89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

October 16, 2019

U.S. Environmental Protection Agency
Office of Ecosystem Protection
EPA/OEP RGP Applications Coordinator
5 Post Office Square, Suite 100 (OEP06-4)
Boston, Massachusetts 02109-3912

Reference: **Notice of Intent (NOI) - Remediation General Permit (RGP)**
Jacking and Receiving Pits for Mill River Crossing
National Grid 345 kV Electrical Duct Bank Project
Wakefield, Massachusetts

Dear Sir/Madam:

On behalf of United Civil, Inc. (United Civil), Lockwood Remediation Technologies, LLC (LRT) has prepared this Notice of Intent (NOI) requesting a determination of coverage under the United States Environmental Protection Agency's (EPA's) Remediation General Permit (RGP), pursuant EPA's National Pollutant Discharge Elimination System (NPDES) program. This NOI was prepared in accordance with the general requirements of the NPDES and related guidance documentation provided by EPA. The completed NOI Form is provided in **Appendix A**.

Site Information

This NOI is for the management of groundwater that will be generated during dewatering activities associated with the excavation of the jacking and receiving (bore) pits located at the intersection of Nablus Road and Salem Street in Wakefield, Massachusetts (the Site). These pits will be used to horizontally bore and install a 345 kV electrical transmission line below the culverted portion of Mill River. The work will take place over approximately 100 feet and will be completed late Fall 2019 or Spring 2020. A Site Locus is provided as **Figure 1** and a Site Plan satisfying the requirements of RGP Appendix IV Part I.B and I.D is provided as **Figure 2**.

Work Summary

The project includes the installation of jacking and receiving pits adjacent to the intersection of Nablus Road and Salem Street. To maintain dry conditions during the excavations and horizontal boring, dewatering is required to lower the groundwater table. A wellpoint dewatering system will be used at the jacking and receiving pit excavations and the generated groundwater (Source water) will be pumped to a treatment system prior to discharge into Mill River. To characterize groundwater from the proposed excavation area, LRT collected representative groundwater samples on October 4, 2019 from two monitoring wells (designated MW-1 and MW-2) located in the vicinity of the jacking and the receiving

pits. A sample of the receiving water (Mill River) was also collected on October 4, 2019. Sampling locations are depicted on **Figure 2**. The samples were analyzed for various parameters in accordance with the NPDES RGP Activity Category III-G.

Discharge and Receiving Surface Water Information

A summary of the analytical results is provided in **Tables 1 and 2** included within **Appendix A**, and copies of the laboratory data reports are provided in **Appendix B**. Concentrations of total suspended solids (TSS), total residual chlorine, polycyclic aromatic hydrocarbons (PAHs) and certain metals were detected in groundwater at concentrations above the respective NPDES RGP effluent limitations. To meet these standards, Source water will undergo treatment that includes bag filtration and carbon filtration and possibly ion exchange (if necessary) prior to discharge. Details of the water treatment system are provided below.

Water Treatment System

A water treatment system schematic is provided as **Figure 3**. Cutsheets of the system components, product information and Safety Data Sheets (SDS) are included in **Appendix C**.

Source water will be pumped to a treatment system at flow rates up to 150 gallons per minute (gpm). The average effluent flow of the system is estimated to be 100 gpm and the maximum flow will not exceed 150 gpm. Source water will enter one 18,000-gallon weir tank at the head of the system. From the weir tank, the water will be pumped to a triple-bag filter skid (with three single bag filters), followed by two carbon vessels plumbed in series. Each carbon vessel will contain 2,000 pounds of reactivated liquid-phase carbon. Discharge from the carbon vessels will pass through a flow/totalizer meter prior to direct discharge into Mill River. The discharge will be at the location depicted on **Figure 2**. Effluent sampling will correspond with this discharge location.

Two contingent ion exchange vessels will be installed in series following the carbon vessels if metals are not removed by settling and bag filtration. One vessel will be filled with 60 cubic feet of cation resin media and the other will be filled with 60 cubic feet of anion resin media.

Consultation with Federal Services

LRT reviewed online electronic data viewers and databases from the Massachusetts Geographical Information System (MassGIS), the Massachusetts Division of Fisheries and Wildlife (MassWildlife; Natural Heritage and Endangered Species Program), and the U.S. National Parks Service Natural Historic Places (NPS). Based on this review, the Site and the point where the proposed discharge reaches the receiving surface water body are not located within an Area of Critical Environmental Concern (ACEC). The Site and the proposed discharge point are not located within Habitats of Rare Wetland Wildlife, Habitats of Rare Species, Estimated Habitats of Rare Wildlife, or listed as a National Historic Place. Documentation is included in **Appendix D**.

Coverage under NPDES RGP

It is our opinion that the proposed discharge is eligible for coverage under the NPDES RGP. On behalf of United Civil, we are requesting coverage under the NPDES RGP for the discharge of treated groundwater to the Mill River in support of construction dewatering activities associated with the 345 kV electrical duct bank installation below the Mill River.

The enclosed NOI form provides required information on the general site conditions, discharge, treatment system, receiving water, and consultation with federal services. For this project, United Civil is the Operator and has operational control over the construction plans and specifications, including the ability to make modifications to those plans and specifications, if necessary.

Public Notification

A notification of this NOI filing has been provided to Wakefield's Town Administrator, Mr. Stephen P. Maio. A copy of the notification is included in **Appendix E.**

Please feel free to contact us at 774-450-7177 if you have any questions or require additional information.

Sincerely,
Lockwood Remediation Technologies, LLC

James Bennett

James Bennett
Project Manager/Estimator

John Henry

John Henry, PE
Senior Project Manager

Enclosures :
- Figure 1 - Locus Plan
- Figure 2 - Site Plan
- Figure 3 - Water Treatment System Schematic
- Appendix A - NOI Form
- Appendix B - Laboratory Data
- Appendix C - Water Treatment System Cutsheets
- Appendix D - Supplemental Information
- Appendix E – Public Notification Letter

cc: Dylan Smith – United Civil
Cathy Vakalopoulos – DEP
Binoy Koodhathinkal – National Grid

Figures

Source: ArcGIS Map Viewer

Notes

1. Figure is not to scale.

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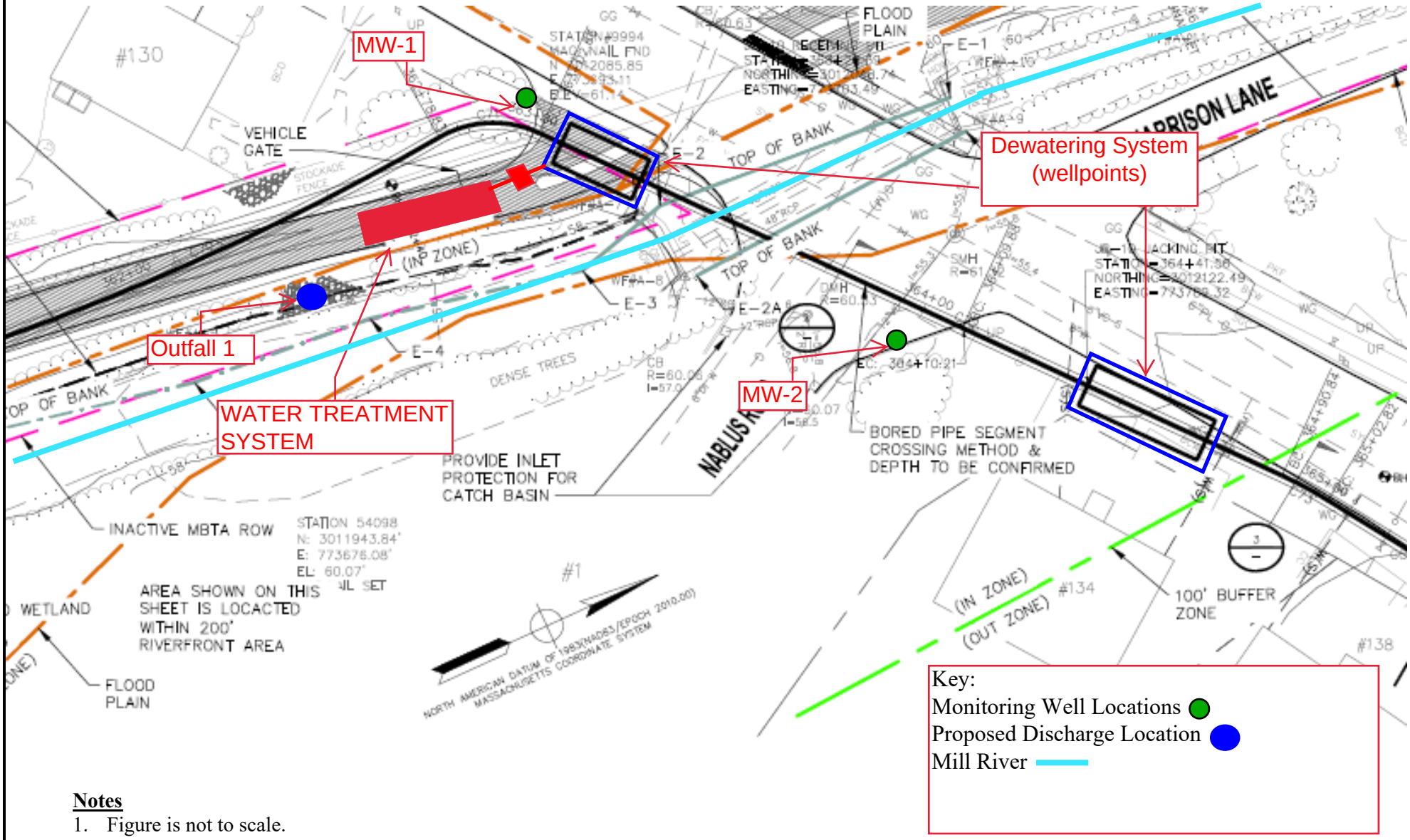
Figure 1 – Locus Plan
Mill River Crossing
National Grid 345 kV Line #3136 Project
Wakefield, MA



Notes

1. Figure is not to scale.

Source: Sheet D-00025-NE – National Grid 345 kV Line #3136 Wakefield, MA Portion Planset by Black & Veatch dated 09/05/19

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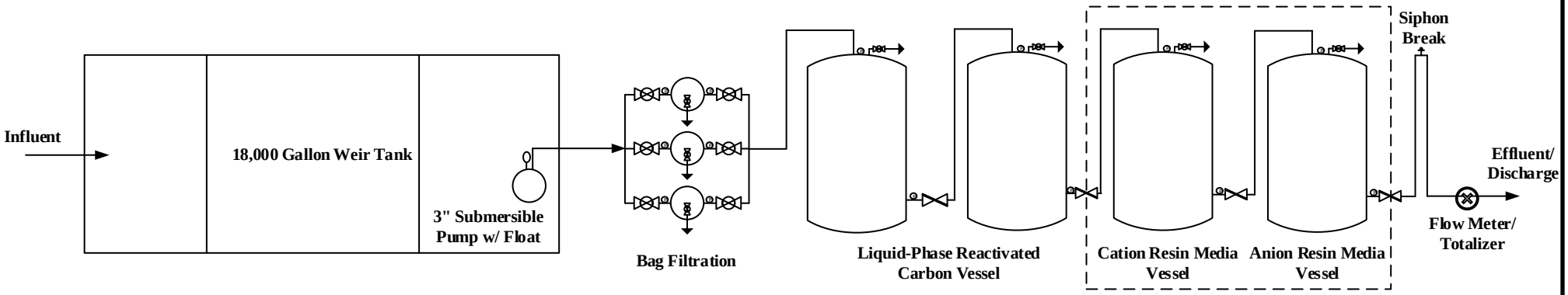
Figure 2 - Site Plan
Mill River Crossing
National Grid 345 kV Line #3136 Project
Wakefield, MA



Notes:

1.) Figure is not to scale
2.) System rated for 150 GPM

Key:
Piping/Hose
Butterfly valve
Pressure gauge
Ball valve
Contingent

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453
Office: 774-450-7177

DESIGNED BY: LRT **DRAWN BY:** JHJ

CHECKED BY: **DATE:**

Water Treatment System Schematic - RGP

Mill River Crossing
National Grid 345kV. Line #3136 Project
Wakefield, MA

PROJECT No. 2-1922

FIGURE No. 3

Appendix A

NOI Form

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

A. General site information:

<table>
<tr><td rowspan="2">1. Name of site:
Jacking and Receiving Pits - Mill River Crossing</td><td colspan="3">Site address: Intersection of Nablus Road and Salem Street
Street:</td></tr>
<tr><td>City: Wakefield</td><td>State: MA</td><td>Zip: 01880</td></tr>
<tr><td rowspan="4">2. Site owner
National Grid

Owner is (check one): ☐ Federal ☐ State/Tribal ☐ Private
■ Other; if so, specify: Utility on Public Right of Way</td><td colspan="3">Contact Person: Binoy Koodhathinkal</td></tr>
<tr><td colspan="2">Telephone: 781-999-2334</td><td>Email: binoy.koodhathinkal@nationalgrid</td></tr>
<tr><td colspan="3">Mailing address: 40 Sylvan Road
Street:</td></tr>
<tr><td>City: Waltham</td><td>State: MA</td><td>Zip: 02541</td></tr>
<tr><td rowspan="4">3. Site operator, if different than owner
United Civil, Inc.</td><td colspan="3">Contact Person: Dylan Smith</td></tr>
<tr><td colspan="2">Telephone: 978-304-1597</td><td>Email: dsmith@united-civil.com</td></tr>
<tr><td colspan="3">Mailing address:
Street: 30 Log Bridge Road, Building 100</td></tr>
<tr><td>City: Middleton</td><td>State: MA</td><td>Zip: 01949</td></tr>
<tr><td>4. NPDES permit number assigned by EPA:

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):
☐ 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):
Mill River (Saugus River)	MA93-31	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. E Coli, Pathogens, Fecal Coliform(50120), Dissolved Oxygen, Total Suspended Solids, Turbidity

4. Indicate the seven day-ten-year low flow (7Q10) of the receiving water determined in accordance with the instructions in Appendix V for sites located in Massachusetts and Appendix VI for sites located in New Hampshire.	0.0118
5. Indicate the requested dilution factor for the calculation of water quality-based effluent limitations (WQBELs) determined in accordance with the instructions in Appendix V for sites in Massachusetts and Appendix VI for sites in New Hampshire.	1.035

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: 10/16/2019

7. Has the operator attached a summary of receiving water sampling results as required in Part 4.2 of the RGP in accordance with the instruction in Appendix VIII? (check one): ■ 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: Fuels Parameters, Non-Halogenated SVOCs and Inorganics	
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): 1	Outfall location(s): (Latitude, Longitude) 42.512399 , -71.063945
Discharges enter the receiving water(s) via (check any that apply): ■ Direct discharge to the receiving water ☐ Indirect discharge, if so, specify: ☐ 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): 11/1/2019 through 10/15/2020 Indicate if the discharge is expected to occur over a duration of: ■ less than 12 months ☐ 12 months or more ☐ is an emergency discharge	
Has the operator attached a site plan in accordance with the instructions in D, above? (check one): ■ Yes ☐ No	

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

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

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

4. Influent and Effluent Characteristics

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
A. Inorganics									
Ammonia		✓	2	SM19-22 +	75	1830	982.5	Report mg/L	---
Chloride		✓	2	EPA 300	10000	240000	195000	Report µg/l	---
Total Residual Chlorine		✓	2	SM21-22 +	20	34	17	0.2 mg/L	11
Total Suspended Solids		✓	2	SM21-22 +	2000	82000	73500	30 mg/L	---
Antimony	✓		2	200.8	1.0	<1.0	<1.0	206 µg/L	
Arsenic		✓	2	200.8	0.80	21	11.1	104 µg/L	10
Cadmium	✓		2	200.8	0.20	<0.20	<0.20	10.2 µg/L	
Chromium III		✓	2	200.8	1.0	5.6	5	323 µg/L	
Chromium VI	✓		2	SM21-22 +	4.0	<4.0	<4.0	323 µg/L	
Copper		✓	2	200.8	1.0	7.8	6.4	242 µg/L	
Iron		✓	2	200.7	50	15000	8050	5,000 µg/L	1000
Lead		✓	2	200.8	0.50	5.3	5.1	160 µg/L	
Mercury	✓		2	245.1	0.1	<0.1	<0.1	0.739 µg/L	
Nickel		✓	2	200.8	5.0	6.3	3.15	1,450 µg/L	
Selenium	✓		2	200.8	5.0	<5.0	<5.0	235.8 µg/L	
Silver	✓		2	200.8	0.20	<0.20	<0.20	35.1 µg/L	
Zinc		✓	2	200.8	10	15	7.5	420 µg/L	
Cyanide		✓	2	SM21-22 +	1	2	1	178 mg/L	
B. Non-Halogenated VOCs									
Total BTEX	✓		2	624.1	2	<2.0	<2.0	100 µg/L	---
Benzene	✓		2	624.1	1.0	<1.0	<1.0	5.0 µg/L	---
1,4 Dioxane	✓		2	624.1	50	<50	<50	200 µg/L	---
Acetone	✓		2	624.1	50	<50	<50	7.97 mg/L	---
Phenol	✓		2	625.1	9.62	<9.62	<9.62	1,080 µg/L	

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
C. Halogenated VOCs									
Carbon Tetrachloride	✓		2	624.1	2.00	<2.00	<2.00	4.4 µg/L	
1,2 Dichlorobenzene	✓		2	624.1	2.00	<2.00	<2.00	600 µg/L	---
1,3 Dichlorobenzene	✓		2	624.1	2.00	<2.00	<2.00	320 µg/L	---
1,4 Dichlorobenzene	✓		2	624.1	2.00	<2.00	<2.00	5.0 µg/L	---
Total dichlorobenzene	✓		2	624.1	N/A	<2.00	<2.00	763 µg/L in NH	---
1,1 Dichloroethane	✓		2	624.1	2.00	<2.00	<2.00	70 µg/L	---
1,2 Dichloroethane	✓		2	624.1	2.00	<2.00	<2.00	5.0 µg/L	---
1,1 Dichloroethylene	✓		2	624.1	2.00	<2.00	<2.00	3.2 µg/L	---
Ethylene Dibromide	✓		2	624.1	2.00	<2.00	<2.00	0.05 µg/L	---
Methylene Chloride	✓		2	624.1	5.00	<5.00	<5.00	4.6 µg/L	---
1,1,1 Trichloroethane	✓		2	624.1	2.00	<2.00	<2.00	200 µg/L	---
1,1,2 Trichloroethane	✓		2	624.1	2.00	<2.00	<2.00	5.0 µg/L	---
Trichloroethylene	✓		2	624.1	2.00	<2.00	<2.00	5.0 µg/L	---
Tetrachloroethylene	✓		2	624.1	2.00	<2.00	<2.00	5.0 µg/L	
cis-1,2 Dichloroethylene	✓		2	624.1	2.00	<2.00	<2.00	70 µg/L	---
Vinyl Chloride	✓		2	624.1	2.00	<2.00	<2.00	2.0 µg/L	---
D. Non-Halogenated SVOCs									
Total Phthalates	✓		2	625.1	0.96	<0.96	<0.96	190 µg/L	
Diethylhexyl phthalate	✓		2	625.1	0.96	<0.96	<0.96	101 µg/L	
Total Group I PAHs		✓	2	625.1	N/A	0.156	0.078	1.0 µg/L	---
Benzo(a)anthracene		✓	2	625.1	0.048	0.023	0.0115	As Total PAHs	0.0038
Benzo(a)pyrene		✓	2	625.1	0.096	0.030	0.015		0.0038
Benzo(b)fluoranthene		✓	2	625.1	0.048	0.038	0.019		0.0038
Benzo(k)fluoranthene		✓	2	625.1	0.19	0.013	0.0065		0.0038
Chrysene		✓	2	625.1	0.19	0.027	0.0135		0.0038
Dibenzo(a,h)anthracene	✓		2	625.1	0.096	<0.096	<0.096		
Indeno(1,2,3-cd)pyrene		✓	2	625.1	0.096	0.025	0.0125		0.0038

Parameter	Known or believed absent	Known or believed present	# of samples	Test method (#)	Detection limit (µg/l)	Influent		Effluent Limitations	
						Daily maximum (µg/l)	Daily average (µg/l)	TBEL	WQBEL
Total Group II PAHs	✓		2	625.1	100	<100	<100	100 µg/L	---
Naphthalene	✓		2	625.1	4.81	<4.81	<4.81	20 µg/L	---
E. Halogenated SVOCs									
Total PCBs	✓		2	608.3	0.0976	<0.0976	<0.0976	0.000064 µg/L	---
Pentachlorophenol	✓		2	625.1	0.96	<0.96	<0.96	1.0 µg/L	---
F. Fuels Parameters									
Total Petroleum Hydrocarbons	✓		2	624.1	5.0	<5.0	<5.0	5.0 mg/L	---
Ethanol	✓		2	624.1	50.0	<50.0	<50.0	Report mg/L	---
Methyl-tert-Butyl Ether		✓	2	624.1	2.00	0.260	0.13	70 µg/L	
tert-Butyl Alcohol	✓		2	624.1	20.0	<20.0	<20.0	120 µg/L in MA 40 µg/L in NH	---
tert-Amyl Methyl Ether	✓		2	624.1	0.500	<0.500	<0.500	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:									
Hardness		✓	2	207.1	0	110000	88500		
pH		✓	2	Field	0-14	6.4	6.4		
Receiving water									
Hardness		✓	1	207.1	0	100000	100000		
ammonia		✓	1	SM19-22	75	65	65		
pH		✓	1	Field	0-14	6.1	6.1		
TSS		✓	1	SM21-22	2000	5200	5200		

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.

Source water will enter one 18,000-gallon weir tank at the head of the system. From the weir tank, the water will be pumped to a triple-bag filter skid (with three single bag filters), followed by two carbon vessels plumbed in series. Each carbon vessel will contain 2,000 pounds of reactivated liquid-phase carbon. Discharge from the carbon vessels will pass through a flow/totalizer meter prior to direct discharge to the Mill River. Two ion exchange vessels plumed in series will be installed after the carbon vessels if settling and bag filtration does not reduce metal concentrations below RGP standards. One vessel will contain 60 CF of cation exchange resin and the other will contain 60 CF of anion exchange resin.

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: Granular activated carbon vessels and ion exchange vessels Is use of a flow meter feasible? (check one): ■ Yes ☐ No, if so, provide justification:	150
Provide the proposed maximum effluent flow in gpm.	150
Provide the average effluent flow in gpm.	100
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:

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

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

G. Endangered Species Act eligibility determination

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

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

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

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

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

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

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

H. National Historic Preservation Act eligibility determination

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

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

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

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

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

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

I. Supplemental information

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

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

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

J. Certification requirement

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

BMPP certification statement:	A BMPP will be developed and maintained to meet the requirements of this permit. The BMPP will be implemented on-site prior to the initiation of discharge
Notification provided to the appropriate State, including a copy of this NOI, if required.	Check one: Yes ■ No ☐
Notification provided to the municipality in which the discharge is located, including a copy of this NOI, if requested.	Check one: Yes ■ No ☐
Notification provided to the owner of a private or municipal storm sewer system, if such system is used for site discharges, including a copy of this NOI, if requested.	Check one: Yes ☐ No ☐ NA ■
Permission obtained from the owner of a private or municipal storm sewer system, if such system is used for site discharges. If yes, attach additional conditions. If no, attach explanation and timeframe for obtaining permission.	Check one: Yes ☐ No ☐ NA ■
Notification provided to the owner/operator of the area associated with activities covered by an additional discharge permit(s). Additional discharge permit is (check one): ☐ RGP ☐ DGP ☐ CGP ☐ MSGP ☐ Individual NPDES permit ☐ Other; if so, specify:	Check one: Yes ☐ No ☐ NA ■
Signature:	Date: 10/17/2019
Print Name and Title:	Dylan Smith, Project Manager for United Civil, Inc.

