Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200, Quincy MA 02169-0982

July 6, 2017
File: 191750030

Attention: Shauna Little
U.S. Environmental Protection Agency
Attn: Remediation General Permit NOI Processing
5 Post Office Square, Suite 100
Mail Code OEP06-4
Boston, Massachusetts 02109-3912

Dear Ms. Little,

Reference: Callahan Senior Center Sump Water Treatment System
535 Union Street, Framingham, Massachusetts
MassDEP RTN 3-0318
Stantec Project 191750030

On behalf of The Town of Framingham, Massachusetts, Stantec has prepared this Notice of Intent (NOI) for Remediation General Permit (RGP) for the Callahan Senior Center Sump Water Treatment System (SWTS). The NOI was prepared consistent with Appendix V of the U.S. Environmental Protection Agency's (EPA) Remediation General Permit under the National Pollutant Discharge Elimination System (NPDES) for Discharges in Massachusetts, Massachusetts General Permit, Permit No. MAG910000. The Town of Framingham owns and operates the SWTS. The Town requests authorization for continued discharge under the provisions of the 2017 RGP. The NOI is included in Attachment A.

Pursuant to Section B(1)(a) of Appendix V, since the SWTS is subject to 310 CMR 40.0000, the Massachusetts Contingency Plan (MCP), there is no requirement to submit state application form BWPWM12 to the Massachusetts Department of Environmental Protection (DEP). However, a copy of the NOI will be provided to the MassDEP.

If you have any questions or comments concerning this NOI, please contact Nate Gardner or Charles Young at (617) 786-7960.

Regards,

STANTEC CONSULTING SERVICES INC.

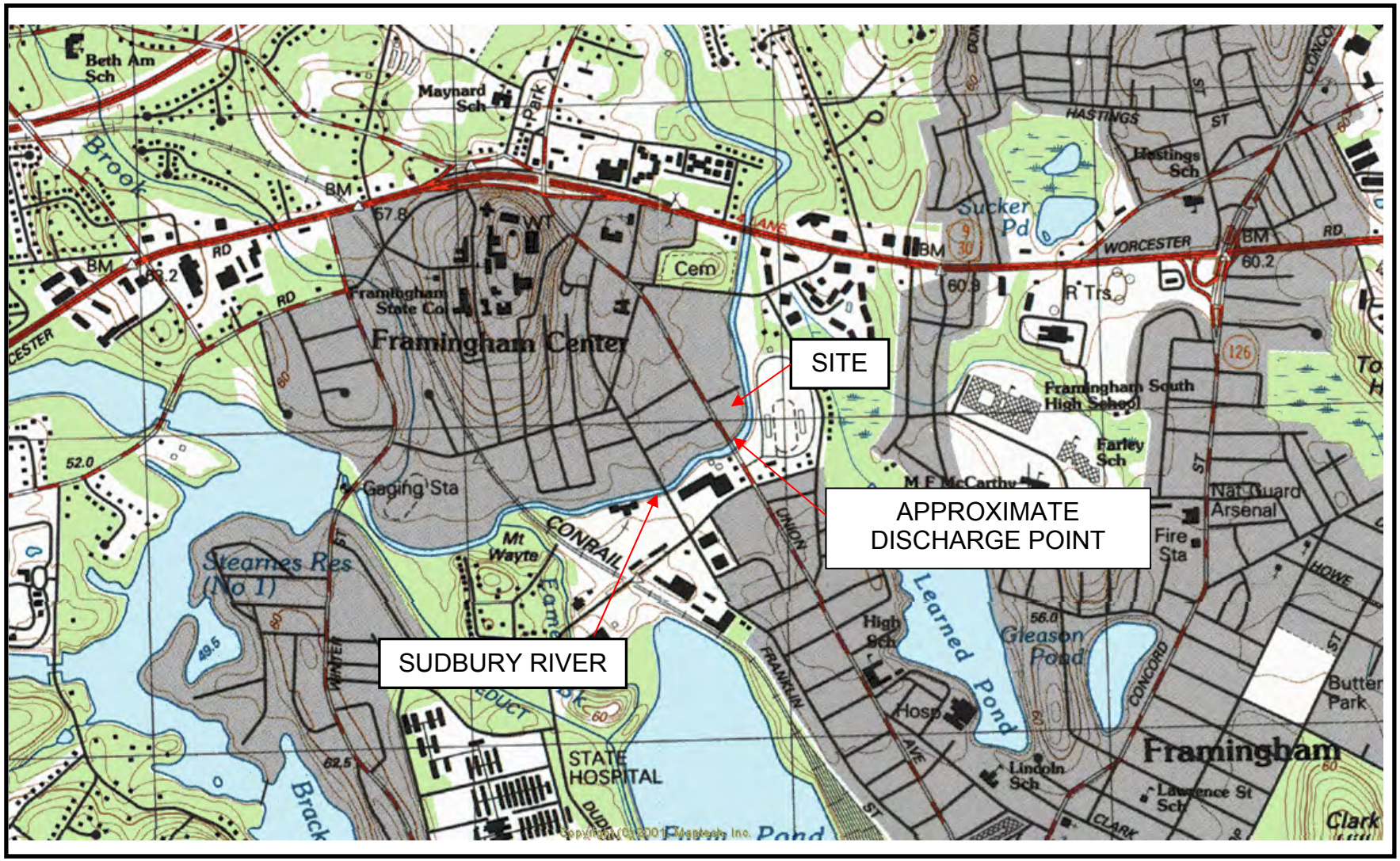
Nate Gardner
Environmental Project Manager
Phone: (508) 591-4349
Fax: (617) 786-7962
Nathan.Gardner@stantec.com

Charles Young, LSP
Senior Environmental Project Manager
Phone: (508) 591-4326
Fax: (617) 786-7962
Charles.Young@stantec.com

Attachment: Notice of Intent for Remediation General Permit
Safety Data Sheets – Granular Activated Carbon
Laboratory Data Sheets
Preliminary Endangered Species IPaC Report
BMPP

c.

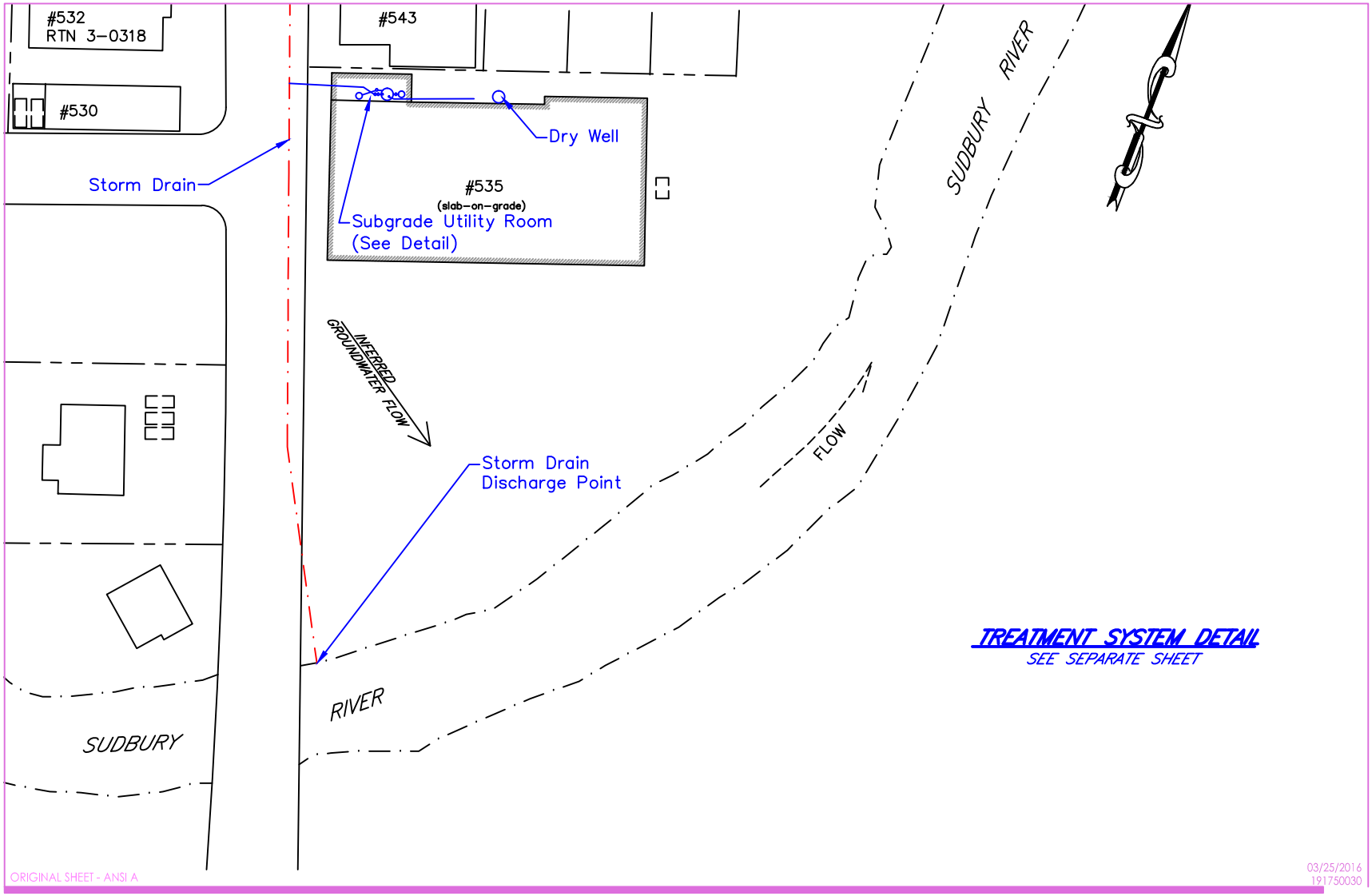
gn v:\1917\active\191750030\epa rgp\2017 renew rgp\callahan center\2017 rgp letter.docx



Stantec

N

Figure 1
Site Locus Map
535 Union Avenue
Framingham, Massachusetts
Source: USGS Topographic, Framingham Quad, 1987
Scale: 1 = 25,000 Contour Interval = 3 meters



V:\1917\active\191750030\EPA RGP\CAD\Figure 2 Site Plan - 2015-03-20.dwg
2017/07/06 12:18 PM By: Gardner, Nathan

ORIGINAL SHEET - ANSI A

03/25/2016
191750030

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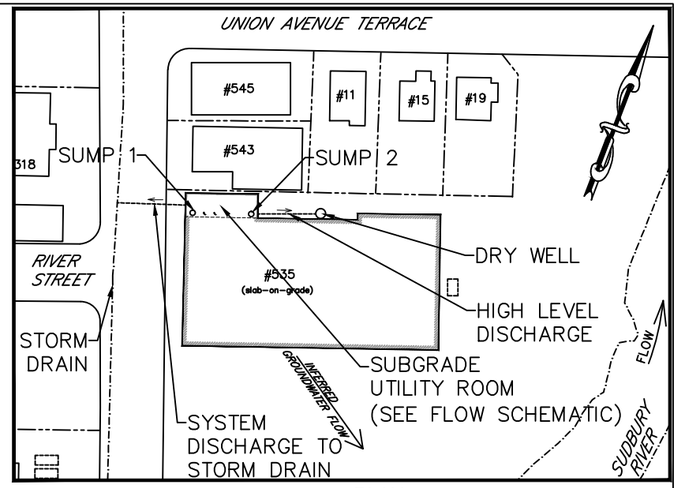
Quincy MA www.stantec.com

Client
TOWN OF FRAMINGHAM
535 UNION STREET
FRAMINGHAM, MASSACHUSETTS

Figure No.
2

Title
FLOW SCHEMATIC
150 CONCORD STREET
FRAMINGHAM, MASSACHUSETTS

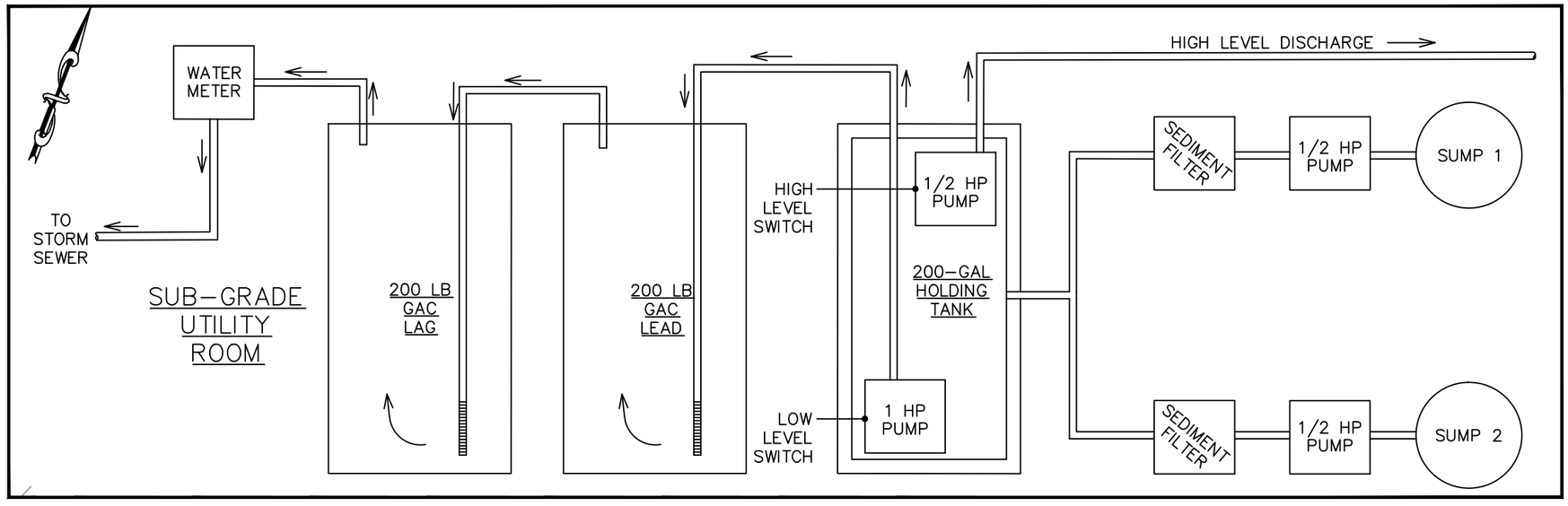
V:\1917\active\191750030\EPA RGP\CAD\Figure 2 Site Plan – 2015-03-20.dwg



PLAN

SCALE: 1" = 100'

0 100' 200'



TREATMENT SYSTEM FLOW SHEMATIC

(NOT TO SCALE)

V:\1917\active\191750030\EPA RGP\Figure 2 Site Plan - 2016-08-10.dwg

ORIGINAL SHEET - ANSI B

03/25/2016
191750030

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Client
TOWN OF FRAMINGHAM
150 CONCORD STREET
FRAMINGHAM, MASSACHUSETTS

Figure No.
3

Title
FLOW SCHEMATIC
535 UNION STREET
FRAMINGHAM, MASSACHUSETTS

Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200, Quincy MA 02169-0982

APPENDIX A

NOTICE OF INTENT FOR REMEDIATION GENERAL PERMIT

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:
Callahan Senior Center</td><td colspan="3">Site address: 535 Union Street
Street:</td></tr>
<tr><td>City: Framingham</td><td>State: MA</td><td>Zip: 01702</td></tr>
<tr><td rowspan="4">2. Site owner
Town of Framingham

Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private
■ Other; if so, specify: Municipal</td><td colspan="3">Contact Person: Jim Paolini</td></tr>
<tr><td colspan="2">Telephone: 508-532-5470</td><td>Email: jjp@framinghamma.gov</td></tr>
<tr><td colspan="3">Mailing address: 150 Concord Street
Street:</td></tr>
<tr><td>City: Framingham</td><td>State: MA</td><td>Zip: 01702</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
Stantec Consulting Services, Inc.</td><td colspan="3">Contact Person: Brian V. Moran, PE, LSP</td></tr>
<tr><td colspan="2">Telephone: 617-786-7960</td><td>Email: brian.moran@stantec.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 400 Crown Colony Drive, Suite 200</td></tr>
<tr><td>City: Quincy</td><td>State: MA</td><td>Zip: 02169</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:
MAG910000

NPDES permit is (check all that apply: ■ RGP ☐ DGP ☐ CGP
☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:</td><td colspan="3">5. Other regulatory program(s) that apply to the site (check all that apply):
■ MA Chapter 21e; list RTN(s):
3-318
☐ 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):
Sudbury River	MA82A-26	Class B

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

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

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

3. Indicate if the receiving water(s) is listed in the State's Integrated List of Waters (i.e., CWA Section 303(d)). Include which designated uses are impaired, and any pollutants indicated. Also, indicate if a final TMDL is available for any of the indicated pollutants. For more information, contact the appropriate State as noted in Part 4.6 of the RGP. Uses impaired: Fish Consumption; Fish, other Aquatic Life and Wildlife. Mercury. No final TMDL.

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.	4.5 ft^3/s
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	41.3

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: 6/23/2017

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: PCE, TCE, cis-1,2 Dichloroethylene, VC	
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): Storm drain at Union Street bridge over Sudbury River	Outfall location(s): (Latitude, Longitude) 42.292784, -71.427585
Discharges enter the receiving water(s) via (check any that apply): ☐ Direct discharge to the receiving water ■ Indirect discharge, if so, specify: Treatment system discharges to the municipal stormwater system, which discharges to the Sudbury River. ☐ 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): Ongoing through end of current permit 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	E350.1	50	510	510	Report mg/L	---
Chloride		✔	1	300.0	27,000	659,000	659,000	Report µg/l	---
Total Residual Chlorine	✔							0.2 mg/L	187
Total Suspended Solids	✔							30 mg/L	---
Antimony	✔							206 µg/L	
Arsenic	✔		1	6010C	4.0			104 µg/L	
Cadmium	✔		1	6010C	2.5			10.2 µg/L	
Chromium III	✔		1	6010C	10.0			323 µg/L	
Chromium VI	✔		1	3500	5			323 µg/L	
Copper		✔	1	6010C	5.0	286	286	242 µg/L	99.6
Iron		✔	1	6010C	15.0	638	638	5,000 µg/L	
Lead	✔		1	6010C	7.5			160 µg/L	
Mercury	✔		1	245.1	0.20			0.739 µg/L	
Nickel	✔		1	6010C	5.0			1,450 µg/L	
Selenium	✔		1	6010C	15.0			235.8 µg/L	
Silver	✔		1	6010C	5.0			35.1 µg/L	
Zinc		✔	1	6010C	5.0	262	262	420 µg/L	
Cyanide	✔							178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX	✔							100 µg/L	---
Benzene	✔		1	8260C	5.00			5.0 µg/L	---
1,4 Dioxane	✔							200 µg/L	---
Acetone	✔		1	8260C	50.0			7.97 mg/L	---
Phenol	✔							1,080 µg/L	

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✔		1	8260C	5.00			4.4 µg/L	
1,2 Dichlorobenzene	✔		1	8260C	5.00			600 µg/L	---
1,3 Dichlorobenzene	✔		1	8260C	5.00			320 µg/L	---
1,4 Dichlorobenzene	✔		1	8260C	5.00			5.0 µg/L	---
Total dichlorobenzene	✔							763 µg/L in NH	---
1,1 Dichloroethane	✔		1	8260C	5.00			70 µg/L	---
1,2 Dichloroethane	✔		1	8260C	5.00			5.0 µg/L	---
1,1 Dichloroethylene	✔		1	8260C	5.00			3.2 µg/L	---
Ethylene Dibromide	✔							0.05 µg/L	---
Methylene Chloride	✔		1	8260C	10.0			4.6 µg/L	---
1,1,1 Trichloroethane	✔		1	8260C	5.00			200 µg/L	---
1,1,2 Trichloroethane	✔		1	8260C	5.00			5.0 µg/L	---
Trichloroethylene		✔	1	8260C	5.00	55.6	55.6	5.0 µg/L	---
Tetrachloroethylene		✔	1	8260C	5.00	946	946	5.0 µg/L	
cis-1,2 Dichloroethylene		✔	1	8260C	5.00	39.7	39.7	70 µg/L	---
Vinyl Chloride		✔	1	8260C	5.00			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	✔		1	8260C	5.00			70 µg/L	
tert-Butyl Alcohol	✔		1	8260C	50.0			120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✔		1	8260C	5.00			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	1293-99B		6.21	6.21		
temperature		✔	1	field		19.1	19.1		
hardness		✔	1	2340B	291	129,000	129,000		

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.

Discharge from two sumps is directed through media filtration cannisters, then into a holding tank, then pumped through a series of cannisters filled with granular activated carbon prior to disposal into the municipal stormwater system.

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: Granulated activated carbon filters Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	50
Provide the proposed maximum effluent flow in gpm.	50
Provide the average effluent flow in gpm.	25
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)

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

2. Provide the following information for each chemical/additive, using attachments, if necessary:
No chemical additives are planned. An SDS (typical) for the granular activated carbon is attached.
a. Product name, chemical formula, and manufacturer of the chemical/additive;
b. Purpose or use of the chemical/additive or remedial agent;
c. Material Safety Data Sheet (MSDS) and Chemical Abstracts Service (CAS) Registry number for each chemical/additive;
d. The frequency (hourly, daily, etc.), duration (hours, days), quantity (maximum and average), and method of application for the chemical/additive;
e. Any material compatibility risks for storage and/or use including the control measures used to minimize such risks; and
f. If available, the vendor's reported aquatic toxicity (NOAEL and/or LC50 in percent for aquatic organism(s)).

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

G. Endangered Species Act eligibility determination

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

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

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

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

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

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

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

H. National Historic Preservation Act eligibility determination

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

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

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

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

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

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

I. Supplemental information

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

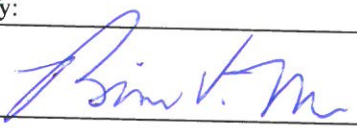
The sump pumps activate infrequently during periods of heavy precipitation/high groundwater. High groundwater is only expected to occur in the spring of any year from rain or snow melt. The sumps each hold approximately 10 gallons (1.34 cubic feet) of water before the pumps are activated. The pumps evacuate the sumps within approximately 10 seconds and then shut down until the sump fills again. Based upon an assumed recharge rate for the sumps of 5 minutes, the average flow rate for the two sumps during times when the treatment system will be operating is 4 GPM (i.e., 20 gallons x 12 events/hour /60 min) or 240 gallons per hour. However, at times of high groundwater the system may operate continuously at a rate of up to 25 gpm.

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: The discharges are in compliance with the requirements of the BMPP and meet the effluent limitations included in this general permit	
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: 7/6/2017
Print Name and Title: Brian V. Moran, P.E., LSP	

Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200, Quincy MA 02169-0982

APPENDIX B

SAFETY DATA SHEETS – GRANULAR ACTIVATED CARBON

Material Safety Data Sheet

Section 1 - Product Identification and Use

Product Identifier: **GRANULAR ACTIVATED CARBON (GAC)**

Description: Black granule, pellet or powder, activated carbon

Product Use: Water filtration & treatment/air treatment

Manufacturer's Name:
PICA USA Inc.
432 McCormick Boulevard
Columbus, Ohio 43213-1585
Phone: [614] 864-8100
Emergency Phone: [800] 424-9300

Supplier's Name:
AWI (Anthratech Western Inc.)
4450 – 46 Avenue, SE
Calgary, Alberta T2B 3N7
Emergency Phone: [403] 255-7377

* Activated Carbon is manufactured by PICA USA Inc. and is distributed by AWI.

Section 2 - Hazardous Ingredients

This material is composed of 100% activated carbon. Caution should be taken not to inhale dust.

CARBON:	LD50-Oral:	N/A	C.A.S. #:	7440-44-0
	LC50:	N/A	Range % (w/w):	90-100
	LD50-Dermal:	N/A	T.L.V.:	3.5 mg/cu.m

Section 3 - Physical Data

Boiling Point:	N/A	Incompatibility:	Avoid contact with strong oxidizers
Solubility in Water:	Not soluble	Flash Point:	N/A
Specific Gravity:	0.30 - 0.50 @ 25 °C	Stability:	Stable
Melting Point:	3500 °C	pH:	8-10, 10% suspension in water
Appearance and Odour:	Odourless black solid, flake, granule or pellet, no odour		

Section 4 - Fire and Explosion Data

Flash Point:	N/A	Extinguishing Media:	Water, foam, CO_2 , or dry chemical
Upper Flammable Limit:	N/A	Lower Flammable Limit:	N/A

General Fire Hazards: When exposed to air activated carbon can be a potential fire hazard because of its very high surface area and absorptive capacity. Accumulation of airborne dusts may present an explosion or fire hazard in the presence of an ignition source.

Hazardous Combustion Products: Upon combustion, this product may emit carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons. Other materials absorbed onto the carbon may also be released during combustion.

Section 5 - Reactivity Data

Stability:	Stable
Incompatibility:	Oxidizers, nitric acid, hydrogen, peroxide, metals, oxosalts, potassium, nitric acid, sodium sulphide, halogens, oxygen, ozone bromates, chlorates, iodates and nitrates.
Hazardous Polymerization:	Will not occur
Hazardous Decomposition:	Normal combustion

Section 6 - Toxicological Properties

Potential Health Effects:

Eye Contact:	Contact may produce mechanical eye irritation.
Skin Contact:	Skin irritation would not be expected from single short term exposure to this product. Prolonged or repeated contact may produce some irritation.
Ingestion:	Ingestion of this product may cause gastrointestinal irritation, nausea, vomiting and constipation. Small amounts of this product in solution, if aspirated into lungs, may cause mild to severe pulmonary injury, possibly death.
Inhalation:	Chronic inhalation may produce carbon deposition in the lungs. Oral LD50 rats: >5g/kg.

No carcinogenicity data available for this product.

Section 7 - Preventative Measures

Spilled or released material may be swept up and discarded or repackaged

Waste Disposal:	Non toxic. Dispose of in accordance with all federal, provincial and local regulations.
Handling/Storage:	Provide adequate ventilation. Store away from heat, ignition sources, combustible materials and incompatible materials.

CAUTION! Wet activated carbon removes oxygen from the air causing a severe hazard to workers in confined spaces. Sampling and work procedures for low oxygen levels should be taken whenever workers may be entering carbon vessels, enclosed, or confined spaces. All federal, provincial, and local regulations should be observed.

Respiratory:	Wear approved dust and mist respirator NIOSH/OHSA
Eyes:	Approved safety glasses with side shields must be worn at all times.
Gloves:	(protective) None required
Ventilation:	Local exhaust
Clothing:	Proper work clothing to be worn to prevent skin contact
Hygiene:	Maintain clean environment

Section 8 - First Aid Measures

Eyes:	Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.
Skin:	Wash with soap and large amounts of water. If irritation persists, seek medical attention.
Ingestion:	If material is swallowed, get immediate medical attention or advice – DO NOT induce vomiting unless instructed to do so by medical personnel.
Inhalation:	Remove source of contamination or move victim to fresh air. Seek medical attention if irritation persists.

Section 9 - Preparation of Date of MSDS

Prepared by:	Kellsie Donaldson (Safety Officer) AWI, 4450 – 46 Ave SE; Calgary, AB T2B 3N7
Telephone Number:	[403] 255- 7377
Date Prepared:	January 13, 2010

Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200, Quincy MA 02169-0982

APPENDIX C

LABORATORY DATA SHEETS

eurofins | Spectrum Analytical

☑ Final Report
☐ Revised Report

Report Date:
21-Jun-17 16:10

Laboratory Report
SC35969

Stantec Consulting Services
400 Crown Colony Drive, Suite 200
Quincy, MA 02169
Attn: Charles Young

Project: Callahan Center - Framingham, MA
Project #: 191750030

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87936
Maine # MA138
New Hampshire # 2972/2538
New Jersey # MA011
New York # 11393
Pennsylvania # 68-04426/68-02924
Rhode Island # LAO00348
USDA # P330-15-00375
Vermont # VT-11393

Authorized by:

Christina White
Laboratory Director

Christina A. White

Eurofins Spectrum Analytical holds primary certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 14 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Eurofins Spectrum Analytical, Inc.

Eurofins Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Eurofins Spectrum Analytical, Inc. is currently accredited for the specific method or analyte indicated. Please refer to our 'Quality' web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Eurofins Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (PA-68-04426).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

Sample Summary

Work Order: SC35969

Project: Callahan Center - Framingham, MA

Project Number: 191750030

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SC35969-01	CFS - INFLUENT	Ground Water	16-Jun-17 08:45	16-Jun-17 18:20
SC35969-02	Sudbury SW	Surface Water	16-Jun-17 09:05	16-Jun-17 18:20

MassDEP Analytical Protocol Certification Form

Laboratory Name: Eurofins Spectrum Analytical, Inc.	**Project #:** 191750030
Project Location: Callahan Center - Framingham, MA	**RTN:**
This form provides certifications for the following data set:	SC35969-01 through SC35969-02
Matrices: Ground Water Surface Water	

CAM Protocol

8260 VOC CAM II A	✓ 7470/7471 Hg CAM III B	MassDEP VPH CAM IV A	8081 Pesticides CAM V B	✓ 7196 Hex Cr CAM VI B	MassDEP APH CAM IX A
8270 SVOC CAM II B	7010 Metals CAM III C	MassDEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B
✓ 6010 Metals CAM III A	6020 Metals CAM III D	8082 PCB CAM V A	9012 Total Cyanide/PAC CAM VI A	9014 Total Cyanide/PAC CAM VI A	6860 Perchlorate CAM VIII B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

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

Responses to questions G, H and I below are required for "Presumptive Certainty" status

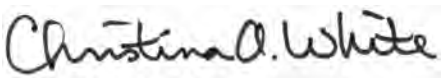
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	✓ Yes No

***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	✓ Yes No
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ✓ No

All negative responses are addressed in a case narrative on the cover page of this report.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.



Christina A. White
Laboratory Director
Date: 6/21/2017

CASE NARRATIVE:

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

The samples were received 0.5 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

MADEP has published a list of analytical methods (CAM) which provides a series of recommended protocols for the acquisition, analysis and reporting of analytical data in support of MCP decisions. "Presumptive Certainty" can be established only for those methods published by the MADEP in the MCP CAM. The compounds and/or elements reported were specifically requested by the client on the Chain of Custody and in some cases may not include the full analyte list as defined in the method. Regulatory limits may not be achieved if specific method and/or technique was not requested on the Chain of Custody.

According to WSC-CAM 5/2009 Rev.1, Table 11 A-1, recovery for some VOC analytes have been deemed potentially difficult. Although they may still be within the recommended recovery range, a range has been set based on historical control limits.

Some target analytes which are not listed as exceptions in the Summary of CAM Reporting Limits may exceed the recommended RL based on sample initial volume or weight provided, % moisture content, or responsiveness of a particular analyte to purge and trap instrumentation.

Analyses for Total Hardness, pH, and Total Residual Chlorine fall under the state of Pennsylvania code Chapter 252.6 accreditation by rule.

There is no relevant protocol-specific QC and/or performance standards non-conformances to report.

