



BERGMANN
ARCHITECTS ENGINEERS PLANNERS

APPENDIX D

Spill Incidents Database Search Details

Spill Record

Administrative Information

DEC Region: 8

Spill Number: 1805258

Spill Date/Time

Spill Date: 08/14/2018 **Spill Time:** 02:18:00 PM

Call Received Date: 08/14/2018 **Call Received Time:** 02:18:00 PM

Location

Spill Name: 102 VIOLETTA STREET

Address: 102 VIOLETTA STREET

City: ROCHESTER **County:** Monroe

Spill Description

Material Spilled	Amount Spilled	Resource Affected
other	UNKNOWN	Soil , Groundwater

Cause: Other

Source: Commercial/Industrial

Waterbody:

Record Close

Date Spill Closed: Not closed

If you have questions about this reported incident, please contact the [Regional Office](#) where the incident occurred.

Spill Incidents Database Search Details

Spill Record

Administrative Information

DEC Region: 8

Spill Number: 1805259

Spill Date/Time

Spill Date: 08/14/2018 **Spill Time:** 02:21:00 PM

Call Received Date: 08/14/2018 **Call Received Time:** 02:21:00 PM

Location

Spill Name: 350 EXCHANGE BOULEVARD

Address: 350 EXCHANGE BOULEVARD

City: ROCHESTER **County:** Monroe

Spill Description

Material Spilled	Amount Spilled	Resource Affected
other	UNKNOWN	Soil , Groundwater

Cause: Equipment Failure

Source: Commercial/Industrial

Waterbody:

Record Close

Date Spill Closed: Not closed

If you have questions about this reported incident, please contact the [Regional Office](#) where the incident occurred.



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APPENDIX E



LIMITATIONS FOR INVESTIGATION PROJECT WORK

1. While additional explorations will always better define the nature and extent of contamination at any given site, it is our professional opinion that soil and groundwater at the site has been sampled and analyzed for VOCs, SVOCs, and Metals. Soil and groundwater is impacted at levels above the NYSDEC standards.
2. Environmental impairment of a property may result from activities such as illegal, unreported dumping, or sudden spilling of hazardous waste or materials. It should be noted that the presence of contaminants at a particular property may not always be apparent, and the completion of a Phase I, Phase II Environmental Site Assessment at select areas and sample intervals cannot provide a guarantee that contamination and/or hazardous waste or regulated materials do not exist in media tested or at other areas on the Site that were not tested.
3. It should be noted that no subsurface exploration can be thorough enough to exclude the possible presence of, variation of chemical compounds, hazardous materials or wastes at a given site. In cases where contaminants have not been discovered through exploration, this should not be construed as a guarantee that contaminants do not exist. At a given site, environmental conditions may exist that cannot be identified by visual observation. Where sample collection and testing have been performed, Bergmann's professional opinions are based in part on the interpretation of data from discrete sampling locations that may not represent conditions at unsampled locations.
4. It is the nature of environmental site assessment work for soil conditions observed during future remediation to vary from the conditions identified during the site assessment explorations, even when the exploration program conforms to industry standards.



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APPENDIX F

AMERICAN RECYCLERS COMPANY

Waste Profile Report (WPR)

177 Wales Avenue Tonawanda, New York 14151 Phone (716) 695-6720 Fax (716) 695-0161	APPROVAL NUMBER: L-14163L EXPIRATION DATE: _____ HANDLING CODE: L
---	--

Generator: City of Rochester Div of Env Quality EPA ID #: _____
 Address: Erie Harbor West River Wall Contact: Jane MH Forbes, MPA
 City Rochester STATE: NY ZIP: _____ Phone: _____ Fax: _____

Waste Name: <u>Soil Cuttings</u> Generating Process: <u>Soil Cuttings from Drilling</u>	Shipping Name: <u>Non RCRA Non DOT Regulated</u> Rate of Generation: <u>Once</u> Container Type: <u>55 Gal Steel 1A2</u>
--	--