From:	Ruan, Xiaodan (DEP)
To:	Jake Jennings
Cc:	Vakalopoulos, Catherine (DEP)
Subject:	RE: NPDES RGP Application - 7Q10 and Dilution Factor Confirmation Nablus Road Wakefield, MA
Date:	Wednesday, October 16, 2019 4:47:39 PM

Thanks Jake for the clarification.

I can confirm that the 7Q10 value of 0.0118 cfs and a dilution factor of 1.035 for the proposed discharge from 132 Salem Street, Wakefield, MA to the Mill River are correct.

To assist you with filling out the NOI for coverage under the RGP, this segment of the Mill River, within North Coastal Watershed is identified as MA93-31 (as you have already included the segment ID in your original email), classified as Class B, and is not listed as an Outstanding Resource Water. There is one approved TMDL for pathogens (https://www.mass.gov/files/documents/2016/08/vx/ncoastl1.pdf). To see the causes of impairments, go to: https://www.mass.gov/files/documents/2016/08/sa/14list2_0.pdf and search for "MA93-31".

Note that if this is not a *current* MCP site, you must apply to MassDEP alongside submittal of the NOI by following the instructions at: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of-intent. There is a $500 fee unless the applicant is fee-exempt (e.g. a municipality).

Please let me know if you have any questions.

Thanks,
Xiaodan

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

From: Vakalopoulos, Catherine (DEP)
Sent: Tuesday, October 15, 2019 9:57 AM
To: Ruan, Xiaodan (DEP)
Cc: 'Jake Jennings'
Subject: FW: NPDES RGP Application - 7Q10 and Dilution Factor Confirmation Nablus Road Wakefield, MA

Hi Xiaodan,
Do you have time to look at this today?
Thanks,
Cathy

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

From: Jake Jennings [mailto:JJennings@lrt-llc.net]
Sent: Monday, October 14, 2019 11:02 AM
To: Vakalopoulos, Catherine (DEP)
Cc: John Henry; Jamie Bennett
Subject: NPDES RGP Application - 7Q10 and Dilution Factor Confirmation Nablus Road Wakefield, MA

Good Morning Cathy,

As required in appendix V, please see attached StreamStats Report along with our dilution calcs for your review and conformation.

The project location:

The intersection of Salem Street and Nablus Road (132 Salem Street on Google maps)
Wakefield, MA

We plan on discharging to the Mill River (MA93-31) which is a tributary of the Saugus River.

The 7 Day 10 Year Low Flow value from the StreamStats report is 0.0118 cfs and the calculated dilution factor is 1.035.

Can you please confirm that these values are appropriate.

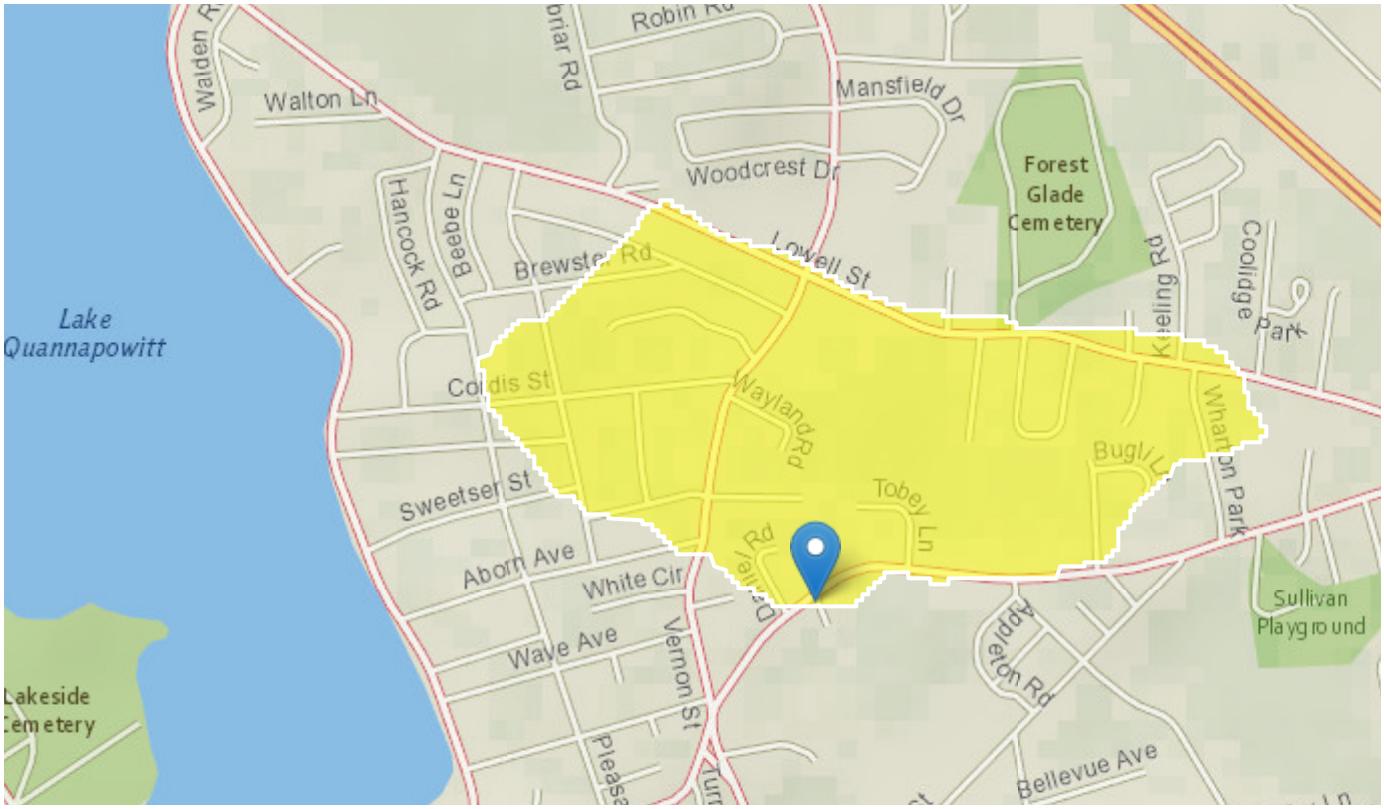
Thank you,

Jake Jennings

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453
O: 774.450.7177
F: 888.835.0617
M: 508.930.9812
jjennings@lrt-llc.net

StreamStats Report

Region ID: MA
Workspace ID: MA20191014112825216000
Clicked Point (Latitude, Longitude): 42.51236, -71.06393
Time: 2019-10-14 07:28:44 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.22	square miles
BSLDEM250	Mean basin slope computed from 1:250K DEM	0.66	percent
DRFTPERSTR	Area of stratified drift per unit of stream length	0.96	square mile per mile
MAREGION	Region of Massachusetts 0 for Eastern 1 for Western	0	dimensionless

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

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.22	square miles	1.61	149
BSLDEM250	Mean Basin Slope from 250K DEM	0.66	percent	0.32	24.6
DRFTPERSTR	Stratified Drift per Stream Length	0.96	square mile per mile	0	1.29
MAREGION	Massachusetts Region	0	dimensionless	0	1

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

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0294	ft^3/s
7 Day 10 Year Low Flow	0.0118	ft^3/s

Low-Flow Statistics Citations

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

USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.3.8

Enter number values in green boxes below

Enter values in the units specified

↓

0.0076	Q_R = Enter upstream flow in **MGD**
0.216	Q_P = Enter discharge flow in **MGD**
0.0076	Downstream 7Q10

Enter a dilution factor, if other than zero

↓

1.035

Enter values in the units specified

↓

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

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

↓

6.1	pH in **Standard Units**
18	Temperature in **^oC**
0.065	Ammonia in **mg/L**
100	Hardness in **mg/L** $CaCO_3$
0	Salinity in **ppt**
0	Antimony in **µg/L**
1.6	Arsenic in **µg/L**
0	Cadmium in **µg/L**
1.7	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
2.2	Copper in **µg/L**
1000	Iron in **µg/L**
0.91	Lead in **µg/L**
0	Mercury in **µg/L**
0	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
0	Zinc in **µg/L**

Enter **influent** concentrations in the units specified

↓

0.034	TRC in **µg/L**
0.98	Ammonia in **mg/L**
0	Antimony in **µg/L**
11.1	Arsenic in **µg/L**
0	Cadmium in **µg/L**
5	Chromium III in **µg/L**
0	Chromium VI in **µg/L**
6.4	Copper in **µg/L**
8050	Iron in **µg/L**
5.1	Lead in **µg/L**
0	Mercury in **µg/L**
6.3	Nickel in **µg/L**
0	Selenium in **µg/L**
0	Silver in **µg/L**
15	Zinc in **µg/L**
2	Cyanide in **µg/L**
0	Phenol in **µg/L**
0	Carbon Tetrachloride in **µg/L**
0	Tetrachloroethylene in **µg/L**
0	Total Phthalates in **µg/L**
0	Diethylhexylphthalate in **µg/L**
0.023	Benzo(a)anthracene in **µg/L**
0.03	Benzo(a)pyrene in **µg/L**
0.038	Benzo(b)fluoranthene in **µg/L**
0.013	Benzo(k)fluoranthene in **µg/L**
0.027	Chrysene in **µg/L**
0	Dibenzo(a,h)anthracene in **µg/L**
0.025	Indeno(1,2,3-cd)pyrene in **µg/L**
0.26	Methyl-tert butyl ether in **µg/L**

Dilution Factor	1.0			
	TBEL applies if bolded		WQBEL applies if bolded	
A. Inorganics				
Ammonia	**Report**	mg/L	---	
Chloride	**Report**	µg/L	---	
Total Residual Chlorine	0.2	mg/L	**11**	µg/L
Total Suspended Solids	**30**	mg/L	---	
Antimony	**206**	µg/L	640	µg/L
Arsenic	104	µg/L	**10**	µg/L
Cadmium	**10.2**	µg/L	3.0381	µg/L
Chromium III	**323**	µg/L	1248.4	µg/L
Chromium VI	**323**	µg/L	11.4	µg/L
Copper	**242**	µg/L	151.7	µg/L
Iron	5000	µg/L	**1000**	µg/L
Lead	**160**	µg/L	202.83	µg/L
Mercury	**0.739**	µg/L	0.91	µg/L
Nickel	**1450**	µg/L	825.2	µg/L
Selenium	**235.8**	µg/L	5.0	µg/L
Silver	**35.1**	µg/L	1037.8	µg/L
Zinc	**420**	µg/L	1903.6	µg/L
Cyanide	**178**	mg/L	5.2	µg/L
B. Non-Halogenated VOCs				
Total BTEX	**100**	µg/L	---	
Benzene	**5.0**	µg/L	---	
1,4 Dioxane	**200**	µg/L	---	
Acetone	**7970**	µg/L	---	
Phenol	**1,080**	µg/L	300	µg/L
C. Halogenated VOCs				
Carbon Tetrachloride	**4.4**	µg/L	1.6	µg/L
1,2 Dichlorobenzene	**600**	µg/L	---	
1,3 Dichlorobenzene	**320**	µg/L	---	
1,4 Dichlorobenzene	**5.0**	µg/L	---	
Total dichlorobenzene	**---**	µg/L	---	
1,1 Dichloroethane	**70**	µg/L	---	
1,2 Dichloroethane	**5.0**	µg/L	---	
1,1 Dichloroethylene	**3.2**	µg/L	---	
Ethylene Dibromide	**0.05**	µg/L	---	
Methylene Chloride	**4.6**	µg/L	---	
1,1,1 Trichloroethane	**200**	µg/L	---	
1,1,2 Trichloroethane	**5.0**	µg/L	---	
Trichloroethylene	**5.0**	µg/L	---	
Tetrachloroethylene	**5.0**	µg/L	3.3	µg/L
cis-1,2 Dichloroethylene	**70**	µg/L	---	

Vinyl Chloride	**2.0**	µg/L	---	
D. Non-Halogenated SVOCs				
Total Phthalates	**190**	µg/L	---	µg/L
Diethylhexyl phthalate	**101**	µg/L	2.2	µg/L
Total Group I Polycyclic Aromatic Hydrocarbons	**1.0**	µg/L	---	
Benzo(a)anthracene	1.0	µg/L	**0.0038**	µg/L
Benzo(a)pyrene	1.0	µg/L	**0.0038**	µg/L
Benzo(b)fluoranthene	1.0	µg/L	**0.0038**	µg/L
Benzo(k)fluoranthene	1.0	µg/L	**0.0038**	µg/L
Chrysene	1.0	µg/L	**0.0038**	µg/L
Dibenzo(a,h)anthracene	**1.0**	µg/L	0.0038	µg/L
Indeno(1,2,3-cd)pyrene	1.0	µg/L	**0.0038**	µg/L
Total Group II Polycyclic Aromatic Hydrocarbons	**100**	µg/L	---	
Naphthalene	**20**	µg/L	---	
E. Halogenated SVOCs				
Total Polychlorinated Biphenyls	**0.000064**	µg/L	---	
Pentachlorophenol	**1.0**	µg/L	---	
F. Fuels Parameters				
Total Petroleum Hydrocarbons	**5.0**	mg/L	---	
Ethanol	**Report**	mg/L	---	
Methyl-tert-Butyl Ether	**70**	µg/L	20	µg/L
tert-Butyl Alcohol	**120**	µg/L	---	
tert-Amyl Methyl Ether	**90**	µg/L	---	

Appendix B

Laboratory Data

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

October 11, 2019

James Bennett
Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453

Project Location: Wakefield, MA
Client Job Number:
Project Number: 2-1922
Laboratory Work Order Number: 19J0332

Enclosed are results of analyses for samples received by the laboratory on October 4, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kerry K. McGee
Project Manager

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con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453
ATTN: James Bennett

REPORT DATE: 10/11/2019

PURCHASE ORDER NUMBER: 2-1922

PROJECT NUMBER: 2-1922

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19J0332

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Wakefield, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
Jacking Pit	19J0332-01	Ground Water		608.3	
				624.1	
				625.1	
				EPA 1664B	
				EPA 200.7	
				EPA 200.8	
				EPA 245.1	
				EPA 300.0	
				SM19-22 4500 NH3 C	MA M-MA-086/CT PH-0574/NY11148
				SM21-22 2540D	
				SM21-22 3500 Cr B	
				SM21-22 4500 CL G	
				SM21-22 4500 CN E	MA M-MA-086/CT PH-0574/NY11148
				Tri Chrome Calc.	
Receiving Pit	19J0332-02	Ground Water		608.3	
				624.1	
				625.1	
				EPA 1664B	
				EPA 200.7	
				EPA 200.8	
				EPA 245.1	
				EPA 300.0	
				SM19-22 4500 NH3 C	MA M-MA-086/CT PH-0574/NY11148
				SM21-22 2540D	
				SM21-22 3500 Cr B	
				SM21-22 4500 CL G	
				SM21-22 4500 CN E	MA M-MA-086/CT PH-0574/NY11148
				Tri Chrome Calc.	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

624.1

Qualifications:

L-01

Laboratory fortified blank /laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.

Analyte & Samples(s) Qualified:

1,4-Dioxane
B242540-BS1

625.1

Qualifications:

S-07

One associated surrogate standard recovery is outside of control limits but the other(s) is/are within limits. All recoveries are > 10%.

Analyte & Samples(s) Qualified:

2,4,6-Tribromophenol
B242457-BS1

2,4,6-Tribromophenol (SIM)
B242558-BS1

V-04

Initial calibration did not meet method specifications. Compound was calibrated using a response factor where %RSD is outside of method specified criteria. Reported result is estimated.

Analyte & Samples(s) Qualified:

Bis(2-ethylhexyl)phthalate (SIM)
19J0332-01[Jacking Pit], 19J0332-02[Receiving Pit], B242558-BLK1, B242558-BS1, B242558-BSD1, S041220-CCV1, S041260-CCV1

V-05

Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.

Analyte & Samples(s) Qualified:

Benzidine
19J0332-01[Jacking Pit], 19J0332-02[Receiving Pit], B242457-BLK1, B242457-BS1, B242457-BSD1, S041175-CCV1

V-35

Initial calibration verification (ICV) did not meet method specifications and was biased on the high side for this compound. Reported result is estimated.

Analyte & Samples(s) Qualified:

Benzidine
19J0332-01[Jacking Pit], 19J0332-02[Receiving Pit], B242457-BLK1, B242457-BS1, B242457-BSD1, S041175-CCV1

EPA 1664B

Qualifications:

PR-01

Sample preservative does not satisfy the method specifications.

Analyte & Samples(s) Qualified:

Silica Gel Treated HEM (SGT-HEM
19J0332-01[Jacking Pit], 19J0332-02[Receiving Pit]

EPA 300.0

Qualifications:

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:

Chloride
19J0332-02[Receiving Pit], B242527-MS1

SM21-22 4500 CL G

Qualifications:

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery.Possibility of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:

Chlorine, Residual

19J0332-02[Receiving Pit], B242358-MS1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Lisa A. Worthington
Technical Representative

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Jacking Pit | Sampled: 10/4/2019 10:30

Sample ID: 19J0332-01

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	<50.0	50.0	3.79	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
tert-Amyl Methyl Ether (TAME)	<0.500	0.500	0.140	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Benzene	<1.00	1.00	0.180	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Bromodichloromethane	<2.00	2.00	0.160	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Bromoform	<2.00	2.00	0.460	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Bromomethane	<5.00	5.00	0.780	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
tert-Butyl Alcohol (TBA)	<20.0	20.0	4.17	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Carbon Tetrachloride	<2.00	2.00	0.110	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Chlorobenzene	<2.00	2.00	0.150	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Chlorodibromomethane	<2.00	2.00	0.210	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Chloroethane	<2.00	2.00	0.350	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Chloroform	<2.00	2.00	0.170	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Chloromethane	<2.00	2.00	0.450	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,2-Dichlorobenzene	<2.00	2.00	0.160	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,3-Dichlorobenzene	<2.00	2.00	0.120	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,4-Dichlorobenzene	<2.00	2.00	0.130	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,2-Dichloroethane	<2.00	2.00	0.410	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,1-Dichloroethane	<2.00	2.00	0.160	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,1-Dichloroethylene	<2.00	2.00	0.320	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
trans-1,2-Dichloroethylene	<2.00	2.00	0.310	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,2-Dichloropropane	<2.00	2.00	0.200	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
cis-1,3-Dichloropropene	<2.00	2.00	0.130	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,4-Dioxane	<50.0	50.0	22.5	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
trans-1,3-Dichloropropene	<2.00	2.00	0.230	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Ethanol	<50.0	50.0	10.5	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Ethylbenzene	<2.00	2.00	0.130	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Methyl tert-Butyl Ether (MTBE)	0.260	2.00	0.250	µg/L	1	J	624.1	10/8/19	10/9/19 2:25	LBD
Methylene Chloride	<5.00	5.00	0.340	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,1,2,2-Tetrachloroethane	<2.00	2.00	0.220	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Tetrachloroethylene	<2.00	2.00	0.180	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Toluene	<1.00	1.00	0.140	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,1,1-Trichloroethane	<2.00	2.00	0.200	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
1,1,2-Trichloroethane	<2.00	2.00	0.160	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Trichloroethylene	<2.00	2.00	0.240	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Trichlorofluoromethane (Freon 11)	<2.00	2.00	0.330	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
Vinyl Chloride	<2.00	2.00	0.450	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
m+p Xylene	<2.00	2.00	0.300	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD
o-Xylene	<2.00	2.00	0.170	µg/L	1		624.1	10/8/19	10/9/19 2:25	LBD

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	98.3	70-130		10/9/19 2:25
Toluene-d8	106	70-130		10/9/19 2:25
4-Bromofluorobenzene	102	70-130		10/9/19 2:25

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Jacking Pit | Sampled: 10/4/2019 10:30

Sample ID: 19J0332-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Benzo(a)anthracene (SIM)	0.023	0.048	0.015	µg/L	1	J	625.1	10/7/19	10/8/19 16:13	IMR
Benzo(a)pyrene (SIM)	0.030	0.096	0.012	µg/L	1	J	625.1	10/7/19	10/8/19 16:13	IMR
Benzo(b)fluoranthene (SIM)	0.038	0.048	0.014	µg/L	1	J	625.1	10/7/19	10/8/19 16:13	IMR
Benzo(k)fluoranthene (SIM)	0.013	0.19	0.012	µg/L	1	J	625.1	10/7/19	10/8/19 16:13	IMR
Bis(2-ethylhexyl)phthalate (SIM)	<0.96	0.96	0.41	µg/L	1	V-04	625.1	10/7/19	10/8/19 16:13	IMR
Chrysene (SIM)	0.027	0.19	0.014	µg/L	1	J	625.1	10/7/19	10/8/19 16:13	IMR
Dibenz(a,h)anthracene (SIM)	<0.096	0.096	0.016	µg/L	1		625.1	10/7/19	10/8/19 16:13	IMR
Indeno(1,2,3-cd)pyrene (SIM)	0.025	0.096	0.017	µg/L	1	J	625.1	10/7/19	10/8/19 16:13	IMR
Pentachlorophenol (SIM)	<0.96	0.96	0.32	µg/L	1		625.1	10/7/19	10/8/19 16:13	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2-Fluorophenol (SIM)	36.8	15-110		10/8/19 16:13
Phenol-d6 (SIM)	29.0	15-110		10/8/19 16:13
Nitrobenzene-d5	71.0	30-130		10/8/19 16:13
2-Fluorobiphenyl	49.9	30-130		10/8/19 16:13
2,4,6-Tribromophenol (SIM)	92.9	15-110		10/8/19 16:13
p-Terphenyl-d14	76.0	30-130		10/8/19 16:13

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Jacking Pit | Sampled: 10/4/2019 10:30

Sample ID: 19J0332-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Acenaphthylene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Anthracene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Benzidine	<19.2	19.2	µg/L	1	V-05, V-35	625.1	10/7/19	10/8/19 12:30	BGL
Benzo(g,h,i)perylene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
4-Bromophenylphenylether	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Butylbenzylphthalate	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
4-Chloro-3-methylphenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Bis(2-chloroethyl)ether	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Bis(2-chloroisopropyl)ether	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2-Chloronaphthalene	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2-Chlorophenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
4-Chlorophenylphenylether	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Di-n-butylphthalate	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
1,3-Dichlorobenzene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
1,4-Dichlorobenzene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
1,2-Dichlorobenzene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
3,3-Dichlorobenzidine	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2,4-Dichlorophenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Diethylphthalate	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2,4-Dimethylphenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Dimethylphthalate	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
4,6-Dinitro-2-methylphenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2,4-Dinitrophenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2,4-Dinitrotoluene	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2,6-Dinitrotoluene	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Di-n-octylphthalate	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
1,2-Diphenylhydrazine/Azobenzene	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Bis(2-Ethylhexyl)phthalate	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Fluoranthene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Fluorene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Hexachlorobenzene	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Hexachlorobutadiene	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Hexachlorocyclopentadiene	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Hexachloroethane	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Isophorone	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Naphthalene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Nitrobenzene	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2-Nitrophenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
4-Nitrophenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
N-Nitrosodimethylamine	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
N-Nitrosodiphenylamine	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
N-Nitrosodi-n-propylamine	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2-Methylnaphthalene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Jacking Pit | Sampled: 10/4/2019 10:30

Sample ID: 19J0332-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Phenanthrene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2-Methylphenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Phenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
3/4-Methylphenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
Pyrene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
1,2,4-Trichlorobenzene	<4.81	4.81	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL
2,4,6-Trichlorophenol	<9.62	9.62	µg/L	1		625.1	10/7/19	10/8/19 12:30	BGL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2-Fluorophenol	42.2	15-110		10/8/19 12:30
Phenol-d6	32.9	15-110		10/8/19 12:30
Nitrobenzene-d5	64.5	30-130		10/8/19 12:30
2-Fluorobiphenyl	70.4	30-130		10/8/19 12:30
2,4,6-Tribromophenol	96.7	15-110		10/8/19 12:30
p-Terphenyl-d14	100	30-130		10/8/19 12:30