Sample Acceptance Check Form

Client:	Stantec Consulting Services - Quincy, MA
Project:	Callahan Center - Framingham, MA / 191750030
Work Order:	SC35969
Sample(s) received on:	6/16/2017

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
Were custody seals present?	☐	☑	☐
Were custody seals intact?	☐	☐	☑
Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
Were samples refrigerated upon transfer to laboratory representative?	☑	☐	☐
Were sample containers received intact?	☑	☐	☐
Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
Were samples accompanied by a Chain of Custody document?	☑	☐	☐
Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
Did sample container labels agree with Chain of Custody document?	☑	☐	☐
Were samples received within method-specific holding times?	☑	☐	☐

Summary of Hits

Lab ID: SC35969-01 **Client ID:** CFS - INFLUENT

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Ammonia as Nitrogen	0.51		0.05	mg/L	E350.1
Hardness	129		0.291	mg/l CaCO3	SM 2340B (11)
Calcium	40.4		0.100	mg/l	SW846 6010C
Copper	0.286		0.0050	mg/l	SW846 6010C
Iron	0.638		0.0150	mg/l	SW846 6010C
Magnesium	6.92		0.0100	mg/l	SW846 6010C
Zinc	0.0262		0.0050	mg/l	SW846 6010C

Lab ID: SC35969-02 **Client ID:** Sudbury SW

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Ammonia as Nitrogen	0.19		0.05	mg/L	E350.1
Hardness	53.7		0.291	mg/l CaCO3	SM 2340B (11)
Calcium	15.6		0.100	mg/l	SW846 6010C
Iron	0.612		0.0150	mg/l	SW846 6010C
Magnesium	3.59		0.0100	mg/l	SW846 6010C
Zinc	0.0074		0.0050	mg/l	SW846 6010C

Please note that because there are no reporting limits associated with hazardous waste characterizations or micro analyses, this summary does not include hits from these analyses if included in this work order.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
CFS - INFLUENT SC35969-01	191750030	Ground Water	16-Jun-17 08:45	16-Jun-17

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Total Metals by EPA 200/6000 Series Methods													
Prepared by method General Prep-Metal													
	Preservation	**Field Preserved; pH<2 confirmed**		N/A			1	EPA 200/6000 methods	16-Jun-17		AAW	1710137	
Total Metals by EPA 6000/7000 Series Methods													
Prepared by method SW846 3005A													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0006	1	SW846 6010C	19-Jun-17	20-Jun-17	TBC	1710190	
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0014	1	"	"	"	"	"	
7440-70-2	Calcium	**40.4**		mg/l	0.100	0.0071	1	"	"	"	"	"	
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0004	1	"	"	"	"	"	
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	
7440-50-8	Copper	**0.286**		mg/l	0.0050	0.0023	1	"	"	"	"	"	
7439-89-6	Iron	**0.638**		mg/l	0.0150	0.0045	1	"	"	21-Jun-17	"	"	
7439-95-4	Magnesium	**6.92**		mg/l	0.0100	0.0044	1	"	"	20-Jun-17	"	"	
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0062	1	"	"	"	"	"	
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0016	1	"	"	"	"	"	
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0042	1	"	"	"	"	"	
7440-66-6	Zinc	**0.0262**		mg/l	0.0050	0.0016	1	"	"	"	"	"	
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00013	1	EPA 245.1/7470A	19-Jun-17	19-Jun-17	JLC	1710191	X
General Chemistry Parameters													
Prepared by method SW846 3005A													
16065-83-1	Trivalent Chromium	< 0.0100		mg/l	0.0100	0.0053	1	Calculation	19-Jun-17	21-Jun-17	TBC	1710190	
Prepared by method [CALC]													
	Hardness	**129**	HD	mg/l CaCO3	0.291	0.0360	1	SM 2340B (11)	"	20-Jun-17	TBC	[CALC]	
18540-29-9	Hexavalent Chromium	< 0.005		mg/l	0.005	0.002	1	SM3500-Cr-B (11)/7196A	16-Jun-17 19:39	17-Jun-17 08:34	RLT	1710148	
	pH	**6.21**	pH	pH Units			1	ASTM D 1293-99B	16-Jun-17 19:00	16-Jun-17 19:15	BD	1710139	X
Subcontracted Analyses													
Prepared by method 390559													
*Analysis performed by Phoenix Environmental Labs, Inc. * - MACT007*													
7664-41-7	Ammonia as Nitrogen	**0.51**		mg/L	0.05	0.05	1	E350.1		20-Jun-17 10:39	MACT0	390559A	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
Sudbury SW SC35969-02	191750030	Surface Water	16-Jun-17 09:05	16-Jun-17

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Total Metals by EPA 200/6000 Series Methods													
Prepared by method General Prep-Metal													
	Preservation	**Field Preserved; pH<2 confirmed**		N/A			1	EPA 200/6000 methods	16-Jun-17		AAW	1710137	
Total Metals by EPA 6000/7000 Series Methods													
Prepared by method SW846 3005A													
7440-22-4	Silver	< 0.0050		mg/l	0.0050	0.0006	1	SW846 6010C	19-Jun-17	20-Jun-17	TBC	1710190	
7440-38-2	Arsenic	< 0.0040		mg/l	0.0040	0.0014	1	"	"	"	"	"	
7440-70-2	Calcium	**15.6**		mg/l	0.100	0.0071	1	"	"	"	"	"	
7440-43-9	Cadmium	< 0.0025		mg/l	0.0025	0.0004	1	"	"	"	"	"	
7440-47-3	Chromium	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	
7440-50-8	Copper	< 0.0050		mg/l	0.0050	0.0023	1	"	"	"	"	"	
7439-89-6	Iron	**0.612**		mg/l	0.0150	0.0045	1	"	"	21-Jun-17	"	"	
7439-95-4	Magnesium	**3.59**		mg/l	0.0100	0.0044	1	"	"	20-Jun-17	"	"	
7440-02-0	Nickel	< 0.0050		mg/l	0.0050	0.0009	1	"	"	"	"	"	
7439-92-1	Lead	< 0.0075		mg/l	0.0075	0.0062	1	"	"	"	"	"	
7440-36-0	Antimony	< 0.0060		mg/l	0.0060	0.0016	1	"	"	"	"	"	
7782-49-2	Selenium	< 0.0150		mg/l	0.0150	0.0042	1	"	"	"	"	"	
7440-66-6	Zinc	**0.0074**		mg/l	0.0050	0.0016	1	"	"	"	"	"	
Total Metals by EPA 200 Series Methods													
7439-97-6	Mercury	< 0.00020		mg/l	0.00020	0.00013	1	EPA 245.1/7470A	19-Jun-17	19-Jun-17	JLC	1710191	X
General Chemistry Parameters													
Prepared by method SW846 3005A													
16065-83-1	Trivalent Chromium	< 0.0100		mg/l	0.0100	0.0053	1	Calculation	19-Jun-17	21-Jun-17	TBC	1710190	
Prepared by method [CALC]													
	Hardness	**53.7**	HD	mg/l CaCO3	0.291	0.0360	1	SM 2340B (11)	"	20-Jun-17	TBC	[CALC]	
18540-29-9	Hexavalent Chromium	< 0.005		mg/l	0.005	0.002	1	SM3500-Cr-B (11)/7196A	16-Jun-17 19:39	17-Jun-17 08:35	RLT	1710148	
	pH	**6.52**	pH	pH Units			1	ASTM D 1293-99B	16-Jun-17 19:00	16-Jun-17 19:15	BD	1710139	X
Subcontracted Analyses													
Prepared by method 390559													
*Analysis performed by Phoenix Environmental Labs, Inc. * - MACT007*													
7664-41-7	Ammonia as Nitrogen	**0.19**		mg/L	0.05	0.05	1	E350.1		20-Jun-17 10:40	MACT0	390559A	

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 6010C										
Batch 1710190 - SW846 3005A										
Blank (1710190-BLK1)					Prepared: 19-Jun-17 Analyzed: 21-Jun-17					
Iron	< 0.0150		mg/l	0.0150						
Zinc	< 0.0050		mg/l	0.0050						
Selenium	< 0.0150		mg/l	0.0150						
Antimony	< 0.0060		mg/l	0.0060						
Lead	< 0.0075		mg/l	0.0075						
Nickel	< 0.0050		mg/l	0.0050						
Magnesium	< 0.0100		mg/l	0.0100						
Chromium	< 0.0050		mg/l	0.0050						
Cadmium	< 0.0025		mg/l	0.0025						
Calcium	< 0.100		mg/l	0.100						
Arsenic	< 0.0040		mg/l	0.0040						
Silver	< 0.0050		mg/l	0.0050						
Copper	< 0.0050		mg/l	0.0050						
LCS (1710190-BS1)					Prepared: 19-Jun-17 Analyzed: 21-Jun-17					
Iron	**1.32**		mg/l	0.0150	1.25		106	85-115		
Arsenic	**1.29**		mg/l	0.0040	1.25		104	85-115		
Selenium	**1.27**		mg/l	0.0150	1.25		102	85-115		
Antimony	**1.22**		mg/l	0.0060	1.25		97	85-115		
Lead	**1.26**		mg/l	0.0075	1.25		101	85-115		
Nickel	**1.24**		mg/l	0.0050	1.25		99	85-115		
Magnesium	**1.27**		mg/l	0.0100	1.25		101	85-115		
Copper	**1.27**		mg/l	0.0050	1.25		102	85-115		
Chromium	**1.31**		mg/l	0.0050	1.25		105	85-115		
Silver	**1.25**		mg/l	0.0050	1.25		100	85-115		
Calcium	**6.10**		mg/l	0.100	6.25		98	85-115		
Zinc	**1.28**		mg/l	0.0050	1.25		102	85-115		
Cadmium	**1.28**		mg/l	0.0025	1.25		102	85-115		
LCS Dup (1710190-BSD1)					Prepared: 19-Jun-17 Analyzed: 21-Jun-17					
Iron	**1.26**		mg/l	0.0150	1.25		101	85-115	5	20
Silver	**1.25**		mg/l	0.0050	1.25		100	85-115	0.1	20
Copper	**1.27**		mg/l	0.0050	1.25		102	85-115	0.1	20
Magnesium	**1.27**		mg/l	0.0100	1.25		101	85-115	0	20
Nickel	**1.24**		mg/l	0.0050	1.25		99	85-115	0.2	20
Lead	**1.26**		mg/l	0.0075	1.25		101	85-115	0.1	20
Antimony	**1.21**		mg/l	0.0060	1.25		97	85-115	0.4	20
Selenium	**1.27**		mg/l	0.0150	1.25		101	85-115	0.5	20
Zinc	**1.27**		mg/l	0.0050	1.25		102	85-115	0.4	20
Cadmium	**1.27**		mg/l	0.0025	1.25		102	85-115	0.3	20
Calcium	**6.12**		mg/l	0.100	6.25		98	85-115	0.2	20
Chromium	**1.31**		mg/l	0.0050	1.25		105	85-115	0.1	20
Arsenic	**1.29**		mg/l	0.0040	1.25		103	85-115	0.6	20
Duplicate (1710190-DUP1)			**Source: SC35969-01**		Prepared: 19-Jun-17 Analyzed: 21-Jun-17					
Iron	**0.616**		mg/l	0.0150		0.638			4	20
Selenium	< 0.0150		mg/l	0.0150		BRL				20
Antimony	< 0.0060		mg/l	0.0060		BRL				20
Lead	< 0.0075		mg/l	0.0075		BRL				20
Nickel	< 0.0050		mg/l	0.0050		BRL				20
Magnesium	**7.11**		mg/l	0.0100		6.92			3	20
Copper	**0.289**		mg/l	0.0050		0.286			0.9	20
Chromium	< 0.0050		mg/l	0.0050		BRL				20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 6010C										
Batch 1710190 - SW846 3005A										
Duplicate (1710190-DUP1)			**Source: SC35969-01**			Prepared: 19-Jun-17 Analyzed: 20-Jun-17				
Cadmium	< 0.0025		mg/l	0.0025		BRL				20
Calcium	**41.5**		mg/l	0.100		40.4			3	20
Arsenic	< 0.0040		mg/l	0.0040		BRL				20
Silver	< 0.0050		mg/l	0.0050		BRL				20
Zinc	**0.0280**		mg/l	0.0050		0.0262			6	20
Matrix Spike (1710190-MS1)			**Source: SC35969-01**			Prepared: 19-Jun-17 Analyzed: 21-Jun-17				
Iron	**1.92**		mg/l	0.0150	1.25	0.638	102	75-125		
Zinc	**1.30**		mg/l	0.0050	1.25	0.0262	102	75-125		
Copper	**1.56**		mg/l	0.0050	1.25	0.286	102	75-125		
Magnesium	**8.37**		mg/l	0.0100	1.25	6.92	116	75-125		
Nickel	**1.17**		mg/l	0.0050	1.25	BRL	94	75-125		
Lead	**1.18**		mg/l	0.0075	1.25	BRL	94	75-125		
Chromium	**1.31**		mg/l	0.0050	1.25	BRL	105	75-125		
Selenium	**1.30**		mg/l	0.0150	1.25	BRL	104	75-125		
Cadmium	**1.26**		mg/l	0.0025	1.25	BRL	101	75-125		
Silver	**1.31**		mg/l	0.0050	1.25	BRL	105	75-125		
Calcium	**47.9**		mg/l	0.100	6.25	40.4	120	75-125		
Arsenic	**1.35**		mg/l	0.0040	1.25	BRL	108	75-125		
Antimony	**1.22**		mg/l	0.0060	1.25	BRL	98	75-125		
Matrix Spike Dup (1710190-MSD1)			**Source: SC35969-01**			Prepared: 19-Jun-17 Analyzed: 21-Jun-17				
Iron	**1.96**		mg/l	0.0150	1.25	0.638	106	75-125	2	20
Silver	**1.33**		mg/l	0.0050	1.25	BRL	106	75-125	1	20
Arsenic	**1.38**		mg/l	0.0040	1.25	BRL	110	75-125	2	20
Lead	**1.20**		mg/l	0.0075	1.25	BRL	96	75-125	1	20
Chromium	**1.32**		mg/l	0.0050	1.25	BRL	106	75-125	0.9	20
Copper	**1.58**		mg/l	0.0050	1.25	0.286	103	75-125	1	20
Nickel	**1.19**		mg/l	0.0050	1.25	BRL	95	75-125	1	20
Cadmium	**1.28**		mg/l	0.0025	1.25	BRL	102	75-125	1	20
Antimony	**1.24**		mg/l	0.0060	1.25	BRL	100	75-125	2	20
Selenium	**1.32**		mg/l	0.0150	1.25	BRL	106	75-125	2	20
Zinc	**1.31**		mg/l	0.0050	1.25	0.0262	103	75-125	1	20
Calcium	**47.6**		mg/l	0.100	6.25	40.4	116	75-125	0.6	20
Magnesium	**8.34**		mg/l	0.0100	1.25	6.92	114	75-125	0.3	20
Post Spike (1710190-PS1)			**Source: SC35969-01**			Prepared: 19-Jun-17 Analyzed: 21-Jun-17				
Iron	**1.90**		mg/l	0.0150	1.25	0.638	101	80-120		
Selenium	**1.31**		mg/l	0.0150	1.25	BRL	105	80-120		
Antimony	**1.22**		mg/l	0.0060	1.25	BRL	98	80-120		
Zinc	**1.32**		mg/l	0.0050	1.25	0.0262	103	80-120		
Magnesium	**8.14**		mg/l	0.0100	1.25	6.92	97	80-120		
Lead	**1.19**		mg/l	0.0075	1.25	BRL	95	80-120		
Nickel	**1.18**		mg/l	0.0050	1.25	BRL	95	80-120		
Calcium	**47.2**		mg/l	0.100	6.25	40.4	110	80-120		
Cadmium	**1.28**		mg/l	0.0025	1.25	BRL	102	80-120		
Arsenic	**1.36**		mg/l	0.0040	1.25	BRL	109	80-120		
Silver	**1.33**		mg/l	0.0050	1.25	BRL	106	80-120		
Chromium	**1.33**		mg/l	0.0050	1.25	BRL	107	80-120		
Copper	**1.57**		mg/l	0.0050	1.25	0.286	103	80-120		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
EPA 245.1/7470A										
Batch 1710191 - EPA200/SW7000 Series										
Blank (1710191-BLK1)					Prepared & Analyzed: 19-Jun-17					
Mercury	< 0.00020		mg/l	0.00020						
LCS (1710191-BS1)					Prepared & Analyzed: 19-Jun-17					
Mercury	**0.00444**		mg/l	0.00020	0.00500		89	85-115		
Duplicate (1710191-DUP1)			**Source: SC35969-02**		Prepared & Analyzed: 19-Jun-17					
Mercury	< 0.00020		mg/l	0.00020		BRL				20
Matrix Spike (1710191-MS1)			**Source: SC35969-02**		Prepared & Analyzed: 19-Jun-17					
Mercury	**0.00445**		mg/l	0.00020	0.00500	BRL	89	80-120		
Matrix Spike Dup (1710191-MSD1)			**Source: SC35969-02**		Prepared & Analyzed: 19-Jun-17					
Mercury	**0.00426**		mg/l	0.00020	0.00500	BRL	85	80-120	4	20
Post Spike (1710191-PS1)			**Source: SC35969-02**		Prepared & Analyzed: 19-Jun-17					
Mercury	**0.00431**		mg/l	0.00020	0.00500	BRL	86	85-115		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
ASTM D 1293-99B										
Batch 1710139 - General Preparation										
Reference (1710139-SRM1)						Prepared & Analyzed: 16-Jun-17				
pH	**5.96**		pH Units		6.00		99	97.5-102.5		
Reference (1710139-SRM2)						Prepared & Analyzed: 16-Jun-17				
pH	**6.01**		pH Units		6.00		100	97.5-102.5		
SM3500-Cr-B (11)/7196A										
Batch 1710148 - General Preparation										
Blank (1710148-BLK1)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	< 0.005		mg/l	0.005						
LCS (1710148-BS1)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	**0.052**		mg/l	0.005	0.0500		104	90-111		
Calibration Blank (1710148-CCB1)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	**0.0001**		mg/l							
Calibration Blank (1710148-CCB2)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	**-0.002**		mg/l							
Calibration Blank (1710148-CCB3)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	**-0.002**		mg/l							
Calibration Check (1710148-CCV1)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	**0.051**		mg/l	0.005	0.0500		103	90-110		
Calibration Check (1710148-CCV2)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	**0.048**		mg/l	0.005	0.0500		97	90-110		
Calibration Check (1710148-CCV3)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	**0.048**		mg/l	0.005	0.0500		97	90-110		
Reference (1710148-SRM1)						Prepared: 16-Jun-17 Analyzed: 17-Jun-17				
Hexavalent Chromium	**0.027**		mg/l	0.005	0.0250		108	85-115		

Subcontracted Analyses - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
E350.1										
Batch 390559A - 390559										
BLK (BY40933-BLK)						Prepared: 19-Jun-17 Analyzed: 20-Jun-17				
Ammonia as Nitrogen	< 0.05		mg/L	0.05				-		
DUP (BY40933-DUP)			**Source: BY40933**			Prepared: 19-Jun-17 Analyzed: 20-Jun-17				
Ammonia as Nitrogen	**53.3**		mg/L	0.50				-	0.4	20
LCS (BY40933-LCS)						Prepared: 19-Jun-17 Analyzed: 20-Jun-17				
Ammonia as Nitrogen	**3.450**		mg/L	0.05	3.74		92.2	90-110		20
MS (BY40933-MS)			**Source: BY40933**			Prepared: 19-Jun-17 Analyzed: 20-Jun-17				
Ammonia as Nitrogen	**71.10**		mg/L	0.05	20		90.0	90-110		20

Notes and Definitions

dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
pH	The method for pH does not stipulate a specific holding time other than to state that the samples should be analyzed as soon as possible. For aqueous samples the 40 CFR 136 specifies a holding time of 15 minutes from sampling to analysis. Therefore all aqueous pH samples not analyzed in the field are considered out of hold time at the time of sample receipt. All soil samples are analyzed as soon as possible after sample receipt.
HD	Total Hardness is a calculation based on the reported values of Ca and Mg.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

SC35969 Rev

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CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
- ☐ Standard TAT - 7 to 10 business days
- ☑ Rush TAT - Date Needed: 6/21

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed

Report To: STANTEC
700 CROWN COLONY DRIVE
SUITE 200
QUINCY, MA 02169
Telephone #:
Project Mgr: CHARLES YOUNG

Invoice To: SAME
P.O No.: Quote #: STANTEC MSA

Project No: 19175003.8
Site Name: CALLAHAN CENTER
Location: FRAMINGHAM State: MA
Sampler(s): NCG

F=Field Filtered 1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11= 12=

DW=Dinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O-Oil SO-Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1= X2= X3=

G= Grab C=Compsite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	pH	HARDNESS	AMMONIA	METALS *	Cr6				Check if chlorinated
SC35969-01	CFS- INFLUENT	6/16/17	0845	G	GW		1		3	X	X	X	X	X				☐
-02	SUDBURY SW	6/16/17	0905	G	SW		1		3	X	X	X	X	X				☐
																		☐
																		☐
																		☐
																		☐
																		☐
																		☐
																		☐
																		☐
																		☐

List Preservative Code below: — | 4 | 3 | 4 | —

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☑ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☑ Standard ☑ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☐ Other:
State-specific reporting standards:

GW-1

* METALS: Sb, As, Cd, Cr3, Cu, Fe, Pb, Hg, Ni, Se, Ag, Zn TOTAL

Relinquished by:	Received by:	Date:	Time:
[signature]	[signature]	6/16/17	13:45
[signature]	[signature]	6/16/17	1620

Temp °C: Observed 0.5; Correction Factor 0; Corrected 0.5; IR ID # 01

☑ EDD format: PDF
☑ E-mail to: NATHAN.GARDNER@STANTEC.COM
CHARLES.YOUNG@STANTEC.COM

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☒ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

Batch Summary

[CALC]

General Chemistry Parameters

SC35969-01 (CFS - INFLUENT)
SC35969-02 (Sudbury SW)

1710137

Total Metals by EPA 200/6000 Series Methods

SC35969-01 (CFS - INFLUENT)
SC35969-02 (Sudbury SW)

1710139

General Chemistry Parameters

1710139-SRM1
1710139-SRM2
SC35969-01 (CFS - INFLUENT)
SC35969-02 (Sudbury SW)

1710148

General Chemistry Parameters

1710148-BLK1
1710148-BS1
1710148-CCB1
1710148-CCB2
1710148-CCB3
1710148-CCV1
1710148-CCV2
1710148-CCV3
1710148-SRM1
SC35969-01 (CFS - INFLUENT)
SC35969-02 (Sudbury SW)

1710190

Total Metals by EPA 6000/7000 Series Methods

1710190-BLK1
1710190-BS1
1710190-BSD1
1710190-DUP1
1710190-MS1
1710190-MSD1
1710190-PS1
SC35969-01 (CFS - INFLUENT)
SC35969-01 (CFS - INFLUENT)
SC35969-02 (Sudbury SW)
SC35969-02 (Sudbury SW)

1710191

Total Metals by EPA 200 Series Methods

1710191-BLK1
1710191-BS1
1710191-DUP1
1710191-MS1
1710191-MSD1
1710191-PS1
SC35969-01 (CFS - INFLUENT)
SC35969-02 (Sudbury SW)

390559A

Subcontracted Analyses

BY40933-BLK
BY40933-DUP
BY40933-LCS
BY40933-MS
SC35969-01 (CFS - INFLUENT)
SC35969-02 (Sudbury SW)

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☑ Final Report
☐ Revised Report

Report Date:
06-Jun-17 15:53

Laboratory Report
SC35211

Stantec Consulting Services
400 Crown Colony Drive, Suite 200
Quincy, MA 02169
Attn: Nate Gardner

Project: Callahan Center - Framingham, MA
Project #: 191750030

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87936
Maine # MA138
New Hampshire # 2972/2538
New Jersey # MA011
New York # 11393
Pennsylvania # 68-04426/68-02924
Rhode Island # LAO00348
USDA # P330-15-00375
Vermont # VT-11393

Authorized by:

Christina White
Laboratory Director

Christina A. White

Eurofins Spectrum Analytical holds primary certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 29 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Eurofins Spectrum Analytical, Inc.

Eurofins Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Eurofins Spectrum Analytical, Inc. is currently accredited for the specific method or analyte indicated. Please refer to our 'Quality' web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Eurofins Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (PA-68-04426).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

Sample Summary

Work Order: SC35211

Project: Callahan Center - Framingham, MA

Project Number: 191750030

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SC35211-01	CFS - INFLUENT	Ground Water	26-May-17 08:40	30-May-17 12:35
SC35211-02	CFS - EFFLUENT	Ground Water	26-May-17 08:40	30-May-17 12:35

MassDEP Analytical Protocol Certification Form

Laboratory Name: Eurofins Spectrum Analytical, Inc.	**Project #:** 191750030
Project Location: Callahan Center - Framingham, MA	**RTN:**
This form provides certifications for the following data set:	SC35211-01 through SC35211-02
Matrices: Ground Water	

CAM Protocol

✓ 8260 VOC CAM II A	7470/7471 Hg CAM III B	MassDEP VPH CAM IV A	8081 Pesticides CAM V B	7196 Hex Cr CAM VI B	MassDEP APH CAM IX A
8270 SVOC CAM II B	7010 Metals CAM III C	MassDEP EPH CAM IV B	8151 Herbicides CAM V C	8330 Explosives CAM VIII A	TO-15 VOC CAM IX B
6010 Metals CAM III A	6020 Metals CAM III D	8082 PCB CAM V A	9012 Total Cyanide/PAC CAM VI A	9014 Total Cyanide/PAC CAM VI A	6860 Perchlorate CAM VIII B

Affirmative responses to questions A through F are required for Presumptive Certainty status

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

Responses to questions G, H and I below are required for Presumptive Certainty status

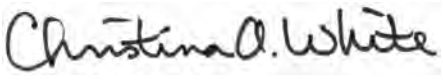
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	Yes	✓ No

***Data User Note:* Data that achieve Presumptive Certainty status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	Yes	✓ No
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	✓ Yes	No

All negative responses are addressed in a case narrative on the cover page of this report.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.



Christina A. White
Laboratory Director
Date: 6/6/2017

CASE NARRATIVE:

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

The samples were received 0.3 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

MADEP has published a list of analytical methods (CAM) which provides a series of recommended protocols for the acquisition, analysis and reporting of analytical data in support of MCP decisions. "Presumptive Certainty" can be established only for those methods published by the MADEP in the MCP CAM. The compounds and/or elements reported were specifically requested by the client on the Chain of Custody and in some cases may not include the full analyte list as defined in the method. Regulatory limits may not be achieved if specific method and/or technique was not requested on the Chain of Custody.

According to WSC-CAM 5/2009 Rev.1, Table 11 A-1, recovery for some VOC analytes have been deemed potentially difficult. Although they may still be within the recommended recovery range, a range has been set based on historical control limits.

Some target analytes which are not listed as exceptions in the Summary of CAM Reporting Limits may exceed the recommended RL based on sample initial volume or weight provided, % moisture content, or responsiveness of a particular analyte to purge and trap instrumentation.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

EPA 300.0

Samples:

SC35211-01 *CFS - INFLUENT*

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Chloride

SC35211-02 *CFS - EFFLUENT*

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Chloride

SW846 8260C

Laboratory Control Samples:

1709154 BS/BSD

2,2-Dichloropropane percent recoveries (120/133) are outside individual acceptance criteria, but within overall method allowances. All reported results of the following samples are considered to have a potentially high bias:

CFS - EFFLUENT
CFS - INFLUENT

Spikes:

1709248-MS1 *Source: SC35211-01RE1*

The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Acetone

1709248-MSD1 *Source: SC35211-01RE1*

SW846 8260C

Spikes:

1709248-MSD1 *Source: SC35211-01RE1*

The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Acetone
Ethanol

Samples:

S704994-CCV1

Analyte percent difference is outside individual acceptance criteria (20), but within overall method allowances.

2,2-Dichloropropane (48.0%)
Carbon tetrachloride (25.8%)

Analyte percent drift is outside individual acceptance criteria (20), but within overall method allowances.

1,1,1,2-Tetrachloroethane (28.1%)
Bromoform (27.2%)
Naphthalene (-20.6%)

This affected the following samples:

1709154-BLK1
1709154-BS1
1709154-BSD1
CFS - EFFLUENT
CFS - INFLUENT

S705033-CCV1

Analyte percent drift is outside individual acceptance criteria (20), but within overall method allowances.

Naphthalene (-35.6%)

This affected the following samples:

1709248-BLK1
1709248-BS1
1709248-BSD1
1709248-MS1
1709248-MSD1
CFS - INFLUENT

SC35211-01 *CFS - INFLUENT*

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

SC35211-01RE1 *CFS - INFLUENT*

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

Sample Acceptance Check Form

Client:	Stantec Consulting Services - Quincy, MA
Project:	Callahan Center - Framingham, MA / 191750030
Work Order:	SC35211
Sample(s) received on:	5/30/2017

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
Were custody seals present?	☐	☑	☐
Were custody seals intact?	☐	☐	☑
Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
Were samples refrigerated upon transfer to laboratory representative?	☑	☐	☐
Were sample containers received intact?	☑	☐	☐
Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
Were samples accompanied by a Chain of Custody document?	☑	☐	☐
Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☑	☐	☐
Did sample container labels agree with Chain of Custody document?	☑	☐	☐
Were samples received within method-specific holding times?	☑	☐	☐

Summary of Hits

Lab ID: SC35211-01 **Client ID:** CFS - INFLUENT

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Chloride	659	GS1, D	27.0	mg/l	EPA 300.0
cis-1,2-Dichloroethene	39.7	D	5.00	µg/l	SW846 8260C
Tetrachloroethene	946	D, E	5.00	µg/l	SW846 8260C
trans-1,2-Dichloroethene	9.90	D	5.00	µg/l	SW846 8260C
Trichloroethene	55.6	D	5.00	µg/l	SW846 8260C

Lab ID: SC35211-01RE1 **Client ID:** CFS - INFLUENT

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
cis-1,2-Dichloroethene	40.6	D	20.0	µg/l	SW846 8260C
Tetrachloroethene	852	D	20.0	µg/l	SW846 8260C
Trichloroethene	58.2	D	20.0	µg/l	SW846 8260C

Lab ID: SC35211-02 **Client ID:** CFS - EFFLUENT

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Chloride	654	GS1, D	27.0	mg/l	EPA 300.0
cis-1,2-Dichloroethene	4.37		1.00	µg/l	SW846 8260C
Tetrachloroethene	2.99		1.00	µg/l	SW846 8260C

Please note that because there are no reporting limits associated with hazardous waste characterizations or micro analyses, this summary does not include hits from these analyses if included in this work order.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
CFS - INFLUENT	191750030	Ground Water	26-May-17 08:40	30-May-17
SC35211-01				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Volatile Organic Compounds by SW846 8260 Prepared by method SW846 5030 Water MS			GS1										
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 5.00	D	µg/l	5.00	2.66	5	SW846 8260C	02-Jun-17	02-Jun-17	EK	1709154	
67-64-1	Acetone	< 50.0	D	µg/l	50.0	4.02	5	"	"	"	"	"	
107-13-1	Acrylonitrile	< 2.50	D	µg/l	2.50	2.33	5	"	"	"	"	"	
71-43-2	Benzene	< 5.00	D	µg/l	5.00	1.42	5	"	"	"	"	"	
108-86-1	Bromobenzene	< 5.00	D	µg/l	5.00	1.66	5	"	"	"	"	"	
74-97-5	Bromochloromethane	< 5.00	D	µg/l	5.00	1.69	5	"	"	"	"	"	
75-27-4	Bromodichloromethane	< 2.50	D	µg/l	2.50	2.08	5	"	"	"	"	"	
75-25-2	Bromoform	< 5.00	D	µg/l	5.00	2.12	5	"	"	"	"	"	
74-83-9	Bromomethane	< 10.0	D	µg/l	10.0	4.48	5	"	"	"	"	"	
78-93-3	2-Butanone (MEK)	< 10.0	D	µg/l	10.0	5.35	5	"	"	"	"	"	
104-51-8	n-Butylbenzene	< 5.00	D	µg/l	5.00	2.06	5	"	"	"	"	"	
135-98-8	sec-Butylbenzene	< 5.00	D	µg/l	5.00	1.63	5	"	"	"	"	"	
98-06-6	tert-Butylbenzene	< 5.00	D	µg/l	5.00	1.58	5	"	"	"	"	"	
75-15-0	Carbon disulfide	< 10.0	D	µg/l	10.0	2.06	5	"	"	"	"	"	
56-23-5	Carbon tetrachloride	< 5.00	D	µg/l	5.00	2.18	5	"	"	"	"	"	
108-90-7	Chlorobenzene	< 5.00	D	µg/l	5.00	1.24	5	"	"	"	"	"	
75-00-3	Chloroethane	< 10.0	D	µg/l	10.0	2.94	5	"	"	"	"	"	
67-66-3	Chloroform	< 5.00	D	µg/l	5.00	1.63	5	"	"	"	"	"	
74-87-3	Chloromethane	< 10.0	D	µg/l	10.0	1.84	5	"	"	"	"	"	
95-49-8	2-Chlorotoluene	< 5.00	D	µg/l	5.00	1.58	5	"	"	"	"	"	
106-43-4	4-Chlorotoluene	< 5.00	D	µg/l	5.00	1.58	5	"	"	"	"	"	
96-12-8	1,2-Dibromo-3-chloropropane	< 10.0	D	µg/l	10.0	4.32	5	"	"	"	"	"	
124-48-1	Dibromochloromethane	< 2.50	D	µg/l	2.50	1.58	5	"	"	"	"	"	
106-93-4	1,2-Dibromoethane (EDB)	< 2.50	D	µg/l	2.50	1.01	5	"	"	"	"	"	
74-95-3	Dibromomethane	< 5.00	D	µg/l	5.00	1.54	5	"	"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 5.00	D	µg/l	5.00	1.38	5	"	"	"	"	"	
541-73-1	1,3-Dichlorobenzene	< 5.00	D	µg/l	5.00	1.57	5	"	"	"	"	"	
106-46-7	1,4-Dichlorobenzene	< 5.00	D	µg/l	5.00	1.36	5	"	"	"	"	"	
75-71-8	Dichlorodifluoromethane (Freon12)	< 10.0	D	µg/l	10.0	2.92	5	"	"	"	"	"	
75-34-3	1,1-Dichloroethane	< 5.00	D	µg/l	5.00	1.62	5	"	"	"	"	"	
107-06-2	1,2-Dichloroethane	< 5.00	D	µg/l	5.00	1.38	5	"	"	"	"	"	
75-35-4	1,1-Dichloroethene	< 5.00	D	µg/l	5.00	3.46	5	"	"	"	"	"	
156-59-2	cis-1,2-Dichloroethene	**39.7**	D	µg/l	5.00	1.64	5	"	"	"	"	"	
156-60-5	trans-1,2-Dichloroethene	**9.90**	D	µg/l	5.00	1.88	5	"	"	"	"	"	
78-87-5	1,2-Dichloropropane	< 5.00	D	µg/l	5.00	1.46	5	"	"	"	"	"	
142-28-9	1,3-Dichloropropane	< 5.00	D	µg/l	5.00	1.07	5	"	"	"	"	"	
594-20-7	2,2-Dichloropropane	< 5.00	D	µg/l	5.00	2.09	5	"	"	"	"	"	
563-58-6	1,1-Dichloropropene	< 5.00	D	µg/l	5.00	2.89	5	"	"	"	"	"	
10061-01-5	cis-1,3-Dichloropropene	< 2.50	D	µg/l	2.50	1.80	5	"	"	"	"	"	
10061-02-6	trans-1,3-Dichloropropene	< 2.50	D	µg/l	2.50	1.74	5	"	"	"	"	"	
100-41-4	Ethylbenzene	< 5.00	D	µg/l	5.00	1.64	5	"	"	"	"	"	
87-68-3	Hexachlorobutadiene	< 2.50	D	µg/l	2.50	2.35	5	"	"	"	"	"	
591-78-6	2-Hexanone (MBK)	< 10.0	D	µg/l	10.0	2.64	5	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
CFS - INFLUENT SC35211-01	191750030	Ground Water	26-May-17 08:40	30-May-17

