TETRA TECH

P.N. 117-7013004
June 30, 2017

Electronic submission via NPDES.Generalpermits@epa.gov

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

RE: Notice of Intent for Remediation General Permit
American Landmark III, LLC
3 Van De Graaff Drive
Burlington, Massachusetts
MassDEP Release Tracking Number 3-0981

To Whom It May Concern

Tetra Tech, Inc., on the behalf of American Landmark III, LLC is submitting this Notice of Intent (NOI) for a Remediation General Permit (RGP) to the United States Environmental Protection Agency (USEPA) for discharge to surface water from the groundwater treatment system located at the property referenced above. This property is a known Disposal Site per 310 CMR 40.0000, the Massachusetts Contingency Plan (MCP), and Release Tracking Number (RTN) 3-0981 was provided by the Massachusetts Department of Environmental Protection (MassDEP). The location of the site is shown on **Figure 1** as an Attachment to this letter. **Figure 1** is based on the USGS quadrangle map of the area. A PDF of this NOI is being sent via the email address identified above.

BACKGROUND

Operation of the groundwater extraction and treatment system at the former High Voltage and former Bellofram Sites (RTN 3-0981) began in 1994 (High Voltage site) and in 1995 (Bellofram site). The systems were modified in June 2002 in order to combine groundwater extraction and treatment from both of these sites. The system is currently operating under an existing 2010 RGP, Permit Authorization #MAG910026. The system that is currently operating consists of eight recovery wells designed to limit off-site migration of contaminated groundwater and to decrease source area groundwater contaminant concentrations. **Figure 2** shows the location of the eight pumping wells, the below grade piping that leads to the groundwater treatment system and the groundwater treatment system and the point of discharge to the wetlands of Vine Brook. The capture zone of the pumping system inhibits the migration of groundwater containing soluble volatile organic compounds (VOCs) to the Zone II area of the Vine Brook aquifer. **Figure 2** also shows the location of the approved Zone II boundary.

TETRA TECH
One Monarch Drive, Suite 202, Littleton, MA 01460
Tel 978.952.0120 Fax 978.952.0122 www.tetratech.com

RECEIVING WATER INFORMATION

The treated groundwater from the site is discharged to a wetland that is a tributary of Vine Brook. There is no "upstream" flow at the location of the discharge. In a phone conversation, Ms. Shauna Little at USEPA New England, suggested that we estimate where the wetland would discharge to Vine Brook and collect the receiving water sample from Vine Brook, upstream of that point. The receiving water sample was collected from Vine Brook just upstream of where the brook crosses Wheeler Road (see **Figure 1**). This location was selected, as it is estimated to be upstream of where the wetland would likely discharge to Vine Brook and it was physically accessible for sampling. The receiving water sample results are summarized in **Table 1** and the laboratory report is attached to this letter.

SOURCE WATER INFORMATION

The laboratory data used to complete Section D. 4. Influent and Effluent Characteristics was based on one influent sample collected June 1, 2017 and analyzed using methods approved for the 2017 RGP. The point of collection for the influent sampling data is a sampling port located just prior to any of the treatment components. Therefore, the influent data is representative of groundwater from all eight recovery wells prior to any treatment. The laboratory report used to prepare the NOI is attached to this letter.

GROUNDWATER TREATMENT SYSTEM DESCRIPTION

Groundwater is continuously extracted by eight submersible pumps located in eight separate recovery wells. Groundwater is pumped through below grade piping to the groundwater treatment system. The total flow rate from the eight recovery wells averages approximately 45 gallons per minute (gpm). The groundwater passes through a bag filter which has a straight high-pressure switch to read filter back-pressure that is wired to the control panel to shut down the well pumps upon a high-pressure alarm condition. The bag filter is used to remove fines prior to treatment. The system is equipped with an in-line magnetic drive vertical turbine meter that measures total flow and flow rate.

The air stripper is a stainless steel tray design. The system was designed by BISCO Environmental (Randolph, Massachusetts) in 2001 to treat four specific influent VOCs with a total concentration of 5,650 ppb to less than one part per billion (ppb) at 65 gpm. There have been no issues with the system meeting discharge goals. Total influent VOC concentrations over the past two years of operation have been below 650 ppb. With current VOC influent concentrations eight times lower than the actual design specification (5,650 ppb), the system has a "built-in" safety factor regarding the treatment of VOCs.

Off-gas from the air striper is treated by one granular activated carbon unit with a capacity of 2,000 pounds of activated carbon. Groundwater from the air stripper is pumped by a transfer pump through below grade piping to the discharge point located in the wetlands of Vine Brook. The transfer pump is equipped with on/off/high-high level controls which are wired to the control panel to shut down the well pumps in case of a high water level alarm condition. The transfer pump rate is set at 65 gpm and pumps intermittently. Attached to this letter is a Groundwater Treatment Equipment Process & Instrumentation Diagram as provided by BISCO Environmental.

ENDANGERED SPECIES ACT ELIGIBILITY DETERMINATION

As discussed above, treated groundwater impacted by VOCs is discharged to a wetland that is a tributary to Vine Brook. The discharge has been ongoing since June 2002 and will continue into the future for an unknown number of years. The discharge rate is approximately 45 gallons per minute. The system, including the discharge piping, and the discharge location in the wetland, was installed in 2001 with the approval of the Town of Burlington Conservation Commission. The area surrounding the site is fully developed and no tree cutting/clearing is anticipated.

The USFWS IPaC planning tool was used to evaluate the Site for federally listed species or designated critical habitats. The IPaC report lists the northern long-eared bat, a statewide federally listed threatened species and states that "*there are no critical habitats at this location*". The IPaC report also lists 20 migratory birds, none of which are listed in Appendix I of the RGP as federally protected species in Massachusetts. Since the site is fully developed and no tree cutting/clearing is anticipated and there is no critical habitat at this location, we conclude that our discharge will have "no effect" on listed species or critical habitat and fall under **FWS Criterion C** for ESA Eligibility. (the IPaC report is attached).

NATIONAL HISTORICA PRESERVATION ACT ELIGIBILITY DETERMINATION

Based on the fact that the treatment system is contained in a building and has operated since 2001, the site is fully developed, no construction activities associated with the site are anticipated, and a visual inspection reveals no historic properties, we conclude that the site falls under **Criterion A**. The discharge and discharge related activities do not have the potential to cause effect on historic properties.

If there are any questions regarding this NOI please do not hesitate to call Mr. Thomas Nunno at (978) 952-0120.

Sincerely,

Tetra Tech, Inc.

Thomas Nunno
Project Manager

Attachments:

- Notice of Intent Form
- Tables
  - Table 1 – Receiving Water Sample Results
- Figures
  - Figure 1 – Site Location Map
  - Figure 2 – As-Built Extraction System Layout
- Analytical Results
  - Receiving Water Results
  - Influent Results
- Groundwater Treatment Equipment Process & Instrumentation Diagram
- U. S Fish & Wildlife Service IPaC Report

CC: Mara Riemer-Goldstein, American Landmark III, LLC
Town of Burlington Conservation Commission (*Cover Letter Only*)

NOTICE OF INTENT FORM

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:

Former High Voltage Engineering Corp. / Bellofram</td><td colspan="3">Site address:
3 Van de Graaff Drive
Street:</td></tr>
<tr><td>City: Burlington</td><td>State: MA</td><td>Zip: 01803</td></tr>
<tr><td rowspan="4">2. Site owner

American Landmark III LLC

Owner is (check one): ☐ Federal ☐ State/Tribal ■ Private
☐ Other; if so, specify:</td><td colspan="3">Contact Person: Mara Riemer Goldstein</td></tr>
<tr><td colspan="2">Telephone: 781-229-1996</td><td>Email: mara@ingenuityMA.com</td></tr>
<tr><td colspan="3">Mailing address:
3 Van de Graaff Drive
Street:</td></tr>
<tr><td>City: Burlington</td><td>State: MA</td><td>Zip: 01803</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner

Tetra Tech</td><td colspan="3">Contact Person: Thomas Nunno</td></tr>
<tr><td colspan="2">Telephone: 978-952-0120</td><td>Email: Thomas.Nunno@TetraTech.com</td></tr>
<tr><td colspan="3">Mailing address:
One Monarch Drive
Street:</td></tr>
<tr><td>City: Littleton</td><td>State: MA</td><td>Zip: 01460</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:

MAG910026

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):
RTN 3-0981
☐ 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):
Vine Brook	MA83-06	Class B

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

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

Are sensitive receptors present near the site? (check one): ■ Yes ☐ No
If yes, specify: Discharge is upgradient of the Zone II Boundary for Burlington Public Water Supply wells.

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. Shawsheen River TMDL for Bacteria, August 2002 (Bacteria TMDL for the Shawsheen River Basin, Report MA83-01-2002-24)

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.	NA
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	0

6. Has the operator received confirmation from the appropriate State for the 7Q10and dilution factor indicated? (check one): ■ Yes ☐ No
If yes, indicate date confirmation received: Verbal communication with Cathy Vakalopoulos 5/12/17

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:	
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): One	Outfall location(s): (Latitude, Longitude) 42 deg 28' 47", -71 deg 11' 59"
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Treated groundwater is travels through underground piping from the treatment system a wetland/stream, which is a tributary to Vine Brook. ☐ A private storm sewer system ☐ A municipal storm sewer system If the discharge enters the receiving water via a private or municipal storm sewer system: Has notification been provided to the owner of this system? (check one): ☐ Yes ☐ No Has the operator has received permission from the owner to use such system for discharges? (check one): ☐ Yes ☐ No, if so, explain, with an estimated timeframe for obtaining permission: Has the operator attached a summary of any additional requirements the owner of this system has specified? (check one): ☐ Yes ☐ No	
Provide the expected start and end dates of discharge(s) (month/year): 06/2002 - unknown end date 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	D6919-09	50	50 U	50 U	Report mg/L	---
Chloride		✔	1	300.0	20000	450000	450000	Report µg/l	---
Total Residual Chlorine	✔		1					0.2 mg/L	11
Total Suspended Solids	✔		1	2540 D	1000 ug/L	1000 U	1000 U	30 mg/L	---
Antimony	✔		1	200.8	1	1 U	1 U	206 µg/L	
Arsenic	✔		1	200.8	1	1 U	1 U	104 µg/L	
Cadmium	✔		1	200.8	1	1 U	1 U	10.2 µg/L	
Chromium III	✔		1	200.8	10	10 U	10 U	323 µg/L	
Chromium VI		✔	1	218.6	10	0.7 J	0.7 J	323 µg/L	
Copper		✔	1	200.8	1	1.5	1.5	242 µg/L	
Iron	✔		1	200.7	100	100 U	100 U	5,000 µg/L	
Lead	✔		1	200.8	1	1 U	1 U	160 µg/L	
Mercury	✔		1	7470A	0.2	0.2 U	0.2 U	0.739 µg/L	
Nickel		✔	1	200.8	1	6.8	6.8	1,450 µg/L	
Selenium		✔	1	200.8	2	1.2 J	1.2 J	235.8 µg/L	
Silver	✔		1	200.8	1	1 U	1 U	35.1 µg/L	
Zinc	✔		1	200.8	5	5 U	5 U	420 µg/L	
Cyanide	✔		1	335.4				178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX	✔		1	624	5	5 U	5 U	100 µg/L	---
Benzene	✔		1	624	1	1 U	1 U	5.0 µg/L	---
1,4 Dioxane		✔	1	522	0.2	0.543	0.543	200 µg/L	---
Acetone		✔	1	524.2	5	2.6 J	2.6 J	7.97 mg/L	---
Phenol		✔	1	420.4	5	5 U	5 U	1,080 µg/L	