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Jacking Pit | Sampled: 10/4/2019 10:30

Sample ID: 19J0332-01

Sample Matrix: Ground Water

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	<0.0980	0.0980	0.0902	µg/L	1		608.3	10/7/19	10/9/19 20:09	TG
Aroclor-1221 [1]	<0.0980	0.0980	0.0789	µg/L	1		608.3	10/7/19	10/9/19 20:09	TG
Aroclor-1232 [1]	<0.0980	0.0980	0.0975	µg/L	1		608.3	10/7/19	10/9/19 20:09	TG
Aroclor-1242 [1]	<0.0980	0.0980	0.0848	µg/L	1		608.3	10/7/19	10/9/19 20:09	TG
Aroclor-1248 [1]	<0.0980	0.0980	0.0931	µg/L	1		608.3	10/7/19	10/9/19 20:09	TG
Aroclor-1254 [1]	<0.0980	0.0980	0.0515	µg/L	1		608.3	10/7/19	10/9/19 20:09	TG
Aroclor-1260 [1]	<0.0980	0.0980	0.0961	µg/L	1		608.3	10/7/19	10/9/19 20:09	TG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	57.3	30-150		10/9/19 20:09
Decachlorobiphenyl [2]	59.4	30-150		10/9/19 20:09
Tetrachloro-m-xylene [1]	68.1	30-150		10/9/19 20:09
Tetrachloro-m-xylene [2]	69.9	30-150		10/9/19 20:09

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Jacking Pit | Sampled: 10/4/2019 10:30

Sample ID: 19J0332-01

Sample Matrix: Ground Water

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Arsenic	21	0.80		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Cadmium	ND	0.20		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Chromium	5.6	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Chromium, Trivalent	0.0056			mg/L	1		Tri Chrome Calc.	10/8/19	10/9/19 14:01	QNW
Copper	5.0	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Iron	15	0.050		mg/L	1		EPA 200.7	10/8/19	10/9/19 15:21	MJH
Lead	4.9	0.50		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Mercury	ND	0.00010		mg/L	1		EPA 245.1	10/7/19	10/8/19 9:30	CJV
Nickel	6.3	5.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Selenium	ND	5.0	1.6	µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Silver	ND	0.20		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Zinc	ND	10		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:01	QNW
Hardness	67			mg/L	1		EPA 200.7	10/8/19	10/9/19 15:21	MJH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Jacking Pit | Sampled: 10/4/2019 10:30

Sample ID: 19J0332-01

Sample Matrix: Ground Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Chloride	150	10		mg/L	10		EPA 300.0	10/7/19	10/7/19 15:27	IS
Chlorine, Residual	0.034	0.020		mg/L	1		SM21-22 4500 CL G	10/4/19	10/4/19 22:26	KMV/IS
Hexavalent Chromium	ND	0.0040		mg/L	1		SM21-22 3500 Cr B	10/4/19	10/4/19 19:15	MJG
Total Suspended Solids	82	2.0		mg/L	1		SM21-22 2540D	10/8/19	10/8/19 13:15	LL
Silica Gel Treated HEM (SGT-HEM)	ND	2.8		mg/L	1	PR-01	EPA 1664B	10/8/19	10/8/19 13:15	LL

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Jacking Pit | Sampled: 10/4/2019 10:30

Sample ID: 19J0332-01

Sample Matrix: Ground Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ammonia as N	1.83	0.075	0.024	mg/L	1		SM19-22 4500 NH3 C		10/8/19 18:46	AAL
Cyanide	ND	0.005	0.001	mg/L	1		SM21-22 4500 CN E		10/8/19 11:17	AAL

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Receiving Pit | Sampled: 10/4/2019 12:30

Sample ID: 19J0332-02

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	<50.0	50.0	3.79	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
tert-Amyl Methyl Ether (TAME)	<0.500	0.500	0.140	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Benzene	<1.00	1.00	0.180	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Bromodichloromethane	<2.00	2.00	0.160	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Bromoform	<2.00	2.00	0.460	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Bromomethane	<5.00	5.00	0.780	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
tert-Butyl Alcohol (TBA)	<20.0	20.0	4.17	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Carbon Tetrachloride	<2.00	2.00	0.110	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Chlorobenzene	<2.00	2.00	0.150	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Chlorodibromomethane	<2.00	2.00	0.210	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Chloroethane	<2.00	2.00	0.350	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Chloroform	<2.00	2.00	0.170	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Chloromethane	<2.00	2.00	0.450	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,2-Dichlorobenzene	<2.00	2.00	0.160	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,3-Dichlorobenzene	<2.00	2.00	0.120	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,4-Dichlorobenzene	<2.00	2.00	0.130	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,2-Dichloroethane	<2.00	2.00	0.410	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,1-Dichloroethane	<2.00	2.00	0.160	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,1-Dichloroethylene	<2.00	2.00	0.320	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
trans-1,2-Dichloroethylene	<2.00	2.00	0.310	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,2-Dichloropropane	<2.00	2.00	0.200	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
cis-1,3-Dichloropropene	<2.00	2.00	0.130	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,4-Dioxane	<50.0	50.0	22.5	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
trans-1,3-Dichloropropene	<2.00	2.00	0.230	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Ethanol	<50.0	50.0	10.5	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Ethylbenzene	<2.00	2.00	0.130	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Methyl tert-Butyl Ether (MTBE)	<2.00	2.00	0.250	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Methylene Chloride	<5.00	5.00	0.340	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,1,2,2-Tetrachloroethane	<2.00	2.00	0.220	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Tetrachloroethylene	<2.00	2.00	0.180	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Toluene	<1.00	1.00	0.140	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,1,1-Trichloroethane	<2.00	2.00	0.200	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
1,1,2-Trichloroethane	<2.00	2.00	0.160	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Trichloroethylene	<2.00	2.00	0.240	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Trichlorofluoromethane (Freon 11)	<2.00	2.00	0.330	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
Vinyl Chloride	<2.00	2.00	0.450	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
m+p Xylene	<2.00	2.00	0.300	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD
o-Xylene	<2.00	2.00	0.170	µg/L	1		624.1	10/8/19	10/9/19 2:56	LBD

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	99.4	70-130		10/9/19 2:56
Toluene-d8	104	70-130		10/9/19 2:56
4-Bromofluorobenzene	100	70-130		10/9/19 2:56

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Receiving Pit | Sampled: 10/4/2019 12:30

Sample ID: 19J0332-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Benzo(a)anthracene (SIM)	<0.050	0.050	0.016	µg/L	1		625.1	10/7/19	10/9/19 9:57	CLA
Benzo(a)pyrene (SIM)	<0.10	0.10	0.012	µg/L	1		625.1	10/7/19	10/9/19 9:57	CLA
Benzo(b)fluoranthene (SIM)	<0.050	0.050	0.015	µg/L	1		625.1	10/7/19	10/9/19 9:57	CLA
Benzo(k)fluoranthene (SIM)	<0.20	0.20	0.012	µg/L	1		625.1	10/7/19	10/9/19 9:57	CLA
Bis(2-ethylhexyl)phthalate (SIM)	<1.0	1.0	0.43	µg/L	1	V-04	625.1	10/7/19	10/9/19 9:57	CLA
Chrysene (SIM)	<0.20	0.20	0.015	µg/L	1		625.1	10/7/19	10/9/19 9:57	CLA
Dibenz(a,h)anthracene (SIM)	<0.10	0.10	0.017	µg/L	1		625.1	10/7/19	10/9/19 9:57	CLA
Indeno(1,2,3-cd)pyrene (SIM)	<0.10	0.10	0.018	µg/L	1		625.1	10/7/19	10/9/19 9:57	CLA
Pentachlorophenol (SIM)	<1.0	1.0	0.33	µg/L	1		625.1	10/7/19	10/9/19 9:57	CLA

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2-Fluorophenol (SIM)	51.9	15-110		10/9/19 9:57
Phenol-d6 (SIM)	40.1	15-110		10/9/19 9:57
Nitrobenzene-d5	99.9	30-130		10/9/19 9:57
2-Fluorobiphenyl	69.8	30-130		10/9/19 9:57
2,4,6-Tribromophenol (SIM)	109	15-110		10/9/19 9:57
p-Terphenyl-d14	85.9	30-130		10/9/19 9:57

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Receiving Pit | Sampled: 10/4/2019 12:30

Sample ID: 19J0332-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Acenaphthylene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Anthracene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Benzidine	<20.0	20.0	µg/L	1	V-05, V-35	625.1	10/7/19	10/8/19 12:54	BGL
Benzo(g,h,i)perylene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
4-Bromophenylphenylether	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Butylbenzylphthalate	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
4-Chloro-3-methylphenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Bis(2-chloroethyl)ether	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Bis(2-chloroisopropyl)ether	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2-Chloronaphthalene	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2-Chlorophenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
4-Chlorophenylphenylether	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Di-n-butylphthalate	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
1,3-Dichlorobenzene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
1,4-Dichlorobenzene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
1,2-Dichlorobenzene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
3,3-Dichlorobenzidine	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2,4-Dichlorophenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Diethylphthalate	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2,4-Dimethylphenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Dimethylphthalate	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
4,6-Dinitro-2-methylphenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2,4-Dinitrophenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2,4-Dinitrotoluene	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2,6-Dinitrotoluene	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Di-n-octylphthalate	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
1,2-Diphenylhydrazine/Azobenzene	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Bis(2-Ethylhexyl)phthalate	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Fluoranthene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Fluorene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Hexachlorobenzene	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Hexachlorobutadiene	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Hexachlorocyclopentadiene	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Hexachloroethane	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Isophorone	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Naphthalene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Nitrobenzene	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2-Nitrophenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
4-Nitrophenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
N-Nitrosodimethylamine	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
N-Nitrosodiphenylamine	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
N-Nitrosodi-n-propylamine	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2-Methylnaphthalene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Receiving Pit | Sampled: 10/4/2019 12:30

Sample ID: 19J0332-02

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Phenanthrene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2-Methylphenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Phenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
3/4-Methylphenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
Pyrene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
1,2,4-Trichlorobenzene	<5.00	5.00	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL
2,4,6-Trichlorophenol	<10.0	10.0	µg/L	1		625.1	10/7/19	10/8/19 12:54	BGL

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
2-Fluorophenol	53.5	15-110		10/8/19 12:54
Phenol-d6	38.3	15-110		10/8/19 12:54
Nitrobenzene-d5	84.8	30-130		10/8/19 12:54
2-Fluorobiphenyl	87.2	30-130		10/8/19 12:54
2,4,6-Tribromophenol	105	15-110		10/8/19 12:54
p-Terphenyl-d14	105	30-130		10/8/19 12:54

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Receiving Pit | Sampled: 10/4/2019 12:30

Sample ID: 19J0332-02

Sample Matrix: Ground Water

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	<0.0976	0.0976	0.0898	µg/L	1		608.3	10/7/19	10/9/19 20:22	TG
Aroclor-1221 [1]	<0.0976	0.0976	0.0785	µg/L	1		608.3	10/7/19	10/9/19 20:22	TG
Aroclor-1232 [1]	<0.0976	0.0976	0.0971	µg/L	1		608.3	10/7/19	10/9/19 20:22	TG
Aroclor-1242 [1]	<0.0976	0.0976	0.0844	µg/L	1		608.3	10/7/19	10/9/19 20:22	TG
Aroclor-1248 [1]	<0.0976	0.0976	0.0927	µg/L	1		608.3	10/7/19	10/9/19 20:22	TG
Aroclor-1254 [1]	<0.0976	0.0976	0.0512	µg/L	1		608.3	10/7/19	10/9/19 20:22	TG
Aroclor-1260 [1]	<0.0976	0.0976	0.0956	µg/L	1		608.3	10/7/19	10/9/19 20:22	TG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	61.4	30-150		10/9/19 20:22
Decachlorobiphenyl [2]	63.4	30-150		10/9/19 20:22
Tetrachloro-m-xylene [1]	67.1	30-150		10/9/19 20:22
Tetrachloro-m-xylene [2]	69.0	30-150		10/9/19 20:22

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Receiving Pit | Sampled: 10/4/2019 12:30

Sample ID: 19J0332-02

Sample Matrix: Ground Water

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Arsenic	1.2	0.80		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Cadmium	ND	0.20		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Chromium	4.4	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Chromium, Trivalent	0.0044			mg/L	1		Tri Chrome Calc.	10/8/19	10/9/19 14:04	QNW
Copper	7.8	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Iron	1.1	0.050		mg/L	1		EPA 200.7	10/8/19	10/9/19 15:28	MJH
Lead	5.3	0.50		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Mercury	ND	0.00010		mg/L	1		EPA 245.1	10/7/19	10/8/19 9:12	CJV
Nickel	ND	5.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Selenium	ND	5.0	1.6	µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Silver	ND	0.20		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Zinc	15	10		µg/L	1		EPA 200.8	10/8/19	10/9/19 14:04	QNW
Hardness	110			mg/L	1		EPA 200.7	10/8/19	10/9/19 15:28	MJH

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Receiving Pit | Sampled: 10/4/2019 12:30

Sample ID: 19J0332-02

Sample Matrix: Ground Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Chloride	240	10		mg/L	10	MS-19	EPA 300.0	10/7/19	10/7/19 15:46	IS
Chlorine, Residual	ND	0.020		mg/L	1	MS-07	SM21-22 4500 CL G	10/4/19	10/4/19 19:00	KMV/IS
Hexavalent Chromium	ND	0.0040		mg/L	1		SM21-22 3500 Cr B	10/4/19	10/4/19 19:15	MJG
Total Suspended Solids	65	2.0		mg/L	1		SM21-22 2540D	10/8/19	10/8/19 13:15	LL
Silica Gel Treated HEM (SGT-HEM)	ND	2.8		mg/L	1	PR-01	EPA 1664B	10/8/19	10/8/19 13:15	LL

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0332

Date Received: 10/4/2019

Field Sample #: Receiving Pit | Sampled: 10/4/2019 12:30

Sample ID: 19J0332-02

Sample Matrix: Ground Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ammonia as N	0.135	0.075	0.024	mg/L	1		SM19-22 4500 NH3 C		10/8/19 18:47	AAL
Cyanide	0.002	0.005	0.001	mg/L	1		SM21-22 4500 CN E		10/8/19 11:18	AAL

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Sample Extraction Data

Prep Method: SW-846 3510C-608.3

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242458	1020	5.00	10/07/19
19J0332-02 [Receiving Pit]	B242458	1020	5.00	10/07/19

Prep Method: SW-846 5030B-624.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242540	5	5.00	10/08/19
19J0332-02 [Receiving Pit]	B242540	5	5.00	10/08/19

Prep Method: SW-846 3510C-625.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242457	1040	1.00	10/07/19
19J0332-02 [Receiving Pit]	B242457	1000	1.00	10/07/19

Prep Method: SW-846 3510C-625.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242558	1040	1.00	10/07/19
19J0332-02 [Receiving Pit]	B242558	1000	1.00	10/07/19

EPA 1664B

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242521	500		10/08/19
19J0332-02 [Receiving Pit]	B242521	500		10/08/19

Prep Method: EPA 200.7-EPA 200.7

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242571	50.0	50.0	10/08/19
19J0332-01 [Jacking Pit]	B242571	50.0		10/08/19
19J0332-02 [Receiving Pit]	B242571	50.0	50.0	10/08/19
19J0332-02 [Receiving Pit]	B242571	50.0		10/08/19

Prep Method: EPA 200.8-EPA 200.8

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242570	50.0	50.0	10/08/19
19J0332-02 [Receiving Pit]	B242570	50.0	50.0	10/08/19

Prep Method: EPA 245.1-EPA 245.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242472	6.00	6.00	10/07/19
19J0332-02 [Receiving Pit]	B242472	6.00	6.00	10/07/19

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Sample Extraction Data

Prep Method: EPA 300.0-EPA 300.0

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242527	10.0	10.0	10/07/19
19J0332-02 [Receiving Pit]	B242527	10.0	10.0	10/07/19

SM21-22 2540D

Lab Number [Field ID]	Batch	Initial [mL]	Date
19J0332-01 [Jacking Pit]	B242524	250	10/08/19
19J0332-02 [Receiving Pit]	B242524	250	10/08/19

SM21-22 3500 Cr B

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242355	50.0	50.0	10/04/19
19J0332-02 [Receiving Pit]	B242355	50.0	50.0	10/04/19

SM21-22 4500 CL G

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0332-01 [Jacking Pit]	B242358	100	100	10/04/19
19J0332-02 [Receiving Pit]	B242358	100	100	10/04/19

Prep Method: EPA 200.8-Tri Chrome Calc.

Lab Number [Field ID]	Batch	Initial [mL]	Date
19J0332-01 [Jacking Pit]	B242570	50.0	10/08/19
19J0332-02 [Receiving Pit]	B242570	50.0	10/08/19

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242540 - SW-846 5030B										
Blank (B242540-BLK1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Acetone	ND	50.0	µg/L							
tert-Amyl Methyl Ether (TAME)	ND	0.500	µg/L							
Benzene	ND	1.00	µg/L							
Bromodichloromethane	ND	2.00	µg/L							
Bromoform	ND	2.00	µg/L							
Bromomethane	ND	2.00	µg/L							
tert-Butyl Alcohol (TBA)	ND	20.0	µg/L							
Carbon Tetrachloride	ND	2.00	µg/L							
Chlorobenzene	ND	2.00	µg/L							
Chlorodibromomethane	ND	2.00	µg/L							
Chloroethane	ND	2.00	µg/L							
Chloroform	ND	2.00	µg/L							
Chloromethane	ND	2.00	µg/L							
1,2-Dichlorobenzene	ND	2.00	µg/L							
1,3-Dichlorobenzene	ND	2.00	µg/L							
1,4-Dichlorobenzene	ND	2.00	µg/L							
1,2-Dichloroethane	ND	2.00	µg/L							
1,1-Dichloroethane	ND	2.00	µg/L							
1,1-Dichloroethylene	ND	2.00	µg/L							
trans-1,2-Dichloroethylene	ND	2.00	µg/L							
1,2-Dichloropropane	ND	2.00	µg/L							
cis-1,3-Dichloropropene	ND	2.00	µg/L							
1,4-Dioxane	ND	50.0	µg/L							
trans-1,3-Dichloropropene	ND	2.00	µg/L							
Ethanol	ND	50.0	µg/L							
Ethylbenzene	ND	2.00	µg/L							
Methyl tert-Butyl Ether (MTBE)	ND	2.00	µg/L							
Methylene Chloride	ND	5.00	µg/L							
1,1,2,2-Tetrachloroethane	ND	2.00	µg/L							
Tetrachloroethylene	ND	2.00	µg/L							
Toluene	ND	1.00	µg/L							
1,1,1-Trichloroethane	ND	2.00	µg/L							
1,1,2-Trichloroethane	ND	2.00	µg/L							
Trichloroethylene	ND	2.00	µg/L							
Trichlorofluoromethane (Freon 11)	ND	2.00	µg/L							
Vinyl Chloride	ND	2.00	µg/L							
m+p Xylene	ND	2.00	µg/L							
o-Xylene	ND	2.00	µg/L							
Surrogate: 1,2-Dichloroethane-d4	*24.2*		µg/L	25.0		96.9	70-130			
Surrogate: Toluene-d8	*26.3*		µg/L	25.0		105	70-130			
Surrogate: 4-Bromofluorobenzene	*24.8*		µg/L	25.0		99.2	70-130			
LCS (B242540-BS1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Acetone	200	50.0	µg/L	200		98.2	70-160			†
tert-Amyl Methyl Ether (TAME)	19	0.500	µg/L	20.0		92.7	70-130			
Benzene	18	1.00	µg/L	20.0		87.8	65-135			
Bromodichloromethane	19	2.00	µg/L	20.0		94.8	65-135			
Bromoform	18	2.00	µg/L	20.0		90.4	70-130			
Bromomethane	10	2.00	µg/L	20.0		52.0	15-185			
tert-Butyl Alcohol (TBA)	250	20.0	µg/L	200		124	40-160			†
Carbon Tetrachloride	17	2.00	µg/L	20.0		87.3	70-130			
Chlorobenzene	19	2.00	µg/L	20.0		95.6	65-135			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes	
Batch B242540 - SW-846 5030B												
LCS (B242540-BS1)				Prepared: 10/08/19 Analyzed: 10/09/19								
Chlorodibromomethane	20	2.00	µg/L	20.0		100		70-135				
Chloroethane	16	2.00	µg/L	20.0		80.7		40-160				
Chloroform	18	2.00	µg/L	20.0		87.5		70-135				
Chloromethane	8.7	2.00	µg/L	20.0		43.6		20-205				
1,2-Dichlorobenzene	19	2.00	µg/L	20.0		95.9		65-135				
1,3-Dichlorobenzene	19	2.00	µg/L	20.0		94.2		70-130				
1,4-Dichlorobenzene	19	2.00	µg/L	20.0		93.4		65-135				
1,2-Dichloroethane	21	2.00	µg/L	20.0		104		70-130				
1,1-Dichloroethane	18	2.00	µg/L	20.0		91.5		70-130				
1,1-Dichloroethylene	18	2.00	µg/L	20.0		88.0		50-150				
trans-1,2-Dichloroethylene	19	2.00	µg/L	20.0		94.2		70-130				
1,2-Dichloropropane	20	2.00	µg/L	20.0		101		35-165				
cis-1,3-Dichloropropene	18	2.00	µg/L	20.0		90.8		25-175				
1,4-Dioxane	320	50.0	µg/L	200		**161**	*	40-130			L-01	†
trans-1,3-Dichloropropene	18	2.00	µg/L	20.0		90.4		50-150				
Ethanol	270	50.0	µg/L	200		137		40-160				
Ethylbenzene	18	2.00	µg/L	20.0		89.4		60-140				
Methyl tert-Butyl Ether (MTBE)	19	2.00	µg/L	20.0		95.9		70-130				
Methylene Chloride	17	5.00	µg/L	20.0		83.4		60-140				
1,1,2,2-Tetrachloroethane	22	2.00	µg/L	20.0		112		60-140				
Tetrachloroethylene	21	2.00	µg/L	20.0		104		70-130				
Toluene	19	1.00	µg/L	20.0		95.3		70-130				
1,1,1-Trichloroethane	18	2.00	µg/L	20.0		88.2		70-130				
1,1,2-Trichloroethane	21	2.00	µg/L	20.0		106		70-130				
Trichloroethylene	19	2.00	µg/L	20.0		97.2		65-135				
Trichlorofluoromethane (Freon 11)	15	2.00	µg/L	20.0		75.0		50-150				
Vinyl Chloride	14	2.00	µg/L	20.0		68.2		5-195				
m+p Xylene	35	2.00	µg/L	40.0		87.8		70-130				
o-Xylene	18	2.00	µg/L	20.0		88.7		70-130				
Surrogate: 1,2-Dichloroethane-d4	*23.8*		µg/L	25.0		95.4		70-130				
Surrogate: Toluene-d8	*26.9*		µg/L	25.0		107		70-130				
Surrogate: 4-Bromofluorobenzene	*24.6*		µg/L	25.0		98.4		70-130				