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Volatile Organic Compounds by SW846 8260			GS1										
98-82-8	Isopropylbenzene	< 5.00	D	µg/l	5.00	1.80	5	SW846 8260C	02-Jun-17	02-Jun-17	EK	1709154	
99-87-6	4-Isopropyltoluene	< 5.00	D	µg/l	5.00	1.40	5	"	"	"	"	"	
1634-04-4	Methyl tert-butyl ether	< 5.00	D	µg/l	5.00	1.18	5	"	"	"	"	"	
108-10-1	4-Methyl-2-pentanone (MIBK)	< 10.0	D	µg/l	10.0	2.58	5	"	"	"	"	"	
75-09-2	Methylene chloride	< 10.0	D	µg/l	10.0	3.30	5	"	"	"	"	"	
91-20-3	Naphthalene	< 5.00	D	µg/l	5.00	1.76	5	"	"	"	"	"	
103-65-1	n-Propylbenzene	< 5.00	D	µg/l	5.00	1.72	5	"	"	"	"	"	
100-42-5	Styrene	< 5.00	D	µg/l	5.00	2.02	5	"	"	"	"	"	
630-20-6	1,1,1,2-Tetrachloroethane	< 5.00	D	µg/l	5.00	1.89	5	"	"	"	"	"	
79-34-5	1,1,2,2-Tetrachloroethane	< 2.50	D	µg/l	2.50	1.65	5	"	"	"	"	"	
127-18-4	Tetrachloroethene	**946**	D, E	µg/l	5.00	2.85	5	"	"	"	"	"	
108-88-3	Toluene	< 5.00	D	µg/l	5.00	1.50	5	"	"	"	"	"	
87-61-6	1,2,3-Trichlorobenzene	< 5.00	D	µg/l	5.00	1.88	5	"	"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 5.00	D	µg/l	5.00	1.89	5	"	"	"	"	"	
108-70-3	1,3,5-Trichlorobenzene	< 5.00	D	µg/l	5.00	1.48	5	"	"	"	"	"	
71-55-6	1,1,1-Trichloroethane	< 5.00	D	µg/l	5.00	2.54	5	"	"	"	"	"	
79-00-5	1,1,2-Trichloroethane	< 5.00	D	µg/l	5.00	1.65	5	"	"	"	"	"	
79-01-6	Trichloroethene	**55.6**	D	µg/l	5.00	2.48	5	"	"	"	"	"	
75-69-4	Trichlorofluoromethane (Freon 11)	< 5.00	D	µg/l	5.00	2.44	5	"	"	"	"	"	
96-18-4	1,2,3-Trichloropropane	< 5.00	D	µg/l	5.00	1.46	5	"	"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 5.00	D	µg/l	5.00	1.78	5	"	"	"	"	"	
108-67-8	1,3,5-Trimethylbenzene	< 5.00	D	µg/l	5.00	2.16	5	"	"	"	"	"	
75-01-4	Vinyl chloride	< 5.00	D	µg/l	5.00	2.36	5	"	"	"	"	"	
179601-23-1	m,p-Xylene	< 10.0	D	µg/l	10.0	1.90	5	"	"	"	"	"	
95-47-6	o-Xylene	< 5.00	D	µg/l	5.00	1.42	5	"	"	"	"	"	
109-99-9	Tetrahydrofuran	< 10.0	D	µg/l	10.0	5.30	5	"	"	"	"	"	
60-29-7	Ethyl ether	< 5.00	D	µg/l	5.00	1.87	5	"	"	"	"	"	
994-05-8	Tert-amyl methyl ether	< 5.00	D	µg/l	5.00	2.46	5	"	"	"	"	"	
637-92-3	Ethyl tert-butyl ether	< 5.00	D	µg/l	5.00	1.66	5	"	"	"	"	"	
108-20-3	Di-isopropyl ether	< 5.00	D	µg/l	5.00	1.43	5	"	"	"	"	"	
75-65-0	Tert-Butanol / butyl alcohol	< 50.0	D	µg/l	50.0	29.5	5	"	"	"	"	"	
123-91-1	1,4-Dioxane	< 100	D	µg/l	100	57.0	5	"	"	"	"	"	
110-57-6	trans-1,4-Dichloro-2-butene	< 25.0	D	µg/l	25.0	4.10	5	"	"	"	"	"	
64-17-5	Ethanol	< 1000	D	µg/l	1000	154	5	"	"	"	"	"	
Surrogate recoveries:													
460-00-4	*4-Bromofluorobenzene*	*87*			*70-130 %*			"	"	"	"	"	
2037-26-5	*Toluene-d8*	*95*			*70-130 %*			"	"	"	"	"	
17060-07-0	*1,2-Dichloroethane-d4*	*101*			*70-130 %*			"	"	"	"	"	
1868-53-7	*Dibromofluoromethane*	*100*			*70-130 %*			"	"	"	"	"	
Re-analysis of Volatile Organic Compounds by SW846 8260 Prepared by method SW846 5030 Water MS			GS1										
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 20.0	D	µg/l	20.0	10.6	20	SW846 8260C	05-Jun-17	06-Jun-17	EK	1709248	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
CFS - INFLUENT	191750030	Ground Water	26-May-17 08:40	30-May-17
SC35211-01				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Re-analysis of Volatile Organic Compounds by SW846 8260			GS1										
67-64-1	Acetone	< 200	D	µg/l	200	16.1	20	SW846 8260C	05-Jun-17	06-Jun-17	EK	1709248	
107-13-1	Acrylonitrile	< 10.0	D	µg/l	10.0	9.32	20	"	"	"	"	"	
71-43-2	Benzene	< 20.0	D	µg/l	20.0	5.68	20	"	"	"	"	"	
108-86-1	Bromobenzene	< 20.0	D	µg/l	20.0	6.64	20	"	"	"	"	"	
74-97-5	Bromochloromethane	< 20.0	D	µg/l	20.0	6.76	20	"	"	"	"	"	
75-27-4	Bromodichloromethane	< 10.0	D	µg/l	10.0	8.34	20	"	"	"	"	"	
75-25-2	Bromoform	< 20.0	D	µg/l	20.0	8.50	20	"	"	"	"	"	
74-83-9	Bromomethane	< 40.0	D	µg/l	40.0	17.9	20	"	"	"	"	"	
78-93-3	2-Butanone (MEK)	< 40.0	D	µg/l	40.0	21.4	20	"	"	"	"	"	
104-51-8	n-Butylbenzene	< 20.0	D	µg/l	20.0	8.24	20	"	"	"	"	"	
135-98-8	sec-Butylbenzene	< 20.0	D	µg/l	20.0	6.52	20	"	"	"	"	"	
98-06-6	tert-Butylbenzene	< 20.0	D	µg/l	20.0	6.30	20	"	"	"	"	"	
75-15-0	Carbon disulfide	< 40.0	D	µg/l	40.0	8.24	20	"	"	"	"	"	
56-23-5	Carbon tetrachloride	< 20.0	D	µg/l	20.0	8.74	20	"	"	"	"	"	
108-90-7	Chlorobenzene	< 20.0	D	µg/l	20.0	4.98	20	"	"	"	"	"	
75-00-3	Chloroethane	< 40.0	D	µg/l	40.0	11.8	20	"	"	"	"	"	
67-66-3	Chloroform	< 20.0	D	µg/l	20.0	6.52	20	"	"	"	"	"	
74-87-3	Chloromethane	< 40.0	D	µg/l	40.0	7.36	20	"	"	"	"	"	
95-49-8	2-Chlorotoluene	< 20.0	D	µg/l	20.0	6.32	20	"	"	"	"	"	
106-43-4	4-Chlorotoluene	< 20.0	D	µg/l	20.0	6.32	20	"	"	"	"	"	
96-12-8	1,2-Dibromo-3-chloropropane	< 40.0	D	µg/l	40.0	17.3	20	"	"	"	"	"	
124-48-1	Dibromochloromethane	< 10.0	D	µg/l	10.0	6.34	20	"	"	"	"	"	
106-93-4	1,2-Dibromoethane (EDB)	< 10.0	D	µg/l	10.0	4.04	20	"	"	"	"	"	
74-95-3	Dibromomethane	< 20.0	D	µg/l	20.0	6.18	20	"	"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 20.0	D	µg/l	20.0	5.54	20	"	"	"	"	"	
541-73-1	1,3-Dichlorobenzene	< 20.0	D	µg/l	20.0	6.28	20	"	"	"	"	"	
106-46-7	1,4-Dichlorobenzene	< 20.0	D	µg/l	20.0	5.44	20	"	"	"	"	"	
75-71-8	Dichlorodifluoromethane (Freon12)	< 40.0	D	µg/l	40.0	11.7	20	"	"	"	"	"	
75-34-3	1,1-Dichloroethane	< 20.0	D	µg/l	20.0	6.46	20	"	"	"	"	"	
107-06-2	1,2-Dichloroethane	< 20.0	D	µg/l	20.0	5.54	20	"	"	"	"	"	
75-35-4	1,1-Dichloroethene	< 20.0	D	µg/l	20.0	13.9	20	"	"	"	"	"	
156-59-2	cis-1,2-Dichloroethene	**40.6**	D	µg/l	20.0	6.54	20	"	"	"	"	"	
156-60-5	trans-1,2-Dichloroethene	< 20.0	D	µg/l	20.0	7.54	20	"	"	"	"	"	
78-87-5	1,2-Dichloropropane	< 20.0	D	µg/l	20.0	5.84	20	"	"	"	"	"	
142-28-9	1,3-Dichloropropane	< 20.0	D	µg/l	20.0	4.28	20	"	"	"	"	"	
594-20-7	2,2-Dichloropropane	< 20.0	D	µg/l	20.0	8.36	20	"	"	"	"	"	
563-58-6	1,1-Dichloropropene	< 20.0	D	µg/l	20.0	11.6	20	"	"	"	"	"	
10061-01-5	cis-1,3-Dichloropropene	< 10.0	D	µg/l	10.0	7.18	20	"	"	"	"	"	
10061-02-6	trans-1,3-Dichloropropene	< 10.0	D	µg/l	10.0	6.94	20	"	"	"	"	"	
100-41-4	Ethylbenzene	< 20.0	D	µg/l	20.0	6.58	20	"	"	"	"	"	
87-68-3	Hexachlorobutadiene	< 10.0	D	µg/l	10.0	9.40	20	"	"	"	"	"	
591-78-6	2-Hexanone (MBK)	< 40.0	D	µg/l	40.0	10.6	20	"	"	"	"	"	
98-82-8	Isopropylbenzene	< 20.0	D	µg/l	20.0	7.20	20	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
CFS - INFLUENT	191750030	Ground Water	26-May-17 08:40	30-May-17
SC35211-01				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Re-analysis of Volatile Organic Compounds by SW846 8260			GS1										
99-87-6	4-Isopropyltoluene	< 20.0	D	µg/l	20.0	5.58	20	SW846 8260C	05-Jun-17	06-Jun-17	EK	1709248	
1634-04-4	Methyl tert-butyl ether	< 20.0	D	µg/l	20.0	4.74	20	"	"	"	"	"	
108-10-1	4-Methyl-2-pentanone (MIBK)	< 40.0	D	µg/l	40.0	10.3	20	"	"	"	"	"	
75-09-2	Methylene chloride	< 40.0	D	µg/l	40.0	13.2	20	"	"	"	"	"	
91-20-3	Naphthalene	< 20.0	D	µg/l	20.0	11.8	20	"	"	"	"	"	
103-65-1	n-Propylbenzene	< 20.0	D	µg/l	20.0	6.88	20	"	"	"	"	"	
100-42-5	Styrene	< 20.0	D	µg/l	20.0	8.10	20	"	"	"	"	"	
630-20-6	1,1,1,2-Tetrachloroethane	< 20.0	D	µg/l	20.0	7.56	20	"	"	"	"	"	
79-34-5	1,1,2,2-Tetrachloroethane	< 10.0	D	µg/l	10.0	6.60	20	"	"	"	"	"	
127-18-4	Tetrachloroethene	**852**	D	µg/l	20.0	11.4	20	"	"	"	"	"	
108-88-3	Toluene	< 20.0	D	µg/l	20.0	5.98	20	"	"	"	"	"	
87-61-6	1,2,3-Trichlorobenzene	< 20.0	D	µg/l	20.0	7.54	20	"	"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 20.0	D	µg/l	20.0	7.56	20	"	"	"	"	"	
108-70-3	1,3,5-Trichlorobenzene	< 20.0	D	µg/l	20.0	5.92	20	"	"	"	"	"	
71-55-6	1,1,1-Trichloroethane	< 20.0	D	µg/l	20.0	10.2	20	"	"	"	"	"	
79-00-5	1,1,2-Trichloroethane	< 20.0	D	µg/l	20.0	6.60	20	"	"	"	"	"	
79-01-6	Trichloroethene	**58.2**	D	µg/l	20.0	9.94	20	"	"	"	"	"	
75-69-4	Trichlorofluoromethane (Freon 11)	< 20.0	D	µg/l	20.0	9.74	20	"	"	"	"	"	
96-18-4	1,2,3-Trichloropropane	< 20.0	D	µg/l	20.0	5.84	20	"	"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 20.0	D	µg/l	20.0	7.10	20	"	"	"	"	"	
108-67-8	1,3,5-Trimethylbenzene	< 20.0	D	µg/l	20.0	8.62	20	"	"	"	"	"	
75-01-4	Vinyl chloride	< 20.0	D	µg/l	20.0	9.44	20	"	"	"	"	"	
179601-23-1	m,p-Xylene	< 40.0	D	µg/l	40.0	7.60	20	"	"	"	"	"	
95-47-6	o-Xylene	< 20.0	D	µg/l	20.0	5.66	20	"	"	"	"	"	
109-99-9	Tetrahydrofuran	< 40.0	D	µg/l	40.0	21.2	20	"	"	"	"	"	
60-29-7	Ethyl ether	< 20.0	D	µg/l	20.0	7.48	20	"	"	"	"	"	
994-05-8	Tert-amyl methyl ether	< 20.0	D	µg/l	20.0	9.86	20	"	"	"	"	"	
637-92-3	Ethyl tert-butyl ether	< 20.0	D	µg/l	20.0	6.64	20	"	"	"	"	"	
108-20-3	Di-isopropyl ether	< 20.0	D	µg/l	20.0	5.72	20	"	"	"	"	"	
75-65-0	Tert-Butanol / butyl alcohol	< 200	D	µg/l	200	118	20	"	"	"	"	"	
123-91-1	1,4-Dioxane	< 400	D	µg/l	400	228	20	"	"	"	"	"	
110-57-6	trans-1,4-Dichloro-2-butene	< 100	D	µg/l	100	16.4	20	"	"	"	"	"	
64-17-5	Ethanol	< 4000	D	µg/l	4000	618	20	"	"	"	"	"	
Surrogate recoveries:													
460-00-4	*4-Bromofluorobenzene*	*88*			*70-130 %*			"	"	"	"	"	
2037-26-5	*Toluene-d8*	*96*			*70-130 %*			"	"	"	"	"	
17060-07-0	*1,2-Dichloroethane-d4*	*98*			*70-130 %*			"	"	"	"	"	
1868-53-7	*Dibromofluoromethane*	*106*			*70-130 %*			"	"	"	"	"	
General Chemistry Parameters													
16887-00-6	Chloride	**659**	GS1, D	mg/l	27.0	2.42	27	EPA 300.0	31-May-17	01-Jun-17	CAW	1709037	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
CFS - EFFLUENT	191750030	Ground Water	26-May-17 08:40	30-May-17
SC35211-02				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Volatile Organic Compounds by SW846 8260 Prepared by method SW846 5030 Water MS													
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 1.00		µg/l	1.00	0.53	1	SW846 8260C	02-Jun-17	02-Jun-17	EK	1709154	
67-64-1	Acetone	< 10.0		µg/l	10.0	0.80	1	"	"	"	"	"	
107-13-1	Acrylonitrile	< 0.50		µg/l	0.50	0.47	1	"	"	"	"	"	
71-43-2	Benzene	< 1.00		µg/l	1.00	0.28	1	"	"	"	"	"	
108-86-1	Bromobenzene	< 1.00		µg/l	1.00	0.33	1	"	"	"	"	"	
74-97-5	Bromochloromethane	< 1.00		µg/l	1.00	0.34	1	"	"	"	"	"	
75-27-4	Bromodichloromethane	< 0.50		µg/l	0.50	0.42	1	"	"	"	"	"	
75-25-2	Bromoform	< 1.00		µg/l	1.00	0.42	1	"	"	"	"	"	
74-83-9	Bromomethane	< 2.00		µg/l	2.00	0.90	1	"	"	"	"	"	
78-93-3	2-Butanone (MEK)	< 2.00		µg/l	2.00	1.07	1	"	"	"	"	"	
104-51-8	n-Butylbenzene	< 1.00		µg/l	1.00	0.41	1	"	"	"	"	"	
135-98-8	sec-Butylbenzene	< 1.00		µg/l	1.00	0.33	1	"	"	"	"	"	
98-06-6	tert-Butylbenzene	< 1.00		µg/l	1.00	0.32	1	"	"	"	"	"	
75-15-0	Carbon disulfide	< 2.00		µg/l	2.00	0.41	1	"	"	"	"	"	
56-23-5	Carbon tetrachloride	< 1.00		µg/l	1.00	0.44	1	"	"	"	"	"	
108-90-7	Chlorobenzene	< 1.00		µg/l	1.00	0.25	1	"	"	"	"	"	
75-00-3	Chloroethane	< 2.00		µg/l	2.00	0.59	1	"	"	"	"	"	
67-66-3	Chloroform	< 1.00		µg/l	1.00	0.33	1	"	"	"	"	"	
74-87-3	Chloromethane	< 2.00		µg/l	2.00	0.37	1	"	"	"	"	"	
95-49-8	2-Chlorotoluene	< 1.00		µg/l	1.00	0.32	1	"	"	"	"	"	
106-43-4	4-Chlorotoluene	< 1.00		µg/l	1.00	0.32	1	"	"	"	"	"	
96-12-8	1,2-Dibromo-3-chloropropane	< 2.00		µg/l	2.00	0.86	1	"	"	"	"	"	
124-48-1	Dibromochloromethane	< 0.50		µg/l	0.50	0.32	1	"	"	"	"	"	
106-93-4	1,2-Dibromoethane (EDB)	< 0.50		µg/l	0.50	0.20	1	"	"	"	"	"	
74-95-3	Dibromomethane	< 1.00		µg/l	1.00	0.31	1	"	"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 1.00		µg/l	1.00	0.28	1	"	"	"	"	"	
541-73-1	1,3-Dichlorobenzene	< 1.00		µg/l	1.00	0.31	1	"	"	"	"	"	
106-46-7	1,4-Dichlorobenzene	< 1.00		µg/l	1.00	0.27	1	"	"	"	"	"	
75-71-8	Dichlorodifluoromethane (Freon12)	< 2.00		µg/l	2.00	0.58	1	"	"	"	"	"	
75-34-3	1,1-Dichloroethane	< 1.00		µg/l	1.00	0.32	1	"	"	"	"	"	
107-06-2	1,2-Dichloroethane	< 1.00		µg/l	1.00	0.28	1	"	"	"	"	"	
75-35-4	1,1-Dichloroethene	< 1.00		µg/l	1.00	0.69	1	"	"	"	"	"	
156-59-2	cis-1,2-Dichloroethene	**4.37**		µg/l	1.00	0.33	1	"	"	"	"	"	
156-60-5	trans-1,2-Dichloroethene	< 1.00		µg/l	1.00	0.38	1	"	"	"	"	"	
78-87-5	1,2-Dichloropropane	< 1.00		µg/l	1.00	0.29	1	"	"	"	"	"	
142-28-9	1,3-Dichloropropane	< 1.00		µg/l	1.00	0.21	1	"	"	"	"	"	
594-20-7	2,2-Dichloropropane	< 1.00		µg/l	1.00	0.42	1	"	"	"	"	"	
563-58-6	1,1-Dichloropropene	< 1.00		µg/l	1.00	0.58	1	"	"	"	"	"	
10061-01-5	cis-1,3-Dichloropropene	< 0.50		µg/l	0.50	0.36	1	"	"	"	"	"	
10061-02-6	trans-1,3-Dichloropropene	< 0.50		µg/l	0.50	0.35	1	"	"	"	"	"	
100-41-4	Ethylbenzene	< 1.00		µg/l	1.00	0.33	1	"	"	"	"	"	
87-68-3	Hexachlorobutadiene	< 0.50		µg/l	0.50	0.47	1	"	"	"	"	"	
591-78-6	2-Hexanone (MBK)	< 2.00		µg/l	2.00	0.53	1	"	"	"	"	"	

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
CFS - EFFLUENT	191750030	Ground Water	26-May-17 08:40	30-May-17
SC35211-02				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Volatile Organic Compounds by SW846 8260													
98-82-8	Isopropylbenzene	< 1.00		µg/l	1.00	0.36	1	SW846 8260C	02-Jun-17	02-Jun-17	EK	1709154	
99-87-6	4-Isopropyltoluene	< 1.00		µg/l	1.00	0.28	1	"	"	"	"	"	
1634-04-4	Methyl tert-butyl ether	< 1.00		µg/l	1.00	0.24	1	"	"	"	"	"	
108-10-1	4-Methyl-2-pentanone (MIBK)	< 2.00		µg/l	2.00	0.52	1	"	"	"	"	"	
75-09-2	Methylene chloride	< 2.00		µg/l	2.00	0.66	1	"	"	"	"	"	
91-20-3	Naphthalene	< 1.00		µg/l	1.00	0.35	1	"	"	"	"	"	
103-65-1	n-Propylbenzene	< 1.00		µg/l	1.00	0.34	1	"	"	"	"	"	
100-42-5	Styrene	< 1.00		µg/l	1.00	0.40	1	"	"	"	"	"	
630-20-6	1,1,1,2-Tetrachloroethane	< 1.00		µg/l	1.00	0.38	1	"	"	"	"	"	
79-34-5	1,1,2,2-Tetrachloroethane	< 0.50		µg/l	0.50	0.33	1	"	"	"	"	"	
127-18-4	Tetrachloroethene	**2.99**		µg/l	1.00	0.57	1	"	"	"	"	"	
108-88-3	Toluene	< 1.00		µg/l	1.00	0.30	1	"	"	"	"	"	
87-61-6	1,2,3-Trichlorobenzene	< 1.00		µg/l	1.00	0.38	1	"	"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 1.00		µg/l	1.00	0.38	1	"	"	"	"	"	
108-70-3	1,3,5-Trichlorobenzene	< 1.00		µg/l	1.00	0.30	1	"	"	"	"	"	
71-55-6	1,1,1-Trichloroethane	< 1.00		µg/l	1.00	0.51	1	"	"	"	"	"	
79-00-5	1,1,2-Trichloroethane	< 1.00		µg/l	1.00	0.33	1	"	"	"	"	"	
79-01-6	Trichloroethene	< 1.00		µg/l	1.00	0.50	1	"	"	"	"	"	
75-69-4	Trichlorofluoromethane (Freon 11)	< 1.00		µg/l	1.00	0.49	1	"	"	"	"	"	
96-18-4	1,2,3-Trichloropropane	< 1.00		µg/l	1.00	0.29	1	"	"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 1.00		µg/l	1.00	0.36	1	"	"	"	"	"	
108-67-8	1,3,5-Trimethylbenzene	< 1.00		µg/l	1.00	0.43	1	"	"	"	"	"	
75-01-4	Vinyl chloride	< 1.00		µg/l	1.00	0.47	1	"	"	"	"	"	
179601-23-1	m,p-Xylene	< 2.00		µg/l	2.00	0.38	1	"	"	"	"	"	
95-47-6	o-Xylene	< 1.00		µg/l	1.00	0.28	1	"	"	"	"	"	
109-99-9	Tetrahydrofuran	< 2.00		µg/l	2.00	1.06	1	"	"	"	"	"	
60-29-7	Ethyl ether	< 1.00		µg/l	1.00	0.37	1	"	"	"	"	"	
994-05-8	Tert-amyl methyl ether	< 1.00		µg/l	1.00	0.49	1	"	"	"	"	"	
637-92-3	Ethyl tert-butyl ether	< 1.00		µg/l	1.00	0.33	1	"	"	"	"	"	
108-20-3	Di-isopropyl ether	< 1.00		µg/l	1.00	0.29	1	"	"	"	"	"	
75-65-0	Tert-Butanol / butyl alcohol	< 10.0		µg/l	10.0	5.90	1	"	"	"	"	"	
123-91-1	1,4-Dioxane	< 20.0		µg/l	20.0	11.4	1	"	"	"	"	"	
110-57-6	trans-1,4-Dichloro-2-butene	< 5.00		µg/l	5.00	0.82	1	"	"	"	"	"	
64-17-5	Ethanol	< 200		µg/l	200	30.9	1	"	"	"	"	"	
Surrogate recoveries:													
460-00-4	*4-Bromofluorobenzene*	*86*			*70-130 %*			"	"	"	"	"	
2037-26-5	*Toluene-d8*	*94*			*70-130 %*			"	"	"	"	"	
17060-07-0	*1,2-Dichloroethane-d4*	*102*			*70-130 %*			"	"	"	"	"	
1868-53-7	*Dibromofluoromethane*	*102*			*70-130 %*			"	"	"	"	"	
General Chemistry Parameters													
16887-00-6	Chloride	**654**	GS1, D	mg/l	27.0	2.42	27	EPA 300.0	31-May-17	01-Jun-17	CAW	1709037	X

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709154 - SW846 5030 Water MS										
Blank (1709154-BLK1)					Prepared & Analyzed: 02-Jun-17					
1,1,2-Trichlorotrifluoroethane (Freon 113)	< 1.00		µg/l	1.00						
Acetone	< 10.0		µg/l	10.0						
Acrylonitrile	< 0.50		µg/l	0.50						
Benzene	< 1.00		µg/l	1.00						
Bromobenzene	< 1.00		µg/l	1.00						
Bromochloromethane	< 1.00		µg/l	1.00						
Bromodichloromethane	< 0.50		µg/l	0.50						
Bromoform	< 1.00		µg/l	1.00						
Bromomethane	< 2.00		µg/l	2.00						
2-Butanone (MEK)	< 2.00		µg/l	2.00						
n-Butylbenzene	< 1.00		µg/l	1.00						
sec-Butylbenzene	< 1.00		µg/l	1.00						
tert-Butylbenzene	< 1.00		µg/l	1.00						
Carbon disulfide	< 2.00		µg/l	2.00						
Carbon tetrachloride	< 1.00		µg/l	1.00						
Chlorobenzene	< 1.00		µg/l	1.00						
Chloroethane	< 2.00		µg/l	2.00						
Chloroform	< 1.00		µg/l	1.00						
Chloromethane	< 2.00		µg/l	2.00						
2-Chlorotoluene	< 1.00		µg/l	1.00						
4-Chlorotoluene	< 1.00		µg/l	1.00						
1,2-Dibromo-3-chloropropane	< 2.00		µg/l	2.00						
Dibromochloromethane	< 0.50		µg/l	0.50						
1,2-Dibromoethane (EDB)	< 0.50		µg/l	0.50						
Dibromomethane	< 1.00		µg/l	1.00						
1,2-Dichlorobenzene	< 1.00		µg/l	1.00						
1,3-Dichlorobenzene	< 1.00		µg/l	1.00						
1,4-Dichlorobenzene	< 1.00		µg/l	1.00						
Dichlorodifluoromethane (Freon12)	< 2.00		µg/l	2.00						
1,1-Dichloroethane	< 1.00		µg/l	1.00						
1,2-Dichloroethane	< 1.00		µg/l	1.00						
1,1-Dichloroethene	< 1.00		µg/l	1.00						
cis-1,2-Dichloroethene	< 1.00		µg/l	1.00						
trans-1,2-Dichloroethene	< 1.00		µg/l	1.00						
1,2-Dichloropropane	< 1.00		µg/l	1.00						
1,3-Dichloropropane	< 1.00		µg/l	1.00						
2,2-Dichloropropane	< 1.00		µg/l	1.00						
1,1-Dichloropropene	< 1.00		µg/l	1.00						
cis-1,3-Dichloropropene	< 0.50		µg/l	0.50						
trans-1,3-Dichloropropene	< 0.50		µg/l	0.50						
Ethylbenzene	< 1.00		µg/l	1.00						
Hexachlorobutadiene	< 0.50		µg/l	0.50						
2-Hexanone (MBK)	< 2.00		µg/l	2.00						
Isopropylbenzene	< 1.00		µg/l	1.00						
4-Isopropyltoluene	< 1.00		µg/l	1.00						
Methyl tert-butyl ether	< 1.00		µg/l	1.00						
4-Methyl-2-pentanone (MIBK)	< 2.00		µg/l	2.00						
Methylene chloride	< 2.00		µg/l	2.00						
Naphthalene	< 1.00		µg/l	1.00						
n-Propylbenzene	< 1.00		µg/l	1.00						

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709154 - SW846 5030 Water MS										
Blank (1709154-BLK1)					Prepared & Analyzed: 02-Jun-17					
Styrene	< 1.00		µg/l	1.00						
1,1,1,2-Tetrachloroethane	< 1.00		µg/l	1.00						
1,1,2,2-Tetrachloroethane	< 0.50		µg/l	0.50						
Tetrachloroethene	< 1.00		µg/l	1.00						
Toluene	< 1.00		µg/l	1.00						
1,2,3-Trichlorobenzene	< 1.00		µg/l	1.00						
1,2,4-Trichlorobenzene	< 1.00		µg/l	1.00						
1,3,5-Trichlorobenzene	< 1.00		µg/l	1.00						
1,1,1-Trichloroethane	< 1.00		µg/l	1.00						
1,1,2-Trichloroethane	< 1.00		µg/l	1.00						
Trichloroethene	< 1.00		µg/l	1.00						
Trichlorofluoromethane (Freon 11)	< 1.00		µg/l	1.00						
1,2,3-Trichloropropane	< 1.00		µg/l	1.00						
1,2,4-Trimethylbenzene	< 1.00		µg/l	1.00						
1,3,5-Trimethylbenzene	< 1.00		µg/l	1.00						
Vinyl chloride	< 1.00		µg/l	1.00						
m,p-Xylene	< 2.00		µg/l	2.00						
o-Xylene	< 1.00		µg/l	1.00						
Tetrahydrofuran	< 2.00		µg/l	2.00						
Ethyl ether	< 1.00		µg/l	1.00						
Tert-amyl methyl ether	< 1.00		µg/l	1.00						
Ethyl tert-butyl ether	< 1.00		µg/l	1.00						
Di-isopropyl ether	< 1.00		µg/l	1.00						
Tert-Butanol / butyl alcohol	< 10.0		µg/l	10.0						
1,4-Dioxane	< 20.0		µg/l	20.0						
trans-1,4-Dichloro-2-butene	< 5.00		µg/l	5.00						
Ethanol	< 200		µg/l	200						
Surrogate: 4-Bromofluorobenzene	*44.6*		µg/l		*50.0*		*89*	*70-130*		
Surrogate: Toluene-d8	*46.9*		µg/l		*50.0*		*94*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*50.2*		µg/l		*50.0*		*100*	*70-130*		
Surrogate: Dibromofluoromethane	*51.2*		µg/l		*50.0*		*102*	*70-130*		
LCS (1709154-BS1)					Prepared & Analyzed: 02-Jun-17					
1,1,2-Trichlorotrifluoroethane (Freon 113)	**18.6**		µg/l		20.0		93	70-130		
Acetone	**16.7**		µg/l		20.0		84	70-130		
Acrylonitrile	**17.0**		µg/l		20.0		85	70-130		
Benzene	**19.9**		µg/l		20.0		99	70-130		
Bromobenzene	**22.9**		µg/l		20.0		114	70-130		
Bromochloromethane	**18.9**		µg/l		20.0		94	70-130		
Bromodichloromethane	**21.2**		µg/l		20.0		106	70-130		
Bromoform	**24.8**		µg/l		20.0		124	70-130		
Bromomethane	**16.3**		µg/l		20.0		82	70-130		
2-Butanone (MEK)	**17.8**		µg/l		20.0		89	70-130		
n-Butylbenzene	**20.8**		µg/l		20.0		104	70-130		
sec-Butylbenzene	**20.5**		µg/l		20.0		102	70-130		
tert-Butylbenzene	**20.8**		µg/l		20.0		104	70-130		
Carbon disulfide	**17.7**		µg/l		20.0		89	70-130		
Carbon tetrachloride	**23.8**		µg/l		20.0		119	70-130		
Chlorobenzene	**21.7**		µg/l		20.0		108	70-130		
Chloroethane	**16.9**		µg/l		20.0		84	70-130		
Chloroform	**17.8**		µg/l		20.0		89	70-130		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709154 - SW846 5030 Water MS										
LCS (1709154-BS1)						Prepared & Analyzed: 02-Jun-17				
Chloromethane	**16.9**		µg/l		20.0		85	70-130		
2-Chlorotoluene	**23.1**		µg/l		20.0		115	70-130		
4-Chlorotoluene	**23.0**		µg/l		20.0		115	70-130		
1,2-Dibromo-3-chloropropane	**24.1**		µg/l		20.0		121	70-130		
Dibromochloromethane	**21.4**		µg/l		20.0		107	70-130		
1,2-Dibromoethane (EDB)	**21.0**		µg/l		20.0		105	70-130		
Dibromomethane	**19.8**		µg/l		20.0		99	70-130		
1,2-Dichlorobenzene	**21.9**		µg/l		20.0		110	70-130		
1,3-Dichlorobenzene	**23.3**		µg/l		20.0		116	70-130		
1,4-Dichlorobenzene	**20.7**		µg/l		20.0		104	70-130		
Dichlorodifluoromethane (Freon12)	**16.9**		µg/l		20.0		84	70-130		
1,1-Dichloroethane	**17.9**		µg/l		20.0		89	70-130		
1,2-Dichloroethane	**18.8**		µg/l		20.0		94	70-130		
1,1-Dichloroethene	**17.9**		µg/l		20.0		89	70-130		
cis-1,2-Dichloroethene	**17.7**		µg/l		20.0		88	70-130		
trans-1,2-Dichloroethene	**18.2**		µg/l		20.0		91	70-130		
1,2-Dichloropropane	**19.4**		µg/l		20.0		97	70-130		
1,3-Dichloropropane	**19.7**		µg/l		20.0		99	70-130		
2,2-Dichloropropane	**24.0**		µg/l		20.0		120	70-130		
1,1-Dichloropropene	**19.6**		µg/l		20.0		98	70-130		
cis-1,3-Dichloropropene	**20.0**		µg/l		20.0		100	70-130		
trans-1,3-Dichloropropene	**20.5**		µg/l		20.0		103	70-130		
Ethylbenzene	**21.9**		µg/l		20.0		110	70-130		
Hexachlorobutadiene	**22.4**		µg/l		20.0		112	70-130		
2-Hexanone (MBK)	**18.5**		µg/l		20.0		92	70-130		
Isopropylbenzene	**21.7**		µg/l		20.0		109	70-130		
4-Isopropyltoluene	**20.1**		µg/l		20.0		100	70-130		
Methyl tert-butyl ether	**18.4**		µg/l		20.0		92	70-130		
4-Methyl-2-pentanone (MIBK)	**18.2**		µg/l		20.0		91	70-130		
Methylene chloride	**17.7**		µg/l		20.0		89	70-130		
Naphthalene	**18.9**		µg/l		20.0		95	70-130		
n-Propylbenzene	**20.1**		µg/l		20.0		100	70-130		
Styrene	**20.4**		µg/l		20.0		102	70-130		
1,1,1,2-Tetrachloroethane	**24.3**		µg/l		20.0		122	70-130		
1,1,2,2-Tetrachloroethane	**22.4**		µg/l		20.0		112	70-130		
Tetrachloroethene	**20.1**		µg/l		20.0		101	70-130		
Toluene	**18.8**		µg/l		20.0		94	70-130		
1,2,3-Trichlorobenzene	**21.5**		µg/l		20.0		107	70-130		
1,2,4-Trichlorobenzene	**21.2**		µg/l		20.0		106	70-130		
1,3,5-Trichlorobenzene	**22.3**		µg/l		20.0		112	70-130		
1,1,1-Trichloroethane	**21.6**		µg/l		20.0		108	70-130		
1,1,2-Trichloroethane	**19.8**		µg/l		20.0		99	70-130		
Trichloroethene	**19.2**		µg/l		20.0		96	70-130		
Trichlorofluoromethane (Freon 11)	**18.8**		µg/l		20.0		94	70-130		
1,2,3-Trichloropropane	**22.3**		µg/l		20.0		112	70-130		
1,2,4-Trimethylbenzene	**20.6**		µg/l		20.0		103	70-130		
1,3,5-Trimethylbenzene	**20.8**		µg/l		20.0		104	70-130		
Vinyl chloride	**15.5**		µg/l		20.0		78	70-130		
m,p-Xylene	**21.0**		µg/l		20.0		105	70-130		
o-Xylene	**21.2**		µg/l		20.0		106	70-130		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709154 - SW846 5030 Water MS										
LCS (1709154-BS1)					Prepared & Analyzed: 02-Jun-17					
Tetrahydrofuran	**17.7**		µg/l		20.0		88	70-130		
Ethyl ether	**18.3**		µg/l		20.0		92	70-130		
Tert-amyl methyl ether	**17.1**		µg/l		20.0		86	70-130		
Ethyl tert-butyl ether	**19.1**		µg/l		20.0		95	70-130		
Di-isopropyl ether	**17.3**		µg/l		20.0		87	70-130		
Tert-Butanol / butyl alcohol	**186**		µg/l		200		93	70-130		
1,4-Dioxane	**188**		µg/l		200		94	70-130		
trans-1,4-Dichloro-2-butene	**21.0**		µg/l		20.0		105	70-130		
Ethanol	**334**		µg/l		400		84	70-130		
Surrogate: 4-Bromofluorobenzene	*51.2*		µg/l		*50.0*		*102*	*70-130*		
Surrogate: Toluene-d8	*47.9*		µg/l		*50.0*		*96*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*47.7*		µg/l		*50.0*		*95*	*70-130*		
Surrogate: Dibromofluoromethane	*49.0*		µg/l		*50.0*		*98*	*70-130*		
LCS Dup (1709154-BSD1)					Prepared & Analyzed: 02-Jun-17					
1,1,2-Trichlorotrifluoroethane (Freon 113)	**17.4**		µg/l		20.0		87	70-130	7	20
Acetone	**17.8**		µg/l		20.0		89	70-130	6	20
Acrylonitrile	**18.0**		µg/l		20.0		90	70-130	6	20
Benzene	**18.9**		µg/l		20.0		95	70-130	5	20
Bromobenzene	**21.4**		µg/l		20.0		107	70-130	7	20
Bromochloromethane	**19.0**		µg/l		20.0		95	70-130	0.7	20
Bromodichloromethane	**20.2**		µg/l		20.0		101	70-130	5	20
Bromoform	**24.1**		µg/l		20.0		121	70-130	3	20
Bromomethane	**15.9**		µg/l		20.0		79	70-130	3	20
2-Butanone (MEK)	**19.8**		µg/l		20.0		99	70-130	11	20
n-Butylbenzene	**19.4**		µg/l		20.0		97	70-130	7	20
sec-Butylbenzene	**19.4**		µg/l		20.0		97	70-130	5	20
tert-Butylbenzene	**19.8**		µg/l		20.0		99	70-130	4	20
Carbon disulfide	**16.4**		µg/l		20.0		82	70-130	8	20
Carbon tetrachloride	**21.9**		µg/l		20.0		110	70-130	8	20
Chlorobenzene	**21.0**		µg/l		20.0		105	70-130	3	20
Chloroethane	**16.2**		µg/l		20.0		81	70-130	4	20
Chloroform	**17.0**		µg/l		20.0		85	70-130	5	20
Chloromethane	**14.5**		µg/l		20.0		72	70-130	15	20
2-Chlorotoluene	**21.6**		µg/l		20.0		108	70-130	7	20
4-Chlorotoluene	**21.7**		µg/l		20.0		109	70-130	6	20
1,2-Dibromo-3-chloropropane	**24.0**		µg/l		20.0		120	70-130	0.5	20
Dibromochloromethane	**21.1**		µg/l		20.0		105	70-130	2	20
1,2-Dibromoethane (EDB)	**21.4**		µg/l		20.0		107	70-130	2	20
Dibromomethane	**19.6**		µg/l		20.0		98	70-130	1	20
1,2-Dichlorobenzene	**20.9**		µg/l		20.0		105	70-130	5	20
1,3-Dichlorobenzene	**22.3**		µg/l		20.0		111	70-130	4	20
1,4-Dichlorobenzene	**19.6**		µg/l		20.0		98	70-130	6	20
Dichlorodifluoromethane (Freon12)	**16.0**		µg/l		20.0		80	70-130	5	20
1,1-Dichloroethane	**17.0**		µg/l		20.0		85	70-130	5	20
1,2-Dichloroethane	**18.0**		µg/l		20.0		90	70-130	5	20
1,1-Dichloroethene	**17.1**		µg/l		20.0		86	70-130	4	20
cis-1,2-Dichloroethene	**17.0**		µg/l		20.0		85	70-130	4	20
trans-1,2-Dichloroethene	**17.1**		µg/l		20.0		86	70-130	6	20
1,2-Dichloropropane	**18.8**		µg/l		20.0		94	70-130	3	20
1,3-Dichloropropane	**19.2**		µg/l		20.0		96	70-130	3	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709154 - SW846 5030 Water MS										
LCS Dup (1709154-BSD1)					Prepared & Analyzed: 02-Jun-17					
2,2-Dichloropropane	**26.6**	QM9	µg/l		20.0		133	70-130	10	20
1,1-Dichloropropene	**18.2**		µg/l		20.0		91	70-130	8	20
cis-1,3-Dichloropropene	**19.5**		µg/l		20.0		97	70-130	3	20
trans-1,3-Dichloropropene	**19.9**		µg/l		20.0		99	70-130	3	20
Ethylbenzene	**20.7**		µg/l		20.0		103	70-130	6	20
Hexachlorobutadiene	**21.3**		µg/l		20.0		107	70-130	5	20
2-Hexanone (MBK)	**20.3**		µg/l		20.0		102	70-130	9	20
Isopropylbenzene	**20.2**		µg/l		20.0		101	70-130	7	20
4-Isopropyltoluene	**19.1**		µg/l		20.0		95	70-130	5	20
Methyl tert-butyl ether	**19.0**		µg/l		20.0		95	70-130	3	20
4-Methyl-2-pentanone (MIBK)	**19.8**		µg/l		20.0		99	70-130	8	20
Methylene chloride	**17.1**		µg/l		20.0		86	70-130	4	20
Naphthalene	**20.4**		µg/l		20.0		102	70-130	8	20
n-Propylbenzene	**19.2**		µg/l		20.0		96	70-130	5	20
Styrene	**19.3**		µg/l		20.0		97	70-130	5	20
1,1,1,2-Tetrachloroethane	**23.0**		µg/l		20.0		115	70-130	6	20
1,1,2,2-Tetrachloroethane	**23.1**		µg/l		20.0		116	70-130	3	20
Tetrachloroethene	**19.4**		µg/l		20.0		97	70-130	4	20
Toluene	**18.7**		µg/l		20.0		93	70-130	0.6	20
1,2,3-Trichlorobenzene	**21.4**		µg/l		20.0		107	70-130	0.5	20
1,2,4-Trichlorobenzene	**21.0**		µg/l		20.0		105	70-130	0.7	20
1,3,5-Trichlorobenzene	**20.9**		µg/l		20.0		104	70-130	6	20
1,1,1-Trichloroethane	**20.0**		µg/l		20.0		100	70-130	8	20
1,1,2-Trichloroethane	**19.9**		µg/l		20.0		99	70-130	0.5	20
Trichloroethene	**18.6**		µg/l		20.0		93	70-130	3	20
Trichlorofluoromethane (Freon 11)	**17.5**		µg/l		20.0		87	70-130	7	20
1,2,3-Trichloropropane	**22.4**		µg/l		20.0		112	70-130	0.5	20
1,2,4-Trimethylbenzene	**19.6**		µg/l		20.0		98	70-130	5	20
1,3,5-Trimethylbenzene	**19.5**		µg/l		20.0		97	70-130	7	20
Vinyl chloride	**14.5**		µg/l		20.0		73	70-130	7	20
m,p-Xylene	**19.6**		µg/l		20.0		98	70-130	7	20
o-Xylene	**20.5**		µg/l		20.0		103	70-130	3	20
Tetrahydrofuran	**19.6**		µg/l		20.0		98	70-130	10	20
Ethyl ether	**18.3**		µg/l		20.0		91	70-130	0.2	20
Tert-amyl methyl ether	**16.9**		µg/l		20.0		84	70-130	1	20
Ethyl tert-butyl ether	**21.0**		µg/l		20.0		105	70-130	10	20
Di-isopropyl ether	**17.0**		µg/l		20.0		85	70-130	2	20
Tert-Butanol / butyl alcohol	**206**		µg/l		200		103	70-130	10	20
1,4-Dioxane	**212**		µg/l		200		106	70-130	12	20
trans-1,4-Dichloro-2-butene	**21.7**		µg/l		20.0		109	70-130	3	20
Ethanol	**367**		µg/l		400		92	70-130	9	20
Surrogate: 4-Bromofluorobenzene	*50.4*		µg/l		*50.0*		*101*	*70-130*		
Surrogate: Toluene-d8	*48.6*		µg/l		*50.0*		*97*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*47.6*		µg/l		*50.0*		*95*	*70-130*		
Surrogate: Dibromofluoromethane	*53.8*		µg/l		*50.0*		*108*	*70-130*		
Batch 1709248 - SW846 5030 Water MS										
Blank (1709248-BLK1)					Prepared & Analyzed: 05-Jun-17					
1,1,2-Trichlorotrifluoroethane (Freon 113)	< 1.00		µg/l	1.00						
Acetone	< 10.0		µg/l	10.0						
Acrylonitrile	< 0.50		µg/l	0.50						