TSS reported in ug/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	2	2 U	2 U	4.4 µg/L	
1,2 Dichlorobenzene	✔		1	624	2	2 U	2 U	600 µg/L	---
1,3 Dichlorobenzene	✔		1	624	2	2 U	2 U	320 µg/L	---
1,4 Dichlorobenzene	✔		1	624	2	2 U	2 U	5.0 µg/L	---
Total dichlorobenzene	✔		1	624	6	6 U	6 U	763 µg/L in NH	---
1,1 Dichloroethane		✔	1	624	2	5	5	70 µg/L	---
1,2 Dichloroethane	✔		1	624	2	2 U	2 U	5.0 µg/L	---
1,1 Dichloroethylene		✔	1	624	2	19	19	3.2 µg/L	---
Ethylene Dibromide	✔							0.05 µg/L	---
Methylene Chloride	✔		1	624	2	2 U	2 U	4.6 µg/L	---
1,1,1 Trichloroethane		✔	1	624	2	72	72	200 µg/L	---
1,1,2 Trichloroethane	✔		1	624	2	2 U	2 U	5.0 µg/L	---
Trichloroethylene		✔	1	624	2	10	10	5.0 µg/L	---
Tetrachloroethylene		✔	1	624	2	250	250	5.0 µg/L	3.3
cis-1,2 Dichloroethylene		✔	1	624	2	1.8 J	1.8 J	70 µg/L	---
Vinyl Chloride	✔		1	624	2	2 U	2 U	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✔							190 µg/L	
Diethylhexyl phthalate	✔							101 µg/L	
Total Group I PAHs	✔							1.0 µg/L	---
Benzo(a)anthracene	✔							As Total PAHs	
Benzo(a)pyrene	✔								
Benzo(b)fluoranthene	✔								
Benzo(k)fluoranthene	✔								
Chrysene	✔								
Dibenzo(a,h)anthracene	✔								
Indeno(1,2,3-cd)pyrene	✔								

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	✔							100 µg/L	---
Naphthalene	✔							20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✔							0.000064 µg/L	---
Pentachlorophenol	✔							1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✔							5.0 mg/L	---
Ethanol	✔							Report mg/L	---
Methyl-tert-Butyl Ether	✔							70 µg/L	
tert-Butyl Alcohol	✔							120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔							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	150.2		7.13			
Hardness				2340 B		619 mg/l			
Temperature						18.2 deg C			

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:

2. Provide a written description of all treatment system(s) or processes that will be applied to the effluent prior to discharge.
Groundwater is extracted from eight extraction wells and pumped to a treatment system. System consists of a low profile air stripper EZ Tray Model 12.4-SS. The design was based on treatment of 5,650 ppb influent of VOC concentration down to less than 1 ppb at 65 gpm. The system operates currently operates at up to ~45 gpm and currently has <650 ppb influent total VOC concentration. The bag filter has a high pressure alarm and the transfer pump has a high level alarm, both of which are wired to a control panel which will shut the system down in the event of an alarm.

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:

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: Design Flow Capacity - 65 gpm, Limiting Component - Air Stripper Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	
Provide the proposed maximum effluent flow in gpm.	65
Provide the average effluent flow in gpm.	30
If Activity Category IV applies, indicate the estimated total volume of water that will be discharged:	

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)

None

☐ 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:
Chemical additives are not used

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

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

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 not applicable - discharge is to freshwater

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

See cover letter.

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. Existing discharge, no construction activities required, no historic properties present.

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

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

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

See cover letter.

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

I. Supplemental information

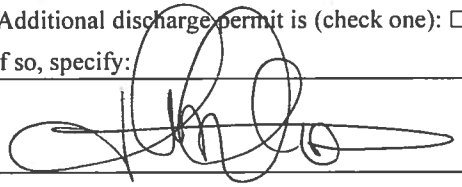
Describe any supplemental information being provided with the NOI. Include attachments if required or otherwise necessary.

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

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

J. Certification requirement

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

BMPP certification statement:	We certify that a BMPP meeting the requirements of the general permit has been developed and implemented.
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: 06/30/2017
Print Name and Title: Thomas Nunno, LSP	

TABLES

TABLE 1 RECEIVING WATER SAMPLE RESULTS

Table 1. Receiving Water Sample Results

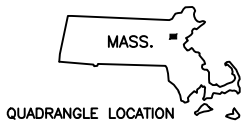
Chris Coner, Chris.Coner@tetratech.com
Former High Voltage Engineering Corp. / Bellofram
RGP Permit # – MAG910026
Vine Brook
Vine Brook at Wheeler Road
Activity Category
↓

II. C.		pH	Temp	Ammonia	Hardness (Freshwater)
Units	→	SU	°C	µg/L	mg/L
Method	→	150.2		ASTM D6919-09	SM2340 C-1997
Permit Limit	→				
Min		7.14	18.3	121	170
Max		7.14	18.3	121	170
Avg		7.14	18.3	121	170
# of measurements		1	1	1	1
Sample Date		Results			
↓		↓			
6/1/2017		7.14	18.3	121	170

FIGURES

Scanned USGS Quads by MassGIS

0 1,500
Scale in feet



QUADRANGLE LOCATION

G:\HIGHVOLT_2017\LOCUS.DWG

TITLE:

SITE LOCATION MAP

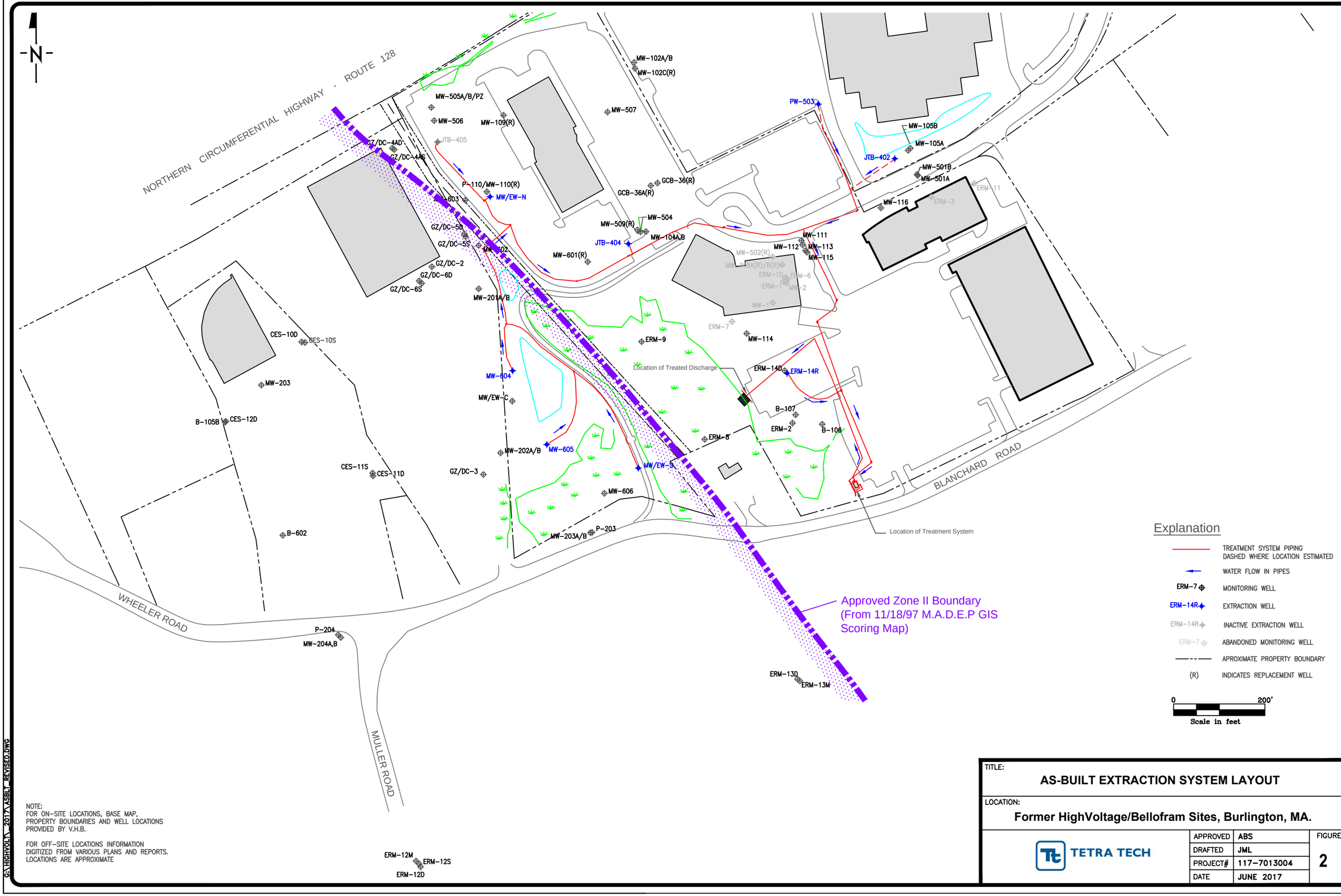
LOCATION:

Former HighVoltage/Bellofram Sites, Burlington, MA.

TETRA TECH

APPROVED	ABS
DRAFTED	JML
PROJECT#	
DATE	JUNE 2017

FIGURE 1


N
NORTHERN CIRCUMFERENTIAL HIGHWAY - ROUTE 128
MW-102A/B
MW-102C(R)
MW-505A/B/PZ
MW-506
MW-109(R)
MW-507
PW-503
MW-105B
MW-105A
JTB-405
GZ/DC-4AD
GZ/DC-4AS
JTB-402
MW-501B
MW-501A
P-110/MW-110(R)
MW/EW-N
GCB-36(R)
GCB-36A(R)
MW-603
MW-116
ERM-11
ERM-3
MW-509(R)
MW-504
GZ/DC-5D
GZ/DC-5S
MW-104A,B
MW-111
MW-112
MW-113
MW-115
JTB-404
MW-502(R)
MW-601(R)
GZ/DC-2
GZ/DC-6D
GZ/DC-6S
MW-201A/B
ERM-10
ERM-6
ERM-1
MW-2
MW-1
ERM-7
MW-114
CES-10D
CES-10S
ERM-9
Location of Treated Discharge
ERM-14D
ERM-14R
MW-203
MW-604
MW/EW-C
B-107
B-105B
CES-12D
ERM-2
B-106
ERM-8
MW-202A/B
MW-605
MW/EW-S
CES-11S
CES-11D
GZ/DC-3
MW-606
BLANCHARD ROAD
B-602
MW-203A/B
P-203
Location of Treatment System
WHEELER ROAD
P-204
MW-204A,B
Approved Zone II Boundary
(From 11/18/97 M.A.D.E.P GIS
Scoring Map)
ERM-13D
ERM-13M
MULLER ROAD
ERM-12M
ERM-12S
ERM-12D
NOTE:
FOR ON-SITE LOCATIONS, BASE MAP,
PROPERTY BOUNDARIES AND WELL LOCATIONS
PROVIDED BY V.H.B.
FOR OFF-SITE LOCATIONS INFORMATION
DIGITIZED FROM VARIOUS PLANS AND REPORTS.
LOCATIONS ARE APPROXIMATE
Explanation
TREATMENT SYSTEM PIPING
DASHED WHERE LOCATION ESTIMATED
WATER FLOW IN PIPES
ERM-7 MONITORING WELL
ERM-14R EXTRACTION WELL
ERM-14R INACTIVE EXTRACTION WELL
ERM-7 ABANDONED MONITORING WELL
APROXIMATE PROPERTY BOUNDARY
(R) INDICATES REPLACEMENT WELL
0
200'
Scale in feet
G:\HIGHVOLT_2017\ASBLT_REVISED.DWG
TITLE:
AS-BUILT EXTRACTION SYSTEM LAYOUT
LOCATION:
Former HighVoltage/Bellofram Sites, Burlington, MA.
TETRA TECH
APPROVED ABS
DRAFTED JML
PROJECT# 117-7013004
DATE JUNE 2017
FIGURE
2

ANALYTICAL RESULTS

RECEIVING WATER RESULTS
INFLUENT RESULTS

June 12, 2017 Service Request No:R1705041

Ms. Anne Sheehan
Tetra Tech Geo
One Monarch Drive, Suite 202
Littleton, MA 01460

Laboratory Results for: HVEC

Dear Ms.Sheehan,

Enclosed are the results of the sample(s) submitted to our laboratory June 02, 2017
For your reference, these analyses have been assigned our service request number **R1705041.**

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Brady Kalkman
Project Manager

ADDRESS 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
PHONE +1 585 288 5380 | FAX +1 585 288 8475
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

1565 Jefferson Rd, Building 300, Rochester, NY 14623 | 585-288-5380 | www.alsglobal.com

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request:R1705041
Date Received:6/2/17

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables, including results of QC samples analyzed from this delivery group. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt

One water sample was received for analysis at ALS Environmental on 06/02/2017. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at ≤6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

General Chemistry Analyses:

No significant anomalies were noted with this analysis.