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QUALITY CONTROL

Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B242558 - SW-846 3510C											
Blank (B242558-BLK1)				Prepared: 10/07/19 Analyzed: 10/08/19							
Benzo(a)anthracene (SIM)	ND	0.050	µg/L								
Benzo(a)pyrene (SIM)	ND	0.10	µg/L								
Benzo(b)fluoranthene (SIM)	ND	0.050	µg/L								
Benzo(k)fluoranthene (SIM)	ND	0.20	µg/L								
Bis(2-ethylhexyl)phthalate (SIM)	ND	1.0	µg/L								V-04
Chrysene (SIM)	ND	0.20	µg/L								
Dibenz(a,h)anthracene (SIM)	ND	0.10	µg/L								
Indeno(1,2,3-cd)pyrene (SIM)	ND	0.10	µg/L								
Pentachlorophenol (SIM)	ND	1.0	µg/L								
Surrogate: 2-Fluorophenol (SIM)	*102*		µg/L	200		51.1		15-110			
Surrogate: Phenol-d6 (SIM)	*78.3*		µg/L	200		39.2		15-110			
Surrogate: Nitrobenzene-d5	*86.2*		µg/L	100		86.2		30-130			
Surrogate: 2-Fluorobiphenyl	*59.2*		µg/L	100		59.2		30-130			
Surrogate: 2,4,6-Tribromophenol (SIM)	*185*		µg/L	200		92.3		15-110			
Surrogate: p-Terphenyl-d14	*80.4*		µg/L	100		80.4		30-130			
LCS (B242558-BS1)				Prepared: 10/07/19 Analyzed: 10/08/19							
Benzo(a)anthracene (SIM)	47.9	1.0	µg/L	50.0		95.8		33-143			
Benzo(a)pyrene (SIM)	48.1	2.0	µg/L	50.0		96.3		17-163			
Benzo(b)fluoranthene (SIM)	52.1	1.0	µg/L	50.0		104		24-159			
Benzo(k)fluoranthene (SIM)	52.0	4.0	µg/L	50.0		104		11-162			
Bis(2-ethylhexyl)phthalate (SIM)	50.5	20	µg/L	50.0		101		8-158			V-04
Chrysene (SIM)	47.1	4.0	µg/L	50.0		94.2		17-168			
Dibenz(a,h)anthracene (SIM)	53.6	2.0	µg/L	50.0		107		10-227			
Indeno(1,2,3-cd)pyrene (SIM)	53.9	2.0	µg/L	50.0		108		10-171			
Pentachlorophenol (SIM)	36.3	20	µg/L	50.0		72.6		14-176			
Surrogate: 2-Fluorophenol (SIM)	*114*		µg/L	200		57.0		15-110			
Surrogate: Phenol-d6 (SIM)	*89.9*		µg/L	200		44.9		15-110			
Surrogate: Nitrobenzene-d5	*94.1*		µg/L	100		94.1		30-130			
Surrogate: 2-Fluorobiphenyl	*76.6*		µg/L	100		76.6		30-130			
Surrogate: 2,4,6-Tribromophenol (SIM)	*230*		µg/L	200		**115**	*	15-110			S-07
Surrogate: p-Terphenyl-d14	*78.8*		µg/L	100		78.8		30-130			
LCS Dup (B242558-BSD1)				Prepared: 10/07/19 Analyzed: 10/08/19							
Benzo(a)anthracene (SIM)	44.4	1.0	µg/L	50.0		88.8		33-143	7.67	53	
Benzo(a)pyrene (SIM)	44.9	2.0	µg/L	50.0		89.8		17-163	6.96	72	
Benzo(b)fluoranthene (SIM)	48.6	1.0	µg/L	50.0		97.3		24-159	6.83	71	
Benzo(k)fluoranthene (SIM)	48.4	4.0	µg/L	50.0		96.8		11-162	7.21	63	
Bis(2-ethylhexyl)phthalate (SIM)	47.3	20	µg/L	50.0		94.6		8-158	6.46	82	V-04
Chrysene (SIM)	43.6	4.0	µg/L	50.0		87.2		17-168	7.67	87	
Dibenz(a,h)anthracene (SIM)	49.9	2.0	µg/L	50.0		99.9		10-227	7.03	126	
Indeno(1,2,3-cd)pyrene (SIM)	49.9	2.0	µg/L	50.0		99.9		10-171	7.59	99	‡
Pentachlorophenol (SIM)	32.4	20	µg/L	50.0		64.9		14-176	11.2	86	
Surrogate: 2-Fluorophenol (SIM)	*106*		µg/L	200		53.0		15-110			
Surrogate: Phenol-d6 (SIM)	*81.4*		µg/L	200		40.7		15-110			
Surrogate: Nitrobenzene-d5	*89.5*		µg/L	100		89.5		30-130			
Surrogate: 2-Fluorobiphenyl	*69.0*		µg/L	100		69.0		30-130			
Surrogate: 2,4,6-Tribromophenol (SIM)	*216*		µg/L	200		108		15-110			
Surrogate: p-Terphenyl-d14	*75.4*		µg/L	100		75.4		30-130			

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QUALITY CONTROL

Semivolatile Organic Compounds by - GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242457 - SW-846 3510C										
Blank (B242457-BLK1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Acenaphthene	ND	5.00	µg/L							
Acenaphthylene	ND	5.00	µg/L							
Anthracene	ND	5.00	µg/L							
Benzidine	ND	20.0	µg/L							V-05, V-35
Benzo(g,h,i)perylene	ND	5.00	µg/L							
4-Bromophenylphenylether	ND	10.0	µg/L							
Butylbenzylphthalate	ND	10.0	µg/L							
4-Chloro-3-methylphenol	ND	10.0	µg/L							
Bis(2-chloroethyl)ether	ND	10.0	µg/L							
Bis(2-chloroisopropyl)ether	ND	10.0	µg/L							
2-Chloronaphthalene	ND	10.0	µg/L							
2-Chlorophenol	ND	10.0	µg/L							
4-Chlorophenylphenylether	ND	10.0	µg/L							
Di-n-butylphthalate	ND	10.0	µg/L							
1,3-Dichlorobenzene	ND	5.00	µg/L							
1,4-Dichlorobenzene	ND	5.00	µg/L							
1,2-Dichlorobenzene	ND	5.00	µg/L							
3,3-Dichlorobenzidine	ND	10.0	µg/L							
2,4-Dichlorophenol	ND	10.0	µg/L							
Diethylphthalate	ND	10.0	µg/L							
2,4-Dimethylphenol	ND	10.0	µg/L							
Dimethylphthalate	ND	10.0	µg/L							
4,6-Dinitro-2-methylphenol	ND	10.0	µg/L							
2,4-Dinitrophenol	ND	10.0	µg/L							
2,4-Dinitrotoluene	ND	10.0	µg/L							
2,6-Dinitrotoluene	ND	10.0	µg/L							
Di-n-octylphthalate	ND	10.0	µg/L							
1,2-Diphenylhydrazine/Azobenzene	ND	10.0	µg/L							
Bis(2-Ethylhexyl)phthalate	ND	10.0	µg/L							
Fluoranthene	ND	5.00	µg/L							
Fluorene	ND	5.00	µg/L							
Hexachlorobenzene	ND	10.0	µg/L							
Hexachlorobutadiene	ND	10.0	µg/L							
Hexachlorocyclopentadiene	ND	10.0	µg/L							
Hexachloroethane	ND	10.0	µg/L							
Isophorone	ND	10.0	µg/L							
Naphthalene	ND	5.00	µg/L							
Nitrobenzene	ND	10.0	µg/L							
2-Nitrophenol	ND	10.0	µg/L							
4-Nitrophenol	ND	10.0	µg/L							
N-Nitrosodimethylamine	ND	10.0	µg/L							
N-Nitrosodiphenylamine	ND	10.0	µg/L							
N-Nitrosodi-n-propylamine	ND	10.0	µg/L							
2-Methylnaphthalene	ND	5.00	µg/L							
Phenanthrene	ND	5.00	µg/L							
2-Methylphenol	ND	10.0	µg/L							
Phenol	ND	10.0	µg/L							
3/4-Methylphenol	ND	10.0	µg/L							
Pyrene	ND	5.00	µg/L							
1,2,4-Trichlorobenzene	ND	5.00	µg/L							
2,4,6-Trichlorophenol	ND	10.0	µg/L							
Surrogate: 2-Fluorophenol	*113*		µg/L	200		56.7	15-110			

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QUALITY CONTROL

Semivolatile Organic Compounds by - GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242457 - SW-846 3510C										
Blank (B242457-BLK1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Surrogate: Phenol-d6	*83.6*		µg/L	200		41.8	15-110			
Surrogate: Nitrobenzene-d5	*79.5*		µg/L	100		79.5	30-130			
Surrogate: 2-Fluorobiphenyl	*84.6*		µg/L	100		84.6	30-130			
Surrogate: 2,4,6-Tribromophenol	*196*		µg/L	200		98.2	15-110			
Surrogate: p-Terphenyl-d14	*99.5*		µg/L	100		99.5	30-130			
LCS (B242457-BS1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Acenaphthene	46.1	5.00	µg/L	50.0		92.3	47-145			
Acenaphthylene	46.7	5.00	µg/L	50.0		93.4	33-145			
Anthracene	46.6	5.00	µg/L	50.0		93.2	27-133			
Benzidine	60.1	20.0	µg/L	50.0		120	40-140			V-05, V-35
Benzo(g,h,i)perylene	47.7	5.00	µg/L	50.0		95.4	10-219			
4-Bromophenylphenylether	42.2	10.0	µg/L	50.0		84.5	53-127			
Butylbenzylphthalate	49.1	10.0	µg/L	50.0		98.2	10-152			
4-Chloro-3-methylphenol	47.1	10.0	µg/L	50.0		94.2	22-147			
Bis(2-chloroethyl)ether	48.3	10.0	µg/L	50.0		96.7	12-158			
Bis(2-chloroisopropyl)ether	56.5	10.0	µg/L	50.0		113	36-166			
2-Chloronaphthalene	40.8	10.0	µg/L	50.0		81.5	60-120			
2-Chlorophenol	45.7	10.0	µg/L	50.0		91.4	23-134			
4-Chlorophenylphenylether	46.5	10.0	µg/L	50.0		93.0	25-158			
Di-n-butylphthalate	45.8	10.0	µg/L	50.0		91.7	10-120			
1,3-Dichlorobenzene	39.6	5.00	µg/L	50.0		79.3	10-172			
1,4-Dichlorobenzene	40.2	5.00	µg/L	50.0		80.3	20-124			
1,2-Dichlorobenzene	42.6	5.00	µg/L	50.0		85.2	32-129			
3,3-Dichlorobenzidine	54.7	10.0	µg/L	50.0		109	10-262			
2,4-Dichlorophenol	47.0	10.0	µg/L	50.0		94.0	39-135			
Diethylphthalate	47.1	10.0	µg/L	50.0		94.3	10-120			
2,4-Dimethylphenol	42.1	10.0	µg/L	50.0		84.2	32-120			
Dimethylphthalate	47.7	10.0	µg/L	50.0		95.4	10-120			
4,6-Dinitro-2-methylphenol	43.1	10.0	µg/L	50.0		86.2	10-181			
2,4-Dinitrophenol	48.6	10.0	µg/L	50.0		97.1	10-191			
2,4-Dinitrotoluene	49.4	10.0	µg/L	50.0		98.8	39-139			
2,6-Dinitrotoluene	52.0	10.0	µg/L	50.0		104	50-158			
Di-n-octylphthalate	52.3	10.0	µg/L	50.0		105	4-146			
1,2-Diphenylhydrazine/Azobenzene	42.9	10.0	µg/L	50.0		85.8	40-140			
Bis(2-Ethylhexyl)phthalate	50.7	10.0	µg/L	50.0		101	8-158			
Fluoranthene	48.3	5.00	µg/L	50.0		96.5	26-137			
Fluorene	47.5	5.00	µg/L	50.0		95.1	59-121			
Hexachlorobenzene	43.3	10.0	µg/L	50.0		86.5	10-152			
Hexachlorobutadiene	38.0	10.0	µg/L	50.0		76.0	24-120			
Hexachlorocyclopentadiene	36.2	10.0	µg/L	50.0		72.3	40-140			
Hexachloroethane	38.8	10.0	µg/L	50.0		77.5	40-120			
Isophorone	49.4	10.0	µg/L	50.0		98.7	21-196			
Naphthalene	44.8	5.00	µg/L	50.0		89.6	21-133			
Nitrobenzene	42.8	10.0	µg/L	50.0		85.7	35-180			
2-Nitrophenol	46.4	10.0	µg/L	50.0		92.8	29-182			
4-Nitrophenol	24.6	10.0	µg/L	50.0		49.3	10-132			
N-Nitrosodimethylamine	28.0	10.0	µg/L	50.0		56.0	40-140			
N-Nitrosodiphenylamine	ND	10.0	µg/L	50.0			40-140	*		
N-Nitrosodi-n-propylamine	48.3	10.0	µg/L	50.0		96.6	10-230			
2-Methylnaphthalene	49.4	5.00	µg/L	50.0		98.8	40-140			
Phenanthrene	45.6	5.00	µg/L	50.0		91.3	54-120			

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QUALITY CONTROL

Semivolatile Organic Compounds by - GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B242457 - SW-846 3510C											
LCS (B242457-BS1)				Prepared: 10/07/19 Analyzed: 10/08/19							
2-Methylphenol	45.5	10.0	µg/L	50.0		91.1		40-140			
Phenol	23.6	10.0	µg/L	50.0		47.2		5-120			
3/4-Methylphenol	40.7	10.0	µg/L	50.0		81.4		40-140			
Pyrene	48.6	5.00	µg/L	50.0		97.1		52-120			
1,2,4-Trichlorobenzene	42.3	5.00	µg/L	50.0		84.6		44-142			
2,4,6-Trichlorophenol	47.6	10.0	µg/L	50.0		95.2		37-144			
Surrogate: 2-Fluorophenol	*135*		µg/L	200		67.3		15-110			
Surrogate: Phenol-d6	*101*		µg/L	200		50.6		15-110			
Surrogate: Nitrobenzene-d5	*90.1*		µg/L	100		90.1		30-130			
Surrogate: 2-Fluorobiphenyl	*97.1*		µg/L	100		97.1		30-130			
Surrogate: 2,4,6-Tribromophenol	*229*		µg/L	200		**114**	*	15-110			S-07
Surrogate: p-Terphenyl-d14	*111*		µg/L	100		111		30-130			
LCS Dup (B242457-BSD1)				Prepared: 10/07/19 Analyzed: 10/08/19							
Acenaphthene	43.7	5.00	µg/L	50.0		87.4		47-145	5.41	48	
Acenaphthylene	44.7	5.00	µg/L	50.0		89.3		33-145	4.46	74	
Anthracene	44.3	5.00	µg/L	50.0		88.5		27-133	5.11	66	
Benzidine	52.6	20.0	µg/L	50.0		105		40-140	13.3	30	V-05, V-35
Benzo(g,h,i)perylene	46.4	5.00	µg/L	50.0		92.7		10-219	2.87	97	
4-Bromophenylphenylether	40.7	10.0	µg/L	50.0		81.5		53-127	3.64	43	
Butylbenzylphthalate	46.8	10.0	µg/L	50.0		93.6		10-152	4.84	60	
4-Chloro-3-methylphenol	45.7	10.0	µg/L	50.0		91.4		22-147	2.93	73	
Bis(2-chloroethyl)ether	45.8	10.0	µg/L	50.0		91.6		12-158	5.40	108	
Bis(2-chloroisopropyl)ether	54.4	10.0	µg/L	50.0		109		36-166	3.91	76	
2-Chloronaphthalene	38.8	10.0	µg/L	50.0		77.5		60-120	5.03	24	
2-Chlorophenol	43.3	10.0	µg/L	50.0		86.5		23-134	5.42	61	
4-Chlorophenylphenylether	44.0	10.0	µg/L	50.0		88.1		25-158	5.45	61	
Di-n-butylphthalate	43.8	10.0	µg/L	50.0		87.7		10-120	4.46	47	
1,3-Dichlorobenzene	38.6	5.00	µg/L	50.0		77.2		10-172	2.74	30	
1,4-Dichlorobenzene	38.9	5.00	µg/L	50.0		77.8		20-124	3.11	30	
1,2-Dichlorobenzene	40.7	5.00	µg/L	50.0		81.3		32-129	4.61	30	
3,3-Dichlorobenzidine	52.4	10.0	µg/L	50.0		105		10-262	4.24	108	
2,4-Dichlorophenol	45.2	10.0	µg/L	50.0		90.5		39-135	3.82	50	
Diethylphthalate	44.3	10.0	µg/L	50.0		88.6		10-120	6.23	100	
2,4-Dimethylphenol	41.1	10.0	µg/L	50.0		82.3		32-120	2.28	58	
Dimethylphthalate	45.4	10.0	µg/L	50.0		90.9		10-120	4.83	183	
4,6-Dinitro-2-methylphenol	41.9	10.0	µg/L	50.0		83.9		10-181	2.68	203	
2,4-Dinitrophenol	46.6	10.0	µg/L	50.0		93.2		10-191	4.10	132	
2,4-Dinitrotoluene	48.0	10.0	µg/L	50.0		96.0		39-139	2.81	42	
2,6-Dinitrotoluene	49.5	10.0	µg/L	50.0		99.1		50-158	4.94	48	
Di-n-octylphthalate	49.6	10.0	µg/L	50.0		99.1		4-146	5.36	69	
1,2-Diphenylhydrazine/Azobenzene	41.4	10.0	µg/L	50.0		82.8		40-140	3.51	30	
Bis(2-Ethylhexyl)phthalate	48.3	10.0	µg/L	50.0		96.7		8-158	4.75	82	
Fluoranthene	45.7	5.00	µg/L	50.0		91.4		26-137	5.51	66	
Fluorene	44.9	5.00	µg/L	50.0		89.8		59-121	5.67	38	
Hexachlorobenzene	41.6	10.0	µg/L	50.0		83.3		10-152	3.86	55	
Hexachlorobutadiene	38.3	10.0	µg/L	50.0		76.5		24-120	0.735	62	
Hexachlorocyclopentadiene	34.9	10.0	µg/L	50.0		69.8		40-140	3.60	30	
Hexachloroethane	38.4	10.0	µg/L	50.0		76.7		40-120	0.985	52	
Isophorone	47.9	10.0	µg/L	50.0		95.8		21-196	2.96	93	
Naphthalene	43.8	5.00	µg/L	50.0		87.6		21-133	2.28	65	
Nitrobenzene	42.1	10.0	µg/L	50.0		84.3		35-180	1.62	62	

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QUALITY CONTROL

Semivolatile Organic Compounds by - GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B242457 - SW-846 3510C											
LCS Dup (B242457-BSD1)				Prepared: 10/07/19 Analyzed: 10/08/19							
2-Nitrophenol	44.9	10.0	µg/L	50.0		89.9		29-182	3.24	55	
4-Nitrophenol	23.2	10.0	µg/L	50.0		46.5		10-132	5.89	131	
N-Nitrosodimethylamine	25.9	10.0	µg/L	50.0		51.9		40-140	7.71	30	
N-Nitrosodiphenylamine	ND	10.0	µg/L	50.0			*	40-140	NC	30	
N-Nitrosodi-n-propylamine	46.2	10.0	µg/L	50.0		92.5		10-230	4.40	87	
2-Methylnaphthalene	47.7	5.00	µg/L	50.0		95.4		40-140	3.44	30	
Phenanthrene	44.0	5.00	µg/L	50.0		87.9		54-120	3.75	39	
2-Methylphenol	41.6	10.0	µg/L	50.0		83.2		40-140	9.02	30	
Phenol	22.9	10.0	µg/L	50.0		45.8		5-120	2.92	64	
3/4-Methylphenol	38.3	10.0	µg/L	50.0		76.6		40-140	6.10	30	
Pyrene	46.8	5.00	µg/L	50.0		93.5		52-120	3.80	49	
1,2,4-Trichlorobenzene	41.5	5.00	µg/L	50.0		82.9		44-142	1.93	50	
2,4,6-Trichlorophenol	46.1	10.0	µg/L	50.0		92.2		37-144	3.16	58	
Surrogate: 2-Fluorophenol	*127*		µg/L	200		63.7		15-110			
Surrogate: Phenol-d6	*93.7*		µg/L	200		46.8		15-110			
Surrogate: Nitrobenzene-d5	*86.5*		µg/L	100		86.5		30-130			
Surrogate: 2-Fluorobiphenyl	*91.7*		µg/L	100		91.7		30-130			
Surrogate: 2,4,6-Tribromophenol	*215*		µg/L	200		108		15-110			
Surrogate: p-Terphenyl-d14	*108*		µg/L	100		108		30-130			

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QUALITY CONTROL

Polychlorinated Biphenyls By GC/ECD - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242458 - SW-846 3510C										
Blank (B242458-BLK1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Aroclor-1016	ND	0.0400	µg/L							
Aroclor-1016 [2C]	ND	0.0400	µg/L							
Aroclor-1221	ND	0.0400	µg/L							
Aroclor-1221 [2C]	ND	0.0400	µg/L							
Aroclor-1232	ND	0.0400	µg/L							
Aroclor-1232 [2C]	ND	0.0400	µg/L							
Aroclor-1242	ND	0.0400	µg/L							
Aroclor-1242 [2C]	ND	0.0400	µg/L							
Aroclor-1248	ND	0.0400	µg/L							
Aroclor-1248 [2C]	ND	0.0400	µg/L							
Aroclor-1254	ND	0.0400	µg/L							
Aroclor-1254 [2C]	ND	0.0400	µg/L							
Aroclor-1260	ND	0.0400	µg/L							
Aroclor-1260 [2C]	ND	0.0400	µg/L							
Surrogate: Decachlorobiphenyl	*0.393*		µg/L	0.400		98.2	30-150			
Surrogate: Decachlorobiphenyl [2C]	*0.394*		µg/L	0.400		98.6	30-150			
Surrogate: Tetrachloro-m-xylene	*0.347*		µg/L	0.400		86.7	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*0.347*		µg/L	0.400		86.8	30-150			
LCS (B242458-BS1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Aroclor-1016	0.460	0.200	µg/L	0.500		92.0	50-140			
Aroclor-1016 [2C]	0.490	0.200	µg/L	0.500		97.9	50-140			
Aroclor-1260	0.436	0.200	µg/L	0.500		87.2	8-140			
Aroclor-1260 [2C]	0.469	0.200	µg/L	0.500		93.8	8-140			
Surrogate: Decachlorobiphenyl	*1.82*		µg/L	2.00		90.8	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.83*		µg/L	2.00		91.3	30-150			
Surrogate: Tetrachloro-m-xylene	*1.74*		µg/L	2.00		86.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*1.75*		µg/L	2.00		87.5	30-150			
LCS Dup (B242458-BSD1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Aroclor-1016	0.471	0.200	µg/L	0.500		94.1	50-140	2.32		
Aroclor-1016 [2C]	0.507	0.200	µg/L	0.500		101	50-140	3.50		
Aroclor-1260	0.455	0.200	µg/L	0.500		90.9	8-140	4.22		
Aroclor-1260 [2C]	0.492	0.200	µg/L	0.500		98.4	8-140	4.79		
Surrogate: Decachlorobiphenyl	*1.88*		µg/L	2.00		94.0	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.90*		µg/L	2.00		95.0	30-150			
Surrogate: Tetrachloro-m-xylene	*1.72*		µg/L	2.00		86.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*1.75*		µg/L	2.00		87.3	30-150			