Composition of Waste	%	%	Phase	%
Soil cuttings	100 - 100		Solids	
	-		Liquid	
			Sludge	
			Debris	

Is the material RCRA listed or Characteristicly Hazardous?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Does the material contain Medical or Biological Wastes?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Does the material contain etiological waste?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Does the material contain, or has it come in contact with PCB's?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Is the material radioactive?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Does the material contain septic or domestic sewage?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Is the material Non-Hazardous as defined by RCRA Title 40?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

Check all below which apply:

Material is to be shipped and recycled as Universal Waste	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Material is to be shipped and recycled under 6 NYCRR Part 371.1(g)(1)(ii)(b) (ie Computer Equipment & monitors)	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Material is being shipped for disposal/recycle via facility transfer/consolidation permit	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Material is a Labpack and all contents are CERTIFIED as Non-RCRA	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
List all Lab Pack Container Numbers: (Attach packing slips to profile)		

I certify that the above submitted information (including any attachments) is true, accurate and complete to the best of my knowledge and ability and that all known and suspected hazards have been disclosed. All material offered herein is deemed Non-RCRA.

Signed:  Print: Dale Granza Date: 9/25/2018
 _____ Signer Title _____ Company _____

ARC Personnel Reviewed and Approved by:

Approved by: _____ Print: Tom Martin Date: _____

AMERICAN RECYCLERS COMPANY

Waste Profile Report (WPR)

177 Wales Avenue Tonawanda, New York 14151 Phone (716) 695-6720 Fax (716) 695-0161	APPROVAL NUMBER: H-14164IN EXPIRATION DATE: _____ HANDLING CODE: B
---	---

Generator: City of Rochester Div of Env Quality EPA ID #: _____
 Address: Erie Harbor West River Wall Contact: Jane MH Forbes, MPA
 City: Rochester STATE: NY ZIP: _____ Phone: _____ Fax: _____

Waste Name: <u>Water</u> Generating Process: <u>Drilling Accumulation</u>	Shipping Name: <u>Non RCRA Non DOT Regulated</u> Rate of Generation: <u>Once</u> Container Type: <u>55 Gal Steel 1A1</u>
--	--

Composition of Waste	%	%	Phase	%
Water	99 - 100		Solids	
Grit	0 - 1		Liquid	
			Sludge	
			Debris	

Is the material RCRA listed or Characteristicly Hazardous?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Does the material contain Medical or Biological Wastes?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Does the material contain etiological waste?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Does the material contain, or has it come in contact with PCB's?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Is the material radioactive?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Does the material contain septic or domestic sewage?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Is the material Non-Hazardous as defined by RCRA Title 40?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO

Check all below which apply:

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Material is a Labpack and all contents are CERTIFIED as Non-RCRA	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
List all Lab Pack Container Numbers: (Attach packing slips to profile)		

I certify that the above submitted information (including any attachments) is true, accurate and complete to the best of my knowledge and ability and that all known and suspected hazards have been disclosed. All material offered herein is deemed Non-RCRA.	Signer Title _____ Company _____
Signed:	Print: <u>Dale Gramma</u> Date: <u>9/25/2018</u>

ARC Personnel Reviewed and Approved by:

Approved by: _____	Print: <u>Tom Martin</u>	Date: _____
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VLD