Approved by _____ Date 6/12/2017

SAMPLE DETECTION SUMMARY

CLIENT ID: Vine Brook	Lab ID: R1705041-001					
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Ammonia as Nitrogen, undistilled	0.121		0.008	0.050	mg/L	ASTM
Hardness, Total as CaCO3	170		0.4	10	mg/L	SM 2340 C-

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Tetra Tech GEO **Service Request:**R1705041
Project: HVEC/117-7013005

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1705041-001	Vine Brook	6/1/2017	1100

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

45102

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 1 OF 1

Project Name: HVEC	Project Number: 117-7013005
Project Manager: Anne Sheehan	Report CC:
Company/Address: Tetra Tech 1 Monarch Dr ste 202 Littleton MA 01460	
Phone #: (978) 952-0120	Email: anne.sheehan@tetratech.com
Sampler's Signature:	Sampler's Printed Name: Chris Coner

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE: 1/0 | 2 | 0 3 0 8 1 4 3 0

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOAs 8260 X / 624 ○ CLP	GC/MS SVOAs ○ 8270 ○ 625	GC VOAs ○ 8021 ○ 601/602	PESTICIDES ○ 8081 ○ 608	PCBs ○ 8082 ○ 608	METALS, TOTAL (List in comments below) Hardness	METALS, DISSOLVED (List in comments below)	300.0-Cl/Tot. Res. Cl	NH_3	522 1,4-dioxane	218.6	524.2 Acetone	Cyanide	Phenol	TSS	REMARKS/ ALTERNATE DESCRIPTION
EFF-060117		6/1/17	0930	GW	19	X					X		X	X	X	X	X	X	X	X	
INF-060117		6/1/17	1000	GW	19	X					X		X	X	X	X	X	X	X	X	
MW/EW-S-517		6/1/17	1030	GW	4	X									X						VOAs: 8260 only
Vine Brook		6/1/17	1100	GW	2						X			X							NH_3, Hardness only
TB-060117		6/1/17	0700	LW	3	X															VOAs: 8260 only

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other Cr6 Buffer

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See project specific analytes/RLs
Cl residual not needed as per Brady Kalkman email 6/2/17

See QAPP ☒

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 1 day ____ 2 day ____ 3 day
____ 4 day ____ 5 day
REQUESTED REPORT DATE: Standard

REPORT REQUIREMENTS
____ I. Results Only
☒ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
Edata X Yes ____ No

INVOICE INFORMATION
PO #
BILL TO: American Landmark JV
c/o Paul Nugent
3 Van de Graaff Dr
Burlington MA

STATE WHERE SAMPLES WERE COLLECTED

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature:	Signature: FedEx	Signature:	Signature:	Signature:	Signature:
Printed Name: Chris Coner	Printed Name:	Printed Name:	Printed Name:	Printed Name:	Printed Name:
Firm: Tetra Tech	Firm:	Firm:	Firm: MS	Firm:	Firm:
Date/Time: 6/1/17 1700	Date/Time: 6/1/17 1700	Date/Time:	Date/Time: 6/2/17 0955	Date/Time:	Date/Time:

R1705041
Tetra Tech Geo
HVEC
7

Distribution: White - Lab Copy; Yellow - Return to Originator

R1705041 Tetra Tech Geo HVEC 7

Cooler Receipt and Preservation Check Form

Project/Client Tetra Tech Folder Number .

Cooler received on 6/2/17 by: @ COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	(Y) N
2	**Custody papers** properly completed (ink, signed)?	(Y) N
3	Did all bottles arrive in good **condition** (unbroken)?	(Y) N
4	Circle: (Wet Ice) **Dry Ice Gel packs** present?	(Y) N

5a	**Perchlorate** samples have required headspace?	Y N (NA)
5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y (N) NA
6	Where did the bottles originate?	(ALS/ROC) CLIENT
7	Soil VOA received as: Bulk Encore 5035set	(NA)

8. Temperature Readings Date: 6/2/17 Time: 1020 ID: IR#7 (IR#8) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	4.7						
Correction Factor (°C)	+0.9						
Corrected Temp (°C)	5.6						
Temp from:Type of bottle	Cent tube						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: Ice melted Poorly Packed Same Day Rule

&Client Approval to Run Samples: Standing Approval Client aware at drop-off Client notified by:

All samples held in storage location: R-002 by @ on 6/2/17 at 1025
5035 samples placed in storage location: by on at

Cooler Breakdown: Date: 6/6/17 Time: 0827 by: @

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
10. Did all bottle labels and tags agree with custody papers? (YES) NO
11. Were correct containers used for the tests indicated? (YES) NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO (N/A)
13. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2	2134/4	HNO_3	✓		BDBZ157E	5/18				
≤2	↓	H_2SO_4	✓		180439	5/18				
<4		$NaHSO_4$								
Residual Chlorine (-)		For CN Phenol and 522			If +, contact PM to add $Na_2S_2O_3$ (CN), ascorbic (phenol).					
		$Na_2S_2O_3$	-	-						
		ZnAcetate	-	-						
		HCl	**	**						

**Not to be tested before analysis – pH tested and recorded by VOAs on a separate worksheet

Bottle lot numbers: 051317-2AMB

Explain all Discrepancies/ Other Comments:

~~CLRES~~	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	~~SUB~~
SO3	MARRS
ALS	REV

Labels secondary reviewed by: @

PC Secondary Review:

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

Miscellaneous Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.

Spike was diluted out.

+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% (25% for CLP) difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

Lab ID # for Massachusetts Certification

M-NY032

Analyses were conducted in accordance with Massachusetts Department of Environmental Protection certification standards, except as noted in the laboratory case narrative provided. A copy of the current Department issued parameter list is included in this report.

The Commonwealth of Massachusetts

Department of Environmental Protection

Division of Environmental Analysis

Senator William X. Wall Experiment Station

certifies

M-NY032

ALS ENVIRONMENTAL ROCHESTER
1565 JEFFERSON RD
BUILDING 300, SUITE 360
ROCHESTER, NY 14623-0000

Laboratory Director: **CARLTON BEECHLER**

for the analysis of **NON POTABLE WATER (CHEMISTRY)**

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

Issued: **01 JUL 2016**

Expires: **30 JUN 2017**

Oscar C. Jacobs

Director, Division of Environmental Analysis

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 25 APR 2017

M-NY032 **ALS ENVIRONMENTAL ROCHESTER**
ROCHESTER NY

NON POTABLE WATER (CHEMISTRY) **Effective Date** **25 APR 2017** **Expiration Date** **30 JUN 2017**

Analytes	Methods
ALUMINUM	EPA 200.7
ANTIMONY	EPA 200.7
ANTIMONY	EPA 200.8
ARSENIC	EPA 200.7
ARSENIC	EPA 200.8
BERYLLIUM	EPA 200.7
BERYLLIUM	EPA 200.8
CADMIUM	EPA 200.7
CADMIUM	EPA 200.8
CHROMIUM	EPA 200.7
CHROMIUM	EPA 200.8
COBALT	EPA 200.7
COBALT	EPA 200.8
COPPER	EPA 200.7
COPPER	EPA 200.8
IRON	EPA 200.7
LEAD	EPA 200.7
LEAD	EPA 200.8
MANGANESE	EPA 200.7
MANGANESE	EPA 200.8
MERCURY	EPA 245.1
MOLYBDENUM	EPA 200.7
MOLYBDENUM	EPA 200.8
NICKEL	EPA 200.7
NICKEL	EPA 200.8
SELENIUM	EPA 200.7
SELENIUM	EPA 200.8
SILVER	EPA 200.7
SILVER	EPA 200.8
THALLIUM	EPA 200.7
THALLIUM	EPA 200.8
VANADIUM	EPA 200.7
VANADIUM	EPA 200.8
ZINC	EPA 200.7
ZINC	EPA 200.8
SPECIFIC CONDUCTIVITY	EPA 120.1
TOTAL DISSOLVED SOLIDS	SM 2540C
HARDNESS (CACO3), TOTAL	SM 2340C
CALCIUM	EPA 200.7
MAGNESIUM	EPA 200.7
SODIUM	EPA 200.7
POTASSIUM	EPA 200.7
ALKALINITY, TOTAL	SM 2320B

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 25 APR 2017

M-NY032 ALS ENVIRONMENTAL ROCHESTER
ROCHESTER NY

NON POTABLE WATER (CHEMISTRY) **Effective Date** **25 APR 2017** **Expiration Date** **30 JUN 2017**

Analytes	Methods
CHLORIDE	EPA 300.0
FLUORIDE	EPA 300.0
SULFATE	EPA 300.0
AMMONIA-N	EPA 350.1
NITRATE-N	EPA 300.0
NITRATE-N	EPA 353.2
KJELDAHL-N	EPA 351.2
ORTHOPHOSPHATE	EPA 365.1
PHOSPHORUS, TOTAL	EPA 365.1
CHEMICAL OXYGEN DEMAND	EPA 410.4
BIOCHEMICAL OXYGEN DEMAND	SM 5210B
TOTAL ORGANIC CARBON	SM 5310C
CYANIDE, TOTAL	EPA 335.4
NON-FILTERABLE RESIDUE	SM 2540D
OIL AND GREASE	EPA 1664
PHENOLICS, TOTAL	EPA 420.4
VOLATILE HALOCARBONS	EPA 624
VOLATILE AROMATICS	EPA 624
SVOC-ACID EXTRACTABLES	EPA 625
SVOC-BASE/NEUTRAL EXTRACTABLES	EPA 625
POLYCHLORINATED BIPHENYLS (WATER)	EPA 608

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client:	Tetra Tech GEO	**Service Request:**	R1705041
Project:	HVEC/117-7013005		

Sample Name:	Vine Brook	**Date Collected:**	06/1/17
Lab Code:	R1705041-001	**Date Received:**	06/2/17
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
ASTM D6919-09		CWOODS
SM 2340 C-1997(2011)		TSANTIAGO

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

Sample Results

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705041
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 11:00
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	Vine Brook	**Basis:**	NA
Lab Code:	R1705041-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Ammonia as Nitrogen, undistilled	ASTM D6919-09	**0.121**	mg/L	0.050	0.008	10	06/08/17 16:21	
Hardness, Total as CaCO3	SM 2340 C-1997(2011)	**170**	mg/L	10	0.4	1	06/06/17 15:30	