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
Blank (1709248-BLK1)					Prepared & Analyzed: 05-Jun-17					
Benzene	< 1.00		µg/l	1.00						
Bromobenzene	< 1.00		µg/l	1.00						
Bromochloromethane	< 1.00		µg/l	1.00						
Bromodichloromethane	< 0.50		µg/l	0.50						
Bromoform	< 1.00		µg/l	1.00						
Bromomethane	< 2.00		µg/l	2.00						
2-Butanone (MEK)	< 2.00		µg/l	2.00						
n-Butylbenzene	< 1.00		µg/l	1.00						
sec-Butylbenzene	< 1.00		µg/l	1.00						
tert-Butylbenzene	< 1.00		µg/l	1.00						
Carbon disulfide	< 2.00		µg/l	2.00						
Carbon tetrachloride	< 1.00		µg/l	1.00						
Chlorobenzene	< 1.00		µg/l	1.00						
Chloroethane	< 2.00		µg/l	2.00						
Chloroform	< 1.00		µg/l	1.00						
Chloromethane	< 2.00		µg/l	2.00						
2-Chlorotoluene	< 1.00		µg/l	1.00						
4-Chlorotoluene	< 1.00		µg/l	1.00						
1,2-Dibromo-3-chloropropane	< 2.00		µg/l	2.00						
Dibromochloromethane	< 0.50		µg/l	0.50						
1,2-Dibromoethane (EDB)	< 0.50		µg/l	0.50						
Dibromomethane	< 1.00		µg/l	1.00						
1,2-Dichlorobenzene	< 1.00		µg/l	1.00						
1,3-Dichlorobenzene	< 1.00		µg/l	1.00						
1,4-Dichlorobenzene	< 1.00		µg/l	1.00						
Dichlorodifluoromethane (Freon12)	< 2.00		µg/l	2.00						
1,1-Dichloroethane	< 1.00		µg/l	1.00						
1,2-Dichloroethane	< 1.00		µg/l	1.00						
1,1-Dichloroethene	< 1.00		µg/l	1.00						
cis-1,2-Dichloroethene	< 1.00		µg/l	1.00						
trans-1,2-Dichloroethene	< 1.00		µg/l	1.00						
1,2-Dichloropropane	< 1.00		µg/l	1.00						
1,3-Dichloropropane	< 1.00		µg/l	1.00						
2,2-Dichloropropane	< 1.00		µg/l	1.00						
1,1-Dichloropropene	< 1.00		µg/l	1.00						
cis-1,3-Dichloropropene	< 0.50		µg/l	0.50						
trans-1,3-Dichloropropene	< 0.50		µg/l	0.50						
Ethylbenzene	< 1.00		µg/l	1.00						
Hexachlorobutadiene	< 0.50		µg/l	0.50						
2-Hexanone (MBK)	< 2.00		µg/l	2.00						
Isopropylbenzene	< 1.00		µg/l	1.00						
4-Isopropyltoluene	< 1.00		µg/l	1.00						
Methyl tert-butyl ether	< 1.00		µg/l	1.00						
4-Methyl-2-pentanone (MIBK)	< 2.00		µg/l	2.00						
Methylene chloride	< 2.00		µg/l	2.00						
Naphthalene	< 1.00		µg/l	1.00						
n-Propylbenzene	< 1.00		µg/l	1.00						
Styrene	< 1.00		µg/l	1.00						
1,1,1,2-Tetrachloroethane	< 1.00		µg/l	1.00						
1,1,2,2-Tetrachloroethane	< 0.50		µg/l	0.50						

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
Blank (1709248-BLK1)					Prepared & Analyzed: 05-Jun-17					
Tetrachloroethene	< 1.00		µg/l	1.00						
Toluene	< 1.00		µg/l	1.00						
1,2,3-Trichlorobenzene	< 1.00		µg/l	1.00						
1,2,4-Trichlorobenzene	< 1.00		µg/l	1.00						
1,3,5-Trichlorobenzene	< 1.00		µg/l	1.00						
1,1,1-Trichloroethane	< 1.00		µg/l	1.00						
1,1,2-Trichloroethane	< 1.00		µg/l	1.00						
Trichloroethene	< 1.00		µg/l	1.00						
Trichlorofluoromethane (Freon 11)	< 1.00		µg/l	1.00						
1,2,3-Trichloropropane	< 1.00		µg/l	1.00						
1,2,4-Trimethylbenzene	< 1.00		µg/l	1.00						
1,3,5-Trimethylbenzene	< 1.00		µg/l	1.00						
Vinyl chloride	< 1.00		µg/l	1.00						
m,p-Xylene	< 2.00		µg/l	2.00						
o-Xylene	< 1.00		µg/l	1.00						
Tetrahydrofuran	< 2.00		µg/l	2.00						
Ethyl ether	< 1.00		µg/l	1.00						
Tert-amyl methyl ether	< 1.00		µg/l	1.00						
Ethyl tert-butyl ether	< 1.00		µg/l	1.00						
Di-isopropyl ether	< 1.00		µg/l	1.00						
Tert-Butanol / butyl alcohol	< 10.0		µg/l	10.0						
1,4-Dioxane	< 20.0		µg/l	20.0						
trans-1,4-Dichloro-2-butene	< 5.00		µg/l	5.00						
Ethanol	< 200		µg/l	200						
Surrogate: 4-Bromofluorobenzene	*44.2*		µg/l		*50.0*		*88*	*70-130*		
Surrogate: Toluene-d8	*49.0*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*51.4*		µg/l		*50.0*		*103*	*70-130*		
Surrogate: Dibromofluoromethane	*51.6*		µg/l		*50.0*		*103*	*70-130*		
LCS (1709248-BS1)					Prepared & Analyzed: 05-Jun-17					
1,1,2-Trichlorotrifluoroethane (Freon 113)	**16.8**		µg/l		20.0		84	70-130		
Acetone	**20.3**		µg/l		20.0		101	70-130		
Acrylonitrile	**16.6**		µg/l		20.0		83	70-130		
Benzene	**19.0**		µg/l		20.0		95	70-130		
Bromobenzene	**21.5**		µg/l		20.0		108	70-130		
Bromochloromethane	**18.4**		µg/l		20.0		92	70-130		
Bromodichloromethane	**19.5**		µg/l		20.0		98	70-130		
Bromoform	**23.1**		µg/l		20.0		115	70-130		
Bromomethane	**15.6**		µg/l		20.0		78	70-130		
2-Butanone (MEK)	**18.2**		µg/l		20.0		91	70-130		
n-Butylbenzene	**17.1**		µg/l		20.0		86	70-130		
sec-Butylbenzene	**18.6**		µg/l		20.0		93	70-130		
tert-Butylbenzene	**19.1**		µg/l		20.0		96	70-130		
Carbon disulfide	**15.5**		µg/l		20.0		78	70-130		
Carbon tetrachloride	**21.2**		µg/l		20.0		106	70-130		
Chlorobenzene	**20.5**		µg/l		20.0		102	70-130		
Chloroethane	**16.3**		µg/l		20.0		81	70-130		
Chloroform	**16.9**		µg/l		20.0		84	70-130		
Chloromethane	**15.9**		µg/l		20.0		80	70-130		
2-Chlorotoluene	**21.4**		µg/l		20.0		107	70-130		
4-Chlorotoluene	**21.2**		µg/l		20.0		106	70-130		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
LCS (1709248-BS1)					Prepared & Analyzed: 05-Jun-17					
1,2-Dibromo-3-chloropropane	**20.2**		µg/l		20.0		101	70-130		
Dibromochloromethane	**20.3**		µg/l		20.0		102	70-130		
1,2-Dibromoethane (EDB)	**20.9**		µg/l		20.0		105	70-130		
Dibromomethane	**19.4**		µg/l		20.0		97	70-130		
1,2-Dichlorobenzene	**20.5**		µg/l		20.0		103	70-130		
1,3-Dichlorobenzene	**21.6**		µg/l		20.0		108	70-130		
1,4-Dichlorobenzene	**19.4**		µg/l		20.0		97	70-130		
Dichlorodifluoromethane (Freon12)	**16.7**		µg/l		20.0		84	70-130		
1,1-Dichloroethane	**16.8**		µg/l		20.0		84	70-130		
1,2-Dichloroethane	**18.2**		µg/l		20.0		91	70-130		
1,1-Dichloroethene	**16.5**		µg/l		20.0		83	70-130		
cis-1,2-Dichloroethene	**16.9**		µg/l		20.0		85	70-130		
trans-1,2-Dichloroethene	**16.6**		µg/l		20.0		83	70-130		
1,2-Dichloropropane	**18.3**		µg/l		20.0		91	70-130		
1,3-Dichloropropane	**19.2**		µg/l		20.0		96	70-130		
2,2-Dichloropropane	**21.1**		µg/l		20.0		105	70-130		
1,1-Dichloropropene	**17.6**		µg/l		20.0		88	70-130		
cis-1,3-Dichloropropene	**18.1**		µg/l		20.0		90	70-130		
trans-1,3-Dichloropropene	**18.2**		µg/l		20.0		91	70-130		
Ethylbenzene	**20.2**		µg/l		20.0		101	70-130		
Hexachlorobutadiene	**20.1**		µg/l		20.0		101	70-130		
2-Hexanone (MBK)	**17.7**		µg/l		20.0		88	70-130		
Isopropylbenzene	**19.8**		µg/l		20.0		99	70-130		
4-Isopropyltoluene	**17.9**		µg/l		20.0		89	70-130		
Methyl tert-butyl ether	**17.8**		µg/l		20.0		89	70-130		
4-Methyl-2-pentanone (MIBK)	**17.7**		µg/l		20.0		88	70-130		
Methylene chloride	**16.9**		µg/l		20.0		84	70-130		
Naphthalene	**16.0**		µg/l		20.0		80	70-130		
n-Propylbenzene	**18.0**		µg/l		20.0		90	70-130		
Styrene	**19.1**		µg/l		20.0		96	70-130		
1,1,1,2-Tetrachloroethane	**22.8**		µg/l		20.0		114	70-130		
1,1,2,2-Tetrachloroethane	**22.0**		µg/l		20.0		110	70-130		
Tetrachloroethene	**18.9**		µg/l		20.0		95	70-130		
Toluene	**18.6**		µg/l		20.0		93	70-130		
1,2,3-Trichlorobenzene	**18.1**		µg/l		20.0		91	70-130		
1,2,4-Trichlorobenzene	**17.6**		µg/l		20.0		88	70-130		
1,3,5-Trichlorobenzene	**19.0**		µg/l		20.0		95	70-130		
1,1,1-Trichloroethane	**19.6**		µg/l		20.0		98	70-130		
1,1,2-Trichloroethane	**19.8**		µg/l		20.0		99	70-130		
Trichloroethene	**18.1**		µg/l		20.0		90	70-130		
Trichlorofluoromethane (Freon 11)	**17.4**		µg/l		20.0		87	70-130		
1,2,3-Trichloropropane	**21.4**		µg/l		20.0		107	70-130		
1,2,4-Trimethylbenzene	**19.0**		µg/l		20.0		95	70-130		
1,3,5-Trimethylbenzene	**19.1**		µg/l		20.0		96	70-130		
Vinyl chloride	**16.8**		µg/l		20.0		84	70-130		
m,p-Xylene	**19.4**		µg/l		20.0		97	70-130		
o-Xylene	**19.9**		µg/l		20.0		99	70-130		
Tetrahydrofuran	**17.8**		µg/l		20.0		89	70-130		
Ethyl ether	**17.3**		µg/l		20.0		87	70-130		
Tert-amyl methyl ether	**17.0**		µg/l		20.0		85	70-130		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
LCS (1709248-BS1)					Prepared & Analyzed: 05-Jun-17					
Ethyl tert-butyl ether	**18.6**		µg/l		20.0		93	70-130		
Di-isopropyl ether	**16.9**		µg/l		20.0		84	70-130		
Tert-Butanol / butyl alcohol	**167**		µg/l		200		84	70-130		
1,4-Dioxane	**186**		µg/l		200		93	70-130		
trans-1,4-Dichloro-2-butene	**18.2**		µg/l		20.0		91	70-130		
Ethanol	**334**		µg/l		400		83	70-130		
Surrogate: 4-Bromofluorobenzene	*51.0*		µg/l		*50.0*		*102*	*70-130*		
Surrogate: Toluene-d8	*48.5*		µg/l		*50.0*		*97*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*47.2*		µg/l		*50.0*		*94*	*70-130*		
Surrogate: Dibromofluoromethane	*51.0*		µg/l		*50.0*		*102*	*70-130*		
LCS Dup (1709248-BSD1)					Prepared & Analyzed: 05-Jun-17					
1,1,2-Trichlorotrifluoroethane (Freon 113)	**19.3**		µg/l		20.0		96	70-130	14	20
Acetone	**18.3**		µg/l		20.0		92	70-130	10	20
Acrylonitrile	**16.5**		µg/l		20.0		82	70-130	0.5	20
Benzene	**20.8**		µg/l		20.0		104	70-130	9	20
Bromobenzene	**22.8**		µg/l		20.0		114	70-130	6	20
Bromochloromethane	**19.2**		µg/l		20.0		96	70-130	4	20
Bromodichloromethane	**21.0**		µg/l		20.0		105	70-130	8	20
Bromoform	**23.3**		µg/l		20.0		117	70-130	1	20
Bromomethane	**17.4**		µg/l		20.0		87	70-130	11	20
2-Butanone (MEK)	**17.9**		µg/l		20.0		90	70-130	2	20
n-Butylbenzene	**18.6**		µg/l		20.0		93	70-130	8	20
sec-Butylbenzene	**20.4**		µg/l		20.0		102	70-130	9	20
tert-Butylbenzene	**21.4**		µg/l		20.0		107	70-130	11	20
Carbon disulfide	**18.4**		µg/l		20.0		92	70-130	17	20
Carbon tetrachloride	**24.1**		µg/l		20.0		120	70-130	12	20
Chlorobenzene	**22.3**		µg/l		20.0		112	70-130	9	20
Chloroethane	**17.9**		µg/l		20.0		89	70-130	9	20
Chloroform	**18.1**		µg/l		20.0		91	70-130	7	20
Chloromethane	**17.7**		µg/l		20.0		88	70-130	10	20
2-Chlorotoluene	**23.8**		µg/l		20.0		119	70-130	10	20
4-Chlorotoluene	**23.2**		µg/l		20.0		116	70-130	9	20
1,2-Dibromo-3-chloropropane	**20.9**		µg/l		20.0		104	70-130	3	20
Dibromochloromethane	**20.9**		µg/l		20.0		105	70-130	3	20
1,2-Dibromoethane (EDB)	**21.1**		µg/l		20.0		105	70-130	0.7	20
Dibromomethane	**19.8**		µg/l		20.0		99	70-130	2	20
1,2-Dichlorobenzene	**22.0**		µg/l		20.0		110	70-130	7	20
1,3-Dichlorobenzene	**23.0**		µg/l		20.0		115	70-130	6	20
1,4-Dichlorobenzene	**20.4**		µg/l		20.0		102	70-130	5	20
Dichlorodifluoromethane (Freon12)	**19.2**		µg/l		20.0		96	70-130	14	20
1,1-Dichloroethane	**18.6**		µg/l		20.0		93	70-130	10	20
1,2-Dichloroethane	**18.9**		µg/l		20.0		95	70-130	4	20
1,1-Dichloroethene	**19.0**		µg/l		20.0		95	70-130	14	20
cis-1,2-Dichloroethene	**18.0**		µg/l		20.0		90	70-130	6	20
trans-1,2-Dichloroethene	**18.5**		µg/l		20.0		92	70-130	11	20
1,2-Dichloropropane	**20.3**		µg/l		20.0		101	70-130	10	20
1,3-Dichloropropane	**19.2**		µg/l		20.0		96	70-130	0.2	20
2,2-Dichloropropane	**24.0**		µg/l		20.0		120	70-130	13	20
1,1-Dichloropropene	**20.6**		µg/l		20.0		103	70-130	16	20
cis-1,3-Dichloropropene	**19.4**		µg/l		20.0		97	70-130	7	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
LCS Dup (1709248-BSD1)					Prepared & Analyzed: 05-Jun-17					
trans-1,3-Dichloropropene	**19.3**		µg/l		20.0		96	70-130	6	20
Ethylbenzene	**22.7**		µg/l		20.0		113	70-130	11	20
Hexachlorobutadiene	**22.2**		µg/l		20.0		111	70-130	10	20
2-Hexanone (MBK)	**17.1**		µg/l		20.0		85	70-130	3	20
Isopropylbenzene	**22.4**		µg/l		20.0		112	70-130	12	20
4-Isopropyltoluene	**19.8**		µg/l		20.0		99	70-130	10	20
Methyl tert-butyl ether	**18.4**		µg/l		20.0		92	70-130	3	20
4-Methyl-2-pentanone (MIBK)	**17.7**		µg/l		20.0		88	70-130	0.06	20
Methylene chloride	**18.1**		µg/l		20.0		90	70-130	7	20
Naphthalene	**17.5**		µg/l		20.0		88	70-130	9	20
n-Propylbenzene	**20.2**		µg/l		20.0		101	70-130	12	20
Styrene	**20.4**		µg/l		20.0		102	70-130	6	20
1,1,1,2-Tetrachloroethane	**23.6**		µg/l		20.0		118	70-130	3	20
1,1,2,2-Tetrachloroethane	**22.1**		µg/l		20.0		111	70-130	0.4	20
Tetrachloroethene	**21.2**		µg/l		20.0		106	70-130	11	20
Toluene	**20.5**		µg/l		20.0		102	70-130	10	20
1,2,3-Trichlorobenzene	**19.9**		µg/l		20.0		100	70-130	9	20
1,2,4-Trichlorobenzene	**19.9**		µg/l		20.0		100	70-130	13	20
1,3,5-Trichlorobenzene	**21.2**		µg/l		20.0		106	70-130	11	20
1,1,1-Trichloroethane	**21.9**		µg/l		20.0		109	70-130	11	20
1,1,2-Trichloroethane	**19.8**		µg/l		20.0		99	70-130	0.05	20
Trichloroethene	**20.5**		µg/l		20.0		102	70-130	12	20
Trichlorofluoromethane (Freon 11)	**19.9**		µg/l		20.0		99	70-130	13	20
1,2,3-Trichloropropane	**21.0**		µg/l		20.0		105	70-130	1	20
1,2,4-Trimethylbenzene	**20.7**		µg/l		20.0		104	70-130	9	20
1,3,5-Trimethylbenzene	**21.1**		µg/l		20.0		106	70-130	10	20
Vinyl chloride	**20.2**		µg/l		20.0		101	70-130	18	20
m,p-Xylene	**21.5**		µg/l		20.0		108	70-130	10	20
o-Xylene	**22.2**		µg/l		20.0		111	70-130	11	20
Tetrahydrofuran	**17.0**		µg/l		20.0		85	70-130	4	20
Ethyl ether	**18.5**		µg/l		20.0		92	70-130	6	20
Tert-amyl methyl ether	**17.5**		µg/l		20.0		88	70-130	3	20
Ethyl tert-butyl ether	**20.3**		µg/l		20.0		101	70-130	9	20
Di-isopropyl ether	**17.6**		µg/l		20.0		88	70-130	4	20
Tert-Butanol / butyl alcohol	**168**		µg/l		200		84	70-130	0.8	20
1,4-Dioxane	**185**		µg/l		200		92	70-130	0.6	20
trans-1,4-Dichloro-2-butene	**18.2**		µg/l		20.0		91	70-130	0.2	20
Ethanol	**320**		µg/l		400		80	70-130	4	20
Surrogate: 4-Bromofluorobenzene	*51.1*		µg/l		*50.0*		*102*	*70-130*		
Surrogate: Toluene-d8	*47.9*		µg/l		*50.0*		*96*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*47.5*		µg/l		*50.0*		*95*	*70-130*		
Surrogate: Dibromofluoromethane	*51.6*		µg/l		*50.0*		*103*	*70-130*		
Matrix Spike (1709248-MS1)			**Source: SC35211-01RE1**		Prepared: 05-Jun-17 Analyzed: 06-Jun-17					
1,1,2-Trichlorotrifluoroethane (Freon 113)	**17.2**	D	µg/l		20.0	0.00	86	70-130		
Acetone	**12.4**	QM7, D	µg/l		20.0	0.00	62	70-130		
Acrylonitrile	**15.6**	D	µg/l		20.0	0.00	78	70-130		
Benzene	**19.2**	D	µg/l		20.0	0.00	96	70-130		
Bromobenzene	**21.5**	D	µg/l		20.0	0.00	108	70-130		
Bromochloromethane	**17.9**	D	µg/l		20.0	0.00	89	70-130		
Bromodichloromethane	**19.7**	D	µg/l		20.0	0.00	99	70-130		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
Matrix Spike (1709248-MS1)			**Source: SC35211-01RE1**			Prepared: 05-Jun-17 Analyzed: 06-Jun-17				
Bromoform	**22.2**	D	µg/l		20.0	0.00	111	70-130		
Bromomethane	**15.6**	D	µg/l		20.0	0.00	78	70-130		
2-Butanone (MEK)	**16.7**	D	µg/l		20.0	0.00	84	70-130		
n-Butylbenzene	**18.7**	D	µg/l		20.0	0.00	93	70-130		
sec-Butylbenzene	**19.9**	D	µg/l		20.0	0.00	99	70-130		
tert-Butylbenzene	**20.0**	D	µg/l		20.0	0.00	100	70-130		
Carbon disulfide	**15.9**	D	µg/l		20.0	0.20	78	70-130		
Carbon tetrachloride	**21.6**	D	µg/l		20.0	0.00	108	70-130		
Chlorobenzene	**20.8**	D	µg/l		20.0	0.00	104	70-130		
Chloroethane	**16.1**	D	µg/l		20.0	0.00	81	70-130		
Chloroform	**16.8**	D	µg/l		20.0	0.00	84	70-130		
Chloromethane	**15.6**	D	µg/l		20.0	0.00	78	70-130		
2-Chlorotoluene	**22.2**	D	µg/l		20.0	0.00	111	70-130		
4-Chlorotoluene	**21.7**	D	µg/l		20.0	0.00	109	70-130		
1,2-Dibromo-3-chloropropane	**19.1**	D	µg/l		20.0	0.00	96	70-130		
Dibromochloromethane	**19.8**	D	µg/l		20.0	0.00	99	70-130		
1,2-Dibromoethane (EDB)	**19.8**	D	µg/l		20.0	0.00	99	70-130		
Dibromomethane	**18.8**	D	µg/l		20.0	0.00	94	70-130		
1,2-Dichlorobenzene	**20.4**	D	µg/l		20.0	0.00	102	70-130		
1,3-Dichlorobenzene	**22.4**	D	µg/l		20.0	0.00	112	70-130		
1,4-Dichlorobenzene	**19.3**	D	µg/l		20.0	0.26	95	70-130		
Dichlorodifluoromethane (Freon12)	**16.2**	D	µg/l		20.0	0.00	81	70-130		
1,1-Dichloroethane	**16.8**	D	µg/l		20.0	0.00	84	70-130		
1,2-Dichloroethane	**17.5**	D	µg/l		20.0	0.00	88	70-130		
1,1-Dichloroethene	**16.4**	D	µg/l		20.0	0.00	82	70-130		
cis-1,2-Dichloroethene	**18.7**	D	µg/l		20.0	2.03	83	70-130		
trans-1,2-Dichloroethene	**17.4**	D	µg/l		20.0	0.61	84	70-130		
1,2-Dichloropropane	**19.0**	D	µg/l		20.0	0.00	95	70-130		
1,3-Dichloropropane	**18.9**	D	µg/l		20.0	0.00	94	70-130		
2,2-Dichloropropane	**22.9**	D	µg/l		20.0	0.00	115	70-130		
1,1-Dichloropropene	**18.7**	D	µg/l		20.0	0.00	93	70-130		
cis-1,3-Dichloropropene	**18.4**	D	µg/l		20.0	0.00	92	70-130		
trans-1,3-Dichloropropene	**18.4**	D	µg/l		20.0	0.00	92	70-130		
Ethylbenzene	**21.2**	D	µg/l		20.0	0.00	106	70-130		
Hexachlorobutadiene	**21.2**	D	µg/l		20.0	0.00	106	70-130		
2-Hexanone (MBK)	**16.7**	D	µg/l		20.0	0.00	84	70-130		
Isopropylbenzene	**20.7**	D	µg/l		20.0	0.00	104	70-130		
4-Isopropyltoluene	**18.7**	D	µg/l		20.0	0.00	94	70-130		
Methyl tert-butyl ether	**17.3**	D	µg/l		20.0	0.00	87	70-130		
4-Methyl-2-pentanone (MIBK)	**17.3**	D	µg/l		20.0	0.00	87	70-130		
Methylene chloride	**16.6**	D	µg/l		20.0	0.00	83	70-130		
Naphthalene	**17.0**	D	µg/l		20.0	0.58	82	70-130		
n-Propylbenzene	**19.3**	D	µg/l		20.0	0.00	96	70-130		
Styrene	**19.2**	D	µg/l		20.0	0.00	96	70-130		
1,1,1,2-Tetrachloroethane	**22.3**	D	µg/l		20.0	0.00	112	70-130		
1,1,2,2-Tetrachloroethane	**21.2**	D	µg/l		20.0	0.00	106	70-130		
Tetrachloroethene	**61.8**	D	µg/l		20.0	42.6	96	70-130		
Toluene	**19.1**	D	µg/l		20.0	0.00	96	70-130		
1,2,3-Trichlorobenzene	**19.2**	D	µg/l		20.0	0.00	96	70-130		
1,2,4-Trichlorobenzene	**18.9**	D	µg/l		20.0	0.00	94	70-130		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
Matrix Spike (1709248-MS1)			**Source: SC35211-01RE1**		Prepared: 05-Jun-17 Analyzed: 06-Jun-17					
1,3,5-Trichlorobenzene	**20.6**	D	µg/l		20.0	0.00	103	70-130		
1,1,1-Trichloroethane	**19.9**	D	µg/l		20.0	0.00	100	70-130		
1,1,2-Trichloroethane	**19.1**	D	µg/l		20.0	0.00	95	70-130		
Trichloroethene	**21.8**	D	µg/l		20.0	2.91	94	70-130		
Trichlorofluoromethane (Freon 11)	**17.4**	D	µg/l		20.0	0.00	87	70-130		
1,2,3-Trichloropropane	**20.2**	D	µg/l		20.0	0.00	101	70-130		
1,2,4-Trimethylbenzene	**19.6**	D	µg/l		20.0	0.00	98	70-130		
1,3,5-Trimethylbenzene	**19.9**	D	µg/l		20.0	0.00	100	70-130		
Vinyl chloride	**16.5**	D	µg/l		20.0	0.00	82	70-130		
m,p-Xylene	**20.3**	D	µg/l		20.0	0.00	102	70-130		
o-Xylene	**20.8**	D	µg/l		20.0	0.00	104	70-130		
Tetrahydrofuran	**16.8**	D	µg/l		20.0	0.00	84	70-130		
Ethyl ether	**16.8**	D	µg/l		20.0	0.00	84	70-130		
Tert-amyl methyl ether	**16.4**	D	µg/l		20.0	0.00	82	70-130		
Ethyl tert-butyl ether	**18.6**	D	µg/l		20.0	0.00	93	70-130		
Di-isopropyl ether	**16.5**	D	µg/l		20.0	0.00	83	70-130		
Tert-Butanol / butyl alcohol	**162**	D	µg/l		200	0.00	81	70-130		
1,4-Dioxane	**171**	D	µg/l		200	0.00	86	70-130		
trans-1,4-Dichloro-2-butene	**18.5**	D	µg/l		20.0	0.00	93	70-130		
Ethanol	**296**	D	µg/l		400	0.00	74	70-130		
Surrogate: 4-Bromofluorobenzene	*51.0*		µg/l		*50.0*		*102*	*70-130*		
Surrogate: Toluene-d8	*47.8*		µg/l		*50.0*		*96*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*46.6*		µg/l		*50.0*		*93*	*70-130*		
Surrogate: Dibromofluoromethane	*49.8*		µg/l		*50.0*		*100*	*70-130*		
Matrix Spike Dup (1709248-MSD1)			**Source: SC35211-01RE1**		Prepared: 05-Jun-17 Analyzed: 06-Jun-17					
1,1,2-Trichlorotrifluoroethane (Freon 113)	**17.8**	D	µg/l		20.0	0.00	89	70-130	3	20
Acetone	**12.2**	QM7, D	µg/l		20.0	0.00	61	70-130		20
Acrylonitrile	**15.7**	D	µg/l		20.0	0.00	78	70-130	0.3	20
Benzene	**19.8**	D	µg/l		20.0	0.00	99	70-130	3	20
Bromobenzene	**22.8**	D	µg/l		20.0	0.00	114	70-130	6	20
Bromochloromethane	**17.6**	D	µg/l		20.0	0.00	88	70-130	1	20
Bromodichloromethane	**20.1**	D	µg/l		20.0	0.00	101	70-130	2	20
Bromoform	**22.5**	D	µg/l		20.0	0.00	113	70-130	2	20
Bromomethane	**16.4**	D	µg/l		20.0	0.00	82	70-130		20
2-Butanone (MEK)	**17.0**	D	µg/l		20.0	0.00	85	70-130		20
n-Butylbenzene	**20.1**	D	µg/l		20.0	0.00	101	70-130	8	20
sec-Butylbenzene	**20.6**	D	µg/l		20.0	0.00	103	70-130	4	20
tert-Butylbenzene	**21.1**	D	µg/l		20.0	0.00	106	70-130	5	20
Carbon disulfide	**16.7**	D	µg/l		20.0	0.20	82	70-130	5	20
Carbon tetrachloride	**22.9**	D	µg/l		20.0	0.00	114	70-130	6	20
Chlorobenzene	**21.6**	D	µg/l		20.0	0.00	108	70-130	3	20
Chloroethane	**16.0**	D	µg/l		20.0	0.00	80	70-130	0.6	20
Chloroform	**16.9**	D	µg/l		20.0	0.00	84	70-130	0.5	20
Chloromethane	**15.3**	D	µg/l		20.0	0.00	76	70-130	2	20
2-Chlorotoluene	**23.5**	D	µg/l		20.0	0.00	117	70-130	6	20
4-Chlorotoluene	**22.8**	D	µg/l		20.0	0.00	114	70-130	5	20
1,2-Dibromo-3-chloropropane	**18.6**	D	µg/l		20.0	0.00	93	70-130	3	20
Dibromochloromethane	**19.8**	D	µg/l		20.0	0.00	99	70-130	0.3	20
1,2-Dibromoethane (EDB)	**20.0**	D	µg/l		20.0	0.00	100	70-130	1	20
Dibromomethane	**19.2**	D	µg/l		20.0	0.00	96	70-130	2	20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
Matrix Spike Dup (1709248-MSD1)			**Source: SC35211-01RE1**		Prepared: 05-Jun-17 Analyzed: 06-Jun-17					
1,2-Dichlorobenzene	**21.1**	D	µg/l		20.0	0.00	106	70-130	3	20
1,3-Dichlorobenzene	**23.1**	D	µg/l		20.0	0.00	115	70-130	3	20
1,4-Dichlorobenzene	**20.0**	D	µg/l		20.0	0.26	99	70-130	3	20
Dichlorodifluoromethane (Freon12)	**17.0**	D	µg/l		20.0	0.00	85	70-130	5	20
1,1-Dichloroethane	**17.4**	D	µg/l		20.0	0.00	87	70-130	4	20
1,2-Dichloroethane	**17.7**	D	µg/l		20.0	0.00	88	70-130	0.9	20
1,1-Dichloroethene	**17.6**	D	µg/l		20.0	0.00	88	70-130	7	20
cis-1,2-Dichloroethene	**19.0**	D	µg/l		20.0	2.03	85	70-130	2	20
trans-1,2-Dichloroethene	**17.7**	D	µg/l		20.0	0.61	85	70-130	2	20
1,2-Dichloropropane	**18.8**	D	µg/l		20.0	0.00	94	70-130	0.7	20
1,3-Dichloropropane	**19.1**	D	µg/l		20.0	0.00	96	70-130	1	20
2,2-Dichloropropane	**21.2**	D	µg/l		20.0	0.00	106	70-130	8	20
1,1-Dichloropropene	**20.0**	D	µg/l		20.0	0.00	100	70-130	7	20
cis-1,3-Dichloropropene	**18.7**	D	µg/l		20.0	0.00	94	70-130	2	20
trans-1,3-Dichloropropene	**18.4**	D	µg/l		20.0	0.00	92	70-130	0.05	20
Ethylbenzene	**22.5**	D	µg/l		20.0	0.00	113	70-130	6	20
Hexachlorobutadiene	**23.4**	D	µg/l		20.0	0.00	117	70-130	10	20
2-Hexanone (MBK)	**17.0**	D	µg/l		20.0	0.00	85	70-130	2	20
Isopropylbenzene	**22.1**	D	µg/l		20.0	0.00	111	70-130	7	20
4-Isopropyltoluene	**20.0**	D	µg/l		20.0	0.00	100	70-130	6	20
Methyl tert-butyl ether	**17.1**	D	µg/l		20.0	0.00	86	70-130	1	20
4-Methyl-2-pentanone (MIBK)	**17.1**	D	µg/l		20.0	0.00	85	70-130	1	20
Methylene chloride	**16.4**	D	µg/l		20.0	0.00	82	70-130	0.7	20
Naphthalene	**16.9**	D	µg/l		20.0	0.58	82	70-130	0.4	20
n-Propylbenzene	**20.6**	D	µg/l		20.0	0.00	103	70-130	7	20
Styrene	**20.6**	D	µg/l		20.0	0.00	103	70-130	7	20
1,1,1,2-Tetrachloroethane	**22.7**	D	µg/l		20.0	0.00	114	70-130	2	20
1,1,2,2-Tetrachloroethane	**21.1**	D	µg/l		20.0	0.00	106	70-130	0.4	20
Tetrachloroethene	**64.6**	D	µg/l		20.0	42.6	110	70-130	5	20
Toluene	**19.7**	D	µg/l		20.0	0.00	98	70-130	3	20
1,2,3-Trichlorobenzene	**19.3**	D	µg/l		20.0	0.00	96	70-130	0.3	20
1,2,4-Trichlorobenzene	**19.6**	D	µg/l		20.0	0.00	98	70-130	3	20
1,3,5-Trichlorobenzene	**21.8**	D	µg/l		20.0	0.00	109	70-130	6	20
1,1,1-Trichloroethane	**21.0**	D	µg/l		20.0	0.00	105	70-130	5	20
1,1,2-Trichloroethane	**19.2**	D	µg/l		20.0	0.00	96	70-130	0.6	20
Trichloroethene	**22.7**	D	µg/l		20.0	2.91	99	70-130	4	20
Trichlorofluoromethane (Freon 11)	**18.1**	D	µg/l		20.0	0.00	90	70-130	4	20
1,2,3-Trichloropropane	**20.6**	D	µg/l		20.0	0.00	103	70-130	2	20
1,2,4-Trimethylbenzene	**21.1**	D	µg/l		20.0	0.00	105	70-130	7	20
1,3,5-Trimethylbenzene	**21.1**	D	µg/l		20.0	0.00	105	70-130	6	20
Vinyl chloride	**17.8**	D	µg/l		20.0	0.00	89	70-130	8	20
m,p-Xylene	**21.9**	D	µg/l		20.0	0.00	109	70-130	7	20
o-Xylene	**21.5**	D	µg/l		20.0	0.00	108	70-130	3	20
Tetrahydrofuran	**17.4**	D	µg/l		20.0	0.00	87	70-130		20
Ethyl ether	**17.1**	D	µg/l		20.0	0.00	86	70-130	2	20
Tert-amyl methyl ether	**16.0**	D	µg/l		20.0	0.00	80	70-130	3	20
Ethyl tert-butyl ether	**18.5**	D	µg/l		20.0	0.00	93	70-130	0.4	20
Di-isopropyl ether	**16.7**	D	µg/l		20.0	0.00	83	70-130	1	20
Tert-Butanol / butyl alcohol	**159**	D	µg/l		200	0.00	80	70-130	2	20
1,4-Dioxane	**181**	D	µg/l		200	0.00	91	70-130		20