GENERATOR	NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number	2. Page 1 of 1	3. Emergency Response Phone 800-535-5053	4. Waste Tracking Number 18-062		
	5. Generator's Name and Mailing Address City Of Rochester Div of Env Quality Erie Harbor West River wall Rochester, NY 14625				Generator's Site Address (if different than mailing address) City Of Rochester Div of Env Quality Erie Harbor West River wall Rochester, NY 14625			
	6. Transporter 1 Company Name Nature's Way Environmental Consultants & Contractors, Inc.				U.S. EPA ID Number 9A-516			
	7. Transporter 2 Company Name				U.S. EPA ID Number			
	8. Designated Facility Name and Site Address American Recyclers, Inc. 177 Wales Ave Tonawanda, NY 14150 1-716-695-6720				U.S. EPA ID Number NYR000030809			
TRANSPORTER	9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.		
			No.	Type				
	1. Non RCRA Non DOT Regulated, (Water and Grit)		0	0				
	2. Non RCRA Non DOT Regulated, (Soil Cuttings)		4	Drum	1600	P		
	3.							
4.								
DESIGNATED FACILITY	13. Special Handling Instructions and Additional Information				Handling Codes:			
	1 - 1-H-14104IN 2 - 2-L-14163L 3 - 3- 4 - 4-				1 - None 2 - 3 - 4 -			
	24 Hour Emergency Contact: INFOTRAC (Caller Must ID ESG)							
	14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.							
	Generator's/Offor's Printed/Typed Name GARY Maybach IV				Signature 		Month Day Year 10 17 18	
DESIGNATED FACILITY	15. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: Date leaving U.S.:							
	16. Transporter Acknowledgment of Receipt of Materials							
	Transporter 1 Printed/Typed Name GARY Maybach IV				Signature 		Month Day Year 10 17 18	
	Transporter 2 Printed/Typed Name				Signature		Month Day Year	
	17. Discrepancy							
17a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection								
Manifest Reference Number:								
17b. Alternate Facility (or Generator)				U.S. EPA ID Number				
Facility's Phone:								
17c. Signature of Alternate Facility (or Generator)				Month Day Year				
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a								
Printed/Typed Name Julian Mastropoli				Signature 		Month Day Year 10 17 18		

AMERICAN RECYCLERS COMPANY

Waste Profile Report (WPR)

177 Wales Avenue Tonawanda, New York 14151 Phone (716) 695-6720 Fax (716) 695-0161	APPROVAL NUMBER: H-14164IN EXPIRATION DATE: _____ HANDLING CODE: B
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Generator: City of Rochester Div of Env Quality EPA ID #: _____
 Address: Erie Harbor West River Wall Contact: Jane MH Forbes, MPA
 City: Rochester STATE: NY ZIP: _____ Phone: _____ Fax: _____

Waste Name: <u>Water</u> Generating Process: <u>Drilling Accumulation</u>	Shipping Name: <u>Non RCRA Non DOT Regulated</u> Rate of Generation: <u>Once</u> Container Type: <u>55 Gal Steel 1A1</u>
--	--

Composition of Waste	%	%	Phase	%
Water	99 - 100		Solids	
Grit	0 - 1		Liquid	
			Sludge	
			Debris	

Is the material RCRA listed or Characteristicly Hazardous?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
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List all Lab Pack Container Numbers: _____
 (Attach packing slips to profile)

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Signed:	Print: <u>Dale Gramma</u>	Date: <u>9/25/2018</u>
ARC Presonal Reviewed and Approved by: _____		

Approved by: _____	Print: <u>Tom Martin</u>	Date: _____
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AMERICAN RECYCLERS COMPANY

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 City: Rochester STATE: NY ZIP: _____ Phone: _____ Fax: _____

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--	--

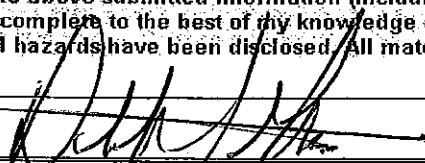
Composition of Waste	%	%	Phase	%
Soil cuttings	100 - 100		Solids	
			Liquid	
			Sludge	
			Debris	

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Signed:  Print: Dale Granza Date: 9/25/2018
 Signer Title: _____ Company: _____

ARC Personnel Reviewed and Approved by:

Approved by: _____ Print: <u>Tom Martin</u>	Date: _____
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PHOTO LOG



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Drill crew on site.



Drill crew on site.



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Drill crew on site.



Drill crew on site.



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Drill crew on site.



Overview of boring SB-02.



Overview of SB-10.



Overview of SB-15.



Overview of SB-20.