QC Summary Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705041
Project:	HVEC/117-7013005	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1705041-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Q
Ammonia as Nitrogen, undistilled	ASTM D6919-09	0.0050	U	mg/L	0.0050	0.0008	1	06/08/17 15:06	
Hardness, Total as CaCO3	SM 2340 C-1997(2011)	2.0	U	mg/L	2.0	0.07	1	06/06/17 15:30	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Tetra Tech GEO	**Service Request:**	R1705041
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17
Sample Matrix:	Water	**Date Received:**	06/02/17
		Date Analyzed:	06/8/17

Duplicate Matrix Spike Summary
Ammonia as Nitrogen, undistilled

Sample Name:	Vine Brook	**Units:**	mg/L
Lab Code:	R1705041-001	**Basis:**	NA
Analysis Method:	ASTM D6919-09		

		Matrix Spike R1705041-001MS			Duplicate Matrix Spike R1705041-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Ammonia as Nitrogen, undistilled	0.121	4.97	5.00	97	4.89	5.00	95	90-110	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request: R1705041
Date Analyzed: 06/06/17 - 06/08/17

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1705041-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen, undistilled	ASTM D6919-09	0.482	0.500	96	90-110
Hardness, Total as CaCO3	SM 2340 C-1997(2011)	21.0	20.0	105	85-112

June 21, 2017 Service Request No:R1705013

Ms. Anne Sheehan
Tetra Tech Geo
One Monarch Drive, Suite 202
Littleton, MA 01460

Laboratory Results for: HVEC

Dear Ms.Sheehan,

Enclosed are the results of the sample(s) submitted to our laboratory June 02, 2017
For your reference, these analyses have been assigned our service request number **R1705013.**

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Brady Kalkman
Project Manager

ADDRESS 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
PHONE +1 585 288 5380 | FAX +1 585 288 8475
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

1565 Jefferson Rd, Building 300, Rochester, NY 14623 | 585-288-5380 | www.alsglobal.com

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request:R1705013
Date Received:6/2/17

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables, including results of QC samples analyzed from this delivery group. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt

Two Water samples were received for analysis at ALS Environmental on 06/02/2017. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at ≤6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

Volatile Organic Analyses:

No significant anomalies were noted with this analysis.

Semi-Volatile Organic Analyses:

No significant anomalies were noted with this analysis.

Metals Analyses:

Method 200.8, 6/8/17, R1705013-001, 002: The recovery of one or more internal standards was outside method control limits. The sample was repeated at a dilution per method requirements and reported. The Method Reporting Limit (MRL) is elevated due to this dilution. No further corrective action was appropriate.

General Chemistry Analyses:

No significant anomalies were noted with this analysis.

Subcontracted Analytical Parameters:

One or more samples were subcontracted to another laboratory for testing. The certified analytical report from the subcontractor has been included in its entirety at the end of this report and includes the name and address of the subcontracted laboratory.

Chromium III Calculation

Effluent: Cr3+ = CrT - Cr6+ 0.01 U mg/L - 0.00007 J mg/L = 0.01 U mg/L
Influent: Cr3+ = CrT - Cr6+ 0.01 U mg/L - 0.00007 J mg/L = 0.01 U mg/L

Approved by _____ Date 6/21/2017

SAMPLE DETECTION SUMMARY

CLIENT ID: EFF-060117	Lab ID: R1705013-001					
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Chromium, Hexavalent, Dissolved	0.0007	J	0.0005	0.010	mg/L	218.6
Chloride	450		2	20	mg/L	300.0
Hardness, Total as CaCO3	619				mg/L	SM 2340 B-
Calcium, Total	167000		800	5000	ug/L	200.7
Copper, Total	3.5		0.2	1.0	ug/L	200.8
Magnesium, Total	48900		9	1000	ug/L	200.7
Nickel, Total	7.0		0.06	1.0	ug/L	200.8
Selenium, Total	1.1	J	0.2	2.0	ug/L	200.8
Tetrachloroethene (PCE)	0.39	J	0.20	1.0	ug/L	624
1,4-Dioxane	0.543		0.0200	0.200	ug/L	522

CLIENT ID: INF-060117	Lab ID: R1705013-002					
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Chromium, Hexavalent, Dissolved	0.0007	J	0.0005	0.010	mg/L	218.6
Chloride	443		2	20	mg/L	300.0
Hardness, Total as CaCO3	618				mg/L	SM 2340 B-
Calcium, Total	169000		800	5000	ug/L	200.7
Copper, Total	1.5		0.2	1.0	ug/L	200.8
Magnesium, Total	47600		9	1000	ug/L	200.7
Nickel, Total	6.8		0.06	1.0	ug/L	200.8
Selenium, Total	1.2	J	0.2	2.0	ug/L	200.8
1,1,1-Trichloroethane (TCA)	72		0.40	2.0	ug/L	624
1,1-Dichloroethane (1,1-DCA)	5.0		0.42	2.0	ug/L	624
1,1-Dichloroethene (1,1-DCE)	19		0.40	2.0	ug/L	624
Tetrachloroethene (PCE)	250		0.40	2.0	ug/L	624
Trichloroethene (TCE)	10		0.40	2.0	ug/L	624
cis-1,2-Dichloroethene	1.8	J	0.40	2.0	ug/L	624
1,4-Dioxane	0.605		0.0200	0.200	ug/L	522

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Tetra Tech GEO **Service Request:**R1705013
Project: HVEC/117-7013005

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1705013-001	EFF-060117	6/1/2017	0930
R1705013-002	INF-060117	6/1/2017	1000

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

45102

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 1 OF 1

Project Name: AVEL	Project Number: 117-7013005
Project Manager: Anne Sheehan	Report CC:
Company/Address: Tetra Tech 1 Monarch Dr ste 202 Littleton MA 01460	
Phone #: (978) 952-0120	Email: anne.sheehan@tetratech.com
Sampler's Signature:	Sampler's Printed Name: Chris Coyer

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE: 1/0 | 2 | 0 3 0 4 | 1 | 4 3 0

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOAs ○ 8260 ○ 624 ○ CLP	GC/MS SVOAs ○ 8270 ○ 625	GC VOAs ○ 8021 ○ 601/602	PESTICIDES ○ 8081 ○ 608	PCBs ○ 8082 ○ 608	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	300.0-Cl/Tot. Res. Cl	NH_3	522 1,4-dioxane	218.6	524.2 Acetone	Cyanide	Phenol	TSS	REMARKS/ ALTERNATE DESCRIPTION
EFF-060117		6/1/17	0930	GW	19	X					X		X	X	X	X	X	X	X	X	
INF-060117		6/1/17	1000	GW	19	X					X		X	X	X	X	X	X	X	X	
MW/EW-S-517		6/1/17	1030	GW	4	X									X						VOAs: 8260 only
Vine Brook		6/1/17	1100	GW	2						X			X							NH_3, Hardness only
TB-060117		6/1/17	0700	LW	3	X															VOAs: 8260 only

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other Cr6 Buffer

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See project specific analytes/RLs
Cl residual not needed as per Brady Kalkman email 6/2/17

See QAPP ☒

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 1 day ____ 2 day ____ 3 day
____ 4 day ____ 5 day
REQUESTED REPORT DATE: Standard

REPORT REQUIREMENTS
____ I. Results Only
☒ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
Edata ☒ Yes ____ No

INVOICE INFORMATION
PO #
BILL TO: American Landmark III
c/o Paul Nugent
3 Van de Graaff Dr
Burlington MA

STATE WHERE SAMPLES WERE COLLECTED

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature FedEx	Signature	Signature	Signature	Signature
Printed Name: Chris Coyer	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Firm: Tetra Tech	Firm	Firm	Firm: ALS	Firm	Firm
Date/Time: 6/1/17 1700	Date/Time: 6/1/17 1700	Date/Time	Date/Time: 6/2/17 0955	Date/Time	Date/Time

Distribution: White - Lab Copy; Yellow - Return to Originator

Cooler Receipt and Preservation Check Form

Project/Client Tetra Tech Folder Number .

Cooler received on 6/2/17 by: @

COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	(Y) N
2	**Custody papers** properly completed (ink, signed)?	(Y) N
3	Did all bottles arrive in good **condition** (unbroken)?	(Y) N
4	Circle: (Wet Ice) **Dry Ice Gel packs** present?	(Y) N

5a	**Perchlorate** samples have required headspace?	Y N (NA)
5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y (N) NA
6	Where did the bottles originate?	(ALS/ROC) CLIENT
7	Soil VOA received as: Bulk Encore 5035set	(NA)

8. Temperature Readings Date: 6/2/17 Time: 1020 ID: IR#7 (IR#8) From: (Temp Blank) Sample Bottle

Observed Temp (°C)	4.7						
Correction Factor (°C)	+0.9						
Corrected Temp (°C)	5.6						
Temp from:Type of bottle	Cent tube						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: Ice melted Poorly Packed Same Day Rule

&Client Approval to Run Samples: Standing Approval Client aware at drop-off Client notified by:

All samples held in storage location: R-002 by @ on 6/2/17 at 1025
5035 samples placed in storage location: by on at

Cooler Breakdown: Date: 6/2/17 Time: 1525 by: @

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
10. Did all bottle labels and tags agree with custody papers? (YES) NO
11. Were correct containers used for the tests indicated? (YES) NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO (N/A)
13. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12	213416	NaOH	✓		177057	7/18				
≤2		HNO_3	✓		BDB261572E	5/18				
≤2		H_2SO_4	✓		180439	5/18				
<4		$NaHSO_4$	✓		BDB261466C	5/18				
Residual Chlorine (-)		For CN Phenol and 522	✓		If +, contact PM to add $Na_2S_2O_3$ (CN), ascorbic (phenol).					
		$Na_2S_2O_3$	-	-						
		ZnAcetate	-	-						
		HCl	**	**	4115022					

**Not to be tested before analysis – pH tested and recorded by VOAs on a separate worksheet

Bottle lot numbers: 6-222-001, 6-195-001, 041517-1BMC, 051317-2HNO, 091916-2HCL, 050917-2HCL

Explain all Discrepancies/ Other Comments:

Cr+6 Buffer : 175295 Exp. 8/17

Read both 624_UNP & 8260_FP vials

Cr+6 & pH adjust

(CLIES)	BULK
DO	FLDT
HPROD	HGFB
(HTR)	LL3541
PH	(SUB)
SO3	MARRS
ALS	REV

Labels secondary reviewed by: @

PC Secondary Review:

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

Miscellaneous Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.

Spike was diluted out.

+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% (25% for CLP) difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

Lab ID # for Massachusetts Certification

M-NY032

Analyses were conducted in accordance with Massachusetts Department of Environmental Protection certification standards, except as noted in the laboratory case narrative provided. A copy of the current Department issued parameter list is included in this report.