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242472 - EPA 245.1										
Blank (B242472-BLK1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Mercury	ND	0.00010	mg/L							
LCS (B242472-BS1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Mercury	0.00383	0.00010	mg/L	0.00400		95.8	85-115			
LCS Dup (B242472-BSD1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Mercury	0.00389	0.00010	mg/L	0.00400		97.2	85-115	1.45	20	
Duplicate (B242472-DUP1)		**Source: 19J0332-02**		Prepared: 10/07/19 Analyzed: 10/08/19						
Mercury	ND	0.00010	mg/L		ND			NC	30	
Matrix Spike (B242472-MS1)		**Source: 19J0332-02**		Prepared: 10/07/19 Analyzed: 10/08/19						
Mercury	0.00368	0.00010	mg/L	0.00400	ND	92.1	75-125			
Batch B242570 - EPA 200.8										
Blank (B242570-BLK1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Antimony	ND	1.0	µg/L							
Arsenic	ND	0.80	µg/L							
Cadmium	ND	0.20	µg/L							
Chromium	ND	1.0	µg/L							
Copper	ND	1.0	µg/L							
Lead	ND	0.50	µg/L							
Nickel	ND	5.0	µg/L							
Selenium	ND	5.0	µg/L							
Silver	ND	0.20	µg/L							
Zinc	ND	10	µg/L							
LCS (B242570-BS1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Antimony	514	10	µg/L	500		103	85-115			
Arsenic	504	8.0	µg/L	500		101	85-115			
Cadmium	501	2.0	µg/L	500		100	85-115			
Chromium	502	10	µg/L	500		100	85-115			
Copper	989	10	µg/L	1000		98.9	85-115			
Lead	512	5.0	µg/L	500		102	85-115			
Nickel	497	50	µg/L	500		99.3	85-115			
Selenium	508	50	µg/L	500		102	85-115			
Silver	501	2.0	µg/L	500		100	85-115			
Zinc	1020	100	µg/L	1000		102	85-115			
LCS Dup (B242570-BSD1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Antimony	518	10	µg/L	500		104	85-115	0.838	20	
Arsenic	501	8.0	µg/L	500		100	85-115	0.571	20	
Cadmium	508	2.0	µg/L	500		102	85-115	1.38	20	
Chromium	520	10	µg/L	500		104	85-115	3.52	20	
Copper	1010	10	µg/L	1000		101	85-115	2.06	20	
Lead	521	5.0	µg/L	500		104	85-115	1.85	20	
Nickel	514	50	µg/L	500		103	85-115	3.45	20	
Selenium	509	50	µg/L	500		102	85-115	0.255	20	
Silver	503	2.0	µg/L	500		101	85-115	0.458	20	
Zinc	1010	100	µg/L	1000		101	85-115	1.57	20	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242571 - EPA 200.7										
Blank (B242571-BLK1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Iron	ND	0.050	mg/L							
LCS (B242571-BS1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Iron	4.18	0.050	mg/L	4.00		105	85-115			
LCS Dup (B242571-BSD1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Iron	4.14	0.050	mg/L	4.00		103	85-115	1.02	20	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B242355 - SM21-22 3500 Cr B											
Blank (B242355-BLK1)				Prepared & Analyzed: 10/04/19							
Hexavalent Chromium	ND	0.0040	mg/L								
LCS (B242355-BS1)				Prepared & Analyzed: 10/04/19							
Hexavalent Chromium	0.11	0.0040	mg/L	0.100		109		83.9-121			
LCS Dup (B242355-BSD1)				Prepared & Analyzed: 10/04/19							
Hexavalent Chromium	0.10	0.0040	mg/L	0.100		104		83.9-121	5.09	10	
Duplicate (B242355-DUP1)		**Source: 19J0332-02**		Prepared & Analyzed: 10/04/19							
Hexavalent Chromium	ND	0.0040	mg/L		ND				NC	45.7	
Matrix Spike (B242355-MS1)		**Source: 19J0332-02**		Prepared & Analyzed: 10/04/19							
Hexavalent Chromium	0.037	0.0040	mg/L	0.100	ND	37.4		25.5-193			
Batch B242358 - SM21-22 4500 CL G											
Blank (B242358-BLK1)				Prepared & Analyzed: 10/04/19							
Chlorine, Residual	ND	0.020	mg/L								
LCS (B242358-BS1)				Prepared & Analyzed: 10/04/19							
Chlorine, Residual	1.6	0.020	mg/L	1.34		117		66.3-134			
LCS Dup (B242358-BSD1)				Prepared & Analyzed: 10/04/19							
Chlorine, Residual	1.6	0.020	mg/L	1.34		120		66.3-134	2.74	9.96	
Duplicate (B242358-DUP1)		**Source: 19J0332-02**		Prepared & Analyzed: 10/04/19							
Chlorine, Residual	ND	0.020	mg/L		ND				NC	32.5	
Matrix Spike (B242358-MS1)		**Source: 19J0332-02**		Prepared & Analyzed: 10/04/19							
Chlorine, Residual	0.12	0.020	mg/L	100	ND	**0.116**	*	10-167			MS-07
Batch B242521 - EPA 1664B											
Blank (B242521-BLK1)				Prepared & Analyzed: 10/08/19							
Silica Gel Treated HEM (SGT-HEM)	ND	1.4	mg/L								
Blank (B242521-BLK2)				Prepared & Analyzed: 10/08/19							
Silica Gel Treated HEM (SGT-HEM)	ND	7.0	mg/L								
LCS (B242521-BS1)				Prepared & Analyzed: 10/08/19							
Silica Gel Treated HEM (SGT-HEM)	10		mg/L	10.0		103		64-132			

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC		%REC Limits	RPD	RPD Limit	Notes
Batch B242521 - EPA 1664B											
LCS (B242521-BS2)				Prepared & Analyzed: 10/08/19							
Silica Gel Treated HEM (SGT-HEM)	52		mg/L	50.0		105		64-132			
Batch B242524 - SM21-22 2540D											
Blank (B242524-BLK1)				Prepared & Analyzed: 10/08/19							
Total Suspended Solids	ND	2.5	mg/L								
LCS (B242524-BS1)				Prepared & Analyzed: 10/08/19							
Total Suspended Solids	158	10	mg/L	200		79.0		57.6-118			
MRL Check (B242524-MRL1)				Prepared & Analyzed: 10/08/19							
Total Suspended Solids	5.00	5.0	mg/L	5.00		100		0-200			
Batch B242527 - EPA 300.0											
Blank (B242527-BLK1)				Prepared & Analyzed: 10/07/19							
Chloride	ND	1.0	mg/L								
LCS (B242527-BS1)				Prepared & Analyzed: 10/07/19							
Chloride	10		mg/L	10.0		103		90-110			
LCS Dup (B242527-BSD1)				Prepared & Analyzed: 10/07/19							
Chloride	10		mg/L	10.0		103		90-110	0.0590	20	
Duplicate (B242527-DUP1)	**Source: 19J0332-02**			Prepared & Analyzed: 10/07/19							
Chloride	240	10	mg/L		240				0.0111	20	
Matrix Spike (B242527-MS1)	**Source: 19J0332-02**			Prepared & Analyzed: 10/07/19							
Chloride	320		mg/L	100	240	**78.8**	*	80-120			MS-19

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

608.3

LCS

Lab Sample ID: B242458-BS1 Date(s) Analyzed: 10/08/2019 10/08/2019

Instrument ID (1): ECD1 Instrument ID (2): ECD1

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.460	
	2	0.000	0.000	0.000	0.490	6.3
Aroclor-1260	1	0.000	0.000	0.000	0.436	
	2	0.000	0.000	0.000	0.469	6.4

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

608.3

LCS Dup

Lab Sample ID: B242458-BSD1 Date(s) Analyzed: 10/08/2019 10/08/2019

Instrument ID (1): ECD1 Instrument ID (2): ECD1

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.471	
	2	0.000	0.000	0.000	0.507	7.6
Aroclor-1260	1	0.000	0.000	0.000	0.455	
	2	0.000	0.000	0.000	0.492	6.7

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.

J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-01	Laboratory fortified blank /laboratory control sample recovery outside of control limits. Data validation is not affected since all results are "not detected" for all samples in this batch for this compound and bias is on the high side.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery.Possibility of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
PR-01	Sample preservative does not satisfy the method specifications.
S-07	One associated surrogate standard recovery is outside of control limits but the other(s) is/are within limits. All recoveries are > 10%.
V-04	Initial calibration did not meet method specifications. Compound was calibrated using a response factor where %RSD is outside of method specified criteria. Reported result is estimated.
V-05	Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.
V-35	Initial calibration verification (ICV) did not meet method specifications and was biased on the high side for this compound. Reported result is estimated.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
608.3 in Water	
Aroclor-1016	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1016 [2C]	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1221	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1221 [2C]	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1232	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1232 [2C]	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1242	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1242 [2C]	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1248	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1248 [2C]	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1254	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1254 [2C]	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1260	CT,MA,NH,NY,RI,NC,ME,VA
Aroclor-1260 [2C]	CT,MA,NH,NY,RI,NC,ME,VA
624.1 in Water	
Acetone	CT,NY,MA,NH
tert-Amyl Methyl Ether (TAME)	MA
Benzene	CT,NY,MA,NH,RI,NC,ME,VA
Bromodichloromethane	CT,NY,MA,NH,RI,NC,ME,VA
Bromoform	CT,NY,MA,NH,RI,NC,ME,VA
Bromomethane	CT,NY,MA,NH,RI,NC,ME,VA
tert-Butyl Alcohol (TBA)	NY,MA
Carbon Tetrachloride	CT,NY,MA,NH,RI,NC,ME,VA
Chlorobenzene	CT,NY,MA,NH,RI,NC,ME,VA
Chlorodibromomethane	CT,NY,MA,NH,RI,NC,ME,VA
Chloroethane	CT,NY,MA,NH,RI,NC,ME,VA
Chloroform	CT,NY,MA,NH,RI,NC,ME,VA
Chloromethane	CT,NY,MA,NH,RI,NC,ME,VA
1,2-Dichlorobenzene	CT,NY,MA,NH,RI,NC,ME,VA
1,3-Dichlorobenzene	CT,NY,MA,NH,RI,NC,ME,VA
1,4-Dichlorobenzene	CT,NY,MA,NH,RI,NC,ME,VA
1,2-Dichloroethane	CT,NY,MA,NH,RI,NC,ME,VA
1,1-Dichloroethane	CT,NY,MA,NH,RI,NC,ME,VA
1,1-Dichloroethylene	CT,NY,MA,NH,RI,NC,ME,VA
trans-1,2-Dichloroethylene	CT,NY,MA,NH,RI,NC,ME,VA
1,2-Dichloropropane	CT,NY,MA,NH,RI,NC,ME,VA
cis-1,3-Dichloropropene	CT,NY,MA,NH,RI,NC,ME,VA
1,4-Dioxane	MA
trans-1,3-Dichloropropene	CT,NY,MA,NH,RI,NC,ME,VA
Ethanol	NY,MA,NH
Ethylbenzene	CT,NY,MA,NH,RI,NC,ME,VA
Methyl tert-Butyl Ether (MTBE)	NY,MA,NH,NC
Methylene Chloride	CT,NY,MA,NH,RI,NC,ME,VA
Naphthalene	NY,MA,NC
1,1,2,2-Tetrachloroethane	CT,NY,MA,NH,RI,NC,ME,VA
Tetrachloroethylene	CT,NY,MA,NH,RI,NC,ME,VA

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
624.1 in Water	
Toluene	CT,NY,MA,NH,RI,NC,ME,VA
1,2,4-Trichlorobenzene	MA,NC
1,1,1-Trichloroethane	CT,NY,MA,NH,RI,NC,ME,VA
1,1,2-Trichloroethane	CT,NY,MA,NH,RI,NC,ME,VA
Trichloroethylene	CT,NY,MA,NH,RI,NC,ME,VA
Trichlorofluoromethane (Freon 11)	CT,NY,MA,NH,RI,NC,ME,VA
Vinyl Chloride	CT,NY,MA,NH,RI,NC,ME,VA
m+p Xylene	CT,NY,MA,NH,RI,NC
o-Xylene	CT,NY,MA,NH,RI,NC
625.1 in Water	
Acenaphthene	CT,MA,NH,NY,NC,RI,ME,VA
Acenaphthylene	CT,MA,NH,NY,NC,RI,ME,VA
Anthracene	CT,MA,NH,NY,NC,RI,ME,VA
Benzidine	CT,MA,NH,NY,NC,RI,ME,VA
Benzo(g,h,i)perylene	CT,MA,NH,NY,NC,RI,ME,VA
4-Bromophenylphenylether	CT,MA,NH,NY,NC,RI,ME,VA
Butylbenzylphthalate	CT,MA,NH,NY,NC,RI,ME,VA
4-Chloro-3-methylphenol	CT,MA,NH,NY,NC,RI,VA
Bis(2-chloroethyl)ether	CT,MA,NH,NY,NC,RI,ME,VA
Bis(2-chloroisopropyl)ether	CT,MA,NH,NY,NC,RI,ME,VA
2-Chloronaphthalene	CT,MA,NH,NY,NC,RI,ME,VA
2-Chlorophenol	CT,MA,NH,NY,NC,RI,ME,VA
4-Chlorophenylphenylether	CT,MA,NH,NY,NC,RI,ME,VA
Di-n-butylphthalate	CT,MA,NH,NY,NC,RI,ME,VA
1,3-Dichlorobenzene	MA,NC
1,4-Dichlorobenzene	MA,NC
1,2-Dichlorobenzene	MA,NC
3,3-Dichlorobenzidine	CT,MA,NH,NY,NC,RI,ME,VA
2,4-Dichlorophenol	CT,MA,NH,NY,NC,RI,ME,VA
Diethylphthalate	CT,MA,NH,NY,NC,RI,ME,VA
2,4-Dimethylphenol	CT,MA,NH,NY,NC,RI,ME,VA
Dimethylphthalate	CT,MA,NH,NY,NC,RI,ME,VA
4,6-Dinitro-2-methylphenol	CT,MA,NH,NY,NC,RI,ME,VA
2,4-Dinitrophenol	CT,MA,NH,NY,NC,RI,ME,VA
2,4-Dinitrotoluene	CT,MA,NH,NY,NC,RI,ME,VA
2,6-Dinitrotoluene	CT,MA,NH,NY,NC,RI,ME,VA
Di-n-octylphthalate	CT,MA,NH,NY,NC,RI,ME,VA
1,2-Diphenylhydrazine/Azobenzene	NC
Bis(2-Ethylhexyl)phthalate	CT,MA,NH,NY,NC,RI,ME,VA
Fluoranthene	CT,MA,NH,NY,NC,RI,ME,VA
Fluorene	CT,MA,NH,NY,NC,RI,ME,VA
Hexachlorobenzene	CT,MA,NH,NY,NC,RI,ME,VA
Hexachlorobutadiene	CT,MA,NH,NY,NC,RI,ME,VA
Hexachlorocyclopentadiene	CT,MA,NH,NY,NC,RI,ME,VA
Hexachloroethane	CT,MA,NH,NY,NC,RI,ME,VA
Isophorone	CT,MA,NH,NY,NC,RI,ME,VA

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
625.1 in Water	
Naphthalene	CT,MA,NH,NY,NC,RI,ME,VA
Nitrobenzene	CT,MA,NH,NY,NC,RI,ME,VA
2-Nitrophenol	CT,MA,NH,NY,NC,RI,ME,VA
4-Nitrophenol	CT,MA,NH,NY,NC,RI,ME,VA
N-Nitrosodimethylamine	CT,MA,NH,NY,NC,RI,ME,VA
N-Nitrosodiphenylamine	CT,MA,NH,NY,NC,RI,ME,VA
N-Nitrosodi-n-propylamine	CT,MA,NH,NY,NC,RI,ME,VA
2-Methylnaphthalene	NC
Phenanthrene	CT,MA,NH,NY,NC,RI,ME,VA
2-Methylphenol	NY,NC
Phenol	CT,MA,NH,NY,NC,RI,ME,VA
3/4-Methylphenol	NY,NC
Pyrene	CT,MA,NH,NY,NC,RI,ME,VA
1,2,4-Trichlorobenzene	CT,MA,NH,NY,NC,RI,ME,VA
2,4,6-Trichlorophenol	CT,MA,NH,NY,NC,RI,ME,VA
2-Fluorophenol	NC
2-Fluorophenol	NC,VA
Phenol-d6	VA
Nitrobenzene-d5	VA
EPA 200.7 in Water	
Iron	CT,MA,NH,NY,RI,NC,ME,VA
Hardness	CT,MA,NH,NY,RI,VA
EPA 200.8 in Water	
Antimony	CT,MA,NH,NY,RI,NC,ME,VA
Arsenic	CT,MA,NH,NY,RI,NC,ME,VA
Cadmium	CT,MA,NH,NY,RI,NC,ME,VA
Chromium	CT,MA,NH,NY,RI,NC,ME,VA
Copper	CT,MA,NH,NY,RI,NC,ME,VA
Lead	CT,MA,NH,NY,RI,NC,ME,VA
Nickel	CT,MA,NH,NY,RI,NC,ME,VA
Selenium	CT,MA,NH,NY,RI,NC,ME,VA
Silver	CT,MA,NH,NY,RI,NC,ME,VA
Zinc	CT,MA,NH,NY,RI,NC,ME,VA
EPA 245.1 in Water	
Mercury	CT,MA,NH,RI,NY,NC,ME,VA
EPA 300.0 in Water	
Chloride	NC,NY,MA,VA,ME,NH,CT,RI
SM19-22 4500 NH3 C in Water	
Ammonia as N	NY,MA,CT,RI,VA,NC,ME
SM21-22 2540D in Water	
Total Suspended Solids	CT,MA,NH,NY,RI,NC,ME,VA
SM21-22 3500 Cr B in Water	
Hexavalent Chromium	NY,CT,NH,RI,ME,VA,NC
SM21-22 4500 CL G in Water	

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SM21-22 4500 CL G in Water	
Chlorine, Residual	CT,MA,RI,ME
SM21-22 4500 CN E in Water	
Cyanide	CT,MA,NH,NY,RI,NC,ME,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2020
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2020
RI	Rhode Island Department of Health	LAO00112	12/30/2019
NC	North Carolina Div. of Water Quality	652	12/31/2019
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2019
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020

1903332

con-test® ANALYTICAL LABORATORY

KKM

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Email: info@contestlabs.com

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

Doc # 381 Rev 1_03242017

39 Spruce Street
East Longmeadow, MA 01028

Page _____ of _____

Company Name: LRT
Address: 89 Crawford Street Leominster MA
Phone: 774-450-7177
Project Name: NGRID Wakefield
Project Location: Wakefield MA
Project Number: 2-1922
Project Manager: John Henry / Jamey Bennett
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By: JAB

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date: 15 Day

Rush-Approval Required
1-Day ☐ 3-Day ☑
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☑ EXCEL ☐
Other:
CLP Like Data Pkg Required: ☐
Email To: jbennett@lrt-llc.net
jjennings@lrt-llc.net

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code
1	Jacking Pit	10/4/19	10:30		X	GW	U
2	Receiving Pit	10/4/19	15:30		X	GW	U

ANALYSIS REQUESTED

# of Containers	2	2	2	2	2	6	4	4	4	2	2	2
[2] Preservation Code	S	I	I	N	X	H	I	I	I	I	N	I
[3] Container Code	P	P	P	P	P	V	A	A	A	P	P	P
	Ammonia	Chloride	TRC	Metals (Sb, Ar, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Zn)	Cyanide	VOCs	Semi Vocs	PCBs	TPH	TSS	Hardness	Chromium VI
1	X	X	X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X	X	X	X	X

Dissolved Metals Samples
○ Field Filtered
○ Lab to Filter

Orthophosphate Samples
○ Field Filtered
○ Lab to Filter

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] Container Codes:
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Comments: Samples for an NPDES RGP.

MW-1 pH = 6.4
pH: MW-2 pH = 6.4

Run Cr III per James B.
-KKM 10/7/19

Please use the following codes to indicate possible sample concentration within the **Conc Code** column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

	Date/Time:
Relinquished by: (signature)	
Received by: (signature)	10/4/19 3:33
Relinquished by: (signature)	10/4/19 3:35
Received by: (signature)	
Relinquished by: (signature)	10/4/19
Received by: (signature)	10/4/19 1732

Detection Limit Requirements
MA
CT
Other

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☐ CT RCP Required
RCP Certification Form Required
☐ MA State DW Required
PWSID #

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NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☐ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

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I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

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Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client LRT

Received By SA Date 10/4/19 Time 1732

How were the samples received? In Cooler T No Cooler ____ On Ice T No Ice ____ Direct from Sampling ____ Ambient ____ Melted Ice ____

Were samples within Temperature? 2-6°C T By Gun # 2 Actual Temp - 4.7, 4.8 By Blank # ____ Actual Temp - ____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Project T Analysis T ID's T Sampler Name T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? ____

Are there Rushes? F Who was notified? ____

Are there Short Holds? ~~F~~ SA T Who was notified? Irma

Is there enough Volume? T

Is there Headspace where applicable? F MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? Acid pH<2 Base pH >12

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.	12	1 Liter Plastic	2	16 oz Amb.	
HCL-		500 mL Amb.	6	500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic	14	4oz Amb/Clear	
Bisulfate-		Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

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October 11, 2019

James Bennett
Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453

Project Location: Wakefield, MA
Client Job Number:
Project Number: 2-1922
Laboratory Work Order Number: 19J0329

Enclosed are results of analyses for samples received by the laboratory on October 4, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kerry K. McGee
Project Manager

Table of Contents

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Lockwood Remediation Technologies, LLC
89 Crawford Street
Leominster, MA 01453
ATTN: James Bennett

REPORT DATE: 10/11/2019

PURCHASE ORDER NUMBER: 2-1922

PROJECT NUMBER: 2-1922

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19J0329

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Wakefield, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
Receiving Water	19J0329-01	Ground Water		EPA 200.7	
				EPA 200.8	
				EPA 245.1	
				SM19-22 4500 NH3 C	MA M-MA-086/CT PH-0574/NY11148
				SM21-22 2540D	
				SM21-22 3500 Cr B	
				SM21-22 4500 CL G	
				Tri Chrome Calc.	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Lisa A. Worthington
Technical Representative

con-test® ANALYTICAL LABORATORY
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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0329

Date Received: 10/4/2019

Field Sample #: Receiving Water | Sampled: 10/4/2019 12:30

Sample ID: 19J0329-01

Sample Matrix: Ground Water

Metals Analyses (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Arsenic	1.6	0.80		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Cadmium	ND	0.20		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Chromium	1.7	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Chromium, Trivalent	0.0017			mg/L	1		Tri Chrome Calc.	10/8/19	10/9/19 13:58	QNW
Copper	2.2	1.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Iron	1.0	0.050		mg/L	1		EPA 200.7	10/8/19	10/9/19 15:06	MJH
Lead	0.91	0.50		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Mercury	ND	0.00010		mg/L	1		EPA 245.1	10/7/19	10/8/19 9:28	CJV
Nickel	ND	5.0		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Selenium	ND	5.0	1.6	µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Silver	ND	0.20		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Zinc	ND	10		µg/L	1		EPA 200.8	10/8/19	10/9/19 13:58	QNW
Hardness	100			mg/L	1		EPA 200.7	10/8/19	10/9/19 15:06	MJH

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0329

Date Received: 10/4/2019

Field Sample #: Receiving Water | Sampled: 10/4/2019 12:30

Sample ID: 19J0329-01

Sample Matrix: Ground Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Chlorine, Residual	ND	0.040		mg/L	2		SM21-22 4500 CL G	10/4/19	10/4/19 22:26	KMV/IS
Hexavalent Chromium	ND	0.0040		mg/L	1		SM21-22 3500 Cr B	10/4/19	10/4/19 19:15	MJG
Total Suspended Solids	5.2	2.0		mg/L	1		SM21-22 2540D	10/6/19	10/6/19 13:40	LL

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Project Location: Wakefield, MA | Sample Description: | Work Order: 19J0329

Date Received: 10/4/2019

Field Sample #: Receiving Water | Sampled: 10/4/2019 12:30

Sample ID: 19J0329-01

Sample Matrix: Ground Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ammonia as N	0.065	0.075	0.024	mg/L	1		SM19-22 4500 NH3 C		10/8/19 18:45	AAL

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Sample Extraction Data

Prep Method: EPA 200.7-EPA 200.7

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0329-01 [Receiving Water]	B242571	50.0	50.0	10/08/19
19J0329-01 [Receiving Water]	B242571	50.0		10/08/19

Prep Method: EPA 200.8-EPA 200.8

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0329-01 [Receiving Water]	B242570	50.0	50.0	10/08/19

Prep Method: EPA 245.1-EPA 245.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0329-01 [Receiving Water]	B242472	6.00	6.00	10/07/19

SM21-22 2540D

Lab Number [Field ID]	Batch	Initial [mL]	Date
19J0329-01 [Receiving Water]	B242401	250	10/06/19

SM21-22 3500 Cr B

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0329-01 [Receiving Water]	B242355	50.0	50.0	10/04/19

SM21-22 4500 CL G

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19J0329-01 [Receiving Water]	B242358	100	100	10/04/19

Prep Method: EPA 200.8-Tri Chrome Calc.