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APPENDIX C

Health and Safety Plan

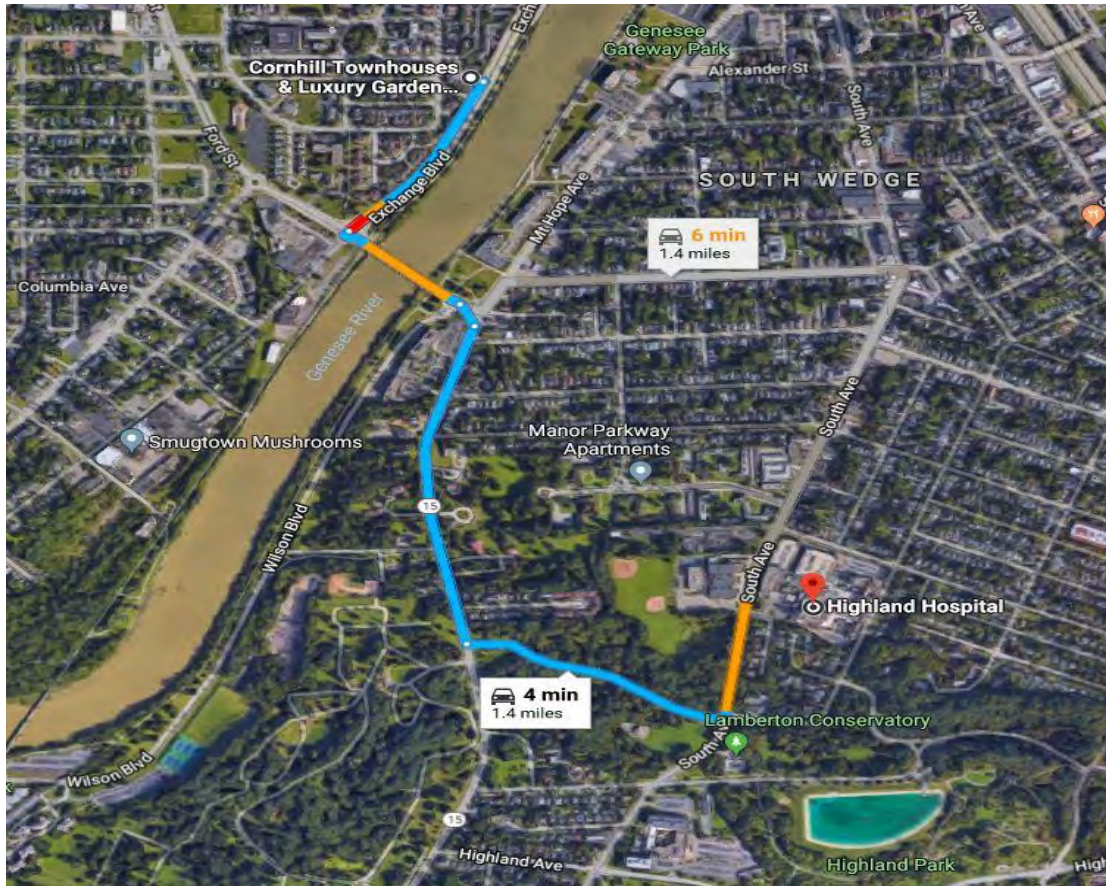


Site-Specific Health and Safety Plan

102642.00 - Rochester West River Wall Segment I

Cornhill

Rochester, NY



Bergmann

Office:

280 East Broad Street, Suite 200
Rochester, NY 14604

Phone: 585.232.5135

www.bergmannpc.com

Issued: April 12, 2018



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Attachments:

Attachment 1 – Emergency Route Driving Directions and Map

Attachment 2 – Site Specific Job Safety Analysis

Attachment 3 – Emergency Contact List



1.0 Introduction

Bergmann has prepared this Site Specific Health and Safety Plan (HASP) for work tasks associated with the planned investigative work detailed in the Draft Sampling and Analysis Plan dated March 6, 2018. The on-site cleanup work tasks include environmental and structural soil boring drilling, groundwater monitoring well installation, and environmental soil and groundwater sample collection. Historically, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and heavy metals have been detected in soil and groundwater on-site.