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1709248 - SW846 5030 Water MS										
Matrix Spike Dup (1709248-MSD1)			**Source: SC35211-01RE1**		Prepared: 05-Jun-17 Analyzed: 06-Jun-17					
trans-1,4-Dichloro-2-butene	**18.4**	D	µg/l		20.0	0.00	92	70-130	0.8	20
Ethanol	**274**	QM7, D	µg/l		400	0.00	68	70-130		20
Surrogate: 4-Bromofluorobenzene	*52.1*		µg/l		*50.0*		*104*	*70-130*		
Surrogate: Toluene-d8	*47.7*		µg/l		*50.0*		*95*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*46.7*		µg/l		*50.0*		*93*	*70-130*		
Surrogate: Dibromofluoromethane	*48.2*		µg/l		*50.0*		*96*	*70-130*		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
EPA 300.0										
Batch 1709037 - General Preparation										
Blank (1709037-BLK1)						Prepared: 31-May-17 Analyzed: 01-Jun-17				
Chloride	< 1.00		mg/l	1.00						
LCS (1709037-BS1)						Prepared: 31-May-17 Analyzed: 01-Jun-17				
Chloride	**20.9**		mg/l	1.00	20.0		104	90-110		
Reference (1709037-SRM1)						Prepared: 31-May-17 Analyzed: 01-Jun-17				
Chloride	**25.9**		mg/l	1.00	25.0		103	90-110		

Notes and Definitions

D	Data reported from a dilution
E	This flag indicates the concentration for this analyte is an estimated value due to exceeding the calibration range or interferences resulting in a biased final concentration.
GS1	Sample dilution required for high concentration of target analytes to be within the instrument calibration range.
QM7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM9	The spike recovery for this QC sample is outside the established control limits. The sample results for the QC batch were accepted based on LCS/LCSD or SRM recoveries within the control limits.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

SC 35311-01C

eurofins | Spectrum Analytical

CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:

☐ Standard TAT - 7 to 10 business days

☑ Rush TAT - Date Needed: 6/1

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed

Report To: STANTEC
400 CROWN COLONY DRIVE
SUITE 200
QUINCY, MA 02169
Telephone #:
Project Mgr: NATE GARDNER

Invoice To: SAME

P.O No.: Quote #:

Project No: 191750030
Site Name: CALLAHAN CENTER
Location: FRAMINGHAM State: MA
Sampler(s): NCG

F=Field Filtered 1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11= 12=

DW=Dinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1= X2= X3=

G= Grab C=Compsite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: CHLORIDE 300	VOC 8260	Check if chlorinated
35311-01	CFS-INFLUENT	5/26/17	0840	G	GW	3			1	X	X	☐
02	CFS-EFFLUENT	5/26/17	0840	G	GW	3			1	X	X	☐
												☐
												☐
												☐
												☐
												☐
												☐
												☐
												☐

List Preservative Code below: — 2

QA/QC Reporting Notes:
* additional charges may appply

MA DEP MCP CAM Report? ☑ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☑ Standard ☐ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☐ Other:
State-specific reporting standards:

Relinquished by:	Received by:	Date:	Time:
		5-30-17	10:25
		5/30/17	1735

Temp °C: Observed 0.3; Correction Factor 0; Corrected 0.3; IR ID# 08

☑ EDD format: PDF
☑ E-mail to: NATHAN.GARDNER@STANTEC.COM

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☒ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

Batch Summary

1709037

General Chemistry Parameters

1709037-BLK1
1709037-BS1
1709037-SRM1
SC35211-01 (CFS - INFLUENT)
SC35211-02 (CFS - EFFLUENT)

1709154

Volatile Organic Compounds

1709154-BLK1
1709154-BS1
1709154-BSD1
SC35211-01 (CFS - INFLUENT)
SC35211-02 (CFS - EFFLUENT)

1709248

Volatile Organic Compounds

1709248-BLK1
1709248-BS1
1709248-BSD1
1709248-MS1
1709248-MSD1
SC35211-01RE1 (CFS - INFLUENT)

S704664

Volatile Organic Compounds

S704664-CAL1
S704664-CAL2
S704664-CAL3
S704664-CAL4
S704664-CAL5
S704664-CAL6
S704664-CAL7
S704664-CAL8
S704664-CAL9
S704664-CALA
S704664-CALB
S704664-ICV1
S704664-LCV1
S704664-LCV2
S704664-TUN1

S704994

Volatile Organic Compounds

S704994-CCV1
S704994-TUN1

S705033

Volatile Organic Compounds

S705033-CCV1
S705033-TUN1

Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200, Quincy MA 02169-0982

APPENDIX D

PRELIMINARY ENDANGERED SPECIES IPaC REPORT

IPaC resource list

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

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

Location

Middlesex County, Massachusetts

Local office

New England Ecological Services Field Office

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

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

http://www.fws.gov/newengland

Endangered species

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

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

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

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

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

5. Click REQUEST SPECIES LIST.

Listed species[1] 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	Breeding
American Oystercatcher Haematopus palliatus https://ecos.fws.gov/ecp/species/8935	Breeding
Bald Eagle Haliaeetus leucocephalus https://ecos.fws.gov/ecp/species/1626	Year-round
Black-billed Cuckoo Coccyzus erythropthalmus https://ecos.fws.gov/ecp/species/9399	Breeding

Blue-winged Warbler Vermivora pinus	Breeding
Canada Warbler Wilsonia canadensis	Breeding
Least Bittern Ixobrychus exilis https://ecos.fws.gov/ecp/species/6175	Breeding
Olive-sided Flycatcher Contopus cooperi https://ecos.fws.gov/ecp/species/3914	Breeding
Peregrine Falcon Falco peregrinus https://ecos.fws.gov/ecp/species/8831	Breeding
Pied-billed Grebe Podilymbus podiceps	Breeding
Prairie Warbler Dendroica discolor	Breeding
Purple Sandpiper Calidris maritima	Wintering
Short-eared Owl Asio flammeus https://ecos.fws.gov/ecp/species/9295	Wintering
Upland Sandpiper Bartramia longicauda https://ecos.fws.gov/ecp/species/9294	Breeding
Willow Flycatcher Empidonax traillii https://ecos.fws.gov/ecp/species/3482	Breeding
Wood Thrush Hylocichla mustelina	Breeding
Worm Eating Warbler Helmitheros vermivorum	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 and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

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:

RIVERINE

R2UBH

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.

Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200, Quincy MA 02169-0982

APPENDIX E

BMPP

Stantec Consulting Services Inc.
400 Crown Colony Drive Suite 200, Quincy MA 02169-0982

STORMWATER BEST MANAGEMENT PRACTICES & OPERATION, MAINTENANCE AND MONITORING PLAN

535 Union Avenue
Framingham, Massachusetts

RTN 3-318
(Stantec Ref. No. 191750030)

October 21, 2013
revised
March 20, 2015
revised
May 5, 2016

Prepared for:

The Town of Framingham
Remediation General Permit
Authorization No. MAG910594
Callahan Senior Center
535 Union Ave, Framingham, MA
&
Casey Properties
145 Dutton Road
Sudbury, Massachusetts 01776

Prepared by:

Stantec Consulting Services, Inc.
400 Crown Colony Drive, Suite 200
Quincy, Massachusetts 02169

TABLE OF CONTENTS

ATTACHEMENTS:

1.0 INTRODUCTION

Stantec Consulting Services, Inc. (Stantec), formerly Fay, Spofford & Thorndike, Inc., has prepared this Stormwater Best Management Practices Plan (BMPP) on behalf of Casey Properties to address the discharge of remedial wastewater into the municipal stormwater system from the property located at 535 Union Avenue in Framingham, Massachusetts (the Site). The Site is currently occupied by the Callahan Senior Center. The objective of this BMPP is to minimize tetrachloroethene (PCE) concentrations and associated breakdown products (trichloroethylene, vinyl chloride and cis-1,2-dichloroethene) identified in groundwater within the sumps located within the sub grade utility room at 535 Union Avenue.

Two (2) sumps are located in the sub grade utility room of the Site building located at 535 Union Avenue and operate intermittently during times of high groundwater, spring snowmelt, or flooding of the river. The sumps are used to control groundwater infiltration and discharge into the municipal storm water system which discharges into the Sudbury River located adjacent to the south and east of the Site.

This BMPP includes procedures for operation, maintenance and monitoring (OMM) of the sump water treatment system (SWTS) associated with the filtration of identified PCE impacts in sump water at the Site. The BMPP is to be used in conjunction with all requisite information pursuant to the Environmental Protection Agency (EPA) Remediation General Permit (RGP) MAG910594 under the National Pollutant Discharge Elimination System (NPDES). A copy of the EPA RGP MAG910594 is included in **Appendix A**.

2.0 POLLUTANT SOURCES AND TYPES

The source of the PCE and associated breakdown compounds, identified in the sump water is in part attributed to a release of dry cleaning solvent from the upgradient property, 530-532 Union Avenue, located across Union Avenue to the northwest. However, two additional releases are located up gradient and in close proximity to 535 Union Avenue. A release of PCE to soil and groundwater has been identified at the property located at 543 Union Avenue (RTN 3-23612) and PCE to soil has been identified at the property located at 11 Union Avenue Terrace (RTN 3-22087). The concentration of PCE within the influent of the sumps has been measured between 2.7 and 3,480 ug/l and varies with seasonal groundwater fluctuations.

3.0 POLLUTANT REDUCTION METHODOLOGY

Concentrations of VOCs, identified in Section 2.0, are reduced from the sump water to concentrations below the criteria stipulated in the RGP. Contaminant concentrations are reduced prior to discharge into the municipal storm water system using the SWTS located within the sub grade utility room. The existing sumps discharge into a 200-gallon holding tank. Prior to discharge into the holding tank, any sediment present in the sump water is filtered by two (2) inline sediment filters. Once the specified volume of the holding tank is reached, a 1 horsepower pump within the holding tank pumps the sump water through two (2) 200 lb. granulated activated carbon (GAC) cylinders in series and which then discharges into the municipal storm water system. A ball valve, inline between the pump within the 200-gallon holding tank and the GAC cylinders, is used to control the flow rate through the filtration system to allow the sump water to remain in contact with

the GAC long enough for contaminant absorption prior to discharge. The GAC cylinders will operate in a lead/lag configuration to maximize absorption efficiency of the GAC. An integrated flow meter is used to record the monthly volume of discharge water which has flowed through the system.

The sumps currently operate during periods of high groundwater or flooding of the river and therefore Stantec anticipates that the sumps will operate infrequently and for short time periods during normal conditions. During periods of sump operation and discharge, it is Stantec's opinion that the additional water pumped into the storm water system which discharges into the Sudbury River will have a negligible effect on river flow. The GAC filtration system was designed and installed by Carbon Filtration Services, Inc. (CFS) of Johnston, RI. Copies of plans and spec sheets associated with the treatment system are included in **Appendix B**.

To prevent the subgrade utility room from flooding in the event that SWTS system cannot discharge as quickly as the sumps discharge into the SWTS system, Stantec installed a "high" level float pump into the 200-gallon holding tank of the SWTS. In the event that the sump discharge into the holding tank exceeds the SWTS discharge flow rate, the additional "high" level pump can drain the holding tank out the overflow discharge pipe. This overflow pipe discharges to a dry well located in a grassy area adjacent to the subgrade utility room to the east.

Stantec will inform the EPA if any future SWTS upgrades are made.

4.0 MONITORING

In accordance with the sampling requirements of the RGP, monthly sampling is performed on the influent and effluent streams of the system. The sampling parameters include MTBE, cis-1,2-dichloroethene, tetrachloroethene, trichloroethene, acetone, vinyl chloride, chloride, instantaneous flow, total flow and pH range for Class A & B Waters in Massachusetts.

In addition to the parameters specified in the RGP permit, Stantec has been monitoring the detection of tetrahydrofuran in the effluent stream. Stantec will maintain records of the monitoring results both at the Site and at Stantec's Quincy, MA office. Certain sampling parameters may be eliminated by filing a Notice of Change with the Environmental Protection Agency. Only parameters which did not exceed the Appendix III limits of the Remediation General Permit for all sampling events are applicable for elimination.

Stantec will periodically check the condition of the two (2) sediment filters associated with the influent stream of the system and replace if need be.

5.0 SITE SECURITY

The GAC filtration system is located within the locked sub grade utility room of the Site building. The utility room remains locked 24 hours a day and only authorized personnel associated with the Callahan Senior Center and the Town of Framingham have access. Signage has been posted on the SWTS system with Stantec contact information as well as a notice stating that "it is a violation of EPA RGP MAG910000 to bypass the carbon filtration system at any time and discharge directly into

the municipal storm water system".

6.0 MANAGEMENT OF GENERATED WASTE

Waste generated in association with the operation and maintenance of the GAC filtration system is anticipated to be spent GAC cylinders as breakthrough is identified in the effluent. Stantec will conduct monthly influent and effluent sampling of the filtration system in accordance with the EPA RGP to determine if any contaminants remain in the filtered sump water. Any contaminant concentrations above the effluent limits of the RGP will be suspect that contaminant breakthrough has occurred. The spent carbon from the GAC cylinder closest to the influent will be removed and disposed off-Site and the remaining GAC cylinder will be moved to replace the disposed GAC cylinder and a new GAC cylinder will be placed at the most effluent position. The spent carbon will be handled and disposed off-Site by CFS. Disposal documentation will be kept on record by Stantec.

7.0 TRAINING

Stantec developed a Health and Safety Plan, which will establish the procedures, personnel responsibilities and training necessary to protect the health and safety of all on-Site personnel. Any employee of Stantec or any subcontractor performing work in association with the filtrations system are expected to familiarize themselves and abide by the Health and Safety Plan. A copy of the Health and Safety Plan is included in Appendix C.

APPENDIX A

EPA Remediation General Permit

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
BOSTON, MA 02109-3912

CERTIFIED MAIL RETURN RECEIPT REQUESTED

April 30, 2015

Mark S. Bartlett
Vice President
Fay, Spofford &Thorndike, Inc.
400 Crown Colony Drive, Suite 200
Quincy, MA 02169

Re: Notice of Change – for Callahan Senior Center located at 535 Union Street, Framingham, MA 01702, Middlesex County; Authorization # MAG910594

Dear Mr. Bartlett:

Based on the review of a Notice of Change (NOC) submitted by Fay, Spofford & Thorndike, Inc., on behalf of the Town of Framingham, for the site referenced above, the U.S. Environmental Protection Agency (EPA) hereby authorizes monitoring discharge change(s) as indicated below.

1. A change in treatment which adds a major operable unit of the system.
   Reason given: We are expanding the treatment system by increasing the size of the units in order to accommodate a flow increase. A size expansion of the units is necessary to accommodate a greater flow and to provide treatment to the permitted RGP pollutants.

2. A Flow increase change from 10 gallons per minute (GPM) to 50 GPM.
   Reason: The flow increase is necessary for the reasons indicated above.

3. Additional Changes: Based on the review of monitoring information (for the influent waters) provided with the request change, this Agency found necessary to include the pollutants Acetone and Vinyl chloride to the list of monitoring requirements indicated below. Reason: Further protection to the receiving stream.

EPA approves all the changes indicated above. These changes are effective immediately and no other changes or modifications will take place unless authorized by the person indicated below. Other conditions of the originally authorized permit remain in place.

If you have any questions or need further clarification do not hesitate to reach me.

Sincerely,

Victor Alvarez

Victor R. Alvarez
Environmental Engineer | U.S. E.P.A. New England
Storm Water and Construction Permits Section
5 Post Office Square, Suite 100 | Boston, MA 02109-3912
Mail Code OEP06-4 | Ph: 617-918-1572
Email: alvarez.victor@epa.gov

Enclosure

cc: Robert Kubit, MassDEP
Charles P. Young, Fay Spofford & Thorndike Inc.

2010 Remediation General Permit
Summary of Monitoring Parameters[1]

NPDES Authorization Number:	**MAG910594**
Authorization Issued:	August, 2013
Facility/Site Name:	Callahan Senior Center
Facility/Site Address:	535 Union Street, Framingham, MA 01702, Middlesex County
	Email address of owner: health@framinghamma.gov
Legal Name of Operator:	Fay Spofford & Throndike
Operator contact name, title, and Address:	Mark S. Barlet, P.E., Vice President, 400 Grown Colony Drive, Quincy , MA 02169
	Email:mbartlett@fstinc.com
Estimated date of Completion:	Unknown
Category and Sub-Category:	Category- Non Petroleum site Remediation. Sub-category A. Volatile Organic Compounds (VOC) Only Sites
RGP Termination Date:	September 10, 2015
Receiving Water:	Sudbury River

Monitoring & Limits are applicable if checked. All samples are to be collected as grab samples

	Parameter	**Effluent Limit/Method#/ML** (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
	1. Total Suspended Solids (TSS)	30 milligrams/liter (mg/L) **, 50 mg/L for hydrostatic testing ** Me#160.2/ML5ug/L
	2. Total Residual Chlorine (TRC) [1]	Freshwater = 11 ug/L ** Saltwater = 7.5 ug/L **/ Me#330.5/ML 20ug/L
	3. Total Petroleum Hydrocarbons (TPH)	5.0 mg/L/ Me# 1664A/ML 5.0mg/L
	4. Cyanide (CN) [2, 3]	Freshwater = 5.2 ug/l ** Saltwater = 1.0 ug/L **/ Me#335.4/ML 10ug/L
	5. Benzene (B)	5ug/L /50.0 ug/L for hydrostatic testing only/ Me#8260C/ML 2 ug/L
	6. Toluene (T)	(limited as ug/L total BTEX)/ Me#8260C/ ML 2ug/L
	7. Ethylbenzene (E)	(limited as ug/L total BTEX) Me#8260C/ ML 2ug/L
	8. (m,p,o) Xylenes (X)	(limited as ug/L total BTEX) Me#8260C/ ML 2ug/L
	9. Total Benzene, Toluene, Ethyl Benzene, and Xylenes (BTEX) [4]	100 ug/L/ Me#8260C/ ML 2ug/L

	Parameter	**Effluent Limit/Method#/ML** (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
	10. Ethylene Dibromide (EDB) (1,2- Dibromoethane)	0.05 ug/l/ Me#8260C/ ML 10ug/L
√	11. Methyl-tert-Butyl Ether (MtBE)	70.0 ug/l/Me#8260C/ML 10ug/L
	12.tert-Butyl Alcohol (TBA) (TertiaryButanol)	Monitor Only(ug/L)/Me#8260C/ML 10ug/L
	13. tert-Amyl Methyl Ether (TAME)	Monitor Only(ug/L)/Me#8260C/ML 10ug/L
	14. Naphthalene [5]	20 ug/L /Me#8260C/ML 2ug/L
	15. Carbon Tetrachloride	4.4 ug/L /Me#8260C/ ML 5ug/L
	16. 1,2 Dichlorobenzene (o-DCB)	600 ug/L /Me#8260C/ ML 5ug/L
	17. 1,3 Dichlorobenzene (m-DCB)	320 ug/L /Me#8260C/ ML 5ug/L
	18. 1,4 Dichlorobenzene (p-DCB)	5.0 ug/L /Me#8260C/ ML 5ug/L
	18a. Total dichlorobenzene	763 ug/L - NH only /Me#8260C/ ML 5ug/L
	19. 1,1 Dichloroethane (DCA)	70 ug/L /Me#8260C/ ML 5ug/L
	20. 1,2 Dichloroethane (DCA)	5.0 ug/L /Me#8260C/ ML 5ug/L
	21. 1,1 Dichloroethene (DCE)	3.2 ug/L/Me#8260C/ ML 5ug/L
√	22. cis-1,2 Dichloroethene (DCE)	70 ug/L/Me#8260C/ ML 5ug/L
	23. Methylene Chloride	4.6 ug/L/Me#8260C/ ML 5ug/L
	24. Tetrachloroethene (PCE)	5.0 ug/L/Me#8260C/ ML 5ug/L
	25. 1,1,1 Trichloro-ethane (TCA)	200 ug/L/Me#8260C/ ML 5ug/L
	26. 1,1,2 Trichloro-ethane (TCA)	5.0 ug/L /Me#8260C/ ML 5ug/L
√	27. Trichloroethene (TCE)	5.0 ug/L /Me#8260C/ ML 5ug/L
√	28. Vinyl Chloride (Chloroethene)	2.0 ug/L /Me#8260C/ ML 5ug/L
√	29. Acetone	Monitor Only(ug/L)/Me#8260C/ML 50ug/L
	30. 1,4 Dioxane	Monitor Only /Me#1624C/ML 50ug/L
	31. Total Phenols	300 ug/L Me#420.1&420.2/ML 2 ug/L/ Me# 420.4 /ML 50ug/L
	32. Pentachlorophenol (PCP)	1.0 ug/L /Me#8270D/ML 5ug/L,Me#604 &625/ML 10ug/L
	33. Total Phthalates (Phthalate esters) [6]	3.0 ug/L ** /Me#8270D/ML 5ug/L, Me#606/ML 10ug/L& Me#625/ML 5ug/L
	34. Bis (2-Ethylhexyl) Phthalate [Di- (ethylhexyl) Phthalate]	6.0 ug/L /Me#8270D/ML 5ug/L,Me#606/ML 10ug/L & Me#625/ML 5ug/L
	35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)	10.0 ug/L
	a. Benzo(a) Anthracene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L

	Parameter	Effluent Limit/Method#/ML (All Effluent Limits are shown as Daily Maximum Limit, unless denoted by a **, in that case it will be a Monthly Average Limit)
	b. Benzo(a) Pyrene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	c. Benzo(b)Fluoranthene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	d. Benzo(k)Fluoranthene [7]	0.0038 ug/L /Me#8270D/ ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	e. Chrysene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	f. Dibenzo(a,h)anthracene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML 5ug/L
	g. Indeno(1,2,3-cd) Pyrene [7]	0.0038 ug/L /Me#8270D/ML 5ug/L, Me#610/ML 5ug/L& Me#625/ML5ug/L
	36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)	100 ug/L
	h. Acenaphthene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	i. Acenaphthylene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	j. Anthracene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	k. Benzo(ghi) Perylene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	l. Fluoranthene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	m. Fluorene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	n. Naphthalene [5]	20 ug/l / Me#8270/ML 5ug/L, Me#610/ML 5ug/L & Me#625/ML 5ug/L
	o. Phenanthrene	X/Me#8270D/ML 5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	p. Pyrene	X/Me#8270D/ML5ug/L,Me#610/ML 5ug/L & Me#625/ML 5ug/L
	37. Total Polychlorinated Biphenyls (PCBs) [8, 9]	0.000064 ug/L/Me# 608/ ML 0.5 ug/L
√	38. Chloride	Monitor only/Me# 300.0/ ML 100 ug/L

	Metal parameter	Total Recoverable MA/Metal Limit H [10] = 50 mg/l CaCO3, Units = ug/l [(11/12)] Freshwater Limts		Minimum level=ML	
	39. Antimony	5.6		ML	10
	40. Arsenic **	10		ML	20
	41. Cadmium **	0.2		ML	10
	42. Chromium III (trivalent) **	48.8		ML	15
	43. Chromium VI (hexavalent) **	11.4		ML	10
	44. Copper **	5.2		ML	15
	45. Lead **	1.3		ML	20
	46. Mercury **	0.9		ML	02
	47. Nickel **	29		ML	20
	48. Selenium **	5		ML	20
	49. Silver	1.2		ML	10
	50. Zinc **	66.6		ML	15
	51. Iron	1,000		ML	20

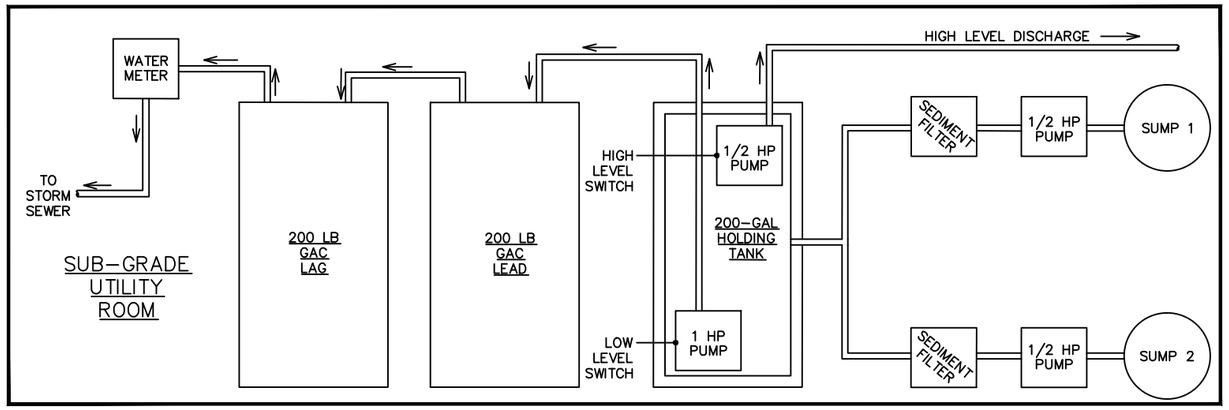
	Other Parameters	Limit
√	52. Instantaneous Flow	Site specific in CFS
√	53. Total Flow	Site specific in CFS
√	54. pH Range for Class A & Class B Waters in MA	6.5-8.3; 1/Month/Grab[13]
	55. pH Range for Class SA & Class SB Waters in MA	6.5-8.3; 1/Month/Grab[13]
	56. pH Range for Class B Waters in NH	6.5-8; 1/Month/Grab[13]
	57. Daily maximum temperature - Warm water fisheries	83°F; 1/Month/Grab[14]
	58. Daily maximum temperature - Cold water fisheries	68°F; 1/Month/Grab[14]
	59. Maximum Change in Temperature in MA - Any Class A water body	1.5°F; 1/Month/Grab[14]
	60. Maximum Change in Temperature in MA - Any Class B water body- Warm Water	5°F; 1/Month/Grab[14]
	61. Maximum Change in Temperature in MA – Any Class B water body - Cold water and Lakes/Ponds	3°F; 1/Month/Grab[14]
	62. Maximum Change in Temperature in MA – Any Class SA water body - Coastal	1.5°F; 1/Month/Grab[14]
	63. Maximum Change in Temperature in MA – Any Class SB water body - July to September	1.5°F; 1/Month/Grab[14]
	64. Maximum Change in Temperature in MA –Any Class SB water body - October to June	4°F; 1/Month/Grab[14]

Footnotes:

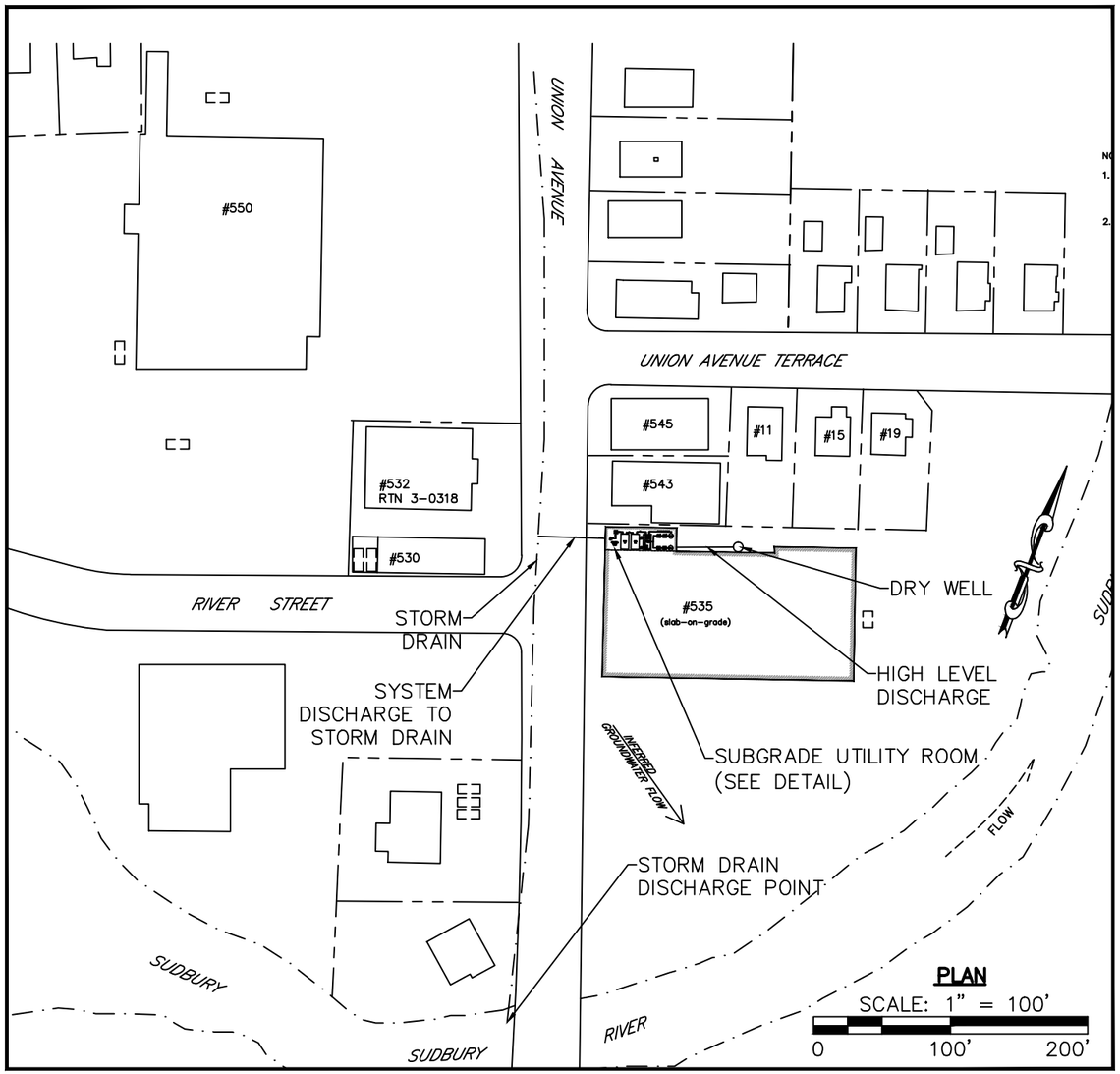
[1] Although the maximum values for TRC are 11ug/l and 7.5 ug/l for freshwater, and saltwater respectively, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI (i.e., Method 330.5, 20 ug/l).
[2] Limits for cyanide are based on EPA's water quality criteria expressed as micrograms per liter. There is currently no EPA approved test method for free cyanide. Therefore, total cyanide must be reported.
[3] Although the maximum values for cyanide are 5.2 ug/l and 1.0 ug/l for freshwater and saltwater, respectively, the compliance limits are equal to the minimum level (ML) of the Method 335.4 as listed in Appendix VI (i.e., 10 ug/l).
[4] BTEX = sum of Benzene, Toluene, Ethylbenzene, and total Xylenes.
[5] Naphthalene can be reported as both a purgeable (VOC) and extractable (SVOC) organic compound. If both VOC and SVOC are analyzed, the highest value must be used unless the QC criteria for one of the analyses is not met. In such cases, the value from the analysis meeting the QC criteria must be used.
[6] The sum of individual phthalate compounds(not including the #34, Bis (2-Ethylhexyl) Phthalate . The compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI.
Total values calculated for reporting on NOIs and discharge monitoring reports shall be calculated by adding the measured concentration of each constituent. If the measurement of a constituent is less than the ML, the permittee shall use a value of zero for that constituent. For each test, the permittee shall also attach the raw data for each constituent to the discharge monitoring report, including the minimum level and minimum detection level for the analysis.
[7] Although the maximum value for the individual PAH compounds is 0.0038 ug/l, the compliance limits are equal to the minimum level (ML) of the test method used as listed in Appendix VI.
[8] In the November 2002 WQC, EPA has revised the definition of Total PCBs for aquatic life as total PCBs is the sum of all homologue, all isomer, all congener, or all "Oroclor analyses."Total values calculated for reporting on NOIs and discharge monitoring reports shall be calculated by adding the measured concentration of each constituent. If the measure of a constituent is less than the ML, the permittee shall use a value of zero for that constituent. For each test, the permittee shall also attach the raw data for each constituent to the discharge monitoring report, including the minimum level and minimum detection level for the analysis.
[9]Although the maximum value for total PCBs is 0.000064 ug/l, the compliance limit is equal to the minimum level (ML) of the test method used as listed in Appendix VI (i.e., 0.5 ug/l for Method 608 or 0.00005 ug/l when Method 1668a is approved).
[10] Hardness. Cadmium, Chromium III, Copper, Lead, Nickel, Silver, and Zinc are Hardness Dependent.
[11] For a Dilution Factor (DF) from 1 to 5, metals limits are calculated using DF times the base limit for the metal. See Appendix IV. For example, iron limits are calculated using DF x 1,000ug/L (the iron base limit). Therefore DF is 1.5, the iron limit will be 1,500 ug/L; DF 2, then iron limit =1,000 x 2 =2,000 ug/L., etc. not to exceed the DF=5.
[12] Minimum Level (ML) is the lowest level at which the analytical system gives a recognizable signal and acceptable calibration point for the analyte. The ML represents the lowest concentration at which an analyte can be measured with a known level of confidence. The ML is calculated by multiplying the laboratory-determined method detection limit by 3.18 (see 40 CFR Part 136, Appendix B).
[13] pH sampling for compliance with permit limits may be performed using field methods as provided for in EPA test Method 150.1.
[14] Temperature sampling per Method 170.1

APPENDIX B

PLANS AND SPEC SHEETS ASSOCIATED WITH TREATMENT SYSTEM



TREATMENT SYSTEM DETAIL
(NOT TO SCALE)



PLAN
SCALE: 1" = 100'
0 100' 200'

03/25/2016
191750030

V:\1917\active\191750030\EPA RGP\Figure 2 Site Plan - 2016-08-10.dwg

ORIGINAL SHEET - ANSI B

Stantec

400 Crown Colony Drive, Suite 200
Quincy MA
www.stantec.com

Legend

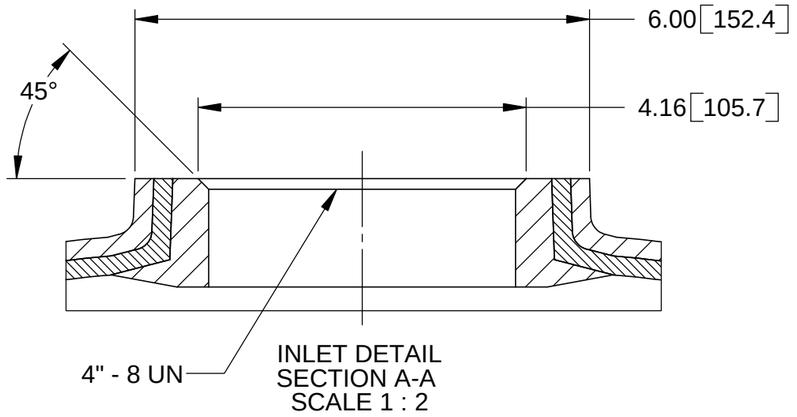
Notes

Client
TOWN OF FRAMINGHAM
150 CONCORD STREET
FRAMINGHAM, MASSACHUSETTS

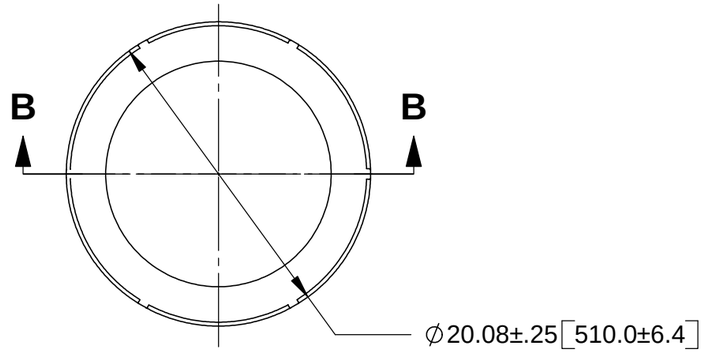
Figure No.
3

Title
FLOW SCHEMATIC
535 UNION STREET
FRAMINGHAM, MASSACHUSETTS

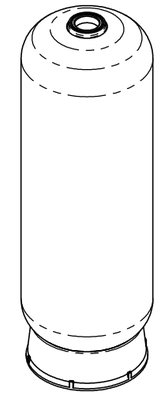
REVISIONS					
ZONE	ECN	REV.	DESCRIPTION	DATE	APP'D
		A	FIRST RELEASE	7/20/06	ILD

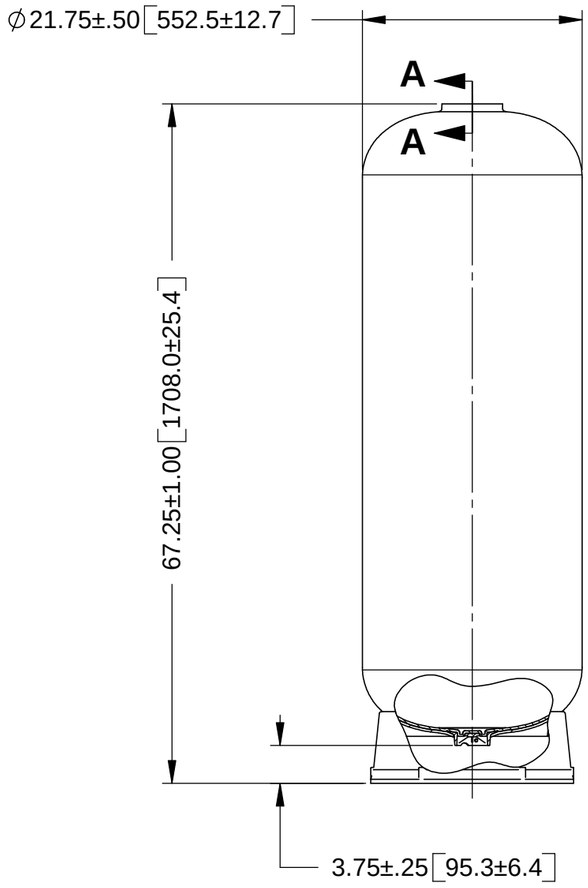


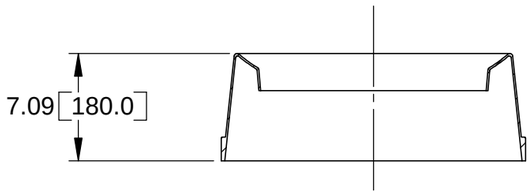
INLET DETAIL
SECTION A-A
SCALE 1 : 2



SMC BASE DETAIL
SCALE 1:10







SECTION B-B
SCALE 1 : 10

MAX OPERATING PRESSURE	150 PSIG	[1034 kPA]
MAX OPERATING TEMPERATURE	120 ^{O}F	[49 ^{O}C]
TANK VOLUME	84.0 GAL	[318.0 L]
DOME VOLUME	6.2 GAL	[23.5 L]
TANK WEIGHT WITH BASE	95 LBS	[43.1 Kg]

1. NOT SUITABLE FOR PNEUMATIC PRESSURE APPLICATIONS.
2. TANK ELONGATES UP TO .25 [6.4mm] AT MAXIMUM OPERATING PRESSURE. FLEXIBLE CONNECTIONS ARE RECOMMENDED TO PREVENT DAMAGE TO THE TANK OR PIPING.
3. TANK IS RATED FOR AN INTERNAL NEGATIVE PRESSURE OF 5.0 in Hg VACUUM. HIGHER VACUUM VALUES MUST BE PREVENTED WITH AN ADEQUATE VACUUM BREAKER
4. MINIMUM CLEARANCE OF 48.0 [1219.2] ON TOP REQUIRED FOR PIPING AND MANEUVERING.

LAST SAVED IN SMARTEAM: 07/24/2006 16:23

CRITICALITY SYMBOLS PER QPSP-001.2

☐ LEVEL I ▬ LEVEL II ▬ LEVEL III

DO NOT SCALE DRAWING. DIMS. ARE IN INCHES [mm]
INTERPRET DIMS AND TOLERANCES PER ASME Y14.5M -1994
UNLESS OTHERWISE SPECIFIED:
CORNER FILLETS R.005-.020 [.127-.508]
TOLERANCES:
ANGLES : ± 1°
1 PLACE .X: ± .015 [0.38]
2 PLACE .XX: ± .01 [0.3]
3 PLACE .XXX: ± .005 [0.13]

THIRD ANGLE PROJECTION

THIS DRAWING MUST BE COMPARED TO THE ERP SYSTEM TO ENSURE CORRECT REVISION LEVEL PRIOR TO USE.

APPROVALS		DATE
DRAWN	ndi	07/24/2006
CHECKED	ILD	7/20/06
APPROVED		

Pentair Water

Pentair Water Chardon
220 PARK DRIVE
CHARDON, OH 44024 USA

TITLE
21X62 TANK WITH SMC STD BASE 4" TOP INLET

SIZE	DWG NO.	REV
B	CHSK-5105	A

SCALE		
1:15	SOLIDWORKS FORMAT	SHEET 1 OF 1

TECHNICAL BROCHURE
B2DW R2

FEATURES

Impeller: Polyurethane for wear and corrosion resistance.

Adjustable Discharge: Discharge can be installed for either vertical or horizontal installation using only 2 screws.

Diffuser: Polyurethane for wear and corrosion resistance.

Mechanical Seal: Dual seals for double leakage protection, outer seal – silicon carbide.

Rubber Liner: Protects against wear around impeller.

Bottom Strainer: Made of impact absorbing EPDM rubber, suction holes allow for low pump down.

2DW

SUBMERSIBLE DEWATERING PUMP

GOULDS
WATER TECHNOLOGY
a xylem brand

APPLICATIONS

Specifically designed to remove water from:

- Drainage ditches
- Trenches
- Basements
- Manholes
- Excavating drainage in the building trades

SPECIFICATIONS

Pump:

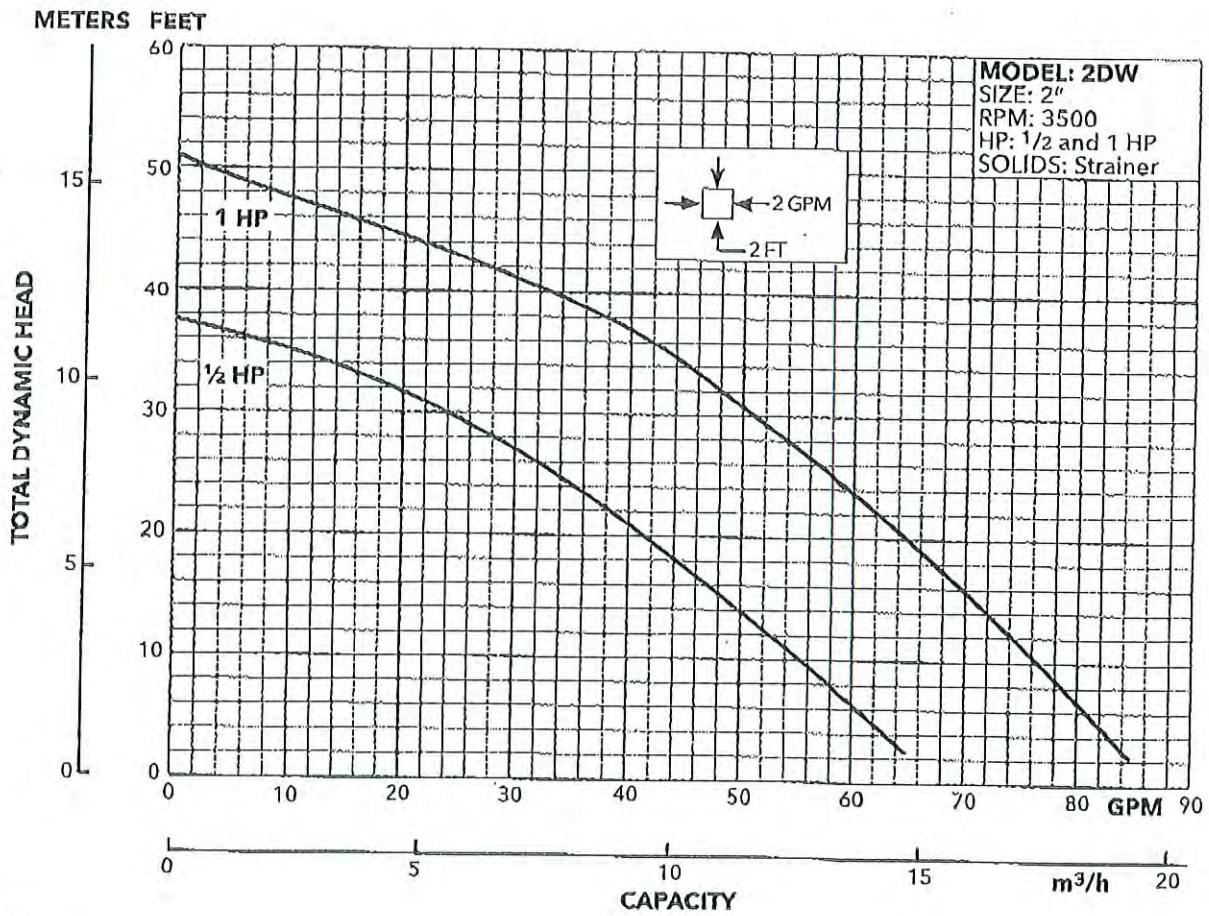
- Discharge size: 2" NPSM threaded hose coupling design, can be rotated
- Capacities: up to 84 GPM
- Total heads: up to 51 feet
- Maximum solids: any particles passing through strainer
- Mechanical seals: outer seal - silicon carbide, inner seal - carbon ceramic
- Temperature limit: 95°F (35° C) maximum
- Depth of immersion: 16.5 feet (5m) maximum

Motor:

- Single phase: 3500 RPM, ½ HP and 1 HP, 115 and 230 V, 60 Hz
- Built-in starter with full overload and temperature protection.
- Class F insulation.
- Air filled design.
- Upper and lower heavy duty ball bearing construction.
- Power cord: 50 feet.

AGENCY LISTINGS

Tested to UL778 and CSA 22.2 108 standards by Canadian Standards Association.
NRTL File #LR13533



REPLACEMENT KITS

Each kit contains the following parts:

Impeller Kit (15K97 for ½ HP, 15K98 for 1 HP) - Impeller, impeller screw, protective plug, washer, assembly instruction

Diffuser Kit (15K99 for both ½ HP and 1 HP) - Diffuser, barrel nuts, screws, washers, assembly instruction, sticker

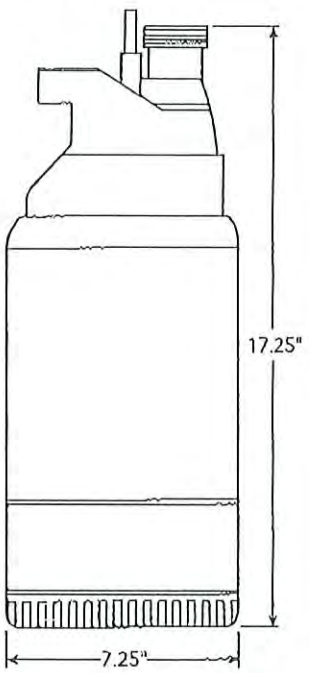
Outer seal Kit (15K14 for both ½ HP and 1 HP) - Mechanical face-seal unit, assembly instruction, sticker

O-ring Kit (15K100 for both ½ HP and 1 HP) - All o-rings

MODEL INFORMATION

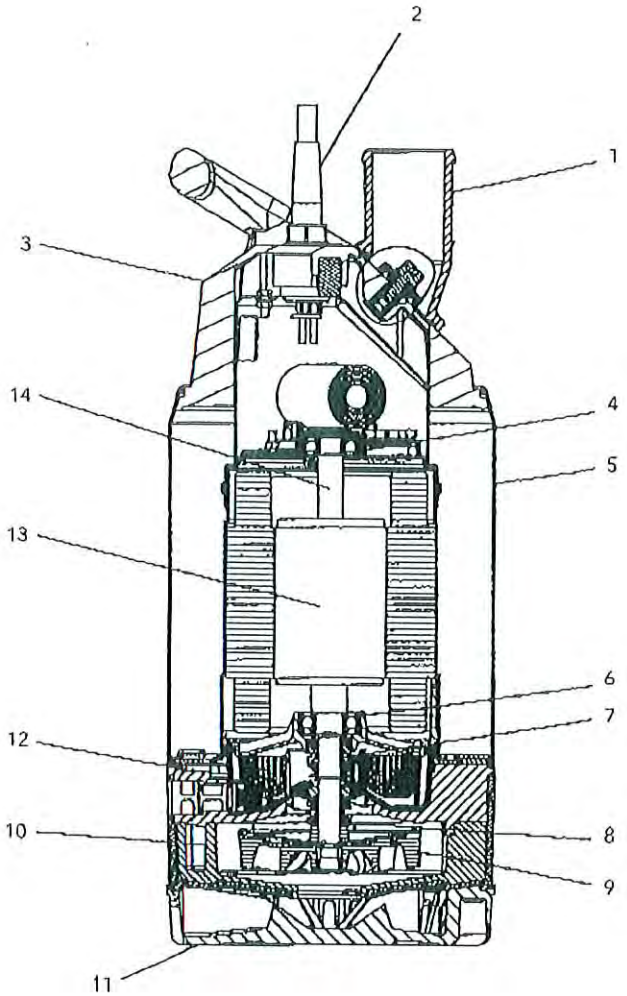
Order No.	HP	Volts	Phase	Maximum Amp	RPM	Height (in.)	Weight (lbs.)
2DW0511	½	115	1	5.5	3500	17.25	26
2DW0512		230		2.9			
2DW1011	1	115		9.8			32
2DW1012		230		4.9			

DIMENSIONS



COMPONENTS

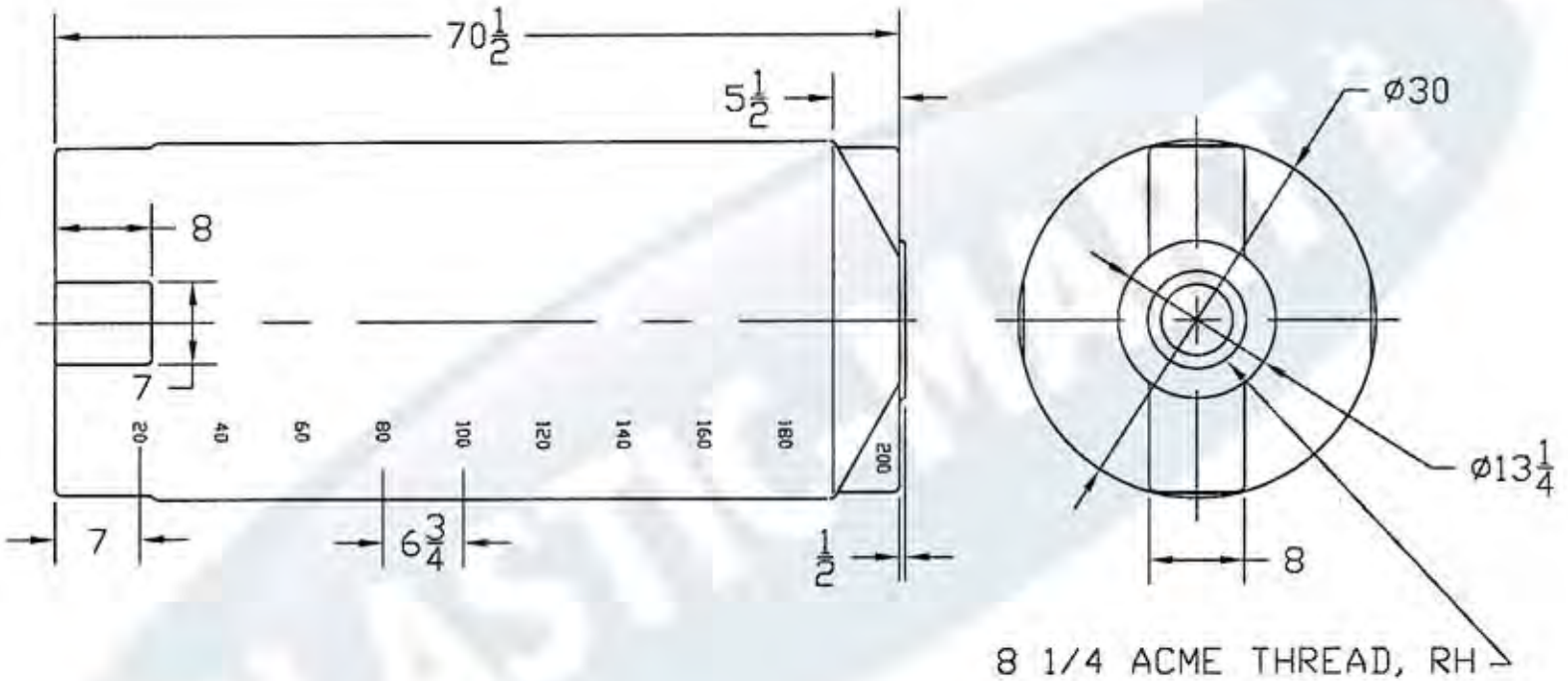
Item No.	Description	
1	Discharge	Not Available
2	Power cord	Not Available
3	Handle/cover	Not Available
4	Support bearing	Not Available
5	Pump casing	Not Available
6	Main bearing	Not Available
7	Inner mechanical seal	Not Available
8	Outer mechanical seal	Available
9	Impeller	Available
10	Suction cover/diffuser	Available
11	Strainer	Not Available
12	Oil plug	Not Available
13, 14	Motor	Not Available



xylem
Let's Solve Water

Xylem, Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.xyleminc.com/brands/gouldswatertechnology

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



PLASTIC-MART

866-310-2556

200 GALLON VERTICAL TANK X 30 DIA

JTP 11JUL03	SIZE A	FSCM NO.	DWG NO.	REV
	SCALE 1/16		SHEET	

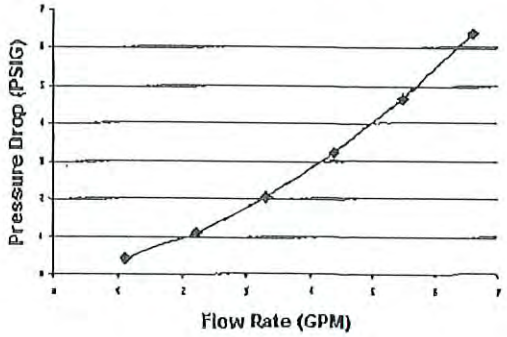
HPP SERIES FILTERS
MODEL HPP-100

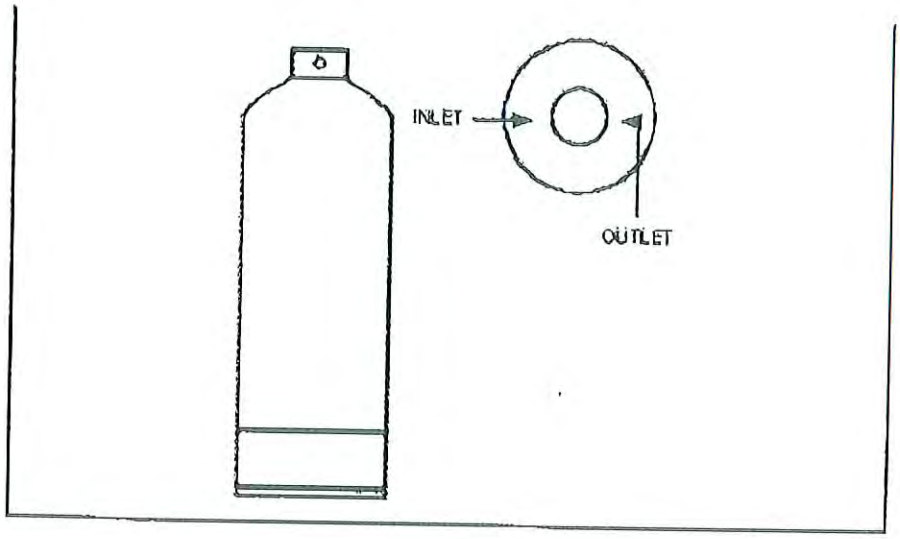
The HPP-100 filter is a media filter vessel designed to treat liquid streams. While the typical design application is a activated carbon adsorbtion unit, the filter can easily accommodate many medias. Some applications include:

- Dissolved Organic Removal (Activated Carbon)
- Suspended Solids Removal (Sand Filter)
- Dissolved Minerals (Softener Resin)
- Oil and Grease Removal (Organo-Clays)
- Dissolved and Precipitated Metals Removal
- Special Organics (Resin/Carbon Blend)
- Catalytic Reactor (Chlorine and Peroxide Removal)
- Bio-Remediation Contactor Unit

PRESSURE DROP GRAPH

*(As Filled - 8*30 GAC)*





HPP-100 SPECIFICATIONS			
Overall Height	4'7"	Vessel/Internal Piping Materials	Polyetheylene / SCH40 PVC
Diameter	12"	Internal Coating	Polyamide Epoxy Resin
Inlet / Outlet (FNPT)	3/4"	External Coating	Polyetheylene
Drain / Vent (FNPT)	NA	Maximum Pressure / Temp	125 PSIG / 120° F
GAC Fill (lbs)	100	Cross Sectional Bed Area	0.7 FT^2
Shipping / Operational Weight (lbs)	130/245	Bed Depth/Volume	4.7 FT / 3.3 FT^3

Tetrasolv Filtration, Inc. • 1200 East 26th Street • Anderson, Indiana 46016 • USA
Toll Free: 800-441-4034 Telephone: 765-643-3941 • Fax: 765-643-3949
www.tetrasolv.com • info@tetrasolv.com

BIG BLUE® HOUSINGS

1" #10 Big Blue® 1" #20 Big Blue®

NSF COMPLIANT

The 150233, 150234, 150235, 150236, 150237, 150238, 150239, 150240, 150467 and 150469 are Tested and Certified by NSF International under NSF/ANSI Standard 42 for material and structural integrity requirements only.

- *Large capacity housing suitable for high flow applications*
- *Available in 10" and 20" lengths*
- *Optional pressure-relief/bleed button on inlet side of cap*
- *Accepts 4½" diameter cartridges*

Big Blue filter housings offer the versatility to meet all of your large-capacity filtration needs, including high-flow and heavy-sediment applications. The extra large housing allows for greater cartridge capacity, reducing the number of vessels required for high flow-rate applications. Sumps are constructed of durable reinforced polypropylene and are available in both 10" and 20" lengths.

The high-flow polypropylene (HFPP) cap is available with 3/4", 1" or 1½" NPT inlet and outlet ports. The 1½" internal port allows a greater volume of liquid to pass through the HFPP cap more rapidly.

Big Blue housings are compatible with a broad range of chemicals and are available with or without an optional pressure-relief button. They accept a wide variety of 4½" diameter cartridges in either 10" or 20" lengths.

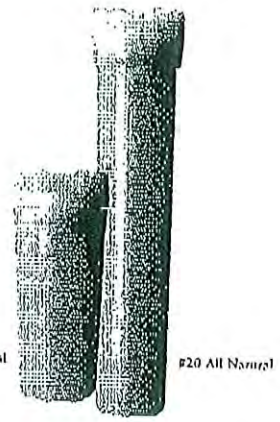
Housing Specifications and Performance Data

Model	Maximum Dimensions	Initial ΔP (psi) @ Flow Rate (gpm)
3/4" #10BB	13¼" x 7¼" (333 mm x 184 mm)	2 psi @ 15 gpm (0.1 bar @ 57 L/min)
1" #10BB	13¼" x 7¼" (333 mm x 184 mm)	1 psi @ 15 gpm (0.1 bar @ 57 L/min)
1½" #10BB	13¼" x 7¼" (346 mm x 184 mm)	1 psi @ 20 gpm (0.1 bar @ 76 L/min)
3/4" #20BB	23½" x 7¼" (594 mm x 184 mm)	2 psi @ 15 gpm (0.1 bar @ 57 L/min)
1" #20BB	23¼" x 7¼" (594 mm x 184 mm)	1 psi @ 15 gpm (0.1 bar @ 57 L/min)
1½" #20BB	23¾" x 7¼" (606 mm x 184 mm)	1 psi @ 20 gpm (0.1 bar @ 76 L/min)

Materials of Construction

- *Housing:* Polypropylene
- *Cap:* Polypropylene (HFPP)
- *Button Assembly:* 300-series Stainless Steel, Polypropylene and EPDM
- *O-Ring:* Buna-N
- *Maximum Temperature:* 100°F (37.8°C)
- *Maximum Pressure:* #10BB – 100 psi (6.90 bar)
  #20BB – 90 psi (6.2 bar)

ALL NATURAL HOUSINGS



#10 All Natural #20 All Natural

- *An economical solution to fluoropolymer, stainless steel or Teflon® housings*
- *Pure polypropylene components – no fillers, colorants, plasticizers or lubricants*
- *Ultra-smooth contact surfaces prevent bacterial adhesion and build-up*
- *Resists DI water and other inorganic solutions*
- *Resists stress cracking*
- *Viton® o-rings provide dependable sealing*

All Natural filter housings help maintain high standards of purity and performance required in critical contamination control systems and processes. These housings can also be used for a variety of other applications where purity, quality, filtration and economy are required.

All housings have 3/4" (19 mm) NPT inlet and outlet threads. Some housings are available with plugged 1/4" (6.4 mm) NPT inlet, outlet and sump ports.

Compatible with most Pall, Millipore, Gelman, Brunswick, Sartorius, Filterite and Nuclepore membrane cartridges.

Housing Specifications and Performance Data

Model	Cartridge Sealing	Maximum Dimensions	Initial ΔP (psi) @ Flow Rate (gpm)
3/4" #10	DOE[1]	12¼" x 5¼" (320 mm x 180 mm)	3 psi @ 7 gpm (0.2 bar @ 26.5 L/min)
3/4" #12	222[2]	15¾" x 5¼" (390 mm x 180 mm)	3 psi @ 7 gpm (0.2 bar @ 26.5 L/min)
3/4" #20	DOE[1] 222[2]	23½" x 5¼" (590 mm x 180 mm)	3 psi @ 7 gpm (0.2 bar @ 26.5 L/min)

[1]Double Open End [2]222 o-ring sealing

Materials of Construction

- *Housing:* All Natural Polypropylene
- *Cap:* All Natural Polypropylene
- *O-Ring:* Viton®
- *Maximum Temperature:* 100°F (37.8°C)
- *Maximum Pressure:* 100 psi (6.90 bar)

APPENDIX C

Health and Safety Plan

HEALTH AND SAFETY PLAN

STANTEC CONSULTING SERVICES, INC.

PROJECT IDENTIFICATION

Project Name:	*Callahan Senior Center*
Job site Address:	*535 Union Avenue, Framingham, MA*
Stantec Project Number:	*191750030*
Client:	*Casey Properties*
Date Prepared:	*3/25/2016*
Date of Work Start-Up:	*On-going prior to 3/25/2016*
Duration On-site:	*Minimum of monthly sampling events*

TABLE OF CONTENTS

APPENDICES

HEALTH AND SAFETY PLAN

STANTEC CONSULTING SERVICES, INC.

1.0 INTRODUCTION

This Health and Safety Plan (HASP) establishes guidelines and requirements for safety of personnel during the conduct field activities associated with the scope of work to be implemented on the Site. All employees of Stantec Consulting Services, Inc. (Stantec) involved in field activities associated with this project are required to abide by and adopt the provisions of this HASP. They are required to read the HASP and sign the attached acknowledgement sheet prior to initiating work.

The health and safety guidelines and requirements presented herein are based on a review of available information along with an evaluation of potential hazards. This HASP outlines the health and safety procedures and monitoring equipment required for tasks performed at this site to minimize the potential for exposure to hazardous situations by field personnel. The completed Hazard Analysis forms for activities at the Site are attached (Appendix B).

All personnel involved in field activities must have completed the 40-hour hazardous waste training program (including Hazard Communication [HazCom] training) and respirator fit testing as specified by the Occupational Safety and Health Administration (OSHA) regulations codified at 29 CFR 1920.120 – Hazardous Waste Operations and 29 CFR 1910.134. Additionally, all annual 8-hour updates must be completed and documented. Those personnel acting as site supervisors shall have also completed the one-time 8-hour supervisor training program. Stantec Health & Safety Officer or Project Manager will review all workers' paperwork prior to the start of work. Certifications for all Stantec personnel will be provided in Appendix C of this HASP.

All Stantec site workers shall be regularly monitored as part of corporate medical surveillance program. Subcontractors must comply with an equivalent program.

All Stantec personnel shall sign and adhere to this HASP. Stantec subcontractors (to include sub-consultants and designated vendors) have the responsibility of implementing health and safety plans and precautions for their employees based on health hazard information provided by Stantec, the Client, and other available sources. Subcontractor plans and precautions can not conflict with the plans and precautions of Stantec, the Client, or other parties at the work location. Any such conflicts must be resolved before work is initiated. Stantec will document all training sessions and site safety (Daily Toolbox or Last Minute Risk Assessment) meetings or talks for this project.