Lab Number [Field ID]	Batch	Initial [mL]	Date
19J0329-01 [Receiving Water]	B242570	50.0	10/08/19

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242472 - EPA 245.1										
Blank (B242472-BLK1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Mercury	ND	0.00010	mg/L							
LCS (B242472-BS1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Mercury	0.00383	0.00010	mg/L	0.00400		95.8	85-115			
LCS Dup (B242472-BSD1)				Prepared: 10/07/19 Analyzed: 10/08/19						
Mercury	0.00389	0.00010	mg/L	0.00400		97.2	85-115	1.45	20	
Batch B242570 - EPA 200.8										
Blank (B242570-BLK1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Antimony	ND	1.0	µg/L							
Arsenic	ND	0.80	µg/L							
Cadmium	ND	0.20	µg/L							
Chromium	ND	1.0	µg/L							
Copper	ND	1.0	µg/L							
Lead	ND	0.50	µg/L							
Nickel	ND	5.0	µg/L							
Selenium	ND	5.0	µg/L							
Silver	ND	0.20	µg/L							
Zinc	ND	10	µg/L							
LCS (B242570-BS1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Antimony	514	10	µg/L	500		103	85-115			
Arsenic	504	8.0	µg/L	500		101	85-115			
Cadmium	501	2.0	µg/L	500		100	85-115			
Chromium	502	10	µg/L	500		100	85-115			
Copper	989	10	µg/L	1000		98.9	85-115			
Lead	512	5.0	µg/L	500		102	85-115			
Nickel	497	50	µg/L	500		99.3	85-115			
Selenium	508	50	µg/L	500		102	85-115			
Silver	501	2.0	µg/L	500		100	85-115			
Zinc	1020	100	µg/L	1000		102	85-115			
LCS Dup (B242570-BSD1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Antimony	518	10	µg/L	500		104	85-115	0.838	20	
Arsenic	501	8.0	µg/L	500		100	85-115	0.571	20	
Cadmium	508	2.0	µg/L	500		102	85-115	1.38	20	
Chromium	520	10	µg/L	500		104	85-115	3.52	20	
Copper	1010	10	µg/L	1000		101	85-115	2.06	20	
Lead	521	5.0	µg/L	500		104	85-115	1.85	20	
Nickel	514	50	µg/L	500		103	85-115	3.45	20	
Selenium	509	50	µg/L	500		102	85-115	0.255	20	
Silver	503	2.0	µg/L	500		101	85-115	0.458	20	
Zinc	1010	100	µg/L	1000		101	85-115	1.57	20	

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QUALITY CONTROL

Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242571 - EPA 200.7										
Blank (B242571-BLK1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Iron	ND	0.050	mg/L							
LCS (B242571-BS1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Iron	4.18	0.050	mg/L	4.00		105	85-115			
LCS Dup (B242571-BSD1)				Prepared: 10/08/19 Analyzed: 10/09/19						
Iron	4.14	0.050	mg/L	4.00		103	85-115	1.02	20	

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QUALITY CONTROL

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B242355 - SM21-22 3500 Cr B										
Blank (B242355-BLK1)				Prepared & Analyzed: 10/04/19						
Hexavalent Chromium	ND	0.0040	mg/L							
LCS (B242355-BS1)				Prepared & Analyzed: 10/04/19						
Hexavalent Chromium	0.11	0.0040	mg/L	0.100		109	83.9-121			
LCS Dup (B242355-BSD1)				Prepared & Analyzed: 10/04/19						
Hexavalent Chromium	0.10	0.0040	mg/L	0.100		104	83.9-121	5.09	10	
Batch B242358 - SM21-22 4500 CL G										
Blank (B242358-BLK1)				Prepared & Analyzed: 10/04/19						
Chlorine, Residual	ND	0.020	mg/L							
LCS (B242358-BS1)				Prepared & Analyzed: 10/04/19						
Chlorine, Residual	1.6	0.020	mg/L	1.34		117	66.3-134			
LCS Dup (B242358-BSD1)				Prepared & Analyzed: 10/04/19						
Chlorine, Residual	1.6	0.020	mg/L	1.34		120	66.3-134	2.74	9.96	
Batch B242401 - SM21-22 2540D										
Blank (B242401-BLK1)				Prepared & Analyzed: 10/06/19						
Total Suspended Solids	ND	2.5	mg/L							
LCS (B242401-BS1)				Prepared & Analyzed: 10/06/19						
Total Suspended Solids	170	10	mg/L	200		85.0	57.6-118			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level

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

No results have been blank subtracted unless specified in the case narrative section.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.7 in Water	
Iron	CT,MA,NH,NY,RI,NC,ME,VA
Hardness	CT,MA,NH,NY,RI,VA
EPA 200.8 in Water	
Antimony	CT,MA,NH,NY,RI,NC,ME,VA
Arsenic	CT,MA,NH,NY,RI,NC,ME,VA
Cadmium	CT,MA,NH,NY,RI,NC,ME,VA
Chromium	CT,MA,NH,NY,RI,NC,ME,VA
Copper	CT,MA,NH,NY,RI,NC,ME,VA
Lead	CT,MA,NH,NY,RI,NC,ME,VA
Nickel	CT,MA,NH,NY,RI,NC,ME,VA
Selenium	CT,MA,NH,NY,RI,NC,ME,VA
Silver	CT,MA,NH,NY,RI,NC,ME,VA
Zinc	CT,MA,NH,NY,RI,NC,ME,VA
EPA 245.1 in Water	
Mercury	CT,MA,NH,RI,NY,NC,ME,VA
SM19-22 4500 NH3 C in Water	
Ammonia as N	NY,MA,CT,RI,VA,NC,ME
SM21-22 2540D in Water	
Total Suspended Solids	CT,MA,NH,NY,RI,NC,ME,VA
SM21-22 3500 Cr B in Water	
Hexavalent Chromium	NY,CT,NH,RI,ME,VA,NC
SM21-22 4500 CL G in Water	
Chlorine, Residual	CT,MA,RI,ME

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2020
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2020
RI	Rhode Island Department of Health	LAO00112	12/30/2019
NC	North Carolina Div. of Water Quality	652	12/31/2019
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2019
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020

1903329

con-test ANALYTICAL LABORATORY

KKM

Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

http://www.contestlabs.com

Doc # 381 Rev 1_03242017

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Page __1__ of __1__

Company Name: LRT
Address: 89 Crawford Street Leominster MA
Phone: 774-450-7177
Project Name:
Project Location: Wakefield MA
Project Number: 2-1922
Project Manager: John Henry / Jamey Bennett
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By: JAB

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date: 5 Day

Rush Approval Required
1-Day ☐ 3-Day ☑
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☑ EXCEL ☐
Other:
CLP Like Data Pkg Required: ☐
Email To: jbennett@lrt-llc.net
jjennings@lrt-llc.net

Sampled By:	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	Ammonia xSM4500B	Hardness	Chromium VI	TRC Metals (Sb, Ar, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Zn)	TSS
								1	1	1	1	1
								S	I/N	I	N	I
								P	P	P	P	P
	Receiving Water	10/4/2019	12:30 PM		X	GW	U	X	X	X	X	X

ANALYSIS REQUESTED

# of Containers
[2] Preservation Code
[3] Container Code

Dissolved Metals Samples
O Field Filtered
O Lab to Filter

Orthophosphate Samples
O Field Filtered
O Lab to Filter

[1] Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] Preservation Codes:
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] Container Codes:
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Comments: Samples for NPDES RGP Parameters (Receiving Water)

Receiving Water PH = 6.1

PH=

Run Cr III per James B.
-KKM 10/7/19

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
	10/4/19 3:53
Received by: (signature)	Date/Time:
	10/4/19 7:13
Relinquished by: (signature)	Date/Time:
	10/4/19 5:33
Received by: (signature) 4.7 10/5/19	Date/Time:
	1735
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Detection Limit Requirements
MA
CT
Other:

Special Requirements
☐ MA MCP Required
MCP Certification Form Required
☐ CT RCP Required
RCP Certification Form Required
☐ MA State DW Required
PWSID #

con-test ANALYTICAL LABORATORY
www.contestlabs.com
NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☐ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

Table of Contents

I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client LRT

Received By SA Date 10/4/19 Time 1733

How were the samples received? In Cooler T No Cooler _____ On Ice T No Ice _____ Direct from Sampling _____ Ambient _____ Melted Ice _____

Were samples within Temperature? 2-6°C T By Gun # 5 Actual Temp - 4.7 By Blank # _____ Actual Temp - _____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Project F Analysis T ID's T Sampler Name T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? _____

Are there Rushes? F Who was notified? _____

Are there Short Holds? ~~F~~ SA T Who was notified? Jmg

Is there enough Volume? T

Is there Headspace where applicable? NA MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? Acid PHS2 Base NA

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic	1	16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic	3	4oz Amb/Clear	
Bisulfate-		Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

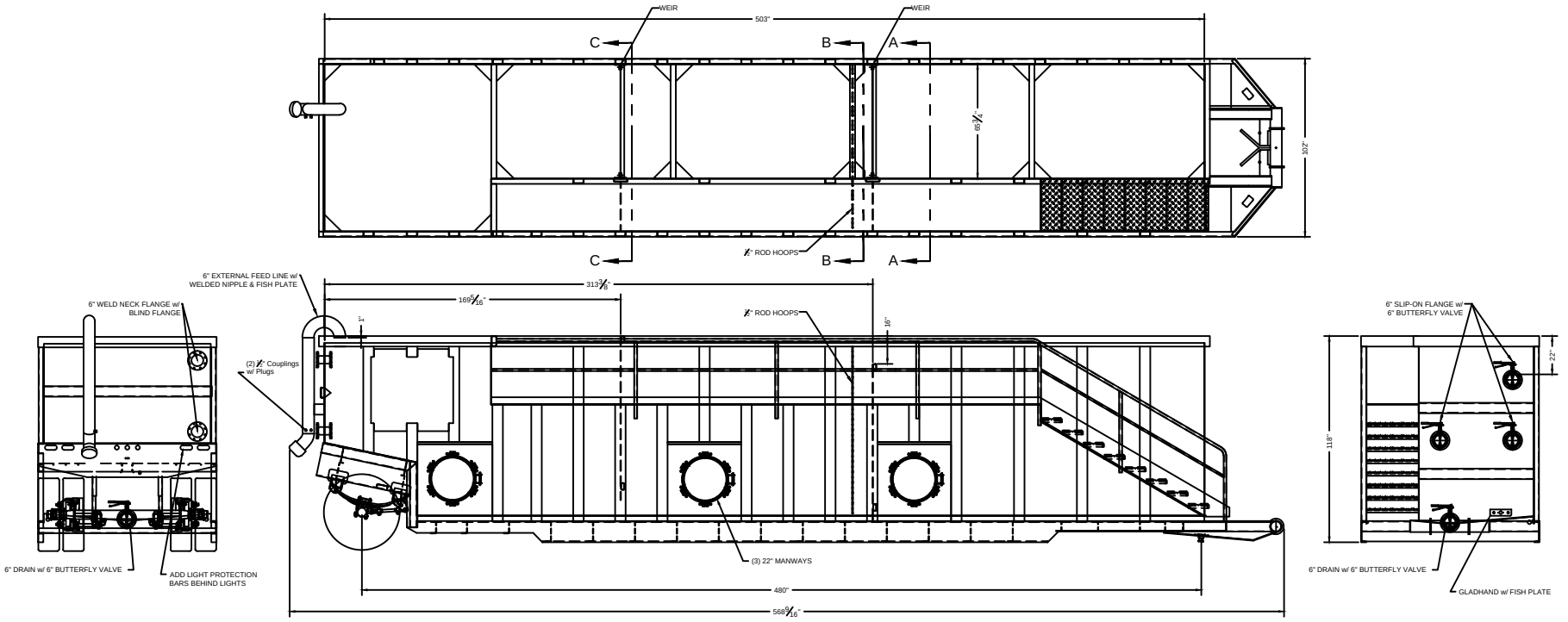
Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

* missing project name on COC

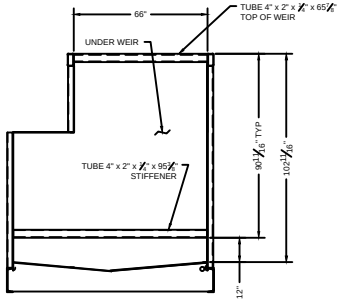
Appendix C

Cutsheets

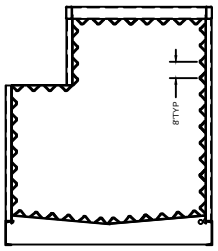


STANDARD SPECIFICATION

CAPACITY: .... 18,480 GALLONS (440 BBL)
SIDE SHEETS: .... 1/4" A36 PLATE
FRONT SHEET: .... 1/4" A36 PLATE
REAR SHEET: .... 1/4" A36 PLATE
FLOOR: .... 1/4" A36 PLATE
MAIN FLOOR RAILS: .... 12" x 20.7# STRUCTURAL CHANNEL
FLOOR CROSSMEMBERS: .... 1/4" A36 PLATE
SIDE STAKES: .... ONE PIECE 3/16" A36 PLATE
SUSPENSION: .... 3 LEAF SPRING, 22,500 LBS. CACPACITY
AXLE: .... 77.5" TRACK, 22,500 LBS. CAPACITY
TIRES: .... 11R22.5 RADIAL
WHEELS: .... 8.25 x 22.5 STEEL
MANWAYS: .... 3 - 22" DIA. CURB SIDE
VALVES: .... 3 - 6" BUTTERFLY VALVE (FRONT)
1 - 6" DRAIN BUTTERFLY VALVE (FRONT)
1 - 6" DRAIN BUTTERFLY VALVE (REAR)
2 - 6" BLIND FLANGE CONNECTION (REAR)
INLET PIPING: .... 1 - 6" PIPE SYSTEM (REAR)
BLAST: .... (INTERIOR) SSPC-SP-10 (NEAR WHITE)
(EXTERIOR) SSPC-SP-6 (COMMERCIAL BLAST)
PAINT: .... (INTERIOR) EPOXYPHENOLIC 100% SOLID 20.0 MILS D.F.T.
(EXTERIOR) FINISH COAT POLURETHANE 4.0 TO 5.0 D.F.T.



SECTION VIEW "C-C"



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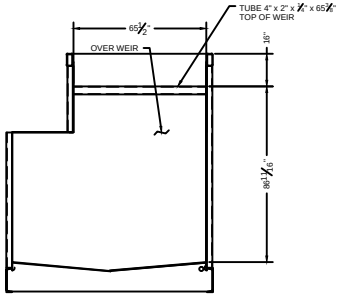
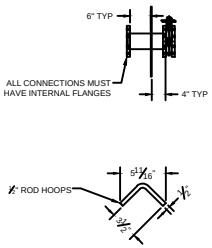


SECTION VIEW "A-A"



18,000 Gal. Weir Tank

Lockwood Remediation Technologies, LLC

89 Crawford Street
Leominster, Massachusetts 01453
O: 774-450-7177
F: 888-835-0617

Centrifugal - Single Phase

Motor Protection

All models provide built-in thermal overload protection that shuts down the pump when operating temperature becomes too high, and automatically restarts once the motor cools and a proper temperature is met.

Quality and Safety

ST Series Single Phase Pumps are in accordance with ISO9001 Quality Management System standard. Also, all Single Phase models carry the Underwriters Laboratories (UL) Listing for compliance with both U.S. or Canadian electrical safety codes.

YELLSUB

1 1/4" Discharge
33 GPM - 15' HEAD

The Yellow Submarine is MQ's most lightweight, compact submersible pump. A great choice for common household moving water applications. One piece polymer pump casing body resists corrosion and heat. Includes internal thermal overload protection, dual shaft seals, and positive direct drive thermoplastic impeller secured with stainless steel fittings.

SS233

2" Discharge
60 GPM - 20' HEAD

This lightweight, compact submersible pump is the first choice for many applications: flooded rooms, flat roofs, fill tanks, basins, fountains and waterfalls. Hardy thermoplastic pump casing body resists corrosion and heat. Further, the SS233 incorporates internal thermal overload protection, dual shaft seals, and positive direct drive thermoplastic impeller secured with stainless steel fittings.

ST2038P

2" Discharge
60 GPM - 38' HEAD

This lightweight, compact submersible pump is ideal for moving water in multiple confined and open area applications. The unique casing design permits it to draw water to a level of 1/16" without having to place the pump in any kind of sump. The ST2038P incorporates a rugged cast aluminum housing, internal thermal overload protection, and sealed dual shaft seals and bearings .

ST2037

2" Discharge
73 GPM - 37' HEAD

The ST2037 incorporates a rugged cast aluminum housing, internal thermal overload protection, dual shaft seals, sealed ball bearings impeller and molded 25' Power Cable with strain relief. This is a powerful, versatile, low maintenance pump that is perfect for a wide range of operations supporting Contractors Service Utilities, Municipalities, and Homeowners.

ST2047

2" Discharge
87 GPM - 47' HEAD

A compact, powerful pump that tackles tough dewatering jobs. Perfect for Contractors, Service Utilities, Municipalities, and Homeowners. The ST2047 incorporates a rugged cast aluminum housing, internal thermal overload protection, dual shaft seals, sealed ball bearings impeller and molded 50' Power Cable with strain relief.

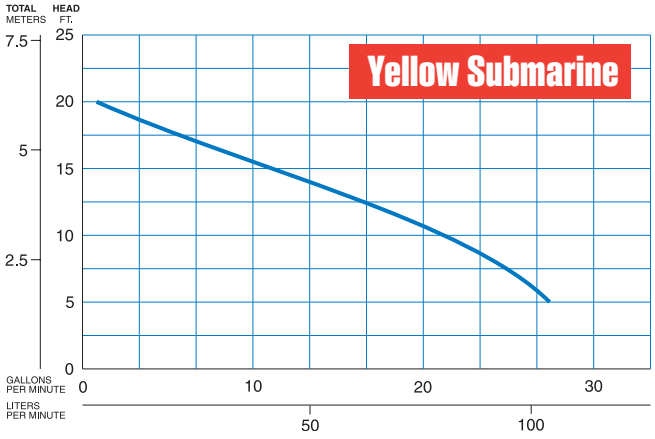
ST3020BCUL

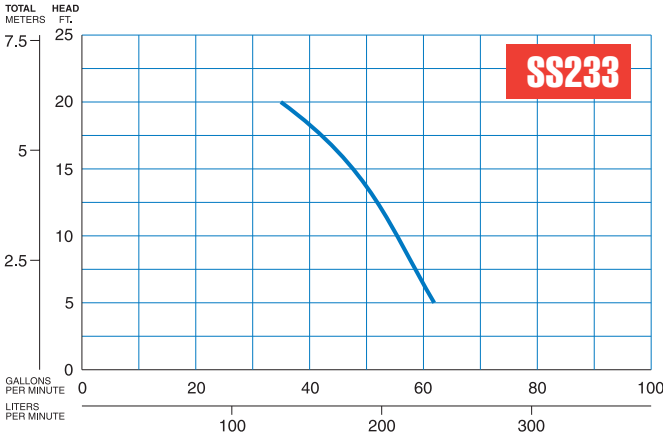
3" Discharge
170 GPM - 72' HEAD

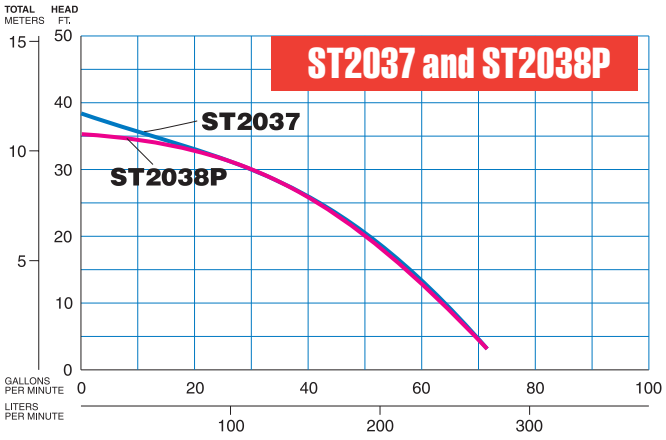
This is a rugged 2HP 230V pump with a heat conducting cast iron/steel motor casing. Pumps liquid up to 120° and de-waters surfaces up to 1/2. The ST3020BCUL incorporates reliable double mechanical oil-filled seals, internal thermal overload protection, sealed ball bearings, Ductile Iron impeller, carrying handle, and molded 50' Power Cable with strain relief. The 6.7" diameter design permits the pump to fit into tight spaces & conduits.