This plan outlines health and safety procedures, personal protective equipment (PPE), and field monitoring equipment required for monitoring the performance of health & safety requirements during the proposed investigative sampling and analysis activities. The details outlined in this HASP are intended to minimize the potential for injury or exposure to contaminants of concern (COCs) to Bergmann employees conducting work on the site.

1.1 HEALTH & SAFETY PLAN OVERVIEW

This HASP has been prepared for Bergmann personnel for activities conducted during the proposed investigative site work. The procedures and PPE described in this plan were developed after reviewing historic information regarding potential hazards that may be encountered during the proposed investigative work. The purpose of this HASP is to:

- Establish personnel safety/protection standards that meet or exceed the Occupational Safety and Health Administration (OSHA) Regulations;
- Define responsibilities of different organizations and personnel with contact information;
- Provide a map route to the nearest hospital (cover) or Urgent Care Facility;
- Establish an emergency contact list;
- Establish safe operating procedures relative to the conditions encountered at the project work area;
- Define the project work area;
- Provide for anticipated contingencies that may arise during the course of remediation work; and
- Modify the HASP in response to new environmental data or conditions encountered during implementation of the remedial action.



2.0 SITE ACCESS & PERSONNEL

Bergmann personnel prior to arriving at the project work area must read, ask questions, understand, and agree to follow the site health and safety protocol as outlined in this HASP. Bergmann personnel will do so by signing the acknowledgement located on page X of this HASP. This HASP only pertains to Bergmann personnel.

Bergmann personnel entering the project work area at the Site must follow this HASP.

2.1 SITE ACCESS

Site access will be given to Bergmann personnel, the drilling contractor, and associated field monitoring contractor. The drilling and field monitoring contractors are responsible for providing a health and safety plan that meets their construction work task, safe work area and securing the project work area during work hours. The development of this document was not required to and has not evaluated the health and safety of other personnel or contractors that may be present within the work zone.

2.2 SITE SPECIFIC HEALTH & SAFETY PERSONNEL

Bergmann is responsible for the health and safety of Bergmann personnel. This responsibility includes:

- Providing overall health and safety oversight for the project;
- Preparing and/or reviewing potential changes to this HASP and edit a task-specific addendum to the HASP, if required; and
- Monitoring health and safety performance.
- Upon completion of the first boring the efficacy of this plan and the ongoing work should be evaluated and changes to this plan made as needed.

One (1) person may be designated as having the responsibilities of the key personnel listed below for this project. A description of the responsibilities of the key personnel involved in the HASP program is presented below.

2.3 PROJECT MANAGER

The Project Manager (PM): Anthony Borelli, P.E. will assist with management of on-site work tasks and can be reached at 585-498-7777. Tony will be responsible for:

- Managing the planned work requirements so that work performed adheres to the outlined health and safety procedures;
- Provide guidance so that personnel follow health and safety procedures;
- Review daily work activities and field conditions encountered that may result in potential injury or exposure to contaminants of concern (COCs) as identified during project work; and
- Provide notification of unsafe conditions noted during fieldwork to Site owner and contractor.



2.4 SITE HEALTH AND SAFETY OFFICER

The Site Health and Safety Officer (SHSO): Steve DeMeo, P.G. will be responsible for the HASP implementation by the on-site representative who will be present during the majority of the field phases of the project. Steve can be reached at 585-498-7805 and will be responsible for the ensuring the execution of the following tasks:

- Implementing the HASP;
- On-site maintenance of a daily record (if relevant to health and safety at the project site) of personnel activities, monitoring activities and results, exposure incidents, and personnel protection equipment usage;
- Monitoring anticipated hazards and propose modifications (if necessary) for the level of personnel protection and/or work procedures;
- Advising the PM on work activities completed and proposed work tasks or conditions which may impact health and safety requirements;
- Having copies of this HASP available on-site for review and provide copies of 40-Hour HAZWOPER certificates to authoritative agencies by request; and
- Record daily weather conditions (e.g., temperature, wind speed/direction, etc.) if these conditions are relevant to health and safety at the project site.

