method
Ammonia	SM4500-NH3-D (11)
Antimony	EPA 200.8
Arsenic	EPA 200.8
Cadmium	EPA 200.8
Chromium	EPA 200.8
Iron	EPA 200.8
Lead	EPA 200.8
pH	SM4500-H-B (11)
Salinity	SM2510-B (11)
Zinc	EPA 200.8

Method References

Methods for the Determination of Metals in Environmental Samples EPA-600/R-94/111, USEPA, 1994

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: General Chemistry

Sample: RW-1

Lab Number: 0A20002-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Ammonia	ND		0.1	mg/L	01/23/20	01/23/20
pH	**7.8**		0.1	SU	01/20/20 17:30	01/20/20 17:30
Salinity	**27.7**		1.0	ppt	01/21/20	01/21/20

Results: Total Metals

Sample: RW-1

Lab Number: 0A20002-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.0010	mg/L	01/21/20	01/21/20
Arsenic	**0.0413**		0.0010	mg/L	01/21/20	01/21/20
Cadmium	ND		0.0010	mg/L	01/21/20	01/21/20
Chromium	**0.0026**		0.0010	mg/L	01/21/20	01/21/20
Iron	**0.630**		0.010	mg/l	01/21/20	01/21/20
Zinc	**0.046**		0.010	mg/l	01/21/20	01/21/20
Lead	**0.0153**		0.0010	mg/L	01/21/20	01/21/20

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0718 - pH										
LCS (B0A0718-BS1)					Prepared & Analyzed: 01/20/20					
pH	7.1		0.1	SU	7.00		101	90-110		
LCS (B0A0718-BS2)					Prepared & Analyzed: 01/20/20					
pH	7.1		0.1	SU	7.00		101	90-110		
Duplicate (B0A0718-DUP1)		**Source: 0A20002-01**			Prepared & Analyzed: 01/20/20					
pH	7.8		0.1	SU		7.8			0.639	20
Batch: B0A0738 - General Chemistry										
Blank (B0A0738-BLK1)					Prepared & Analyzed: 01/21/20					
Salinity	ND		1.0	ppt						
Duplicate (B0A0738-DUP1)		**Source: 0A14024-01**			Prepared & Analyzed: 01/21/20					
Salinity	29.9		1.0	ppt		30.3			1.33	20
Batch: B0A0916 - Ammonia										
Blank (B0A0916-BLK1)					Prepared & Analyzed: 01/23/20					
Ammonia	ND		0.1	mg/L						
Blank (B0A0916-BLK2)					Prepared & Analyzed: 01/23/20					
Ammonia	ND		0.1	mg/L						
LCS (B0A0916-BS1)					Prepared & Analyzed: 01/23/20					
Ammonia	1.1		0.1	mg/L	1.00		106	90-110		

Quality Control
(Continued)

General Chemistry (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0916 - Ammonia (Continued)										
LCS (B0A0916-BS2)					Prepared & Analyzed: 01/23/20					
Ammonia	1.0		0.1	mg/L	1.00		102	90-110		
Duplicate (B0A0916-DUP1)		**Source: 0A16025-01**			Prepared & Analyzed: 01/23/20					
Ammonia	0.5		0.1	mg/L		0.5			5.80	20
Matrix Spike (B0A0916-MS1)		**Source: 0A16025-01**			Prepared & Analyzed: 01/23/20					
Ammonia	1.5		0.1	mg/L	1.00	0.5	99.5	80-120		

Quality Control
(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B0A0754 - Metals Digestion Waters										
Blank (B0A0754-BLK1)					Prepared & Analyzed: 01/21/20					
Arsenic	ND		0.0001	mg/L						
Cadmium	ND		0.0001	mg/L						
Chromium	ND		0.0001	mg/L						
Iron	ND		0.001	mg/l						
Antimony	ND		0.0001	mg/L						
Zinc	ND		0.001	mg/l						
Lead	ND		0.0001	mg/L						
LCS (B0A0754-BS2)					Prepared & Analyzed: 01/21/20					
Chromium	0.0228		0.0001	mg/L	0.0200		114	85-115		
Cadmium	0.0192		0.0001	mg/L	0.0200		96.2	85-115		
Arsenic	0.0202		0.0001	mg/L	0.0200		101	85-115		
Antimony	0.0202		0.0001	mg/L	0.0200		101	85-115		
Zinc	0.199		0.001	mg/l	0.200		99.3	85-115		
Iron	0.213		0.001	mg/l	0.200		106	85-115		
Lead	0.0199		0.0001	mg/L	0.0200		99.3	85-115		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

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New England Testing Laboratory
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

Chain of Custody Record

Project No.	Project Name/Location
2020.05	1 Pine St, Manchester-by-the-Sea, MA
Client:	Clean Soils Environmental, Ltd. 33 Estes St. Ipswich, MA 01938
Report To:	kevin@cleansoils.com
Invoice To:	denise@cleansoils.com

Date	Time	COMP	GRAB	Sample I.D.	Matrix: Aqueous	Soil	Other	No. of Containers	Preservative	Tests**: Ammonia (NH3)	Nitrate	Salinity	Metals - Total (see list)
1/17/2020	1510		/	RW-1	X			3	NaOH HNO3 non	X	X	X	X

Sampled By: [signature] — Date/Time: 1/17/2020 — Received By: [signature]

Relinquished By: [signature] — Date/Time: 1/20/2020 1430 — Received By: [signature]

Date/Time: 1/20/20 1730 — Laboratory Remarks:

Temp. Received: 4

Special Instructions:
NPDES Permit Parameters:
(Use EPA 2017 RGP Approved Testing Methods)
Total Metals: Antimony, Arsenic, Cadmium, Chromium III, Iron, Zinc, Lead,

Turnaround Time [Business Days]: 5

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