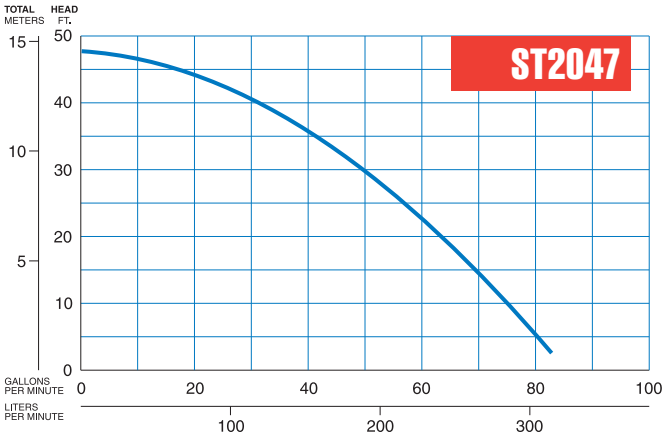
*** All Multiquip single phase submersible pumps do not require a Control Box for safe, efficient operations. However, a Control Box may be desired if operations call for a manual ON/OFF Switch option.**

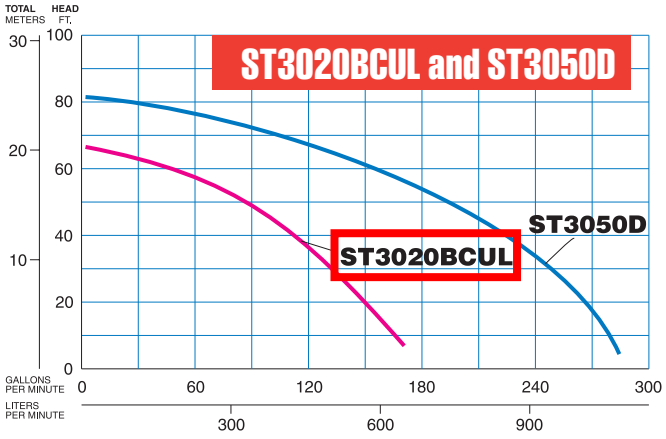
Pump Performance Curves

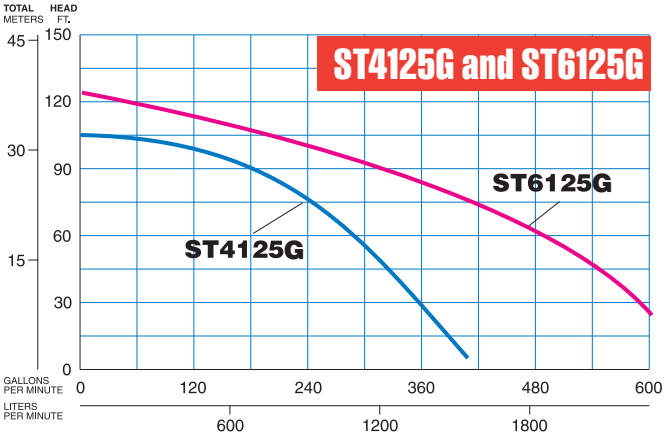


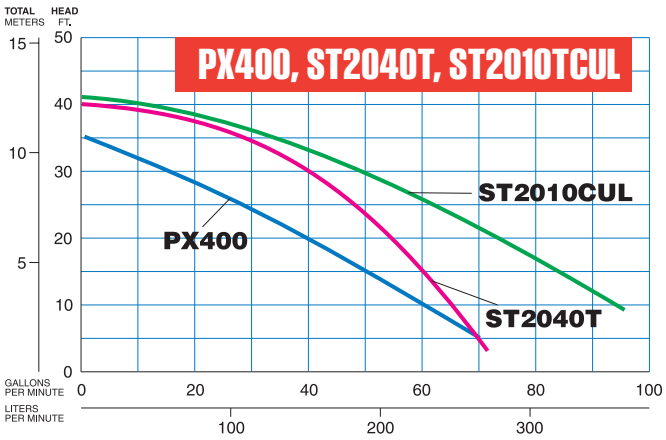






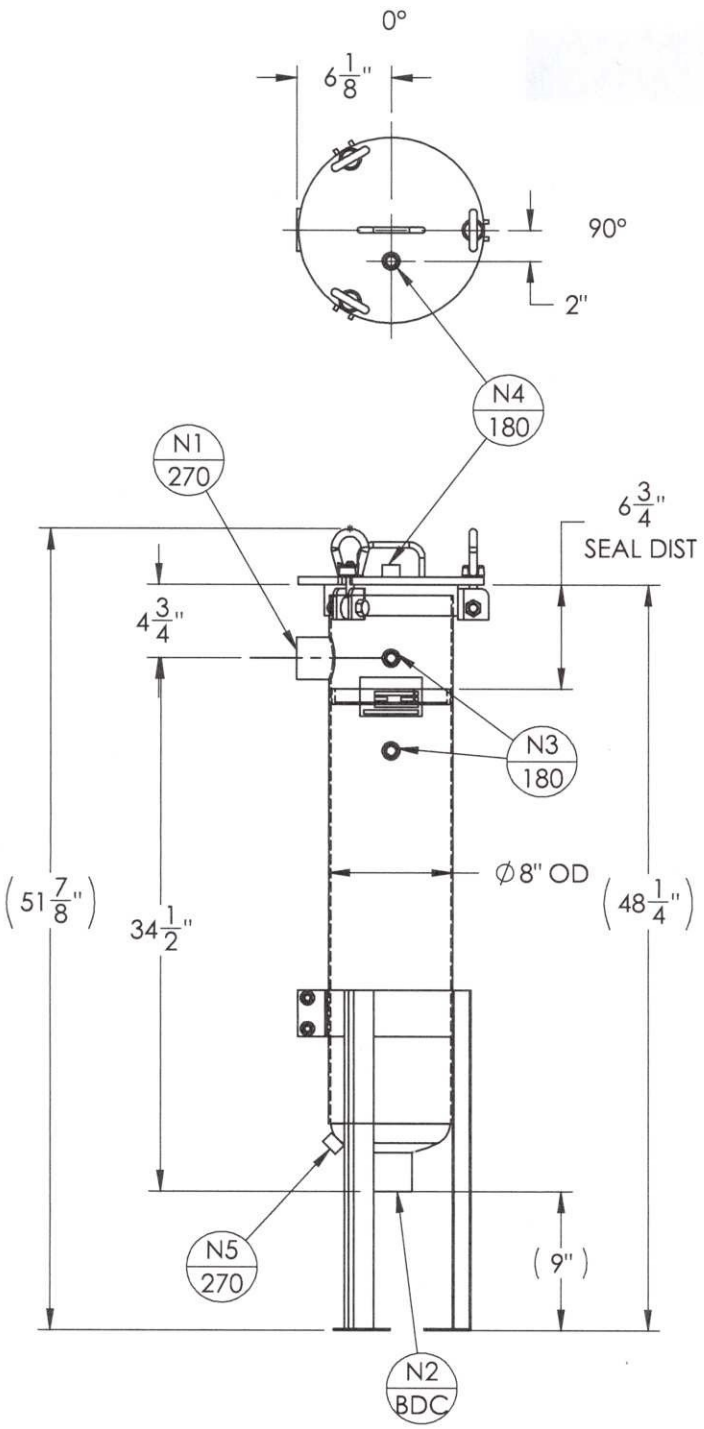




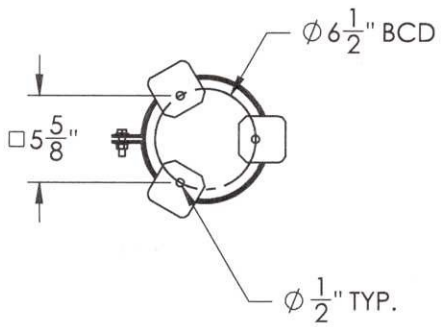


NOZZLE SCHEDULE			
MARK	QTY	SIZE / RATING	DESCRIPTION
N1	1	2" 150# NPT	INLET
N2	1	2" 150# NPT	OUTLET
N3	2	1/2" 3000# NPT	PRESS GA
N4	1	1/2" 3000# NPT	VENT
N5	1	1/2" 3000# NPT	CLEAN DRAIN
N6	-	-	DIRTY DRAIN

VESSEL DESIGN CONDITIONS			
CODE:	BEST COMMERCIAL PRACTICE		
M.A.W.P.:	150 PSI @ 250°F	M.D.M.T.:	-20° F @ 150 PSI
M.A.E.P.:	15 PSI @ 250°F		
CORROSION ALLOWANCE:	NONE	HYDROTEST PRESS:	195 PSI
STAMP:	'NC'	SERVICE:	NON LETHAL
PWHT:	N/A	RADIOGRAPHY:	N/A
MATERIAL:	SS 304/L	GASKET:	BUNA-N



DRY WEIGHT: 77.62 #'s
FLOODED WEIGHT: 140 #'s
SHIPPING WEIGHT: 100 #'s
VESSEL VOLUME: 1.0 C.F.



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NOTES:
- VESSEL WILL HOUSE (QTY=1) DOUBLE LENGTH BASKET.

THIRD ANGLE PROJECTION

TOLERANCES-UNLESS OTHERWISE NOTED
DECIMAL .X =±.1" .XX =±.02" .XXX =±.005"
FRACTIONAL ≤24" =±1/16" >24" =±1/8"
ANGULAR =± 1°
MAX. MACHINED SURFACE FINISH 125

REV.	DATE	REVISION	DRAWN	APP'D

LRT Lockwood Remediation Technologies LLC
89 Crawford Street
Leominster, MA 01453
Tel: 774.450.7177
Fax: 888.835.0617

LRT Provided Bag Filter Housing

EQUIPMENT:	BAG FILTER HOUSING (EB SERIES)
MODEL NO:	S4EB112-2P-SW
CUSTOMER:	-

PARENT: NONE	DRAWN: CR	DATE: JAN 13 2011	JOB No. V-	DWG. No. 001-0123	REV. No. 0
PAGE: 1 OF 4	CHK'D: JM	SCALE: NTS			

Polyester Liquid Filter Bag

Features

* Polyester liquid bag filter are available with a carbon steel ring, stainless steel ring or plastic flanges.
* Heavy-duty handle eases installation and removal
* Metal ring sewn into bag top for increased durability and positive sealing
* Wide array of media fibers to meet needed temperature and micron specifications

Applications

Polyester liquid filter bags can be used in the filtering of a wide array of industrial and commercial process fluids

Sizes

Our liquid filter bags are available for all common liquid bag housings. Dimensions range from 4.12" diameter X 8" length thru 9" diameter X 32" length.

Micron Ratings

Available fibers range from 1 to 1500 microns

Options

* Bag finish or covers for strict migration requirements.
* Plastic top O.E.M. replacements
* Multi-layered filtering capabilities for higher dirt holding capacities

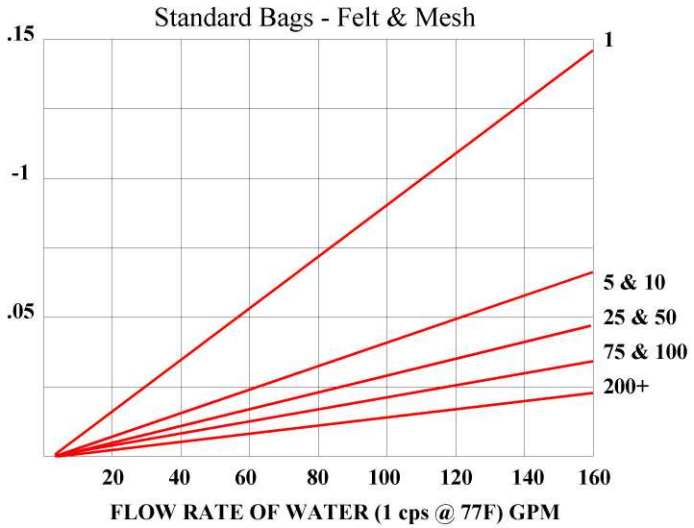
Optional Filter Media

Felt: Nomex, Polyester, Polypropylene

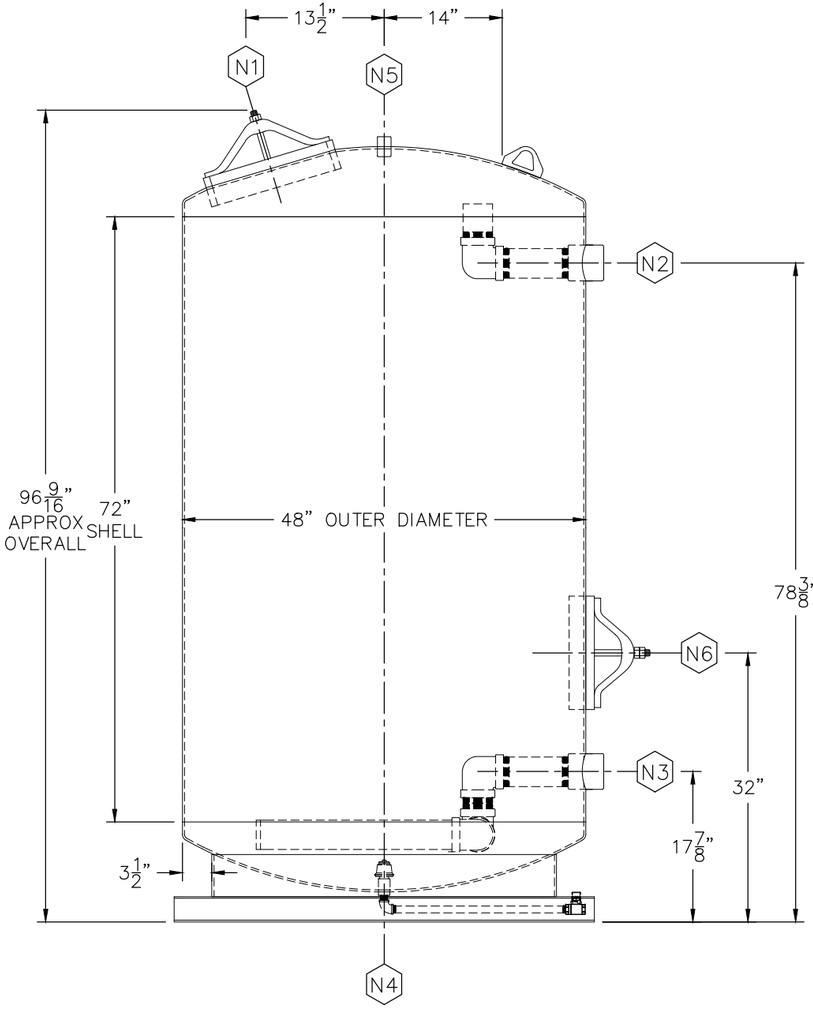
Monofilament: Nylon, Polyester, Polypropylene

Multifilament: Nylon, Polyester

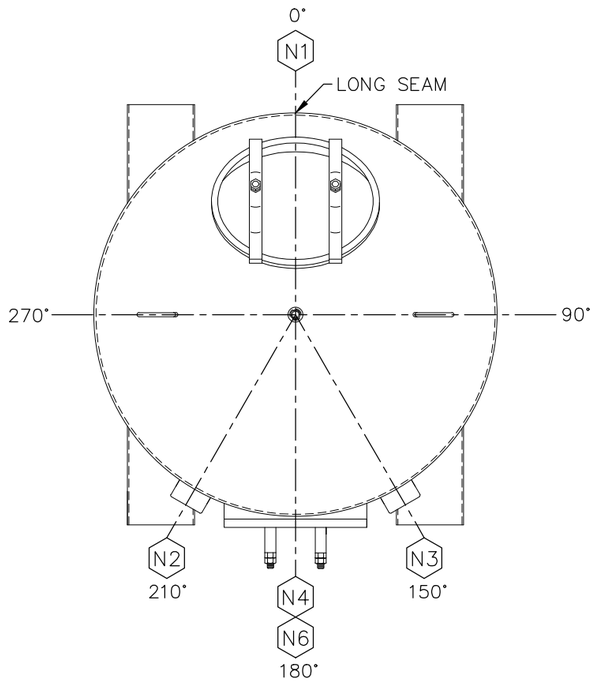
Polypropylene: Oil Removal



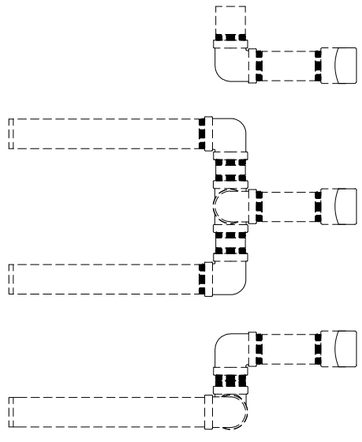
SCHEDULE OF OPENINGS		
ID	*DESCRIPTION*	*SERVICE*
N1	14" x 18" ELLIPTICAL MANWAY	UPPER BED ACCESS
N2	3" 3000# FNPT FULL COUPLING	PROCESS INFLUENT
N3	3" 3000# FNPT FULL COUPLING	PROCESS EFFLUENT
N4	1/2" 3000# FNPT FULL COUPLING	DRAIN w/ BALL VALVE
N5	1/4" 150# FNPT TANK FLANGE	VENT w/ VALVE
N6	14" x 18" ELLIPTICAL MANWAY	LOWER BED ACCESS



ELEVATION VIEW
NOT TRUE ORIENTATION



PLAN VIEW
TRUE ORIENTATION



INTERNALS

VESSEL DESIGN DATA			
VESSEL REGISTRATION	N/A	YEAR BUILT	NOT YET BUILT
VESSEL CONSTRUCTION	NON-CODE	VESSEL SERIAL NUMBER	TBD
INTERNAL DESIGN PRESSURE	75 PSIG	CAPACITY (VOLUME)	703.44 gal
INTERNAL DESIGN TEMP.	140 DEG. F	WEIGHT (EMPTY)	1432 lbs
EXTERNAL DESIGN PRESSURE	ATMOSPHERIC	WEIGHT (FULL)	8385 lbs
OPERATING PRESSURE	N/A	SHELL 1 MATERIAL	SA-36 ROLLED PLATE NOM. TH. = 0.25"
OPERATING TEMP.	N/A	SHELL 2 MATERIAL	N/A
MIN. DESIGN METAL TEMP.	-20 DEG. F @ 75 PSIG	TOP HEAD MATERIAL	SA-36 HOT FORMED NOM. TH. = 0.25"
MAWP (NEW & COLD)	TBD	BOTTOM HEAD MATERIAL	SA-36 HOT FORMED NOM. TH. = 0.25"
MAWP (HOT & CORRODED)	TBD	NOZZLES NECKS/FLANGES	SA-106-B, SA-105, SA-312-304
HYDROSTATIC TEST PRESSURE	N/A	GASKETS	BUNA-N
HYDROSTATIC TEST MEDIUM	N/A	INTERNALS	STAINLESS STEEL
CORROSION ALLOWANCE	NONE	SURFACE PREP INTERNAL	SSPC-SP10
RADIOGRAPHY	NONE	SURFACE PREP EXTERNAL	SSPC-SP6
POST WELD HEAT TREAT.	N/A	INTERNAL COATING	CARBOLINE CARBOGUARD 635 5-10 MILS DFT
MATERIAL IMPACT TESTS	N/A	EXTERNAL PRIMER	CARBOLINE CARBOGUARD 635 5-10 MILS DFT
MATERIAL HARDNESS	N/A	EXTERNAL PAINT/COATING	CARBOLINE CARBOTHANE 8845(GREEN)3-5 MILS DFT

REV NO	REVISION NOTE	DATE	SIGNATURE
1			
2			
3			
4			
5			

Lockwood Remediation Technologies LLC

JOB #	DATE	SCALE
		NTS

HPAF-2000

APPROVED BY	QUANTITY	UNITS	DRAWING #
—			

FILTRATION MEDIA :
8x30 RE-ACTIVATED CARBON
4x10 RE-ACTIVATED CARBON

GENERAL DESCRIPTION

Select Re-Activated carbon from domestic sources is quality screened during our purchasing process for activity, density and fines. The use of re-activated carbon is recommended as a lower cost alternative for most sites where drinking water quality is not necessary. In many cases our re-activated carbon meets and exceeds imported virgin carbon. In addition all carbon either sold by itself or installed in our filtration units traced by lot number to the installation or sale.

8x30 (Liquid Phase) Standard Specifications:	Standard	Value
Iodine Number	ASTM D-4607	800 Minimum
Moisture Content	ASTM D-2867	5% Maximum (as packed)
Particle Size	ASTM D-2862	8x30 US Mesh
Ash		10% Maximum
Total Surface Area (N2BET)		1050 Minimum
Pore Volume (cc/g)		0.75

4*10 (Vapor Phase) Standard Specifications:	Standard	Value
Carbon Tetrachloride Activity Level	ASTM D-3467	40 Minimum
Moisture Content	ASTM D-2867	5% Maximum (as packed)
Particle Size	ASTM D-2862	4x10 US Mesh
Ash		10% Maximum
Total Surface Area (N2BET)		1050 Minimum
Pore Volume (cc/g)		0.75

RESINTECH INC
INNOVATIONS IN ION EXCHANGE

CGS

CATION EXCHANGE RESIN
SOFTENING GRADE
Na FORM

RESINTECH CGS is a sodium form standard crosslinked gel strong acid cation resin. *CGS* is optimized for residential applications that require good regeneration efficiency and high capacity. *RESINTECH CGS* is intended for use in all residential and commercial softening applications that do not have significant amounts of chlorine in the feedwater. *CGS* is supplied in the sodium form.

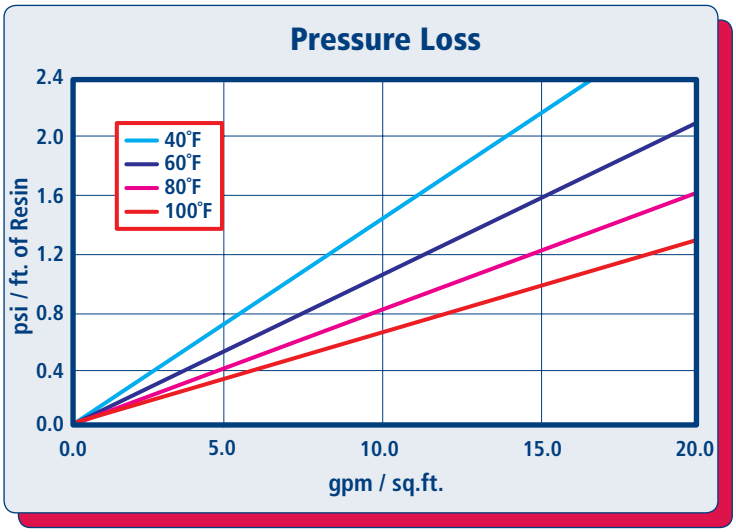
NSF/ANSI 44-61 CERTIFIED FOR MATERIAL SAFETY

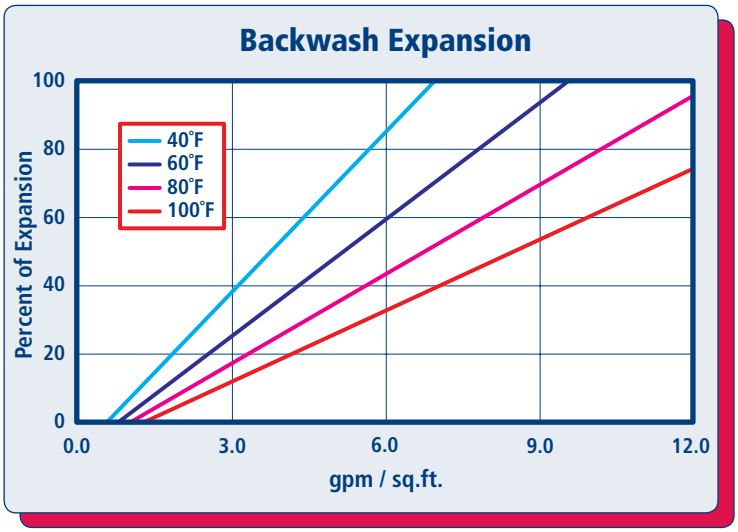
FEATURES & BENEFITS

- **RESIDENTIAL SOFTENING APPLICATIONS**
  Resin parameters are optimized for residential softeners
- **LOW COLOR THROW**
- **SUPERIOR PHYSICAL STABILITY**
  93% plus sphericity and high crush strengths together with carefully controlled particle distribution provides long life and low pressure drop
- **COMPLIES WITH US FDA REGULATIONS**
  Conforms to paragraph 21CFR173.25 of the Food Additives Regulations of the US FDA

Prior to first use for potable water, resin should be backwashed for a minimum of 20 minutes, followed by 10 bed volumes of downflow rinse.

HYDRAULIC PROPERTIES





PRESSURE LOSS

The graph above shows the expected pressure loss of *ResinTech CGS* per foot of bed depth as a function of flow rate at various temperatures.

BACKWASH

The graph above shows the expansion characteristics of *ResinTech CGS* as a function of flow rate at various temperatures.

160 Cooper Road • West Berlin, NJ 08091 USA • p: 856.768.9600 • f: 856.768.9601 • e: ixresin@resintech.com • w: resintech.com

RESINTECH® CGS

PHYSICAL PROPERTIES

Polymer Structure	Styrene/DVB
Polymer Type	Gel
Functional Group	Sulfonic Acid
Physical Form	Spherical beads
Ionic Form as shipped	Sodium
Total Capacity	
Sodium form	>1.8 meq/mL
Water Retention	
Sodium form	40 to 52 percent
Approximate Shipping Weight	
Sodium form	50 lbs./cu.ft.
Screen Size Distribution (U.S. mesh)	16 to 50
Maximum Fines Content (<50 mesh)	1 percent
Minimum Sphericity	90 percent
Uniformity Coefficient	1.6 approx.
Resin Color	Amber

Note: Physical properties can be certified on a per lot basis, available upon request

SUGGESTED OPERATING CONDITIONS

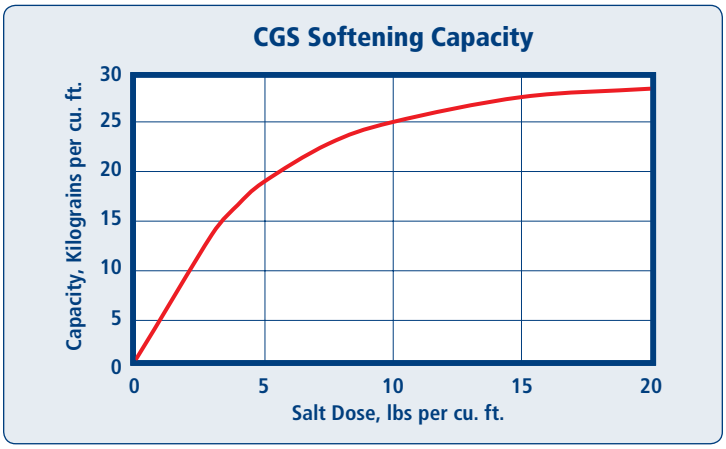
Maximum continuous temperature	
Sodium form	250˚F
Minimum bed depth	24 inches
Backwash expansion	25 to 50 percent
Maximum pressure loss	25 psi
Operating pH range	0 to 14 SU
Regenerant Concentration	
Salt cycle	10 to 15 percent NaCl
Regenerant level	4 to 15 lbs./cu.ft.
Regenerant flow rate.	0.5 to 1.5 gpm/cu.ft.
Regenerant contact time	>20 minutes
Displacement flow rate	Same as dilution water
Displacement volume	10 to 15 gallons/cu.ft.
Rinse flow rate	Same as service flow
Rinse volume	35 to 60 gallons/cu.ft.
Service flow rate	1 to 10 gpm/cu.ft.