The Commonwealth of Massachusetts

Department of Environmental Protection

Division of Environmental Analysis

Senator William X. Wall Experiment Station

certifies

M-NY032

ALS ENVIRONMENTAL ROCHESTER
1565 JEFFERSON RD
BUILDING 300, SUITE 360
ROCHESTER, NY 14623-0000

Laboratory Director: **CARLTON BEECHLER**

for the analysis of **NON POTABLE WATER (CHEMISTRY)**

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

Issued: **01 JUL 2016**

Expires: **30 JUN 2017**

Oscar C. Jacobs

Director, Division of Environmental Analysis

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 25 APR 2017

M-NY032 **ALS ENVIRONMENTAL ROCHESTER**
ROCHESTER NY

NON POTABLE WATER (CHEMISTRY) **Effective Date** **25 APR 2017** **Expiration Date** **30 JUN 2017**

Analytes	Methods
ALUMINUM	EPA 200.7
ANTIMONY	EPA 200.7
ANTIMONY	EPA 200.8
ARSENIC	EPA 200.7
ARSENIC	EPA 200.8
BERYLLIUM	EPA 200.7
BERYLLIUM	EPA 200.8
CADMIUM	EPA 200.7
CADMIUM	EPA 200.8
CHROMIUM	EPA 200.7
CHROMIUM	EPA 200.8
COBALT	EPA 200.7
COBALT	EPA 200.8
COPPER	EPA 200.7
COPPER	EPA 200.8
IRON	EPA 200.7
LEAD	EPA 200.7
LEAD	EPA 200.8
MANGANESE	EPA 200.7
MANGANESE	EPA 200.8
MERCURY	EPA 245.1
MOLYBDENUM	EPA 200.7
MOLYBDENUM	EPA 200.8
NICKEL	EPA 200.7
NICKEL	EPA 200.8
SELENIUM	EPA 200.7
SELENIUM	EPA 200.8
SILVER	EPA 200.7
SILVER	EPA 200.8
THALLIUM	EPA 200.7
THALLIUM	EPA 200.8
VANADIUM	EPA 200.7
VANADIUM	EPA 200.8
ZINC	EPA 200.7
ZINC	EPA 200.8
SPECIFIC CONDUCTIVITY	EPA 120.1
TOTAL DISSOLVED SOLIDS	SM 2540C
HARDNESS (CACO3), TOTAL	SM 2340C
CALCIUM	EPA 200.7
MAGNESIUM	EPA 200.7
SODIUM	EPA 200.7
POTASSIUM	EPA 200.7
ALKALINITY, TOTAL	SM 2320B

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 25 APR 2017

M-NY032 **ALS ENVIRONMENTAL ROCHESTER**
ROCHESTER NY

NON POTABLE WATER (CHEMISTRY) **Effective Date** **25 APR 2017** **Expiration Date** **30 JUN 2017**

Analytes	Methods
CHLORIDE	EPA 300.0
FLUORIDE	EPA 300.0
SULFATE	EPA 300.0
AMMONIA-N	EPA 350.1
NITRATE-N	EPA 300.0
NITRATE-N	EPA 353.2
KJELDAHL-N	EPA 351.2
ORTHOPHOSPHATE	EPA 365.1
PHOSPHORUS, TOTAL	EPA 365.1
CHEMICAL OXYGEN DEMAND	EPA 410.4
BIOCHEMICAL OXYGEN DEMAND	SM 5210B
TOTAL ORGANIC CARBON	SM 5310C
CYANIDE, TOTAL	EPA 335.4
NON-FILTERABLE RESIDUE	SM 2540D
OIL AND GREASE	EPA 1664
PHENOLICS, TOTAL	EPA 420.4
VOLATILE HALOCARBONS	EPA 624
VOLATILE AROMATICS	EPA 624
SVOC-ACID EXTRACTABLES	EPA 625
SVOC-BASE/NEUTRAL EXTRACTABLES	EPA 625
POLYCHLORINATED BIPHENYLS (WATER)	EPA 608

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: Tetra Tech GEO **Service Request:** R1705013
Project: HVEC/117-7013005

Sample Name: EFF-060117 **Date Collected:** 06/1/17
Lab Code: R1705013-001 **Date Received:** 06/2/17
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.7	KMCLAEN	NMANSEN
200.8	KMCLAEN	CKUTZER
218.6		CWOODS
300.0		AMOSES
335.4	MROGERSON	GNITAJOUPPI
420.4		BBOWE
522	JMISIUREWICZ	JMISIUREWICZ
624		DLIPANI
7470A	NMANSEN	NMANSEN
ASTM D6919-09		CWOODS
SM 2340 B-1997(2011)		CWOODS
SM 2540 D-1997(2011)		KWONG

Sample Name: INF-060117 **Date Collected:** 06/1/17
Lab Code: R1705013-002 **Date Received:** 06/2/17
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.7	KMCLAEN	NMANSEN
200.8	KMCLAEN	CKUTZER
218.6		CWOODS
300.0		AMOSES
335.4	MROGERSON	GNITAJOUPPI
420.4		BBOWE
522	JMISIUREWICZ	JMISIUREWICZ
624		DLIPANI
7470A	NMANSEN	NMANSEN
ASTM D6919-09		CWOODS
SM 2340 B-1997(2011)		CWOODS
SM 2540 D-1997(2011)		KWONG

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

Sample Results

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Volatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 09:30
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	EFF-060117	**Units:**	ug/L
Lab Code:	R1705013-001	**Basis:**	NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analysis Method: 624

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	1.0	U	1.0	0.20	1	06/05/17 17:38	
1,1,2-Trichloroethane	1.0	U	1.0	0.20	1	06/05/17 17:38	
1,1-Dichloroethane (1,1-DCA)	1.0	U	1.0	0.21	1	06/05/17 17:38	
1,1-Dichloroethene (1,1-DCE)	1.0	U	1.0	0.20	1	06/05/17 17:38	
1,2-Dichlorobenzene	1.0	U	1.0	0.25	1	06/05/17 17:38	
1,2-Dichloroethane	1.0	U	1.0	0.20	1	06/05/17 17:38	
1,3-Dichlorobenzene	1.0	U	1.0	0.22	1	06/05/17 17:38	
1,4-Dichlorobenzene	1.0	U	1.0	0.20	1	06/05/17 17:38	
Benzene	1.0	U	1.0	0.20	1	06/05/17 17:38	
Carbon Tetrachloride	1.0	U	1.0	0.20	1	06/05/17 17:38	
Methylene Chloride	1.0	U	1.0	0.20	1	06/05/17 17:38	
Ethylbenzene	1.0	U	1.0	0.20	1	06/05/17 17:38	
Tetrachloroethene (PCE)	**0.39**	**J**	1.0	0.20	1	06/05/17 17:38	
Toluene	1.0	U	1.0	0.20	1	06/05/17 17:38	
Trichloroethene (TCE)	1.0	U	1.0	0.20	1	06/05/17 17:38	
Vinyl Chloride	1.0	U	1.0	0.20	1	06/05/17 17:38	
cis-1,2-Dichloroethene	1.0	U	1.0	0.20	1	06/05/17 17:38	
m,p-Xylenes	2.0	U	2.0	0.26	1	06/05/17 17:38	
o-Xylene	1.0	U	1.0	0.20	1	06/05/17 17:38	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	102	81 - 127	06/05/17 17:38	
4-Bromofluorobenzene	104	79 - 123	06/05/17 17:38	
Toluene-d8	105	83 - 120	06/05/17 17:38	

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 10:00
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	INF-060117	**Units:**	ug/L
Lab Code:	R1705013-002	**Basis:**	NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analysis Method: 624

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	**72**		2.0	0.40	2	06/05/17 18:40	
1,1,2-Trichloroethane	2.0	U	2.0	0.40	2	06/05/17 18:40	
1,1-Dichloroethane (1,1-DCA)	**5.0**		2.0	0.42	2	06/05/17 18:40	
1,1-Dichloroethene (1,1-DCE)	**19**		2.0	0.40	2	06/05/17 18:40	
1,2-Dichlorobenzene	2.0	U	2.0	0.50	2	06/05/17 18:40	
1,2-Dichloroethane	2.0	U	2.0	0.40	2	06/05/17 18:40	
1,3-Dichlorobenzene	2.0	U	2.0	0.44	2	06/05/17 18:40	
1,4-Dichlorobenzene	2.0	U	2.0	0.40	2	06/05/17 18:40	
Benzene	2.0	U	2.0	0.40	2	06/05/17 18:40	
Carbon Tetrachloride	2.0	U	2.0	0.40	2	06/05/17 18:40	
Methylene Chloride	2.0	U	2.0	0.40	2	06/05/17 18:40	
Ethylbenzene	2.0	U	2.0	0.40	2	06/05/17 18:40	
Tetrachloroethene (PCE)	**250**		2.0	0.40	2	06/05/17 18:40	
Toluene	2.0	U	2.0	0.40	2	06/05/17 18:40	
Trichloroethene (TCE)	**10**		2.0	0.40	2	06/05/17 18:40	
Vinyl Chloride	2.0	U	2.0	0.40	2	06/05/17 18:40	
cis-1,2-Dichloroethene	**1.8**	**J**	2.0	0.40	2	06/05/17 18:40	
m,p-Xylenes	4.0	U	4.0	0.52	2	06/05/17 18:40	
o-Xylene	2.0	U	2.0	0.40	2	06/05/17 18:40	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	105	81 - 127	06/05/17 18:40	
4-Bromofluorobenzene	101	79 - 123	06/05/17 18:40	
Toluene-d8	103	83 - 120	06/05/17 18:40	

Semivolatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 09:30
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	EFF-060117	**Units:**	ug/L
Lab Code:	R1705013-001	**Basis:**	As Received

1,4-Dioxane by Solid Phase Extraction and GC/MS With Selected Ion Monitoring

Analysis Method: 522
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	**0.543**	0.200	0.0200	1	06/05/17 21:27	6/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	91	70 - 130	06/05/17 21:27	

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 10:00
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	INF-060117	**Units:**	ug/L
Lab Code:	R1705013-002	**Basis:**	As Received

1,4-Dioxane by Solid Phase Extraction and GC/MS With Selected Ion Monitoring

Analysis Method: 522
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	**0.605**	0.200	0.0200	1	06/05/17 21:46	6/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	98	70 - 130	06/05/17 21:46	

Metals

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 09:30
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	EFF-060117	**Basis:**	NA
Lab Code:	R1705013-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Antimony, Total	200.8	1.0 U	ug/L	1.0	0.4	1	06/08/17 18:13	06/07/17	
Arsenic, Total	200.8	1.0 U	ug/L	1.0	0.4	1	06/08/17 18:13	06/07/17	
Cadmium, Total	200.8	1.0 U	ug/L	1.0	0.03	1	06/08/17 18:13	06/07/17	
Calcium, Total	200.7	**167000**	ug/L	5000	800	5	06/12/17 12:16	06/06/17	
Chromium, Total	200.8	10 U	ug/L	10	2	5	06/12/17 16:49	06/07/17	
Copper, Total	200.8	**3.5**	ug/L	1.0	0.2	1	06/08/17 18:13	06/07/17	
Iron, Total	200.7	100 U	ug/L	100	20	1	06/08/17 18:39	06/06/17	
Lead, Total	200.8	1.0 U	ug/L	1.0	0.3	1	06/08/17 18:13	06/07/17	
Magnesium, Total	200.7	**48900**	ug/L	1000	9	1	06/08/17 18:39	06/06/17	
Mercury, Total	7470A	0.20 U	ug/L	0.20	0.04	1	06/06/17 15:35	06/05/17	
Nickel, Total	200.8	**7.0**	ug/L	1.0	0.06	1	06/08/17 18:13	06/07/17	
Selenium, Total	200.8	**1.1 J**	ug/L	2.0	0.2	1	06/08/17 18:13	06/07/17	
Silver, Total	200.8	1.0 U	ug/L	1.0	0.07	1	06/08/17 18:13	06/07/17	
Zinc, Total	200.8	5.0 U	ug/L	5.0	1.2	1	06/08/17 18:13	06/07/17	