ABBREVIATIONS

The following abbreviations will be used throughout the remainder of this Environmental, Health and Safety Plan:

PPE -	Personal Protection Equipment	LEL -	Lower Explosive Limit
PVC-	Polyvinyl Chloride	SSO -	Site Safety Officer
SCBA -	Self-contained Breathing Apparatus	EZ -	Exclusion Zone
APR -	Air Purifying Respirator	MSDS -	Material Safety Data Sheet
PEL -	Permissible Exposure Limit	STEL -	Short Term Exposure Limit
TLV -	Threshold Limit Value	PPM -	Parts Per Million

2.0 SITE INFORMATION

2.1 Site Description

The Site is located at 535 Union Avenue in Framingham, MA. The Site building is currently occupied by the Town of Framingham Callahan Senior Center and associated paved parking and landscaped areas. The Site is bounded to the west by Union Avenue, the south and east by the Sudbury River and to the north by residential properties.

2.2 Site History

Groundwater at the Site has been impacted by a release of tetrachloroethene (PCE) and associated breakdown products (trichloroethylene, vinyl chloride and cis-1,2-dichloroethene). Two (2) sumps are located in the sub grade utility room of the Site building located at 535 Union Avenue and operate intermittently during times of high groundwater, spring snowmelt, or flooding of the river. The sumps are used to control groundwater infiltration and discharge into the municipal storm water system which discharges into the Sudbury River located adjacent to the south and east of the Site. PCE and associated breakdown products have been identified in the sump discharge water. A sump water treatment system (SWTS) using granulated activated carbon (GAC) was installed to address the discharge of remedial wastewater into the municipal storm water system.

The source of the PCE and associated breakdown compounds, identified in the sump water is in part attributed to a release of dry cleaning solvent from the upgradient property, 530-532 Union Avenue, located across Union Avenue to the northwest. However, two additional releases are located up gradient and in close proximity to 535 Union Avenue. A release of PCE to soil and groundwater has been identified at the property located at 543 Union Avenue (RTN 3-23612) and PCE to soil has been identified at the property located at 11 Union Avenue Terrace (RTN 3-22087). The concentration of PCE within the influent of the sumps has been measured between 2.7 and 3,480 ug/l and varies with seasonal groundwater fluctuations.

2.3 Scope of Work

The scope of work includes the collection of treatment system influent and effluent groundwater samples.

Task Description	Invasive? (Y/N)	Protection Level	Dig Safe Information
1) SWTS sampling/maintenance	N	D	N/A
2) Groundwater sampling	N	D	N/A

2.4 Site Access

If the Client is not the Site Owner or if access to the Site property is achieved by crossing other properties, work cannot be initiated without having an access agreement in writing in the file before work on site is initiated. The following information must be provided.

Check here if not required:

ACCESS AGREEMENT FROM PROPERTY OWNER	ON-FILE IN WRITING (Yes/No)
Owner Name and Date: Town of Framingham, August 2014	YES

3.0 PERSONNEL AND RESPONSIBILITIES

Name	Firm	Project Responsibilities	On-Site by Task
Charles Young	Stantec	Project Manager	2
Andrew Eckhardt	Stantec	H&SAdvisor/Project Manager	1 and 2
Brian Moran	Stantec	LSP	2
Nate Gardner	Stantec	Project Manager	1 and 2
Carbon Filtration Systems	Subcontractor	Maintenance of SWTS	1

Field personnel listed on this page have completed the training, medical, and respiratory program of the Stantec Environmental Health and Safety Program and OSHA standard 29 CFR 1910.120, as applicable.

Stantec will perform observation of the field activities and will perform health and safety monitoring, during the activities indicated in Section 2.3.

4.0 HAZARD ASSESSMENT SUMMARY

This section identifies the hazards expected at this specific site.

4.1 Physical Hazards

(x) Slips, Trips & Falls
(x) Noise
(x) Temperature
( ) Electrical (Hazardous Energy)
(x) Pinch Points
( ) Other (specify):_____
( ) N/A

4.2 Chemical Hazards

The MSDSs for the chemicals and products indicated below are provided in Appendix D. It is not anticipated that any other chemicals or products will be used during the investigation.

4.2.1 Sample Preservation Chemicals

Expected types of sample preservation (check as many as applicable)

(x) HCl – hydrochloric acid ( ) HNO_3 – nitric acid ( ) H_2SO_4 – sulfuric acid
( ) NaOH – sodium hydroxide ( ) $Na_2S_2O_3$ – sodium bisulfate ( ) CH_3OH - methanol
( ) Other (specify):_____
( ) N/A

4.2.2 Calibration Gases

( ) isobutylene
( ) other (specify):_____

4.2.3 Types of Waste

Expected physical state of waste (check as many as applicable)

(x) Liquid (x) Solid ( ) Sludge ( ) Gas ( ) Unknown
( ) Other (specify)_____
( ) N/A

Expected waste characteristics (check as many as applicable)

(x) Corrosive (x) Toxic ( ) Inert ( ) Flammable (x) Volatile
( ) Reactive ( ) Radioactive ( ) Unknown ( ) Other (specify):_____
_____

4.2.4 Types of Chemicals or Contaminants

Expected Chemicals or Contaminants (check as many as applicable, **excluding those indicated above**)

Miscellaneous	Solids	Sludges	Solvents	Oils
( ) Acids	( ) Fly Ash/Bottom Ash	( ) Paint Pigments	(x) Halogenated Solvents	( ) Oily Wastes
( ) Pickling	( ) Asbestos	( ) Metals Sludge	( ) Non-Halogenated Solvents	( ) Other (specify): _____
( ) Liquors	( ) Milling/Mine Tailings	( ) POTW Sludge	( ) Other (specify): _____	
( ) Caustics	( ) Ferrous Smelter	( ) Aluminum		
( ) Pesticides	( ) Non-Ferrous Smelter	( ) Other (specify): _____		
( ) Dyes/Inks				
( ) Cyanides	(x) Other (specify): Spent Granulated Activated Carbon			
( ) Phenols				
( ) Halogens				
( ) Flammable Liquids				
( ) Flammable Solids				
( ) Phthalates				
( ) PCBs				
( ) Metals				
( ) Explosives (UXO)				
( ) Other (specify): _____				
( ) N/A				

Other Chemicals or Contaminants:
( ) Laboratory
( ) Pharmaceutical
( ) Hospital
( ) Radiological
( ) Municipal
( ) Other (specify): _____

4.3 Biological

( ) N/A
( ) Bacteria (specify type): _____
( ) Fungi (specify type): _____
( ) Viruses (specify type): _____
(x) Insects (specify type): ticks, bees, mosquitoes, black flies
( ) Wildlife (specify type): _____
( ) Flora (specify type): _____
( ) Other (specify): _____

4.4 Ergonomic

(x) Position
( ) Lighting
(x) Heavy Lifting
( ) Repetitive motion
( ) Other (specify):_____
( ) N/A

4.5 Environmental

Weather conditions, geographic location
(x) Heat Stress (see attached guidelines)
(x) Cold Stress (see attached guidelines)
( ) Oxygen Deficient Atmosphere
( ) Hazardous Atmosphere
( ) Radiological

TABLE OF CHEMICALS AND SAFETY DATA

Chemical	PEL/REL/STEL	HEALTH HAZARDS
PAHs	PEL = 0.2 mg/m^3 (TWA) REL = 0.1 mg/m^3 (TWA)	Lung and other tumors
Chromium	PEL = 1 mg/m^3 (TWA) REL = 0.5 mg/m^3 (TWA)	Pulmonary disease
Lead	PEL = 0.05 mg/m^3 (TWA) REL = 0.05 mg/m^3 (TWA)	Irritates skin and eyes; can be toxic to blood, kidneys, and central nervous system; possible carcinogen
Petroleum distallates	PEL = 500 ppm (TWA) PEL = 350 mg/m^3 (TWA)	Dizziness, headache, anesthesia, irritation of the eyes, nose, and throat, vascular damage, and pulmonary edema
Methanol	PEL = 200 ppm REL = 200 ppm	Irritates eyes, skin, upper respiratory system; causes dizziness, nausea, headaches, and visual disturbance
Hydrochloric Acid	PEL = 5 ppm (ceiling) REL = 5 ppm (ceiling)	Irritates nose, throat; causes coughing, choking, eye and skin burns
Isobutylene	PEL = None established	Inhalation causes rapid breathing, dizziness, fatigue, nausea, and asphyxiation
Standard Action Level will be 10% of PEL (*e.g.*, AL for xylenes is 10 ppm).		
PEL = OSHA Permissible Exposure Limit REL = NIOSH Recommended Exposure Limit STEL = OSHA Short Term Exposure Limit		

5.0 OVERALL HAZARD RATING

Task	Description	Ranking
1	SWTS sampling and maintenance	( ) Extreme ( ) High ( ) Moderate (x) Low ( ) Unknown
2	Groundwater sampling	( ) Extreme ( ) High ( ) Moderate (x) Low ( ) Unknown

Protection Level Determination:

Ranking	Protection Level
Extreme or High	Exposure hazard justifies level A or B PPE
Moderate	Exposure hazard justifies Level C PPE
Low	Exposure hazard justifies Level D PPE
Unknown	Knowledge of existing hazards insufficient to determine proper level of protection. Use most conservative PPE (A or B) until more thorough site reconnaissance completed

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Task 1: ***SWTS maintenance and sampling***

Protection Level: ( ) A ( ) B ( ) C (X) D (x) Modified

Check required elements:

Required?	Respiratory: (x) Not Required*		Required?	Protective Clothing: ( ) Not Required		Required?	Boots:	
	Type	Specify make/model		Type	Specify make/model		Type	Specify make/model
	SCBA, Airline			Encapsulated Suit		X	Steel Toed	
	APR*			Splash Suit			Sole puncture protection	
	Cartridge			Apron			Electrical Resist.	
	Escape Mask			Tyvek Coverall			Static Dissipative	
	Other			Saranex Coverall			Chainsaw prot.	
				Cold weather gear			Other	
				Safety Vest				
				Other				

Check required elements:

Required?	Head, Eye & Ear:		Required?	Hands:	
	Type	Specify make/model		Type	Specify make/model
	Hard Hat			Undergloves	
x	Safety Glasses		X	Gloves	nitrile
	Face Shield			Overgloves	
	Goggles			Other	
	Ear Plugs				
	Ear Muffs				
	Other				

The Personal Protective Equipment indicated above will conform to 29 CFR 1910 requirements.

Task 2: ***Groundwater sampling***

Protection Level: ( ) A ( ) B ( ) C (X) D (x) Modified

Check required elements:

Required?	Respiratory: (x) Not Required*		Required?	Protective Clothing: ( ) Not Required		Required?	Boots:	
	Type	Specify make/model		Type	Specify make/model		Type	Specify make/model
	SCBA, Airline			Encapsulated Suit		X	Steel Toed	
	APR*			Splash Suit			Sole puncture protection	
	Cartridge			Apron			Electrical Resist.	
	Escape Mask			Tyvek Coverall			Static Dissipative	
	Other			Saranex Coverall			Chainsaw prot.	
			X	Cold weather gear			Other	
			X	Safety Vest				
				Other				

Check required elements:

Required?	Head, Eye & Ear:		Required?	Hands:	
	Type	Specify make/model		Type	Specify make/model
	Hard Hat			Undergloves	
	Safety Glasses		X	Gloves	nitrile
	Face Shield			Overgloves	
	Goggles			Other	
	Ear Plugs				
	Ear Muffs				
	Other				

The Personal Protective Equipment indicated above will conform to 29 CFR 1910 requirements.

MONITORING EQUIPMENT

Specify monitoring equipment required by task. Indicate type as necessary. Attach additional sheets, if necessary.

6.1 Photoionization Detector (PID)

INSTRUMENT	TASK	ACTION LEVELS
Photoionization Detector	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5	Parameter: *Total Volatile Organics*
Type: *Thermo 580B*	(x) Not needed	PPE Level / At Concentration
( ) 11.7 eV lamp		D — Background - 5.0 ppm
( ) 10.6 eV lamp		C — 5.0 ppm to 50 ppm above background
( ) 10.2 eV lamp		B — 50 - 500 ppm above background

COMMENTS:

All Stantec field personnel are trained and experienced in the calibration and proper use of the PID that will be used at the site. The PID will be calibrated at the start of each work day on-site using 100 ppm isobutylene standard gas. Calibration results will be recorded in the field book. The PID is factory calibrated on an annual basis.

The SSO or other site personnel will notify the Project Manager when concentrations approach action levels. Action levels must be sustained for 15 minutes at the breathing zone to justify implementing specific PPE. The Project Manager will evaluate and implement engineering controls, administrative controls, or changes in PPE to mitigate respiratory hazards.

6.2 Flame-Ionization Detector (FID)

INSTRUMENT	TASK	ACTION LEVELS
Flame Ionization Detector	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5	Parameter: Total Volatile Organics
Type: *Make/Model*	(X) Not needed	PPE Level / At Concentration
		D — Background - 5.0 ppm
		C — 5.0 ppm to 50 ppm above background
		B — 50 - 500 ppm above background

COMMENTS:

6.3 Detector Tubes

INSTRUMENT	TASK	ACTION LEVELS			
Detector Tubes	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5	Contaminant	TLV	STEL	Tube Type
Type: *Draeger*	(X) Not needed				

COMMENTS:

6.4 Combustible Gas Meter

INSTRUMENT	TASK	ACTION LEVELS	
Combustible Gas Indicator	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5 (X) Not needed	0-10% LEL	No explosion hazard.
		10-25% LEL	Potential explosion hazard; notify SSO.
Type: LEL/O2		>25% LEL	Explosion hazard; interrupt task/evacuate.
		21.0% O_2	Oxygen normal.
		<21.0% O_2	Oxygen deficient; notify SSO.
		<19.5% O_2	Interrupt task/evacuate.

COMMENTS:

6.5 4 Gas Landfill Gas Meter

INSTRUMENT	TASK
4 Gas Landfill Gas Meter	( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5
Type: *Make/Model* Gem 2000	(X) Not needed

COMMENTS:

7.0 DECONTAMINATION PROCEDURES

7.1 Personnel Decontamination Procedures

( ) Not applicable

Level C
* Wash overboots and overgloves with detergent (i.e., Alconox) solution.
* Rinse with potable water.
* Remove tape from overboots and wrists.
* Remove overboots, overgloves, and coverall.
* Discard all into secure drum; label and place drum in the on-site cargo container.
* Remove respirator.
* Remove undergloves and discard into secure drum; label and place drum in the on-site cargo container.
* Wash face and hands with soap and water.

Non-expendable reusable equipment (i.e., outer gloves, boots, and hard-hats) will be thoroughly washed at the decontamination location. Decontamination will consist of: scrubbing contaminated gloves and boots with an Alconox (or equivalent) detergent followed by a water rinse. Equipment will either be allowed to drip dry or be wiped off with paper towels, which will be collected, in secure drums. The drums will be labeled and staged in an area designated by Client pending characterization.

Level D
- Wash face and hands with soap and water.

Respirator Decontamination and Cleaning : Please refer to Stantec Respiratory Protection Program

7.2 Equipment Decontamination

Sampling Equipment

Required for: (x) Task 1 (x) Task 2 *(If none checked, this subsection is not applicable)*

All sampling equipment will be decontaminated between each sampling location using the following procedures:

* Wear clean nitrile gloves (and outer gloves if task-required).
* Dissemble equipment and place component parts on polyethylene sheeting.
* Clean all component parts with detergent solution (i.e., Alconox or Simple Green) using a brush to clean inside and outside surfaces.
* Rinse surfaces with potable water.
* Allow all components to air dry.
* Reassemble equipment.

Containment and Disposal Method (Sampling Equipment, spent Granulated Activated Carbon and sediment filters)

Required for: (x) Task 1 (x) Task 2 *(If none checked, this subsection is not applicable)*

Materials will be containerized (solids & water separately) and marked with a permanent marker indicating the site, date, and medium (solid or water). Containerized materials will be stored until characterized by Stantec and disposed of by the Subcontractor. The decontamination area will be lined with polyethylene sheeting to capture any and all steam-cleaning fluids.

8.0 SITE CONTROL

Site workers should minimize contact of personnel, visitors, general public, and equipment with contaminated or potentially contaminated materials. Selected controls indicated in subsequent subsections are indicated on Figure 1 in Appendix A. The SSO will ensure that these precautions are in-place before work begins each day.

8.1 Engineering Controls

(x) None Required

Indicate all that apply:

Engineering Controls	Description
( )	
( )	
( )	

8.2 Administrative Controls

(x) None Required

Check all that apply:

Administrative Controls	Description
( ) Exclusion zone	
( ) Decontamination zone	
( ) Support zone	
( ) Other: Reposition / Excavation	
( ) Other:	
( ) Other:	

8.3 Physical Controls

( ) None Required

Check all that apply:

Physical Controls	Description
( ) Barriers/fencing	
( ) Caution tape	
( ) Signs	
(x) Cones	Around sampling equipment at monitoring wells
( ) Other:	
( ) Other:	

9.0 EMERGENCY PROCEDURES

All Stantec personnel are considered by the local office Medical Monitoring Program. Please contact the H&S Officer for a copy of the Program (see contact list in Section 10.7).

9.1 Personnel Exposure

In the event of chemical exposure to known site contaminants, the MSDS or chemical data sheet, if available, should be consulted first. General practice exposure emergency actions include:

Inhalation Exposure - The following actions should be taken based on the condition of the effected employee.

* If symptoms are present (dizziness, nausea, headache, shortness of breath, burning sensation in mouth, throat, or lungs), the victim should be escorted from the work zone immediately.

* If unconscious, the victim should be removed from the work zone immediately. Rescuers must be wearing proper respiratory and protective equipment before attempting the rescue.

* If the victim is no longer breathing, cardiopulmonary resuscitation (CPR) or some other form of artificial respiration should begin immediately and medical support personnel notified.

Skin Exposure - The skin should be thoroughly washed with copious amounts of soap and water. If clothing is contaminated, it should be removed immediately and the skin washed thoroughly with running water. All contaminated parts of the body, including the hair, should be thoroughly decontaminated. It may be necessary to wash repeatedly.

Ingestion Exposure - Medical support should be obtained immediately.

Eye Exposure- If a toxicant should get into the eyes, flush with generous amounts of water. Washing should be continued for at least fifteen minutes and medical attention should be obtained if deemed necessary by the SSO or Alternate.

9.2 Personnel Injury or Medical Emergency

The following contingency plan will be enacted in the event of personnel injuries.

1. **Initial alarm and first aid**. Upon observation of an injury, quickly get attention of other nearby workers. Immediately act to protect the injured person from a life-threatening situation. Render appropriate first aid. Warn unsuspecting persons of the potential hazard.
2. Notify SSO of the situation. Identify the injured person, the type of injury and the project site location.
3. Ambulance and hospital services. The SSO or other appropriate personnel will immediately assess the situation and, if necessary, notify the designated ambulance service and hospital of the emergency situation.
4. Begin incident notification and reporting procedures.

9.3 Fire or Explosion

Upon notification of a fire or explosion on site, the designated emergency signal shall be sounded and all site personnel assembled at the designated access points. The Fire Department shall be alerted and all personnel moved to a safe distance from the involved area. Personnel in the immediate vicinity of a fire shall use fire extinguishers or other immediately available means if this can be done safely and the fire can be immediately controlled or stopped from spreading, but should not attempt to fight major fires or fires involving potential explosives.

The potential for chemical or fuel ignition, fire or explosion shall be assessed and precautions will be developed prior to initiation of the work in the hazard area. The local fire department must be notified for these hazards

9.4 Spills

In the event of a liquid/solid spill:

1. **First aid will be administered to injured/contaminated persons.** Any person observing a spill will act immediately to safely remove and protect injured/contaminated persons from any life-threatening situation. First aid and decontamination procedures will be implemented as appropriate by the SSO or approved on-site personnel.

2. **Warn unsuspecting persons/vehicles of the hazard.** All personnel will act to prevent any unsuspecting persons from coming in contact with spilled materials by alerting other nearby persons and by obtaining assistance of other personnel who are familiar with spill control and clean-up techniques.

3. **Stop the spill at the source, if possible.** Without taking unnecessary risks, personnel will attempt to stop the spill at the source. This may involve activities such as uprighting a drum, closing a valve or temporarily sealing a hole with a plug.

4. **Notify the Program Manager/Project Manager.** Utilizing available personal radio communications or other rapid communication procedures, the Stantec Project Manager will be notified of the spill, including information on material spilled, quantity, personnel injuries and immediate life-threatening hazards.

5. **Notify Client**. The on-site Stantec representative will immediately notify the client on-site representative, if any, of any spill or release that occurs during the site investigation. The client will be responsible for reporting of spills to appropriate State or Federal agencies.

6. Begin notification and reporting procedures.

9.5 Evacuation Procedures

If at any time, the entire project site needs to be evacuated, the following procedures are to be carried out immediately:

1. The SSO will initiate the site evacuation.

2. The SSO will instruct that the evacuation signal be given. This signal will consist of verbal command or two (or more) sets of three air horn or car horn blasts.

3. All personnel will immediately halt work and proceed off-site to an adequate meeting area.

4. Unless otherwise directed, all site personnel will report to this location or other staging area.

Following an emergency situation, the SSO will begin notification and reporting procedures.

9.6 Emergency Equipment

Emergency equipment (**other than PPE already indicated previously**) that will be available at the Site includes:

Check all that apply:

	Level D Equipment		Level C Equipment (in addition to Level D)
X	Hard Hat		Full face APR
	Nitrile gloves		Appropriate cartridges
	Standard tyvek suit		Respirator disinfectant
	Safety glasses or goggles		Other:
X	Ear plugs/muffs		
X	First aid kit		
	Eyewash kit		
	Fire extinguisher – Type:		
	Air horn		
	Other:		

9.7 Emergency Contacts

CONTACT	NAME	PHONE NUMBER	LOCATION
Stantec Project Manager	Charles Young	Cell: 508-326-9918	Quincy, MA
Stantec Project Manager	Andrew Eckhardt	Cell: 508-304-5848	Quincy, MA
Stantec H&S Officer/LSP	Brian Moran	Cell: 508-509-7423	Quincy, MA
Site Contact	Carol Bois (Town of Framingham)	Cell: 508-272-3126	Framingham, MA
Client H&S Officer/Contact	NA		
Fire Department	Framingham Fire Dept.	911 or (508) 532-5930	Framingham, MA
Police or Sheriff's Department	Framingham Police Dept.	911 or (508) 872-1212	Framingham, MA
Poison Control Center		(800) 682-9211	
State Hazmat Emergency Agency	DFS Hazmat District #1	(978) 567-3150	Stow, MA
State Environmental Agency	MassDEP	(617) 292-5500	Boston, MA
National Response Center		800-424-8802	Washington, D.C.
USEPA Environmental Response Team		201-321-6660	
CHEMTREC		800-424-9300	

9.8 Medical Emergency

Hospital Name: Framingham Union Hospital

Hospital Address: 115 Lincoln Street, Framingham, MA 01702

Hospital Telephone #: (508) 383-1000

Name of Contact at Hospital: Emergency Room

Telephone of 24-hr Ambulance: 911

Distance to Hospital: 0.8 miles

Route to Hospital: Head south on Union Avenue (left out of parking lot of Site) and follow Union Avenue for 0.64 miles then make a slight left onto Lincoln Street for 0.12 miles to reach Framingham Union Hospital.

10.0 OTHER CONSIDERATIONS

10.1 Heat & Cold Stress Monitoring

The SSO or Alternate shall monitor ambient temperature and implement the following work/rest regimes accordingly:

* For ambient temperatures between 15^{o} and 70^{o}F, standard rest breaks (i.e., fifteen minutes every four hours should be used).
  (Rest breaks will be taken inside the heated cab of the work and transport vehicles at the discretion of the workers)

* For temperatures below 15^{o}F, work will be done at the discretion of the SSO or Alternate.

* For temperatures above 70^{o}F, the following regime shall be followed for workers wearing permeable coveralls:

Adjusted Temperature (a)	Normal Work Ensemble (b)	Impermeable Ensemble
90^{o}F or above	after 45 min. of work	after 15 min. of work
87.5^{o}F to 90^{o}F	after 60 min. of work	after 30 min. of work
82.5^{o}F to 87.5^{o}F	after 90 min. of work	after 60 min. of work
77.5^{o}F to 82.5^{o}F	after 120 min. of work	after 120 min. of work
77.2^{o}F to 77.5^{o}F	after 150 min. of work	after 120 min. of work

a) Calculate the adjusted air temperature (ta adj) by using this equation: ta adj degrees F = ta ^{o}F + 13^{o} x sunshine). Measure air temperature (ta) with a standard mercury-in glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun causes shadows. (100 percent sunshine - no cloud cover and a sharp, distinct shadow; 0-percent sunshine - cloudy, no shadows).

b) A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Workers wearing semi-permeable or impermeable encapsulating protective clothing should be monitored when the temperature in the work area is above 70^{o}F. To monitor the worker, measure:

1. **Heart Rate** - Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third. If the heart rate exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third. An alternate test is if the heart rate exceeds 140 beats per minute at the end of the work period, and 100 beats per minute at the end of the rest period, shorten the work cycle by one-third or lengthen the rest period by one-third.

2. **Oral Temperature** - Use a clinical thermometer (3 minutes under the tongue or similar device to measure the oral temperature at the end of the work period (before drinking). If oral temperature exceeds 99.6^{o} F, shorten the next work cycle by one-third. If oral temperature still exceeds 99.6^{o} F at the beginning of the next rest period, shorten the following work cycle by one-third.

Do not permit a worker to wear a semi-permeable or impermeable garment when their temperature exceeds 100.6^{o} F. Workers shall not be required to continue working if they feel any of the symptoms of heart stress. Rest periods should be a minimum of 15 minutes. Length of rest periods should be extended as appropriate or as recommended by the SSO or Alternate.

10.2 Bloodborne Pathogens

FOR ANY SERIOUS INURY OR ACCIDENT CALL 911 IMMEDIATELY.

Risks and Exposures:
Anytime there is a potential for contact with blood, body fluids, or infectious materials such as broken glass, sharp objects, needles, etc., precautions must be taken.

Protection:
Treat all potentially infectious material as if it were infected

- Proper PPE must be used at all times when there is a chance for exposure to infectious materials.
- Hand-washing facilities or products (antiseptic hand cleaner, etc.) must be readily available to all employees.
- All infectious material must be placed in appropriate, labeled containers (sharps containers, biohazard bags, etc.) and disposed of properly.
- All infected equipment and surfaces must be decontaminated with an appropriate disinfecting solution prior to re-use.

10.3 Near Miss and Hazard Reporting

A Near Miss is an act or condition where no physical injury or property damage has occurred, but had the potential to result in injury or property damage. If a Near Miss incident occurs, the Stantec representative will initiate notification and reporting procedures. EMPLOYEES WHO REPORT CLOSE CALLS WILL NOT BE DISCIPLINED.

10.4 Fire Protection and Prevention

The fire department should be notified immediately once a fire is detected. Trained personnel using an appropriate fire extinguisher can extinguish incipient-stage fires. Larger fires will require the assistance of the fire department. The fire department must be informed of the nature of any combustible materials at the job site.

10.5 Hearing Conservation

Noise can cause sudden traumatic temporary hearing loss, long-term slowly occurring hearing loss that is irreversible.

- When noise levels exceed the permissible limits, worker exposure must be controlled through engineering controls, administrative controls, personal protective equipment (PPE), or a combination of these.
- Engineering controls consist of isolating, enclosing, or insulating equipment or operations or substituting quieter equipment or operations.
- Administrative controls involve rotating workers to jobs having lower noise exposures and reducing the time that each worker is exposed.
- PPE, for example earplugs and earmuffs, must be rated to reduce the noise exposure to within acceptable limits.

10.6 Time Out Program

When a safety, health, or environmental concern arises on a job, an employee has the right to call a “Time Out” or “Stop Work.” Upon calling a “Time Out”, the employee must immediately notify his/her supervisor and provide him/her with information regarding the nature of the safety, health, or environmental concern and state that a “Time Out” is being called.

The supervisor must contact the employee with the intent of resolving the employee’s concerns. When the concerns are resolved,work may resume. Please refer to Stantec Health and Safety Manual for additional procedures.

11.0 HEALTH AND SAFETY PLAN APPROVALS

Signature:_____ Date: 3/30/2016

Stantec Health & Safety Advisor

Signature:_____ Date: 3/30/2016

Stantec Project Manager

HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT

I (signatory below), have received a copy of the Health and Safety Plan for the Site. I have read the plan, understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

Signature/Firm_____ Date:_____

12.0 HEALTH AND SAFETY PLAN REVISIONS

Date:_____

SSO Approval:_____

Health and Safety Advisor Approval:_____

Revision (describe below)

_____

_____

_____

_____

_____

Date:_____

SSO Approval:_____

Health and Safety Advisor Approval:_____

Revision (describe below)

_____

_____

_____

_____

_____

Date:_____

SSO Approval:_____

Health and Safety Officer Approval:_____

Revision (describe below)

_____

_____

_____

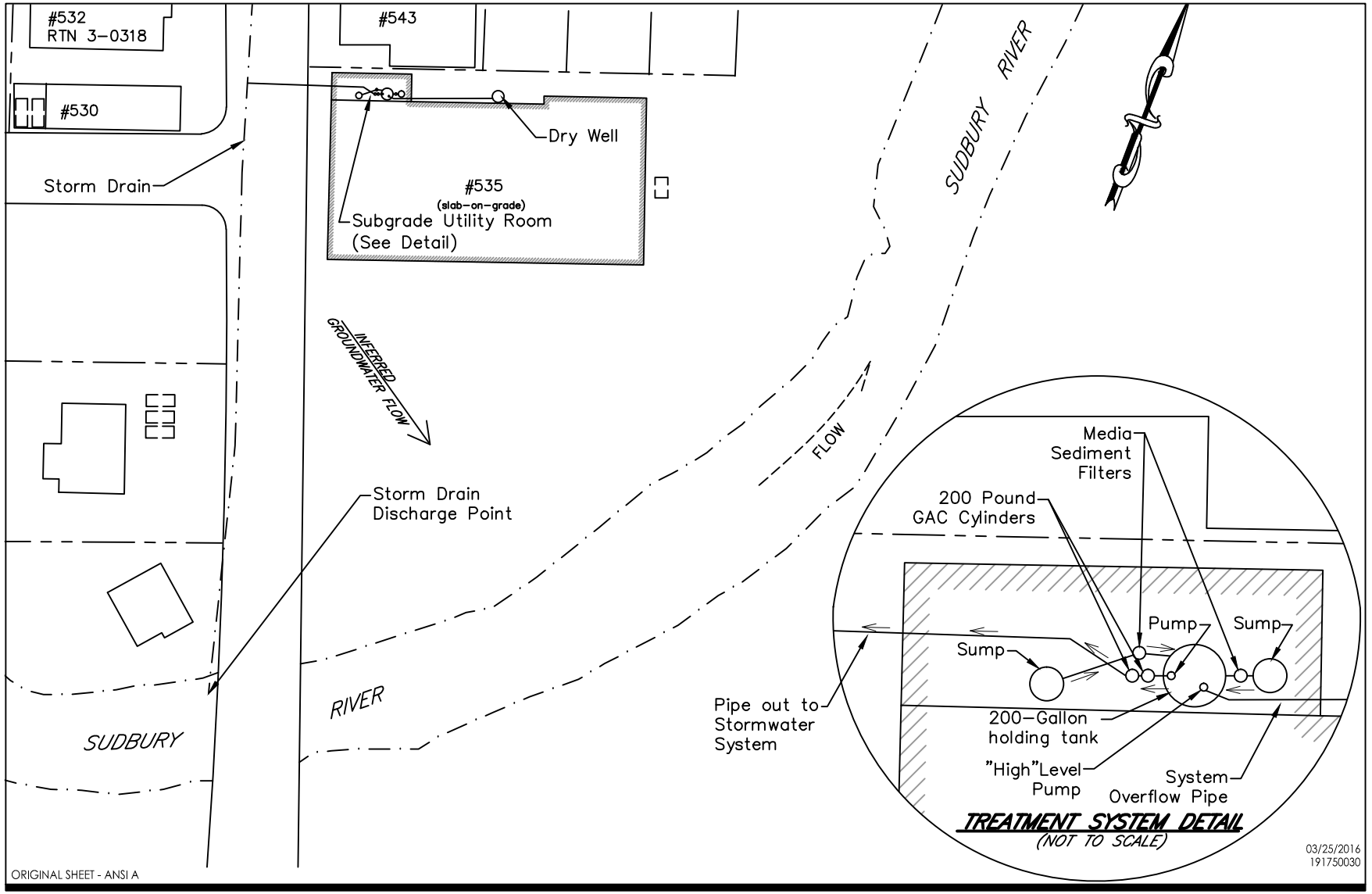
_____

APPENDIX A

Figures

Name: FRAMINGHAM
Date: 4/30/2008
Scale: 1 inch equals 2000 feet

Location: 042° 17' 35.9" N 071° 25' 45.1" W
Caption: FIGURE 1: SITE LOCUS
530-532 Union Avenue
Framingham, MA



Stantec

400 Crown Colony Drive, Suite 200
Quincy MA www.stantec.com

Client
TOWN OF FRAMINGHAM
150 CONCORD STREET
FRAMINGHAM, MASSACHUSETTS

Figure No.
2

Title
FLOW SCHEMATIC
535 UNION STREET
FRAMINGHAM, MASSACHUSETTS

APPENDIX B

Hazard Assessment Forms

(NONE NECESSARY AS HASP PREPARED FOR PROJECT)

APPENDIX C

Training Certificates for Site Personnel

Certificate of Completion

Presented to

Andrew Eckhardt

of

Stantec Inc.

for successful completion of

Stantec HAZWOPER Refresher Course v4, PS4 eLesson Updated 032316

Dated: **04-07-2016**

HSE Systems Coordinator

Certificate of Completion

Presented to

Charles Young

of

Stantec Inc.

for successful completion of

Stantec HAZWOPER Refresher Course v4, PS4 eLesson Updated 032316

HSE Systems Coordinator

Dated: **04-07-2016**

Certificate of Completion

Presented to

Nathan Gardner

of

Stantec Inc.

for successful completion of

Stantec HAZWOPER Refresher Course v4, PS4 eLesson Updated 032316

Dated: **04-05-2016**

HSE Systems Coordinator

Certificate of Completion

Presented to

Brian Moran

of

Stantec Inc.

for successful completion of

Stantec HAZWOPER Refresher Course v4, PS4 eLesson Updated 032316

Dated: **04-03-2016**

HSE Systems Coordinator

Certificate of Completion

Presented to

Eric Sullivan

of

Stantec Inc.

for successful completion of

Stantec HAZWOPER Refresher Course v4, PS4 eLesson Updated 032316

HSE Systems Coordinator

Dated: **03-29-2016**

APPENDIX D

Material Safety Data Sheets (MSDSs)

SAFETY DATA SHEET

M47014 - ANSI - EN

PERCHLOROETHYLENE, ALL GRADES

SDS No.: M47014 **SDS Revision Date:** 20-Feb-2015

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 5005 LBJ Freeway P.O. Box 809050 Dallas, TX 75380-9050 1-800-752-5151
24 Hour Emergency Telephone Number:	1-800-733-3665 or 1-972-404-3228 (USA); CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186
To Request an SDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700
Product Identifier:	**PERCHLOROETHYLENE, ALL GRADES**
Trade Name:	PERCHLOROETHYLENE, TECHNICAL; PERCHLOROETHYLENE, FLUOROCARBON (PTAP); PERCHLOROETHYLENE, INDUSTRIAL; PERCHLOROETHYLENE, VAPOR DEGREASING; PERCHLOROETHYLENE, ISOMERIZATION
Synonyms:	1,1,2,2 TETRACHLOROETHENE, TETRACHLOROETHENE, TETRACHLOROETHYLENE, PERCHLOROETHYLENE, PERCHLOROETHENE
Product Use:	Petroleum industry, Refrigerant manufacturing, Metal cleaning, Paint stripping, Aerosol carrier
Uses Advised Against:	NOT FOR USE IN DRY CLEANING.