Jim has the authority to suspend work activities if it is felt that the Site or weather conditions may adversely affect personnel health and safety. The SHSO will notify the PM, drilling and field monitoring contractors, and the City of such actions.

2.5 ON-SITE WORKERS

Bergmann project personnel involved in the proposed remediation activities are responsible for:

- Reading, understanding, and complying with the requirements of the HASP;
- Taking reasonable precautions to prevent incidents and to report accidents;
- Implement procedures specified in this HASP, and report deviations to the SHSO;
- Perform tasks that they are trained to do; and
- For this project, hard hats, work boots, safety glasses, and gloves are required for field project work tasks (Level D PPE).

2.6 VISITORS

Non-site workers and site visitors (Bergmann) are responsible for:

- Reading, understanding, and complying with the requirements of the HASP;
- Having the required personnel protecting equipment (e.g., hard hats, safety glass, and work boots);
- Taking reasonable precautions to prevent incidents that may result in injury;
- Limit visit time to less than an hour; and
- Visitors must request and receive permission for a date and time to visit the site from the Bergmann PM and the City of Rochester. This does not apply to New York State Canals Corporation, NYSDEC, NYSDOH, and the Monroe County Health Department.



3.0 HEALTH & SAFETY RISK ANALYSES

3.1 SITE OVERVIEW

The Site is located at:

The western portion of the River Wall adjacent to the Cornhill neighborhood, in the City of Rochester, Monroe County, New York.

Bergmann will monitor the investigative activities completed by the drilling and field monitoring contractors that include:

- Environmental and Structural soil boring installation;
- Groundwater monitoring well installation; and
- Community Air Monitoring.

Bergmann will also be responsible for the collection of characterization soil samples from the soil borings, locating and installation oversight of ten (10) groundwater monitoring wells, and collection of characterization groundwater samples.

3.2 HAZARD ANALYSES

3.2.1 Physical Hazards

- Physical hazards associated with injury from drilling equipment or vehicles;
- Physical hazards associated with investigation activities (i.e., slip or trip, ergonomics and lifting, moving components around drill rig);
- Underground utilities injury from damage to these utilities (i.e. electric shock, fire, and explosion);
- Biological health risks (e.g. poison ivy, ticks); and
- Heat and/or cold stress.

3.2.1.1 Chemical Hazards

Chemical hazards that could potentially be present on-site and/or associated during the investigative work are presented in the Chemical Hazard Evaluation table below:



CHEMICAL HAZARD EVALUATION									
Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
	PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
Acetone	1000 ppm	250 ppm	500 ppm	Y	Inh, Ing, Con	Irritation to eyes, nose, or throat, skin, skin burns, loss of coordination and equilibrium	Sharp penetrating odor, mint like	1.1	9.69
Aroclor 1260 (PCB)*	0.5 ^{sk} mg/m ³	---	0.5 ^{sk} mg/m ³	Y	Abs, Inh, Ing	Irritation to eyes and skin; dermatitis, liver damage	---	---	---
Arsenic*	0.010 mg/m ³	---	0.01 mg/m ³	Y	Inh, Ing, Abs, Con	Coughing, irritation to eyes, nose, throat, respiratory tract, inflammation of mucous membranes, dyspnea (labored breathing), cyanosis, and rales (rattle breathing), vomiting, bloody diarrhea, cold clammy skin, low blood pressure, weakness, headache cramps, convulsions, coma, redness, burns to skin	Odorless/ silver gray or tin white brittle (metal, inorganic), also can be in solution (clear & odorless)	---	---
Asbestos*	0.1 fibers/c c	---	0.2 - 2.0 fibers/c c	N	Inh, Ing	None	Odorless	---	---
Barium	0.5 mg/m ³	---	0.5 mg/m ³	N	Inh, Ing, Con	Irritation to eyes, nose, throat, or skin; stomach pains, slow pulse, irregular heart beat	Odorless	---	---