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 10:00
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	INF-060117	**Basis:**	NA
Lab Code:	R1705013-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Antimony, Total	200.8	1.0	U	ug/L	1.0	0.4	1	06/08/17 21:05	06/07/17	
Arsenic, Total	200.8	1.0	U	ug/L	1.0	0.4	1	06/08/17 21:05	06/07/17	
Cadmium, Total	200.8	1.0	U	ug/L	1.0	0.03	1	06/08/17 21:05	06/07/17	
Calcium, Total	200.7	**169000**		ug/L	5000	800	5	06/12/17 12:19	06/06/17	
Chromium, Total	200.8	10	U	ug/L	10	2	5	06/08/17 18:07	06/07/17	
Copper, Total	200.8	**1.5**		ug/L	1.0	0.2	1	06/08/17 21:05	06/07/17	
Iron, Total	200.7	100	U	ug/L	100	20	1	06/08/17 18:43	06/06/17	
Lead, Total	200.8	1.0	U	ug/L	1.0	0.3	1	06/08/17 21:05	06/07/17	
Magnesium, Total	200.7	**47600**		ug/L	1000	9	1	06/08/17 18:43	06/06/17	
Mercury, Total	7470A	0.20	U	ug/L	0.20	0.04	1	06/06/17 15:37	06/05/17	
Nickel, Total	200.8	**6.8**		ug/L	1.0	0.06	1	06/08/17 21:05	06/07/17	
Selenium, Total	200.8	**1.2**	**J**	ug/L	2.0	0.2	1	06/08/17 21:05	06/07/17	
Silver, Total	200.8	1.0	U	ug/L	1.0	0.07	1	06/08/17 21:05	06/07/17	
Zinc, Total	200.8	5.0	U	ug/L	5.0	1.2	1	06/08/17 21:05	06/07/17	

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 09:30
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	EFF-060117	**Basis:**	NA
Lab Code:	R1705013-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen, undistilled	ASTM D6919-09	0.050	U	mg/L	0.050	0.008	10	06/08/17 03:44	NA	
Chloride	300.0	**450**		mg/L	20	2	100	06/06/17 17:35	NA	
Chromium, Hexavalent, Dissolved	218.6	**0.0007**	**J**	mg/L	0.010	0.0005	1	06/14/17 13:18	NA	
Cyanide, Total	335.4	0.010	U	mg/L	0.010	0.002	1	06/07/17 14:46	06/06/17	
Hardness, Total as CaCO3	SM 2340 B-1997(2011)	**619**		mg/L	-	-	1	NA	NA	
Phenolics, Total Recoverable	420.4	0.0050	U	mg/L	0.0050	0.0010	1	06/06/17 10:20	NA	
Solids, Total Suspended (TSS)	SM 2540 D-1997(2011)	1.0	U	mg/L	1.0	-	1	06/05/17 12:40	NA	

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17 10:00
Sample Matrix:	Water	**Date Received:**	06/02/17 09:55
Sample Name:	INF-060117	**Basis:**	NA
Lab Code:	R1705013-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen, undistilled	ASTM D6919-09	0.050	U	mg/L	0.050	0.008	10	06/08/17 03:59	NA	
Chloride	300.0	**443**		mg/L	20	2	100	06/06/17 18:18	NA	
Chromium, Hexavalent, Dissolved	218.6	**0.0007**	**J**	mg/L	0.010	0.0005	1	06/14/17 13:27	NA	
Cyanide, Total	335.4	0.010	U	mg/L	0.010	0.002	1	06/07/17 14:48	06/06/17	
Hardness, Total as CaCO3	SM 2340 B-1997(2011)	**618**		mg/L	-	-	1	NA	NA	
Phenolics, Total Recoverable	420.4	0.0050	U	mg/L	0.0050	0.0010	1	06/06/17 10:20	NA	
Solids, Total Suspended (TSS)	SM 2540 D-1997(2011)	1.0	U	mg/L	1.0	-	1	06/05/17 12:40	NA	

QC Summary Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Volatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Tetra Tech GEO **Service Request:** R1705013

Project: HVEC/117-7013005

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Volatile Organic Compounds by GC/MS, Unpreserved

Analysis Method: 624

Sample Name	Lab Code	1,2-Dichloroethane-d4 81 - 127	4-Bromofluorobenzene 79 - 123	Toluene-d8 83 - 120
EFF-060117	R1705013-001	102	104	105
INF-060117	R1705013-002	105	101	103
Lab Control Sample	RQ1705200-03	103	105	109
Method Blank	RQ1705200-04	103	105	107

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	RQ1705200-04	**Basis:**	NA

Volatile Organic Compounds by GC/MS, Unpreserved

Analysis Method: 624

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	1.0 U	1.0	0.20	1	06/05/17 12:15	
1,1,2-Trichloroethane	1.0 U	1.0	0.20	1	06/05/17 12:15	
1,1-Dichloroethane (1,1-DCA)	1.0 U	1.0	0.21	1	06/05/17 12:15	
1,1-Dichloroethene (1,1-DCE)	1.0 U	1.0	0.20	1	06/05/17 12:15	
1,2-Dichlorobenzene	1.0 U	1.0	0.25	1	06/05/17 12:15	
1,2-Dichloroethane	1.0 U	1.0	0.20	1	06/05/17 12:15	
1,3-Dichlorobenzene	1.0 U	1.0	0.22	1	06/05/17 12:15	
1,4-Dichlorobenzene	1.0 U	1.0	0.20	1	06/05/17 12:15	
Benzene	1.0 U	1.0	0.20	1	06/05/17 12:15	
Carbon Tetrachloride	1.0 U	1.0	0.20	1	06/05/17 12:15	
Methylene Chloride	1.0 U	1.0	0.20	1	06/05/17 12:15	
Ethylbenzene	1.0 U	1.0	0.20	1	06/05/17 12:15	
Tetrachloroethene (PCE)	1.0 U	1.0	0.20	1	06/05/17 12:15	
Toluene	1.0 U	1.0	0.20	1	06/05/17 12:15	
Trichloroethene (TCE)	1.0 U	1.0	0.20	1	06/05/17 12:15	
Vinyl Chloride	1.0 U	1.0	0.20	1	06/05/17 12:15	
cis-1,2-Dichloroethene	1.0 U	1.0	0.20	1	06/05/17 12:15	
m,p-Xylenes	2.0 U	2.0	0.26	1	06/05/17 12:15	
o-Xylene	1.0 U	1.0	0.20	1	06/05/17 12:15	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,2-Dichloroethane-d4	103	81 - 127	06/05/17 12:15	
4-Bromofluorobenzene	105	79 - 123	06/05/17 12:15	
Toluene-d8	107	83 - 120	06/05/17 12:15	

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request: R1705013
Date Analyzed: 06/05/17

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS, Unpreserved

Units:ug/L
Basis:NA

Lab Control Sample
RQ1705200-03

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	624	21.2	20.0	106	52-162
1,1,2-Trichloroethane	624	20.6	20.0	103	52-150
1,1-Dichloroethane (1,1-DCA)	624	19.0	20.0	95	59-155
1,1-Dichloroethene (1,1-DCE)	624	18.7	20.0	93	10-234
1,2-Dichlorobenzene	624	19.9	20.0	99	18-190
1,2-Dichloroethane	624	20.4	20.0	102	49-155
1,3-Dichlorobenzene	624	19.5	20.0	97	59-156
1,4-Dichlorobenzene	624	19.7	20.0	98	18-190
Benzene	624	20.3	20.0	102	37-151
Carbon Tetrachloride	624	21.5	20.0	107	70-140
Methylene Chloride	624	19.9	20.0	99	10-221
Ethylbenzene	624	20.4	20.0	102	37-162
Tetrachloroethene (PCE)	624	20.8	20.0	104	64-148
Toluene	624	19.3	20.0	96	47-150
Trichloroethene (TCE)	624	18.8	20.0	94	71-157
Vinyl Chloride	624	22.9	20.0	115	10-251
cis-1,2-Dichloroethene	624	18.9	20.0	95	72-125
m,p-Xylenes	624	41.0	40.0	102	76-131
o-Xylene	624	21.3	20.0	106	78-127

Semivolatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Tetra Tech GEO **Service Request:** R1705013

Project: HVEC/117-7013005

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

1,4-Dioxane by Solid Phase Extraction and GC/MS With Selected Ion Monitoring

Analysis Method: 522

Extraction Method: Method

Sample Name	Lab Code	1,4-Dioxane-d8 70 - 130
EFF-060117	R1705013-001	91
INF-060117	R1705013-002	98
Method Blank	RQ1704999-01	91
Lab Control Sample	RQ1704999-02	88
Duplicate Lab Control Sample	RQ1704999-03	93
Lab Control Sample	RQ1704999-06	88

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	RQ1704999-01	**Basis:**	As Received

1,4-Dioxane by Solid Phase Extraction and GC/MS With Selected Ion Monitoring

Analysis Method: 522
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1,4-Dioxane	0.200 U	0.200	0.0200	1	06/05/17 16:05	6/5/17	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1,4-Dioxane-d8	91	70 - 130	06/05/17 16:05	

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request: R1705013
Date Analyzed: 06/05/17

Duplicate Lab Control Sample Summary
1,4-Dioxane by Solid Phase Extraction and GC/MS With Selected Ion Monitoring

Units: ug/L
Basis: As Received

			Lab Control Sample RQ1704999-02			Duplicate Lab Control Sample RQ1704999-03				
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
1,4-Dioxane	522	10.7	10.1	106	11.2	10.1	111	70-130	5	30

Metals

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1705013-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Antimony, Total	200.8	**0.4 J**	ug/L	1.0	0.4	1	06/08/17 17:54	06/07/17	
Arsenic, Total	200.8	1.0 U	ug/L	1.0	0.4	1	06/08/17 17:54	06/07/17	
Cadmium, Total	200.8	1.0 U	ug/L	1.0	0.03	1	06/08/17 17:54	06/07/17	
Calcium, Total	200.7	1000 U	ug/L	1000	200	1	06/12/17 11:12	06/06/17	
Chromium, Total	200.8	**0.5 J**	ug/L	2.0	0.4	1	06/08/17 17:54	06/07/17	
Copper, Total	200.8	1.0 U	ug/L	1.0	0.2	1	06/08/17 17:54	06/07/17	
Iron, Total	200.7	100 U	ug/L	100	20	1	06/08/17 17:36	06/06/17	
Lead, Total	200.8	1.0 U	ug/L	1.0	0.3	1	06/08/17 17:54	06/07/17	
Magnesium, Total	200.7	1000 U	ug/L	1000	9	1	06/08/17 17:36	06/06/17	
Mercury, Total	7470A	0.20 U	ug/L	0.20	0.04	1	06/06/17 14:48	06/05/17	
Nickel, Total	200.8	1.0 U	ug/L	1.0	0.06	1	06/08/17 17:54	06/07/17	
Selenium, Total	200.8	2.0 U	ug/L	2.0	0.2	1	06/08/17 17:54	06/07/17	
Silver, Total	200.8	1.0 U	ug/L	1.0	0.07	1	06/08/17 17:54	06/07/17	
Zinc, Total	200.8	5.0 U	ug/L	5.0	1.2	1	06/08/17 17:54	06/07/17	

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request: R1705013
Date Analyzed: 06/06/17 - 06/12/17

Lab Control Sample Summary
Inorganic Parameters

Units:ug/L
Basis:NA

Lab Control Sample
R1705013-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Antimony, Total	200.8	21.6	20.0	108	85-115
Arsenic, Total	200.8	20.7	20.0	104	85-115
Cadmium, Total	200.8	21.3	20.0	106	85-115
Calcium, Total	200.7	1980	2000	99	85-115
Chromium, Total	200.8	20.3	20.0	101	85-115
Copper, Total	200.8	21.7	20.0	109	85-115
Iron, Total	200.7	976	1000	98	85-115
Lead, Total	200.8	20.8	20.0	104	85-115
Magnesium, Total	200.7	1970	2000	98	85-115
Mercury, Total	7470A	1.01	1.00	101	80-120
Nickel, Total	200.8	21.1	20.0	105	85-115
Selenium, Total	200.8	20.1	20.0	100	85-115
Silver, Total	200.8	20.5	20.0	102	85-115
Zinc, Total	200.8	21.3	20.0	106	85-115