Note: These guidelines describe average low risk operating conditions. They are not intended to be absolute minimums or maximums.
For operation outside these guidelines, contact ResinTech Technical Support

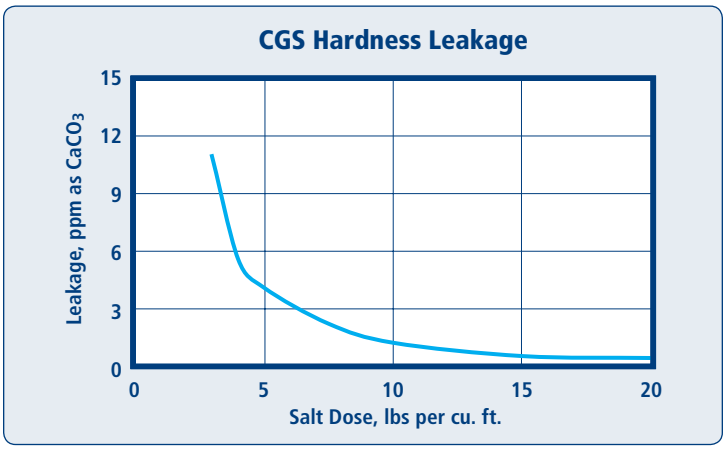
APPLICATIONS

SOFTENING

ResinTech CGS is a standard crosslinked cation resin optimized for residential and commercial applications. This type of resin is easier to regenerate than the higher crosslinked resins. CGS has marginal resistance to chlorine and other oxidants and is not ideal for high temperature and other high stress applications.



Capacity and leakage data are based on the following: 2:1 Ca:Mg ratio, 500 ppm TDS as CaCO3, 0.2% hardness in the salt and 10% brine concentration applied co-currently through the resin over 30 minutes. No engineering downgrade has been applied.



RESINTECH INC.
INNOVATIONS IN ION EXCHANGE

East Coast - West Berlin, NJ p:856.768.9600 • Midwest - Chicago, IL p:708.777.1167 • West Coast - Los Angeles, CA p:323.262.1600

SBG1

ANION EXCHANGE RESIN TYPE ONE GEL Cl OR OH FORM

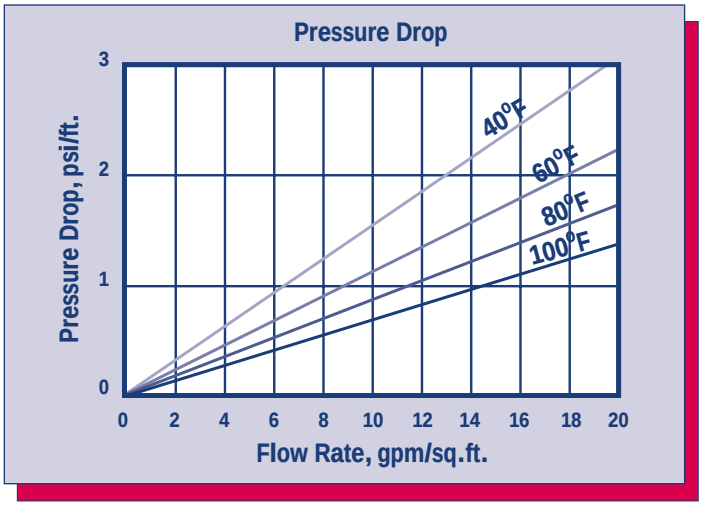
RESINTECH SBG1 is a high capacity, shock resistant, gelular, Type 1, strongly basic anion exchange resin supplied in the chloride or hydroxide form as moist, tough, uniform, spherical beads. *RESINTECH SBG1* is intended for use in all types of deionization systems and chemical processing applications. It is similar to *RESINTECH SBG1P* but has a higher volumetric capacity and exhibits lower TOC leach rates. This makes it the better performer in single use applications such as in cartridge deionization and when high levels of regeneration are used such as in polishing mixed beds. On the other hand, *RESINTECH SBG1P* is more resistant to organic fouling and gives higher operating capacities at low regeneration levels such as those used in make up demineralizers.

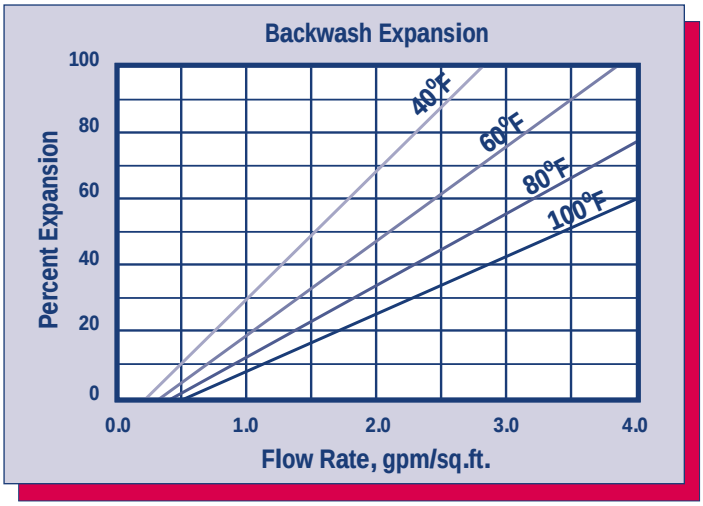
FEATURES & BENEFITS

- **COMPLIES WITH FDA REGULATIONS FOR POTABLE WATER APPLICATIONS.**
  Conforms to paragraph 21CFR173.125 of the Food Additives Regulations of the F.D.A.*
- **HIGH TOTAL CAPACITY**
  Provides longer run lengths in single use applications or where high levels of regeneration are used such as in mixed bed polishers, cartridge demineralizers.
- **UNIFORM PARTICLE SIZE**
  16 to plus 50 mesh range; gives a LOWER PRESSURE DROP while maintaining SUPERIOR KINETICS.
- **SUPERIOR PHYSICAL STABILITY**
- **LOWER TOC LEACH RATE**
  Makes it ideal for polishing mixed beds in wafer washing and other high purity water polishing applications.

*For potable water applications, the resin must be properly pre-treated, usually by multiple exhaustion and regeneration cycles, to ensure compliance with extractable levels.

HYDRAULIC PROPERTIES





PRESSURE DROP

The graph above shows the expected pressure loss per foot of bed depth as a function of flow rate, at various temperatures.

BACKWASH

After each cycle the resin bed should be backwashed at a rate that expands the bed 50 to 75 percent. This will remove any foreign matter and reclassify the bed. The graph above shows the expansion characteristics of *RESINTECH SBG1* in the sodium form.

RESINTECH® SBG1

PHYSICAL PROPERTIES

Polymer Structure	Styrene Crosslinked with DVB
Functional Group	R-N-$(CH_3)_3^+Cl^-$
Ionic Form, as shipped	Chloride or Hydroxide
Physical Form	Tough, Spherical Beads
Screen Size Distribution	16 to 50
+16 mesh (U.S. Std)	< 5 percent
-50 mesh (U.S. Std)	< 1 percent
pH Range	0 to14
Sphericity	> 93 percent
Uniformity Coefficient	Approx. 1.6
Water Retention	
Chloride Form	43 to 50 percent
Hydroxide Form	Approx. 53 to 60 percent
Solubility	Insoluble
Approximate Shipping Weight	
Cl Form	44 lbs/cu.ft.
OH Form	41 lbs/cu.ft.
Swelling Cl- to OH-	18 to 25 percent
Total Capacity	
Cl Form	1.45 meq/ml min
OH Form	1.15 meq/ml min

SUGGESTED OPERATING CONDITIONS

Maximum Continuous Temperature	
Hydroxide Form	140°F
alt Form	170°F
Minimum Bed Depth	24 inches
Backwash Rate	50 to 75 percent Bed Expansion
Regenerant Concentration*	2 to 6 percent
Regenerant Flow Rate	0.25 to 1.0 gpm/cu.ft.
Regenerant Contact Time	At least 40 Minutes
Regenerant Level	4 to 10 pounds/cu.ft.
Displacement Rinse Rate	Same as Regenerant Flow Rate
Displacement Rinse Volume	10 to 15 gals/cu.ft.
Fast Rinse Rate	Same as Service Flow Rate
Fast Rinse Volume	35 to 60 gals/cu.ft.
Service Flow Rates	
Polishing Mixed Beds	3 to 15 gpm/cu.ft.
Non-Polishing Apps.	2 to 4 gpm/cu.ft.

OPERATING CAPACITY

The operating capacity of *RESINTECH SBG1* for a variety of acids at various regeneration levels when treating an influent with a concentration 500 ppm, expressed as $CaCO_3$ is shown in the following table:

Pounds NaOH/ft³	Capacity Kilograms per cubic foot			
	HCl	H_2SO_4	H_2SiO_3	H_2CO_3
4	11.3	14.0	14.7	18.6
6	12.8	16.3	17.3	19.8
8	14.3	13.3	19.5	21.6
10	15.5	20.0	22.2	22.2

APPLICATIONS

DEMINERALIZATION – *RESINTECH SBG1* is highly recommended for use in mixed bed demineralizers, wherever complete ion removal; superior physical and osmotic stability and low TOC leachables are required such as in wafer fabrication and other ultrapure applications.

RESINTECH SBG1 has high total capacity and low swelling on regeneration and provides maximum operating capacity in cartridge deionization applications. It is ideal for single use applications such as precious metal recovery, radwaste disposal and purification of toxic waste streams.

Highly crosslinked Type 1, styrenic anion exchangers have greater thermal and oxidation resistance than other types of strong base resins. They can be operated and regenerated at higher temperatures. The combination of lower porosity, high total capacity and Type 1 functionality make *RESINTECH SBG1* the resin of choice when water temperatures exceed 85°F and where the combination of carbon dioxide, borate and silica exceed 40% of the total anions.

RESINTECH SBG1P and *RESINTECH SBG1* are quite similar; the difference between them is the degree of porosity. *RESINTECH SBG1P* has greater porosity that gives it faster kinetics, and greater ability to reversibly sorb slow moving ions such as Naturally occurring Organic Matter (NOM). At lower regeneration levels and where chlorides make up a substantial portion of the anion load, or where the removal and elution of naturally occurring organics is of concern *RESINTECH SBG1P*, SBACR or SBG2 should be considered. At the higher regeneration levels used in mixed bed polishers *RESINTECH SBG1* provides higher capacity, and the lowest possible TOC leach rates.

***CAUTION:DO NOT MIX ION EXCHANGE RESIN WITH STRONG OXIDIZING AGENTS.** Nitric acid and other strong oxidizing agents can cause explosive reactions when mixed with organic materials,such as ion exchange resins.

Material Safety Data Sheets (MSDS) are available for all ResinTech Inc.products.To obtain a copy,contact your local ResinTech sales representative or our corporate headquarters. They contain important health and safety information.That information may be needed to protect your employees and customers from any known health and safety hazards associated with our products.We recommend that you secure and study the pertinent MSDS for our products and any other products being used These suggestions and data are based on information we believe to be reliable.They are offered in good faith.However we do not make any guarantee or warranty. We caution against using these products in an unsafe manner or in violation of any patents;further we assume no liability for the consequences of any such actions.

GROOVED & SMOOTH-END FLOWMETER MODEL MG/MS100

SPECIFICATIONS

PERFORMANCE

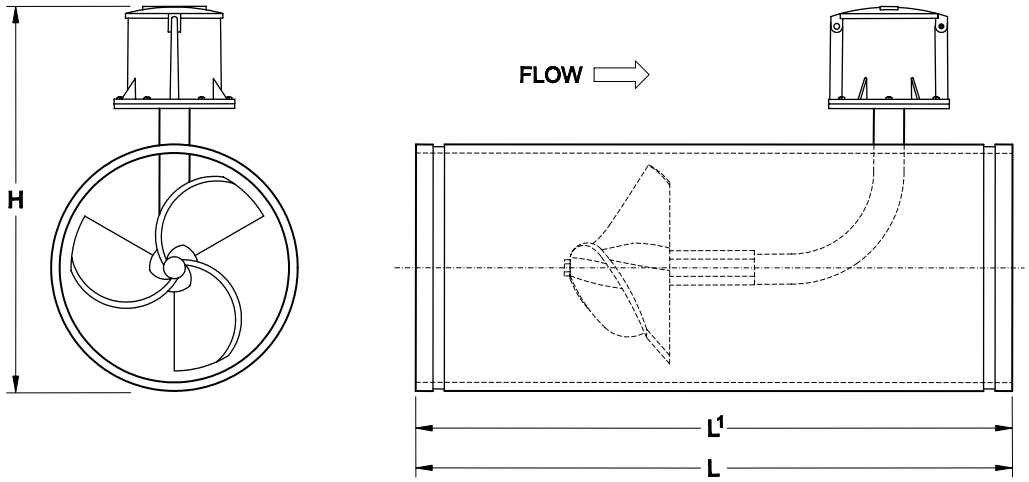
ACCURACY/REPEATABILITY: ±2% of reading guaranteed throughout full range. ±1% over reduced range. Repeatability 0.25% or better.
RANGE: (see dimensions chart below)
HEAD LOSS: (see dimensions chart below)
MAXIMUM TEMPERATURE: (Standard Construction) 160°F constant
PRESSURE RATING: 150 psi

MATERIALS

TUBE: Epoxy-coated carbon steel.
BEARING ASSEMBLY: Impeller shaft is 316 stainless steel. Ball bearings are 440C stainless steel.
MAGNETS: (Permanent type) Cast or sintered alnico
BEARING HOUSING: Brass; Stainless Steel optional
IMPELLER: Impellers are manufactured of high-impact plastic, retaining their shape and accuracy over the life of the meter. High temperature impeller is optional.
REGISTER: An instantaneous flowrate indicator and six-digit straight-reading totalizer are standard. The register is hermetically sealed within a die cast aluminum case. This protective housing includes a domed acrylic lens and hinged lens cover with locking hasp.
COATING: Fusion-bonded epoxy

OPTIONS

- Forward/reverse flow measurement
- High temperature construction
- "Over Run" bearing assembly for higher-than-normal flowrates
- Electronic Propeller Meter available in all sizes of this model
- A complete line of flow recording/control instrumentation
- Straightening vanes and register extensions available
- Certified calibration test results



McCrometer reserves the right to change design or specifications without notice.

MG100 / MS100	DIMENSIONS												
Meter Size (inches)	**2**	**2 ½**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**
Maximum Flow U.S. GPM	250	250	250	600	1200	1500	1800	2500	3000	4000	5000	6000	8500
Minimum Flow U.S. GPM	40	40	40	50	90	100	125	150	250	275	400	475	700
Head Loss in Inches at Max. Flow	29.50	29.50	29.50	23.00	17.00	6.75	3.75	2.75	2.00	1.75	1.50	1.25	1.00
Shipping Weight, lbs.	* See Special Note		17	40	54	68	87	106	140	144	172	181	223
H (inches)			10.9	12.78	13.84	14.84	16.91	18.90	20.53	22.53	25.53	26.53	30.53
L (inches) MG100			13	20	20	20	20	20	20	22	22	22	22
L^1 (inches) MS100			13	20	22	22	22	22	22	24	24	24	24
O.D. of Meter Tube			3.50	4.500	6.625	8.625	10.750	12.750	14.00	16.00	18.00	20.00	24.00

Special Note—
Reducing fittings incorporating grooves are supplied to adapt the 3-inch model to smaller line sizes.

Larger flowmeters on special order.

Appendix D

Supplemental Information

MassDEP - Bureau of Waste Site Cleanup

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

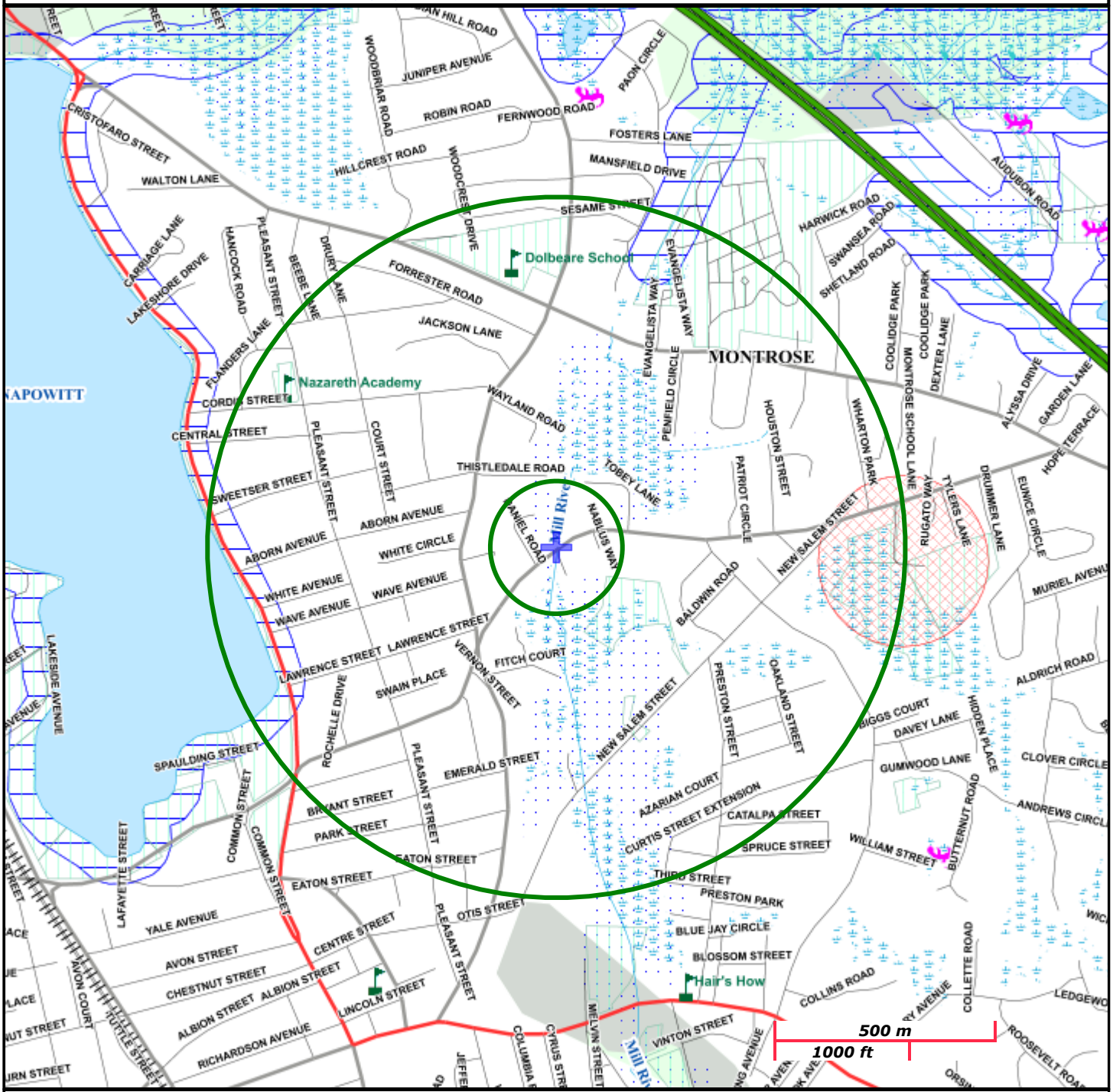
Site Information:

NABLUS WAKEFIELD, MA

NAD83 UTM Meters:
4708757mN , 330444mE (Zone: 19)
September 30, 2019

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

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



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

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

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

Aquifers: Medium Yield, High Yield, EPA Sole Source

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

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

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

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

Documentation of the Results of the ESA Eligibility Determination:

Using information in Appendix II of the NPDES RGP, the project located at Nablus Road Wakefield, MA is eligible for coverage under this general permit under FWS Criterion C. This project is located in Middlesex County. No designated critical habitats were listed in the project area. An Endangered Species Consultation was conducted on the U.S. Fish & Wildlife Service New England Field Office ECOS IPaC webpage for the Site:

• The Northern long-eared bat was listed as "Threatened" wherever it is found;

Temporary dewatering activities at the site are not expected to impact the Northern Long-eared Bat.

Northern long-eared bats spend winter hibernating in caves and mines. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). There are no caves and mines located at the site. There are trees in the immediate vicinity of the site; however, tree removal is not part of the scope of work related to this Notice of Intent. Therefore, temporary dewatering activities will have "no impact" to the Northern Long-eared Bat.

United States Department of the Interior

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

In Reply Refer To: September 30, 2019
Consultation Code: 05E1NE00-2019-SLI-3012
Event Code: 05E1NE00-2019-E-07901
Project Name: Nat'l Grid Wakefield Nablus Road

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

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

Project Summary

Consultation Code: 05E1NE00-2019-SLI-3012

Event Code: 05E1NE00-2019-E-07901

Project Name: Nat'l Grid Wakefield Nablus Road

Project Type: Water Withdrawal / Depletion

Project Description: Construction dewatering

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.512606658335784N71.06384934758738W

Counties: Middlesex, MA

Endangered Species Act Species

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

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

Mammals

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

Critical habitats

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

Documentation of the National Historic Preservation Act Eligibility Determination:

As part of this permit, a determination was made as to whether there were any historic properties or places listed on the national register in the path of the discharge or in the vicinity of the construction of treatment systems or BMPs related to the discharge. A search on the Massachusetts Cultural Resource Information System Database and the National Register of Historic Places did not list any potential historic properties on or near the project site in the databases. Therefore, the proposed discharge will not have the potential to cause effects on historical properties.

Massachusetts Cultural Resource Information System

MACRIS

MACRIS Search Results

Search Criteria: Town(s): Wakefield; Street Name: Nablus Rd; Resource Type(s): Area, Building, Burial Ground, Object, Structure;

Inv. No.	Property Name	Street	Town	Year

National Register of Histori…

National Park Service
U.S. Department of the Interior

Public, non-restricted data depicting National Register spatial data proce…

Appendix E

Public Notification Letter

89 Crawford Street
Leominster, Massachusetts 01453
Tel: 774.450.7177
Fax: 888.835.0617
www.lrt-llc.net

October 16, 2019

Mr. Stephen P. Maio
Town Administrator
Town Hall
1 Lafayette Street
Wakefield, Massachusetts 01880

Reference: Notification of Filing of Notice of Intent - Remediation General Permit
Jacking and Receiving Pits for Mill River Crossing
National Grid 345 kV Electrical Duct Bank Project
Wakefield, Massachusetts

Dear Mr. Maio:

On behalf of United Civil, Inc. (United Civil), Lockwood Remediation Technologies, LLC (LRT) is providing notification that a Notice of Intent (NOI) has been filed with the United States Environmental Protection Agency (EPA) requesting coverage under the EPA's Remediation General Permit (RGP) for the above-referenced project. Specifically, the project is located at the intersection of Nablus Road and Salem Street and the RGP will allow the treatment and discharge of groundwater that is generated during dewatering of the jacking and receiving bore pit excavations. Treated water will be discharged to Mill River and the work is anticipated to begin in late Fall 2019 or Spring 2020. A copy of the NOI can be provided upon request.

Please contact me at 774-450-7177 with any questions or if you require additional information.

Sincerely,
Lockwood Remediation Technologies, LLC

John Henry

John J. Henry, PE
Senior Project Manager

cc: Shauna Little – EPA
Dylan Smith and Jeff Schena – United Civil