2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

****

EMERGENCY OVERVIEW:

Color: Colorless
Physical state Volatile liquid
Appearance: Clear liquid
Odor: Mildly sweet odor, Chloroform-like odor

Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: HARMFUL IF INHALED. MAY CAUSE DROWSINESS OR DIZZINESS. MAY BE HARMFUL IF SWALLOWED. MAY BE HARMFUL IF SWALLOWED AND ENTERS AIRWAYS. MAY BE HARMFUL IN CONTACT WITH SKIN. CAUSES SKIN IRRITATION. CAUSES EYE IRRITATION. CAUSES DAMAGE TO CENTRAL NERVOUS SYSTEM (CNS), LIVER, RESPIRATORY SYSTEM. MAY CAUSE DAMAGE TO CENTRAL NERVOUS SYSTEM (CNS), LIVER, KIDNEY, RESPIRATORY SYSTEM THROUGH PROLONGED OR REPEATED EXPOSURE. MAY CAUSE CANCER.

AQUATIC TOXICITY: TOXIC TO AQUATIC LIFE WITH LASTING EFFECTS.

PRECAUTIONARY STATEMENTS: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist, vapors, or spray. Use with adequate ventilation and wear respiratory protection when exposure to dust, mist, or spray is possible. Use only outdoors or in a well-ventilated area. Avoid contact with eyes, skin and clothing. Wear protective gloves, protective clothing, eye, and face protection. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid release to the environment.

****

GHS CLASSIFICATION:

GHS: CONTACT HAZARD - SKIN:	Category 2 - Causes skin irritation.
GHS: CONTACT HAZARD - EYE:	Category 2B - Causes eye irritation
GHS: ACUTE TOXICITY - INHALATION:	Category 4 - Harmful if inhaled
GHS: ASPIRATION HAZARD:	Category 2 - May be harmful if swallowed and enters airways
GHS: TARGET ORGAN TOXICITY (SINGLE EXPOSURE):	Category 1 - Causes damage to Central Nervous System (CNS), Liver, Respiratory System
GHS: TARGET ORGAN TOXICITY (SINGLE EXPOSURE):	Category 3 - May cause drowsiness or dizziness
GHS: TARGET ORGAN TOXICITY (REPEATED EXPOSURE):	Category 2 - May cause damage to Liver, Kidney, Central Nervous System (CNS), Respiratory System through prolonged or repeated exposure

PERCHLOROETHYLENE, ALL GRADES

GHS: CARCINOGENICITY:	Category 1B - May cause cancer.
GHS: HAZARDOUS TO AQUATIC ENVIRONMENT - ACUTE HAZARD:	Category 2 - Toxic to aquatic life
GHS: HAZARDOUS TO AQUATIC ENVIRONMENT - CHRONIC HAZARD:	Category 2 - Toxic to aquatic life with long lasting effects

UNKNOWN ACUTE TOXICITY:
Not applicable. This product was tested as a whole. This information only pertains to untested mixtures.

GHS SYMBOL:
Health hazard, Exclamation mark, Environmental hazard

GHS SIGNAL WORD: **DANGER**

GHS HAZARD STATEMENTS:

GHS - Health Hazard Statement(s)
May be harmful if swallowed and enters airways
Harmful if inhaled
May cause drowsiness or dizziness
Causes eye irritation
Causes skin irritation
Causes damage to organs : (Central Nervous System (CNS), Liver, Respiratory System)
May cause damage to organs through prolonged or repeated exposure: (Central Nervous System (CNS), Liver, Kidney, Respiratory System)
May cause cancer

GHS - Environmental Hazard Statement(s)
Toxic to aquatic life
Toxic to aquatic life with long lasting effects

GHS - Precautionary Statement(s) - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Do not breathe mist, vapors, or spray
Use only outdoors or in a well-ventilated area
Wear eye protection, face protection, protective gloves
Use personal protective equipment as required
Wash thoroughly after handling
Do not eat, drink or smoke when using this product
Avoid release to the environment

GHS - Precautionary Statement(s) - Response
IF INHALED: Remove person to fresh air and keep comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
IF ON SKIN: Wash with plenty of water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash it before reuse
IF exposed or concerned: Get medical advice/attention
Get medical advice/attention if you feel unwell
Specific treatment (see Section 4 of the safety data sheet and/or the First Aid information on the product label)
Collect spillage. Hazardous to the aquatic environment

GHS - Precautionary Statement(s) - Storage
Store in a well-ventilated place. Keep container tightly closed
Store locked up

GHS - Precautionary Statement(s) - Disposal
Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Hazards Not Otherwise Classified (HNOC)
None Known

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: 1,1,2,2 TETRACHLOROETHENE, TETRACHLOROETHENE, TETRACHLOROETHYLENE, PERCHLOROETHYLENE, PERCHLOROETHENE

Component	Percent [%]	CAS Number
Tetrachloroethylene [Perc]	99.0 - 100.0	127-18-4
Carbon Tetrachloride	<0.45	56-23-5

4. FIRST AID MEASURES

INHALATION: If inhaled and adverse effects occur, remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician. See Notes to Physician below and Section 11 for more information.

SKIN CONTACT: If on skin, wash with plenty of water. If skin irritation occurs: Get medical advice/ attention. Take off contaminated clothing and wash before reuse. See Notes to Physician below and Section 11 for more information.

EYE CONTACT: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

INGESTION: If swallowed, rinse mouth with water (only if the person is conscious). Never give anything by mouth to an unconscious or convulsive person. If feeling unwell, contact a poison center or doctor.physician.

Most Important Symptoms/Effects (Acute and Delayed) :.

Acute Symptoms/Effects: Listed below.
Inhalation (Breathing): Respiratory System Effects: Central Nervous System (CNS) effects are characteristic following inhalation of chlorinated hydrocarbons and can range from lightheadedness at low level exposures to loss of consciousness at high levels. CNS effects are an early warning that exposure to high levels has occurred and there is risk of cardiac effects (palpitations, low blood pressure, arrhythmia, arrest). CNS effects include the following symptoms: abdominal pain, nausea, vomiting, headache, lightheadedness, blurry or double vision, personality changes, weakness, slurred speech, stupor, incoordination (disequilibrium, ataxia), coma, and respiratory arrest. May irritate upper airways.
Skin: Skin Irritation. Skin exposure may cause irritation, rough red, dry skin, edema, blisters.
Eye: Eye Irritation. Eye exposure may cause irritation, tearing, pain, conjunctivitis, clouding of cornea.
Ingestion (Swallowing): Ingesting this material may cause gastrointestinal irritation, nausea. vomiting, headache, breathing difficulty, reduced blood pressure, weak and rapid pulse, Central Nervous System (CNS) depression, and Central Nervous System (CNS) symptoms such as sedation, headache, tremor, nystagmus and memory problems. Ingestion may cause unconsciousness and death.
Other Health Effects: Most people can smell perchloroethylene at levels of 5-50 ppm (OSHA PEL is 100 ppm). Odor is an adequate warning for high dose acute exposures, but might not be adequate for prolonged exposure due to olfactory fatigue. Vapors are heavier than air, can collect in low lying areas and cause asphyxiation. CNS effects have been observed at exposures of 100 to 300 ppm. Exposures of 1000 to 1500 ppm for less than 2 hours have caused symptoms of mood changes, slight ataxia, faintness and dizziness. Exposure to higher concentrations for longer periods can lead to collapse, coma, or death.

Delayed Symptoms/Effects:
- Respiratory System Effects: May cause chemical or irritant induced asthma or bronchoconstriction. May cause a chemical pneumonitis. Reduced renal output (oliguria), elevation of liver enzymes, to renal failure and liver failure
- May cause effects to the skin such as chronic dermatitis, dermal hypersensitivity
- May cause eye damage such as corneal damage, decreased vision
- May cause delayed liver and kidney effects
- Prolonged exposures may result in memory and concentration impairment, vision disturbances, dizziness, irritability, ataxia (difficulty walking), and peripheral neuropathy

Interaction with Other Chemicals Which Enhance Toxicity: May potentiate other agents that cause Central Nervous System (CNS) depression and respiratory system depression. Liver toxicity may be enhanced by other agents that cause liver damage, such as alcohol, acetaminophen. Catecholamine administration MAY pose increased risk of cardiac arrhythmias.

Medical Conditions Aggravated by Exposure: May increase potential for cardiac arrhythmia. Liver disorders, kidney disorders, respiratory system disorders.

Protection of First-Aiders: Protect against vapor/gas exposure. Do not breathe gas, fumes, vapor, mist, or spray. Avoid contact with skin and eyes. Use personal protective equipment. Refer to Section 8 for specific personal protective equipment recommendations. Consider the possibility of high levels of gas in confined/unventilated spaces or low-lying areas.

Notes to Physician: There is no antidote for perchloroethylene poisoning. Treatment consists of support of respiratory and cardiovascular functions. Catecholamine administration after exposure to this compound MAY pose enhanced risk of cardiac arrhythmia. For ingestion, nasogastric aspiration is recommended if volume ingested is of sufficient volume to aspirate. Protect the airway. Epinephrine and other sympatomimetic amines may initiate cardiac arrhythmias in individuals exposed and experiencing symptoms from this material. Absorption from skin is slow, and unless prevented from evaporating, systemic toxicity is unlikely. This compound is absorbed rapidly by oral administration and causes similar effects to inhalation exposure. Activated charcoal may be administered. Liver injury may be delayed several days after exposure.

5. FIRE-FIGHTING MEASURES

Fire Hazard: Negligible fire hazard.

Extinguishing Media: Use media appropriate for surrounding fire.

Fire Fighting: Avoid inhalation of material or combustion by-products. Wear NIOSH approved positive-pressure self-contained breathing apparatus. Stay upwind and keep out of low areas. Move container from fire area if it can be done without risk. Cool containers with water from unmanned hose holder or monitor nozzles until well after the fire is out. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Keep water runoff out of water supplies and sewers (see Section 6 of the SDS).

Component	Immediately Dangerous to Life/ Health (IDLH)
Tetrachloroethylene [Perc] 127-18-4	150 ppm IDLH
Carbon Tetrachloride 56-23-5	200 ppm IDLH

Hazardous Combustion Products: Thermal decomposition or combustion products: hydrogen chloride, chlorine, phosgene, oxides of carbon

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not flammable

Upper Flammability Level (air): Not flammable

Flash point: Not flammable

Auto-ignition Temperature: Not applicable

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Keep unnecessary and unprotected persons away. Isolate hazard area and deny entry. Evacuation of surrounding area may be necessary for large spills. Shut off ventilation system if needed. Do not get in eyes, on skin or on clothing. Do not breathe vapors, mist, or spray. Ventilate closed spaces before entering. Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Wear appropriate personal protective equipment recommended in Section 8, Exposure Controls / Personal Protection, of the SDS.

Methods and Materials for Containment and Cleaning Up:
Stop leak if possible without personal risk. Ventilate closed spaces before entering. Completely contain spilled materials with dikes, sandbags, etc. Remove contaminated soil or collect with appropriate absorbent and place into suitable container. Keep container tightly closed and properly labeled. Liquid material may be removed with a properly rated vacuum truck. Properly dispose of in accordance with all applicable regulations. See Section 13, Disposal considerations, for additional information.

Environmental Precautions:
Keep out of water supplies, sewers and soil. Avoid discharge into drains, surface water or groundwater. Releases should be reported, if required, to appropriate agencies.

7. HANDLING AND STORAGE

Precautions for Safe Handling:
Most vapors are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). Use only in well-ventilated areas. Avoid breathing vapor, mist, or spray. Avoid contact with skin, eyes and clothing. Wear personal protective equipment as described in Exposure Controls/Personal Protection (Section 8) of the SDS. Do not taste or swallow. Wash thoroughly after handling. Do not eat, drink or smoke in areas where this material is used.

Safe Storage Conditions:
Store and handle in accordance with all current regulations and standards. Keep container properly labeled and tightly closed. Store in a cool, dry area. Store in a well-ventilated area. Store away from open flames, and combustibles. Do not enter confined spaces without following proper confined space entry procedures. Do not store in aluminum container or use aluminum fittings or transfer lines. Protect from sunlight. Do not reuse drum without recycling or reconditioning in accordance with any applicable federal, state or local laws. Do not use cutting or welding torches, open flames or electric arcs on empty or full containers. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Incompatibilities/ Materials to Avoid:
acids. bases. Strong oxidizing agents. Oxygen. Peroxides. Reactive metals. aluminum.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Regulatory Exposure Limit(s): Listed below for the product components that have regulatory occupational exposure limits (OEL's).

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit

NON-REGULATORY EXPOSURE LIMIT(S): Listed below for the product components that have non-regulatory occupational exposure limits (OEL's).

- *The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).*

- The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

ENGINEERING CONTROLS: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits. Monitoring should be performed regularly to determine exposure limit level(s).

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear safety glasses with side-shields. Wear chemical safety goggles with a face-shield to protect against skin and eye contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear chemical resistant clothing to prevent skin contact. Contaminated clothing should be removed, then discarded or laundered. Always place pants legs over boots.

Hand Protection: Wear appropriate chemical resistant gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types: Polyvinyl alcohol (PVA), Teflon®, Viton®, 4H®/Silver Shield®, CPF® 3, Responder®, Trellchem®, Tychem®

Respiratory Protection: Where vapor or mist concentration exceeds or is likely to exceed applicable exposure limits, a NIOSH approved respirator with organic vapor cartridge filter(s) is required. When an air-purifying respirator is not adequate, for exposures above the IDLH, or for spills and/or emergencies of unknown concentrations, a NIOSH approved self-contained breathing apparatus or airline respirator with full-face piece with auxiliary self-contained escape pack is required. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Component	Immediately Dangerous to Life/ Health (IDLH)
Tetrachloroethylene [Perc] 127-18-4	150 ppm IDLH
Carbon Tetrachloride 56-23-5	200 ppm IDLH

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Volatile liquid
Appearance:	Clear liquid
Color:	Colorless
Odor:	Mildly sweet odor, Chloroform-like odor
Odor Threshold [ppm]:	50 ppm (may cause olfactory fatigue).
Molecular Weight:	165.82
Molecular Formula:	C2-Cl4
Boiling Point/Range:	250 °F (121 °C)
Freezing Point/Range:	-2 °F (-19 °C).
Vapor Pressure:	13 mmHg @ 20 °C
Vapor Density (air=1):	5.8
Relative Density/Specific Gravity (water=1):	1.62 @ 25°C
Water Solubility:	0.015%
pH:	No data available
Volatility:	100%
Evaporation Rate (ether=1):	0.1 (ether=1)
Partition Coefficient (n-octanol/water):	2.88
Flash point:	Not flammable
Flammability (solid, gas):	Not flammable
Lower Flammability Level (air):	Not flammable
Upper Flammability Level (air):	Not flammable
Auto-ignition Temperature:	Not applicable
Viscosity:	No data available

10. STABILITY AND REACTIVITY

Reactivity: Not reactive under normal temperatures and pressures.

Chemical Stability: Stable at normal temperatures and pressures.

Possibility of Hazardous Reactions:
Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Avoid contact with incompatible substances and conditions due to generation of phosgene and other toxic and irritating substances.

Conditions to Avoid:
(e.g., static discharge, shock, or vibration) -. None known.

Incompatibilities/ Materials to Avoid:
acids. bases. Strong oxidizing agents. Oxygen. Peroxides. Reactive metals. aluminum.

Hazardous Decomposition Products: Thermal decomposition or combustion products: hydrogen chloride, chlorine, phosgene, oxides of carbon

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA:

PRODUCT TOXICITY DATA: Perchloroethylene, All Grades

LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
2629 mg/kg oral-rat LD50	>3228 mg/kg skin-rabbit LD50	5200 ppm (4 hr. - Rat)

COMPONENT TOXICITY DATA:

Note: The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given.

Component	LD50 Oral:	LD50 Dermal:	LC50 Inhalation:
Tetrachloroethylene [Perc] 127-18-4	2629 mg/kg (Rat)	2800 mg/kg (Mouse)	27.8 mg/L (4 hr-Rat)
Carbon Tetrachloride 56-23-5	2350 mg/kg (Rat)	5070 mg/kg (Rat)	8000 ppm (4 hr-Rat)

Summary of Toxicity Studies:

Single-dose LD50 values of 3835 and 3005 mg/kg were determined for male and female rats by gavage. Death occurred within 24 hours after dosing and was preceded by tremors, ataxia, and CNS depression. Congestion of the lungs was reported in rats exposed intermittently to 1600 ppm for 13 weeks. In mice exposed intermittently at 100 ppm for 103 weeks, acute passive congestion of the lungs was observed. In animals, hypertrophy, fatty degeneration, and peroxisome proliferation characterize liver effects. Kidney effects, including cancer, have been noted in animals, predominantly male rats. The mechanism for the development of kidney effects in rats (protein droplet nephropathy) may differ from that in humans. The carcinogenicity of perchloroethylene has been documented in certain strains of mice and rats exposed by inhalation or oral routes. Other long-term inhalation studies in rats failed to show tumorigenic response. Human data are limited and have not established an association between perchloroethylene exposure and cancer. Hepatic effects were not detected in workers exposed up to 20 ppm for up to 10 years; however, in 141 workers exposed at an average concentration of 11.3 ppm, total GGT was significantly increased. Workers exposed for up to 14 years at an estimated TWA of 10 ppm had increased urinary enzyme levels suggestive of mild tubular damage. Forestomach ulcers were observed in male rats exposed to intermittently to 400 ppm orally for 103 weeks. Classification as a carcinogen is largely based on animal evidence.

****

POTENTIAL HEALTH EFFECTS:

Eye contact: Eye contact may cause tearing, redness, pain, conjunctival irritation, corneal edema, whitening, corneal erosion, decreased vision.

Skin contact: Skin contact may cause irritation, rough, red, dry skin, edema, blisters.

Inhalation: Inhaling this material may cause sedation, bronchospasm, shortness of breath, lightheadedness, loss of consciousness, cardiotoxicity, palpitations, low blood pressure, arrhythmia, arrest, nausea, vomiting, headache, alterations of light perception, weakness, stupor, incoordination (disequilibrium, ataxia), coma, and respiratory arrest. May irritate upper airways.

Ingestion: This material can get into the lungs during swallowing or vomiting. Ingestion of this material may cause gastrointestinal irritation, central nervous system (CNS) depression, central nervous system symptoms such as tremor, ataxia (difficulty walking), and memory problems; nausea, vomiting, headache, difficulty breathing, reduced blood pressure, weak and rapid pulse. Ingestion may cause unconsciousness and death.

Chronic Effects: The carcinogenicity of perchloroethylene has been documented in certain strains of mice and rats exposed by inhalation or oral routes. Other long-term inhalation studies in rats failed to show tumorigenic response. Human data are limited and have not established an association between perchloroethylene exposure and cancer.

SIGNS AND SYMPTOMS OF EXPOSURE:

Inhalation (Breathing): Respiratory System Effects: Central Nervous System (CNS) effects are characteristic following inhalation of chlorinated hydrocarbons and can range from lightheadedness at low level exposures to loss of consciousness at high levels. CNS effects are an early warning that exposure to high levels has occurred and there is risk of cardiac effects (palpitations, low blood pressure, arrhythmia, arrest). CNS effects include the following symptoms: abdominal pain, nausea, vomiting, headache, lightheadedness, blurry or double vision, personality changes, weakness, slurred speech, stupor, incoordination (disequilibrium, ataxia), coma, and respiratory arrest. May irritate upper airways.

Skin: Skin Irritation. Skin exposure may cause irritation, rough red, dry skin, edema, blisters.

Eye: Eye Irritation. Eye exposure may cause irritation, tearing, pain, conjunctivitis, clouding of cornea.

Ingestion (Swallowing): Ingesting this material may cause gastrointestinal irritation, nausea. vomiting, headache, breathing difficulty, reduced blood pressure, weak and rapid pulse, Central Nervous System (CNS) depression, and Central Nervous System (CNS) symptoms such as sedation, headache, tremor, nystagmus and memory problems. Ingestion may cause unconsciousness and death.

Other Health Effects: Most people can smell perchloroethylene at levels of 5-50 ppm (OSHA PEL is 100 ppm). Odor is an adequate warning for high dose acute exposures, but might not be adequate for prolonged exposure due to olfactory fatigue. Vapors are heavier than air, can collect in low lying areas and cause asphyxiation. CNS effects have been observed at exposures of 100 to 300 ppm. Exposures of 1000 to 1500 ppm for less than 2 hours have caused symptoms of mood changes, slight ataxia, faintness and dizziness. Exposure to higher concentrations for longer periods can lead to collapse, coma, or death.

TOXICITY:

Chlorinated hydrocarbons can act as simple asphyxiants, posing a risk by their displacement of oxygen in the air, thus causing hypoxic environmental conditions leading to reduced oxygen uptake and hypoxemia. Some direct toxicity is also likely, especially at very high exposure levels. The toxic mechanisms include direct myocardial depression and sensitization of the myocardium to endogenous catecholamines. With very high level, as in inhalation abuse, both direct toxicity and reduced oxygen concentrations may exist and can interact to further increase risk. Sudden death may occur. Effects of low level, accidental exposure to chlorinated aliphatic hydrocarbons are usually limited to mild upper respiratory tract irritation and/or mild CNS effects. Direct pulmonary toxicity is usually of little clinical concern; however, moderate to high levels of exposure may result in significant upper airway irritation, pneumonitis and CNS depressant effects. Very high exposures may result in severe respiratory depression or failure. Cardiac arrhythmias are generally associated with moderate to sever exposures. Exposure to high levels produces direct liver and kidney toxicity. The onset of elevated liver enzymes and indicators of renal impairment may be delayed.

Interaction with Other Chemicals Which Enhance Toxicity: May potentiate other agents that cause Central Nervous System (CNS) depression and respiratory system depression. Liver toxicity may be enhanced by other agents that cause liver damage, such as alcohol, acetaminophen. Catecholamine administration MAY pose increased risk of cardiac arrhythmias.

****

GHS HEALTH HAZARDS:

GHS: ACUTE TOXICITY - INHALATION: Category 4 - Harmful if inhaled.

Skin Absorbent / Dermal Route? Yes.

GHS: CONTACT HAZARD - SKIN: Category 2 - Causes skin irritation

GHS: CONTACT HAZARD - EYE: Category 2B - Causes eye irritation

GHS: CARCINOGENICITY:
Category 1B - May cause cancer.

Component	NTP:	IARC (GROUP 1):	IARC (GROUP 2):	OSHA:
Tetrachloroethylene [Perc]	Reasonably Anticipated To Be A Human Carcinogen	Not listed	Group 2	Listed
Carbon Tetrachloride	Reasonably Anticipated To Be A Human Carcinogen	Not listed	Group 2	Listed

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure):
Category 1 - Central Nervous System (CNS), Liver, Respiratory System
Category 3 - Narcotic Effects

SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure):
Category 2 - Central Nervous System (CNS), Liver, Kidney, Respiratory System

MUTAGENIC DATA:
Not classified as a mutagen per GHS criteria. Overall both in vitro and in vivo genetic toxicity studies showed an absence of genotoxicity.

REPRODUCTIVE TOXICITY:
Not classified as a developmental or reproductive toxicant. In laboratory animal studies, effects on the fetus and reproductive system have been seen only at doses that produced significant toxicity to the parent animal.

ASPIRATION HAZARD:
Category 2 - May be harmful if swallowed and enters airways

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

Fish Toxicity:
LC50 Fathead minnow (96 hr.) = 18.4 ppm
LC50 Bluegill sunfish (96 hr.) = 12.9 ppm
LC50 Rainbow trout (96 hr.) = 5 ppm
LC50 Sheephead minnow (96 hr.) = 29.4-52.2 ppm

Invertebrate Toxicity:
LC50 (Static) Mysid shrimp (96 hr.) = 10.2 ppm
LC50 Daphnia magna (48 hr.) = 18 mg/L

FATE AND TRANSPORT:

BIODEGRADATION: Biodegradation may occur under anaerobic conditions (in the absence of oxygen).

PERSISTENCE: AIR: Vapors in air are subject to photooxidation, but do not contribute to tropospheric ozone formation. Half-life estimates range from 3 months to less than 1 hour. SOIL: Average Koc of 237 suggests moderate mobility in soil. This material can leach rapidly through sandy soil to reach groundwater. Soil adsorption potential is low. Will not significantly hydrolyze in soil or water under normal environmental conditions. WATER: Slow biodegradation may occur in groundwater where acclimated populations of microorganisms exist. Does not readily adsorb to sediment. This material in water is subject to volatilization, with half-life estimates ranging from less than one day to several weeks.

BIOCONCENTRATION: Bioconcentration potential is low to moderate with a BCF of 26-77.

13. DISPOSAL CONSIDERATIONS

Waste from material:
Reuse or reprocess, if possible. Keep out of water supplies, sewers and soil. Recovered liquids may be sent to a licensed reclaimer or incineration facility. Dispose in accordance with all applicable regulations.

Container Management:
Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container rinsate must be disposed of in compliance with applicable regulations.

14. TRANSPORT INFORMATION

LAND TRANSPORT

U.S. DOT 49 CFR 172.101:

UN NUMBER:	UN1897
PROPER SHIPPING NAME:	Tetrachloroethylene
HAZARD CLASS/ DIVISION:	6.1
PACKING GROUP:	III

LABELING REQUIREMENTS: 6.1
MARINE POLLUTANT: Tetrachloroethylene
RQ (lbs): RQ 100 lbs (Tetrachloroethylene)
RQ 10 Lbs. (Carbon tetrachloride)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER: UN1897
SHIPPING NAME: Tetrachloroethylene
CLASS OR DIVISION: 6.1
PACKING/RISK GROUP: III
LABELING REQUIREMENTS: 6.1
CAN. MARINE POLLUTANT: Tetrachloroethylene

MARITIME TRANSPORT (IMO / IMDG) :

UN NUMBER: UN1897
PROPER SHIPPING NAME: Tetrachloroethylene
HAZARD CLASS / DIVISION: 6.1
Packing Group: III
MARINE POLLUTANT: Tetrachloroethylene

15. REGULATORY INFORMATION

U.S. REGULATIONS

OSHA REGULATORY STATUS:
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	CERCLA Reportable Quantities:
Tetrachloroethylene [Perc]	1 lb (final RQ) 100 lb (final RQ)
Carbon Tetrachloride	1 lb (final RQ) 10 lb (final RQ)

SARA EHS Chemical (40 CFR 355.30)
Not regulated

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.10):

Acute Health Hazard, Chronic Health Hazard

EPCRA SECTION 313 (40 CFR 372.65):
The following chemicals are listed in 40 CFR 372.65 and may be subject to Community Right-to Know Reporting requirements.

Component	Status:
Tetrachloroethylene [Perc]	0.1 %
Carbon Tetrachloride	0.1 %

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):
Not regulated

Safe Drinking Water Act - MCLs: Subject to 40 CFR Part 41 Safe Drinking Water Act (SDWA). A maximum contaminant level 0.005 mg/L. Subject to 40 CFR Part 63 Subsection T: NESHAP's Halogenated Solvent Cleaning

NATIONAL INVENTORY STATUS

U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA): All components are listed or exempt.

TSCA 12(b): This product is not subject to export notification.

Canadian Chemical Inventory: All components of this product are listed on either the DSL or the NDSL.

STATE REGULATIONS

California Proposition 65:
This product contains a chemical known to the State of California to cause cancer, and/or birth defects, and/or other reproductive harm as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act.

Component	California Proposition 65 Cancer WARNING:	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List
Tetrachloroethylene [Perc] 127-18-4	Listed	Not Listed	Not Listed	Listed	1810	carcinogen
Carbon Tetrachloride 56-23-5	Listed	Not Listed	Not Listed	Listed	0347	carcinogen

Component	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List	Rhode Island Right to Know Hazardous Substance List
Tetrachloroethylene [Perc] 127-18-4	Listed	Listed	Present	Present	Listed
Carbon Tetrachloride 56-23-5	Listed	Listed	Present	Present	Listed

CANADIAN REGULATIONS

• This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations

WHMIS - Classifications of Substances:
• D1B - Poisonous and Infectious Material; Materials causing immediate and serious toxic effects - Toxic material
• D2A - Poisonous and Infectious Material; Materials causing other toxic effects - Very toxic material
• D2B - Poisonous and Infectious Material; Materials causing other toxic effects - Toxic material

16. OTHER INFORMATION

Prepared by: OxyChem Corporate HESS - Product Stewardship

Rev. Date: 20-Feb-2015

HMIS: (SCALE 0-4) (Rated using National Paint & Coatings Association HMIS: Rating Instructions, 2nd Edition)

Health Rating: 2* **Flammability Rating:** 0 **Reactivity Rating:** 0

NFPA 704 - Hazard Identification Ratings (SCALE 0-4)

Health Rating: 2 **Flammability:** 0 **Reactivity Rating:** 0

Reason for Revision:
• Changed the SDS format to meet the GHS requirements of the revised 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200}
• Updated the (M)SDS header
• Updated 24 Hour Emergency Telephone Number: SEE SECTION 1
• Product Identifier has been added or updated: SEE SECTION 1
• Updated Uses Advised Against information: SEE SECTION 1
• Added OSHA Status: SEE SECTION 2
• Emergency Overview was revised: SEE SECTION 2
• Added GHS Information: SEE SECTION 2
• Added synonym(s): SEE SECTION 3
• Updated First Aid Measures: SEE SECTION 4
• Modified Fire Fighting Measure Recommendations: SEE SECTION 5
• Revised Accidental Release Measures: SEE SECTION 6
• Revised Handling and Storage Recommendations: SEE SECTION 7
• Revised Exposure Controls/Personal Protection information: SEE SECTION 8
• Updated Physical and Chemical Properties. SEE SECTION 9
• Stability and Reactivity recommendations: SEE SECTION 10
• Toxicological Information has been revised: SEE SECTION 11
• Updated Disposal Considerations. SEE SECTION 13
• Updated Transportation Information: SEE SECTION 14
• Regulatory Information Changes: SEE SECTION 15
• Revised Preparer Information: SEE SECTION 16
• Added SDS Revision Date: SEE SECTION 16
• Added/Updated Revision Log: SEE SECTION 16

PERCHLOROETHYLENE, ALL GRADES

IMPORTANT:
The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal and other factors that may involve other or additional legal, environmental, safety or performance considerations, and OxyChem assumes no liability whatsoever for the use of or reliance upon this information. While our technical personnel will be happy to respond to questions, safe handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, local or foreign laws.

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Safety Data Sheet available to your employees

End of Safety Data Sheet

APPENDIX E

Directions and Map to Emergency Medical Facility

YOUR TRIP TO:

Framingham Union Hospital

2 MIN | 0.8 MI

Trip time based on traffic conditions as of 10:12 AM on March 25, 2016. Current Traffic: Moderate

1. Start out going southeast on Union Ave toward Mount Wayte Ave.

Then 0.64 miles — 0.64 total miles

2. Turn slight left onto Lincoln St.

Lincoln St is just past Thurber St.

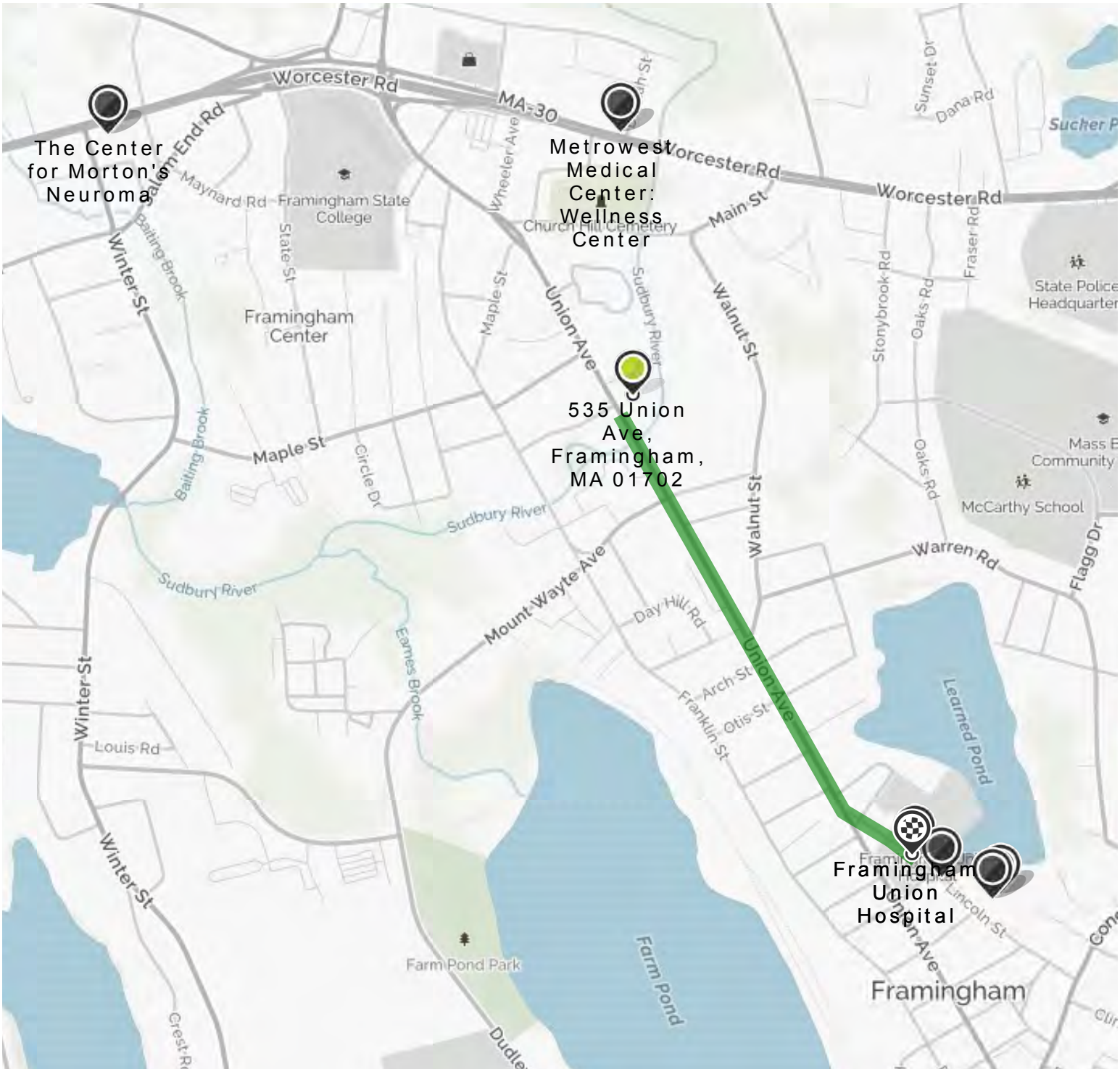
If you are on Union Ave and reach Myrtle St you've gone a little too far.

Then 0.12 miles — 0.77 total miles

3. Framingham Union Hospital, 85 LINCOLN ST.

Your destination is just past Evergreen St.

If you reach Beech St you've gone a little too far.


The Center for Morton's Neuroma
Metrowest Medical Center: Wellness Center
535 Union Ave, Framingham, MA 01702
Framingham Union Hospital
Worcester Rd
MA-30
Salem End Rd
Maynard Rd
Framingham State College
Framingham Center
Winter St
Baiting Brook
State St
Wheeler Ave
Church Hill Cemetery
Main St
Maple St
Union Ave
Sudbury River
Walnut St
Stonybrook Rd
Oaks Rd
Fraser Rd
State Police Headquarter
Mass E Community
McCarthy School
Warren Rd
Flagg Dr
Circle Dr
Mount Wayte Ave
Day Hill Rd
Arch St
Franklin St
Otis St
Eames Brook
Louis Rd
Learned Pond
Lincoln St
Farm Pond Park
Farm Pond
Framingham
Dana Rd
Sunset Dr
Sucker P