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1705013-MB1		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Ammonia as Nitrogen, undistilled	ASTM D6919-09	0.0050	U	mg/L	0.0050	0.0008	1	06/07/17 22:28	NA	
Chloride	300.0	0.20	U	mg/L	0.20	0.02	1	06/06/17 13:44	NA	
Chromium, Hexavalent, Dissolved	218.6	0.010	U	mg/L	0.010	0.0005	1	06/14/17 12:31	NA	
Cyanide, Total	335.4	0.010	U	mg/L	0.010	0.002	1	06/07/17 14:42	06/06/17	
Phenolics, Total Recoverable	420.4	0.0050	U	mg/L	0.0050	0.0010	1	06/06/17 10:20	NA	
Solids, Total Suspended (TSS)	SM 2540 D-1997(2011)	1.0	U	mg/L	1.0	-	1	06/05/17 12:40	NA	

Analytical Report

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1705013-MB2		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Q
Chloride	300.0	0.20 U	mg/L	0.20	0.02	1	06/06/17 17:57	

Client:	Tetra Tech GEO	**Service Request:**	R1705013
Project:	HVEC/117-7013005	**Date Collected:**	06/01/17
Sample Matrix:	Water	**Date Received:**	06/02/17
		Date Analyzed:	06/7/17
		Date Extracted:	06/6/17

Duplicate Matrix Spike Summary
Cyanide, Total

Sample Name:	EFF-060117	**Units:**	mg/L
Lab Code:	R1705013-001	**Basis:**	NA
Analysis Method:	335.4		
Prep Method:	Method		

		Matrix Spike R1705013-001MS			Duplicate Matrix Spike R1705013-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Cyanide, Total	0.010 U	0.094	0.100	94	0.094	0.100	94	90-110	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request:R1705013
Date Collected:06/01/17
Date Received:06/02/17
Date Analyzed:06/06/17 - 06/14/17

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: INF-060117
Lab Code: R1705013-002

Units:mg/L
Basis:NA

			Matrix Spike R1705013-002MS			Duplicate Matrix Spike R1705013-002DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Chloride	300.0	443	640	200	99	642	200	100	90-110	<1	20
Chromium, Hexavalent, Dissolved	218.6	0.0007 J	0.208	0.200	104	0.209	0.200	104	90-110	<1	20
Phenolics, Total Recoverable	420.4	0.0050 U	0.0376	0.0400	94	0.0370	0.0400	93	90-110	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request: R1705013
Date Analyzed: 06/06/17 - 06/14/17

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1705013-LCS1

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Ammonia as Nitrogen, undistilled	ASTM D6919-09	0.482	0.500	96	90-110
Chloride	300.0	1.94	2.00	97	90-110
Chromium, Hexavalent, Dissolved	218.6	0.211	0.200	105	90-110
Cyanide, Total	335.4	0.0923	0.100	92	90-110
Phenolics, Total Recoverable	420.4	0.0381	0.0400	95	90-110

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request: R1705013
Date Analyzed: 06/06/17 - 06/07/17

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1705013-LCS2

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Chloride	300.0	1.91	2.00	95	90-110
Cyanide, Total	335.4	0.552	0.600	92	90-110

Client: Tetra Tech GEO
Project: HVEC/117-7013005
Sample Matrix: Water

Service Request: R1705013
Date Analyzed: 06/05/17

Duplicate Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

		Lab Control Sample			Duplicate Lab Control Sample					
		R1705013-LCS3			R1705013-DLCS3					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Solids, Total Suspended (TSS)	SM 2540 D-1997(2011)	208	214	97	208	214	97	80-120	<1	10

Subcontracted Analytical Parameters

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

June 12, 2017

Reports and Invoices
ALS Environmental
1565 Jefferson Road
Building 300, Suite 360
Rochester, NY 14623

Certificate of Analysis

Project Name:	**Custom EDD, MDL, QC**	Workorder:	**2236217**
Purchase Order:	**58R1705013**	Workorder ID:	**R1705013**

Dear Reports Invoices:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, June 7, 2017.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2236217 R1705013

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2236217001	EFF-060117	Drinking Water	6/1/2017 09:30	6/7/2017 08:57	Collected by Client
2236217002	INF-060117	Drinking Water	6/1/2017 10:00	6/7/2017 08:57	Collected by Client

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

SAMPLE SUMMARY

Workorder: 2236217 R1705013

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incurbator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2236217 R1705013

Lab ID: **2236217001** Date Collected: 6/1/2017 09:30 Matrix: Drinking Water

Sample ID: **EFF-060117** Date Received: 6/7/2017 08:57

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	2.6J	J,1	ug/L	5.0	2.2	EPA 524.2			6/8/17 18:32	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*		*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichlorobenzene-d4 (S)	86.7		%	70 - 130		EPA 524.2			6/8/17 18:32	DD	A
4-Bromofluorobenzene (S)	101		%	70 - 130		EPA 524.2			6/8/17 18:32	DD	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2236217 R1705013

Lab ID: **2236217002** Date Collected: 6/1/2017 10:00 Matrix: Drinking Water

Sample ID: **INF-060117** Date Received: 6/7/2017 08:57

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Acetone	ND		ug/L	5.0	2.2	EPA 524.2		6/8/17 18:56	DD	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*		*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichlorobenzene-d4 (S)	83.1		%	70 - 130		EPA 524.2		6/9/17 13:14	DD	C
1,2-Dichlorobenzene-d4 (S)	91.6		%	70 - 130		EPA 524.2		6/8/17 18:56	DD	A
4-Bromofluorobenzene (S)	101		%	70 - 130		EPA 524.2		6/9/17 13:14	DD	C
4-Bromofluorobenzene (S)	107		%	70 - 130		EPA 524.2		6/8/17 18:56	DD	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2236217001	1	EFF-060117	EPA 524.2	Acetone

The QC sample type MS for method EPA 524.2 was outside the control limits for the analyte Acetone. The % Recovery was reported as 145 and the control limits were 70 to 130.

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA

Workorder: 2236217 R1705013

QC Batch: VOMS/43596 **Analysis Method:** EPA 524.2

QC Batch Method: EPA 524.2

Associated Lab Samples: 2236217001, 2236217002

METHOD BLANK: 2552220

Parameter	Blank Result	Units	Reporting Limit
Acetone	ND	ug/L	5.0
1,2-Dichlorobenzene-d4 (S)	93.9	%	70 - 130
4-Bromofluorobenzene (S)	104	%	70 - 130

LABORATORY CONTROL SAMPLE: 2552221

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
1,2-Dichlorobenzene-d4 (S)	103	%			70 - 130
4-Bromofluorobenzene (S)	111	%			70 - 130

LABORATORY CONTROL SAMPLE: 2552222

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Acetone	116	ug/L	25	28.9	70 - 130
1,2-Dichlorobenzene-d4 (S)	104	%			70 - 130
4-Bromofluorobenzene (S)	115	%			70 - 130

MATRIX SPIKE: 2552616 DUPLICATE: 2552617 ORIGINAL: 2236217001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Acetone	2.56829	ug/L	25	38.7889	31.6948	145*	117	70 - 130	20.1	40
1,2-Dichlorobenzene-d4 (S)	105	%				105	120	70 - 130		
4-Bromofluorobenzene (S)	112	%				112	118	70 - 130		

QUALITY CONTROL DATA

Workorder: 2236217 R1705013

QC Batch: VOMS/43614 **Analysis Method:** EPA 524.2

QC Batch Method: EPA 524.2

Associated Lab Samples: 2236217002

METHOD BLANK: 2553119

Parameter	Blank Result	Units	Reporting Limit
Acetone	ND	ug/L	5.0
1,2-Dichlorobenzene-d4 (S)	77.3	%	70 - 130
4-Bromofluorobenzene (S)	79.5	%	70 - 130

LABORATORY CONTROL SAMPLE: 2553120

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
1,2-Dichlorobenzene-d4 (S)	96.1	%			70 - 130
4-Bromofluorobenzene (S)	106	%			70 - 130

LABORATORY CONTROL SAMPLE: 2553121

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Acetone	120	ug/L	25	29.9	70 - 130
1,2-Dichlorobenzene-d4 (S)	113	%			70 - 130
4-Bromofluorobenzene (S)	116	%			70 - 130

MATRIX SPIKE: 2553280 DUPLICATE: 2553281 ORIGINAL: 2236626001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
1,2-Dichlorobenzene-d4 (S)	104	%				104	109	70 - 130		
4-Bromofluorobenzene (S)	107	%				107	112	70 - 130		

ALS Environmental

34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: A2LA 0818.01
State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 2236217 R1705013

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
2236217001	EFF-060117			EPA 524.2	VOMS/43596
2236217002	INF-060117			EPA 524.2	VOMS/43596

ALS Environmental Chain of Custody

1565 Jefferson Rd, Building 300 • Rochester, NY 14623 • 585-288-5380 • FAX 585-288-8475

ALS Contact: Brady Kalkman

Project Number: R1705013
Project Manager: Brady Kalkman
QAP: LAB QAP

Lab Code	Sample ID	# of Cont.	Matrix	Sample Date	Sample Time	Lab ID	VOC 524.2
~~R1705013-001~~	EFF-060117	3	Water	6/1/17	0930	Middletown ALS	X
~~R1705013-002~~	INF-060117	3	Water	6/1/17	1000	Middletown ALS	X

Acetone only

2236217

	Y	N	Initials
Custody Seals Present?			DWN
(if present) Seals Intact?			
Received on Ice?			
COC/Lbls Complete			
Cont in Good Cond?			
Correct Containers?			
Correct Samp Vol?			
Correct Preservation?			
Headspace/Volatiles?			

Cooler Temp: 2.8 °C
Cooler #:
Therm ID: 291
Ship Carrier: FedEx UPS DHL
Tracking #: 6626 8020 2958

SSL 6/7/17 1526

Special Instructions/Comments
EDD: Rochester Geotech

NPDES

H - Test is On Hold P - Test is Authorized for Prep Only

Turnaround Requirements
____RUSH (Surcharges Apply)
PLEASE CIRCLE WORK DAYS
1 2 3 4 5
____STANDARD
Requested FAX Date: _____
Requested Report Date: 06/13/17

Report Requirements
___ I. Results Only
X II. Results + QC Summaries
___ III. Results + QC and Calibration Summaries
___ IV. Data Validation Report with Raw Data
PQL/MDL/J Y
EDD Y

Invoice Information
PO# 58R1705013
Bill to

Relinquished By: [signature] 6/6/17 / 1329 Received By: [signature] 6/15/17 6/7/17 8:17 Airbill Number:

ALS Environmental Chain of Custody

1565 Jefferson Rd, Building 300 • Rochester, NY 14623 • 585-288-5380 • FAX 585-288-8475

ALS Contact: Brady Kalkman

Project Number: R1705013
Project Manager: Brady Kalkman
QAP: LAB QAP

R1705013

X **Ship To: Middletown ALS**
ALS Laboratory Group
34 Dogwood Lane
Middletown, PA 17057

PC _____ Date _____
SMO _____ Date _____

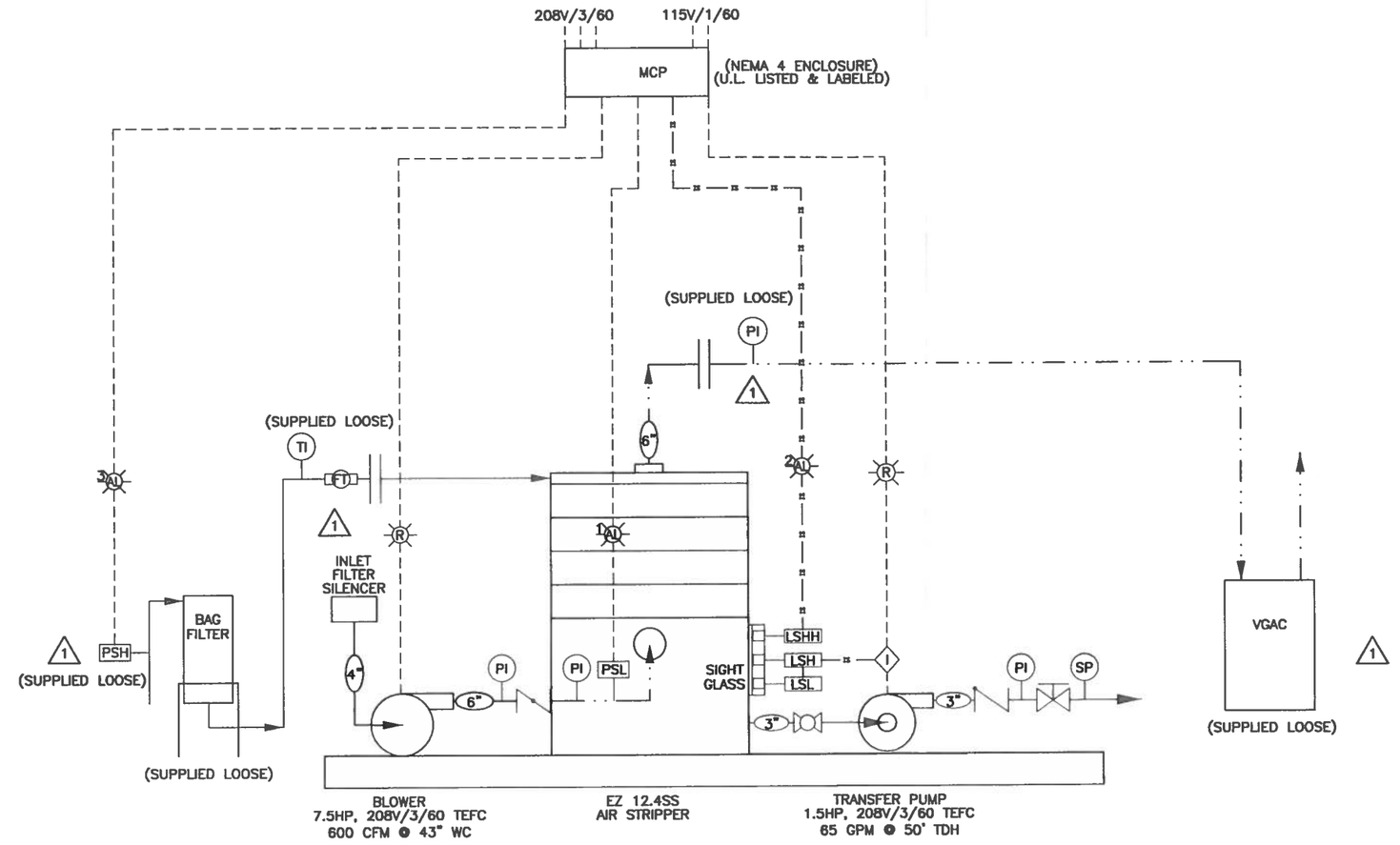
Instructions:
Ice _____
Dry Ice _____
No Ice _____

Shipping:
Overnight _____
2nd Day _____
Ground _____

Bill to Client Account _____

Comments:

GROUNDWATER TREATMENT EQUIPMENT PROCESS & INSTRUMENTATION DIAGRAM



LEGEND

FT	FLOW TOTALIZER
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LSL	LEVEL SWITCH LOW
MCP	MASTER CONTROL PANEL
PI	PRESSURE INDICATOR
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
SP	SAMPLE PORT
TI	TEMPERATURE INDICATOR
VGAC	VAPOR PHASE CARBON
(I)	INTERLOCK
	CHECK VALVE
	BUTTERFLY VALVE
	GATE VALVE
	BALL VALVE
AL	ALARM LIGHT
R	RUN LIGHT
	AIR LINE
	WATER LINE
	CONTROL LINE
	INTRINSICALLY SAFE LINE
	BREAK

ALARMS

1 STRIPPER BLOWER PRESSURE SWITCH LOW
2 AIR STRIPPER SUMP HIGH HIGH LEVEL
3 BAG FILTER PRESSURE SWITCH HIGH

REV.	DESCRIPTION	DATE	APPR.
1	GENERAL REVISION	7/9	
REVISIONS			

DRWN BY DRF DATE 6/20/01
CHK BY DATE
APPR BY DATE

BISCO Environmental
Soil & Groundwater Remediation Equipment
Randolph, Massachusetts 02368

TITLE
GROUNDWATER TREATMENT EQUIPMENT PROCESS & INSTRUMENTATION DIAGRAM

HIGH VOLTAGE ENGINEERING CORP.
HVEC BURLINGTON

JOB NO. 10690

SCALE	SIZE	DWG NO.	SHEET	REV
N/A	B	10690JHP	1 OF 1	1

U. S FISH & WILDLIFE SERVICE IPAC REPORT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

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

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

Project information

NAME

Former HVEC/Bellofram

LOCATION

Middlesex County, Massachusetts

DESCRIPTION

MassDEP
disposal site RTN 3-0981 located at 3 Van de Graaff Drive, Burlington, Massachusetts. Discharge treated groundwater impacted by VOCs to a wetland that
is a tributary to Vine Brook. The discharge has been ongoing since June 2002 and will continue into the future for an unknown number of years. Discharge rate is approximately 50 gallons per minute. The system, including the discharge piping, and the discharge location in the wetland, was installed in 2001 with the approval of the Town of Burlington Conservation Commission. The area surrounding
the site is fully developed and no tree cutting/clearing is
anticipated.

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] are managed by the Endangered Species Program of the U.S. Fish and Wildlife Service.

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

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

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

Critical habitats

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

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

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

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

[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

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

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The migratory birds species listed below are species of particular conservation concern (e.g. Birds of Conservation Concern) that may be potentially affected by activities in this location. It is not a list of every bird species you may find in this location, nor a guarantee that all of the bird species on this list will be found on or near this location. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To view available data on other bird species that may occur in your project area, please visit the AKN Histogram Tools and Other Bird Data Resources. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

NAME	SEASON(S)
American Bittern Botaurus lentiginosus https://ecos.fws.gov/ecp/species/6582	On Land: Breeding
American Oystercatcher Haematopus palliatus https://ecos.fws.gov/ecp/species/8935	On Land: Breeding
Bald Eagle Haliaeetus leucocephalus https://ecos.fws.gov/ecp/species/1626	On Land: Year-round
Black-billed Cuckoo Coccyzus erythropthalmus https://ecos.fws.gov/ecp/species/9399	On Land: Breeding
Blue-winged Warbler Vermivora pinus	On Land: Breeding
Canada Warbler Wilsonia canadensis	On Land: Breeding
Hudsonian Godwit Limosa haemastica	At Sea: Migrating
Least Bittern Ixobrychus exilis https://ecos.fws.gov/ecp/species/6175	On Land: Breeding
Olive-sided Flycatcher Contopus cooperi https://ecos.fws.gov/ecp/species/3914	On Land: Breeding

Peregrine Falcon Falco peregrinus https://ecos.fws.gov/ecp/species/8831	On Land: Breeding
Pied-billed Grebe Podilymbus podiceps	On Land: Breeding
Prairie Warbler Dendroica discolor	On Land: Breeding
Purple Sandpiper Calidris maritima	On Land: Wintering
Seaside Sparrow Ammodramus maritimus	On Land: Breeding
Short-eared Owl Asio flammeus https://ecos.fws.gov/ecp/species/9295	On Land: Wintering
Snowy Egret Egretta thula	On Land: Breeding
Upland Sandpiper Bartramia longicauda https://ecos.fws.gov/ecp/species/9294	On Land: Breeding
Willow Flycatcher Empidonax traillii https://ecos.fws.gov/ecp/species/3482	On Land: Breeding
Wood Thrush Hylocichla mustelina	On Land: Breeding
Worm Eating Warbler Helmitheros vermivorum	On Land: Breeding

What does IPaC use to generate the list of migratory bird species potentially occurring in my specified location?

Landbirds:

Migratory birds that are displayed on the IPaC species list are based on ranges in the latest edition of the National Geographic Guide, Birds of North America (6th Edition, 2011 by Jon L. Dunn, and Jonathan Alderfer). Although these ranges are coarse in nature, a number of U.S. Fish and Wildlife Service migratory bird biologists agree that these maps are some of the best range maps to date. These ranges were clipped to a specific Bird Conservation Region (BCR) or USFWS Region/Regions, if it was indicated in the 2008 list of Birds of Conservation Concern (BCC) that a species was a BCC species only in a particular Region/Regions. Additional modifications have been made to some

ranges based on more local or refined range information and/or information provided by U.S. Fish and Wildlife Service biologists with species expertise. All migratory birds that show in areas on land in IPaC are those that appear in the 2008 Birds of Conservation Concern report.

Atlantic Seabirds:

Ranges in IPaC for birds off the Atlantic coast are derived from species distribution models developed by the National Oceanic and Atmospheric Association (NOAA) National Centers for Coastal Ocean Science (NCCOS) using the best available seabird survey data for the offshore Atlantic Coastal region to date. NOAANCCOS assisted USFWS in developing seasonal species ranges from their models for specific use in IPaC. Some of these birds are not BCC species but were of interest for inclusion because they may occur in high abundance off the coast at different times throughout the year, which potentially makes them more susceptible to certain types of development and activities taking place in that area. For more refined details about the abundance and richness of bird species within your project area off the Atlantic Coast, see the Northeast Ocean Data Portal. The Portal also offers data and information about other types of taxa that may be helpful in your project review.

About the NOAANCCOS models: the models were developed as part of the NOAANCCOS project: Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf. The models resulting from this project are being used in a number of decision-support/mapping products in order to help guide decision-making on activities off the Atlantic Coast with the goal of reducing impacts to migratory birds. One such product is the Northeast Ocean Data Portal, which can be used to explore details about the relative occurrence and abundance of bird species in a particular area off the Atlantic Coast.

All migratory bird range maps within IPaC are continuously being updated as new and better information becomes available.

Can I get additional information about the levels of occurrence in my project area of specific birds or groups of birds listed in IPaC?

Landbirds:

The Avian Knowledge Network (AKN) provides a tool currently called the "Histogram Tool", which draws from the data within the AKN (latest survey, point count, citizen science datasets) to create a view of relative abundance of species within a particular location over the course of the year. The results of the tool depict the frequency of detection of a species in survey events, averaged between multiple datasets within AKN in a particular week of the year. You may access the histogram tools through the Migratory Bird Programs AKN Histogram Tools webpage.

The tool is currently available for 4 regions (California, Northeast U.S., Southeast U.S. and Midwest), which encompasses the following 32 states: Alabama, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North, Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

In the near future, there are plans to expand this tool nationwide within the AKN, and allow the graphs produced to appear with the list of trust resources generated by IPaC, providing you with an additional level of detail about the level of occurrence of the species of particular concern potentially occurring in your project area throughout the course of the year.

Atlantic Seabirds:

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 NOAANCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Facilities

Wildlife refuges

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

THERE ARE NO REFUGES AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

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

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

PEM1E

FRESHWATER FORESTED/SHRUB WETLAND

PFO1E
PSS1E
PSS1Fh

FRESHWATER POND

PUBHh

A full description for each wetland code can be found at the National Wetlands Inventory website: https://ecos.fws.gov/ipac/wetlands/decoder

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.