CHEMICAL HAZARD EVALUATION									
Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
	PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
Benzene*	1 ppm	---	10 ppm	Y	Inh, Abs, Ing, Con	Irritation to eyes, skin, nose, respiratory system; headache, nausea, dizziness, drowsiness, unconsciousness, harmful, fatal if aspirated into lungs	Colorless to light yellow liquid, sweet aromatic odor	0.5	9.25
Benzo(a)anthracene	N/A	N/A	N/A	Y	Inh, Ing, Con, Abs	Irritation to eyes, skin, digestive tract, respiratory tract (prevent contact to skin and eyes)	Yellow to green	---	---
Benzo(a)pyrene	0.2 mg/m ³	---	A2	Y	Ing, Inh, Abs, Con	Irritation to eyes, skin, lungs harmful if swallowed (all hazards and toxic properties not fully known)	Yellow green powder		
Benzo(b)fluoranthene	0.2 mg/m ³	0.1 mg/m ³	A2	Y	Inh, Ing, Con	No signs or symptoms of acute exposure to benzo(b)fluoranthene have been reported in humans	Colorless		



CHEMICAL HAZARD EVALUATION									
Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
	PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
Benzo(k)fluoranthene	N/A	N/A	N/A	Y	Inh, Abs, Ing, Con	Irritation to eyes, skin upper respiratory tract, and digestive tract. Could cause lung damage. Fatal if absorbed through skin, swallowed or inhaled.	Yellow solid, odorless	---	---
Cadmium*	0.005 mg/m ³	LFC	0.01 mg/m ³	N	Inh, Ing, Con	Irritation to eyes, nose, throat, cough, tight chest/pain, dyspnea, pulmonary edema, sweating, chills, slow pulse, muscle aches, weakness, death	Silvery/white (blue tinged) lustrous solid, odorless	---	N/A
Chlorobenzene	75 ppm	---	10 ppm	Y	Inh, Ing, Con	Irritation skin, eyes, nose, respiratory tract, coughing, shortness of breath, dizziness, incoordination, unconsciousness. GI irritation, toxic may cause systematic poisoning, nausea, vomiting, diarrhea	Colorless liquid, faint almond-like odor	0.4	9.06
Chromium (metal)	1.0 mg/m ³	0.5 mg/m ³	0.5 mg/m ³	N	Inh, Ing, Con	Irritation to eyes, skin and respiratory tract (lungs), ulceration of skin and mucous membranes, rash, electrolyte disturbances	Blue-white to steel gray lustrous brittle hard, odorless solid	---	N/A



CHEMICAL HAZARD EVALUATION									
Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
	PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
Chrysene	0.2 mg/m ³	---	0.2 mg/m ³	Y	Inh, Ing, Con	Irritation to eyes, skin, GI with nausea; vomiting, diarrhea, respiratory irritation	Very light beige solid	---	---
Cis-1,2-Dichloroethene	200 ppm	200 ppm	200 ppm	Y	Inh, Ing, Abs, Con	Irritant to skin, eyes, respiratory tract, mucous membranes, liver damage, narcotic effect at high concentrations	Mild odor	0.8	9.66
1,1-Dichloroethene	1 ppm	---	5 ppm	N	Inh, Ing, Abs, Con	Irritation, sensitization to eyes, nose, throat, dizziness	Mild, sweet chloroform-like odor	0.9	9.79
1,2-Dichloroethane*	1 ppm	40 mg/m ³	10 ppm	Y	Inh, Ing, Abs, Con	Nausea, vomiting mental confusion, headache, skin burns, dermatitis, cornea (eye) damage	Pleasant chloroform odor, sweet taste	NR	11.05
4,4'-DDT*	1 mg/m ³		1 mg/m ³	Y	Avoid physical contact	N/A (Toxic irritant)	---	---	---
Dichlorobenzene (p-)	75 ppm	---	10 ppm	Y	Inh, Ing, Abs, Con	Irritation to eyes, nose, throat, skin, loss of consciousness, cyanosis, irregular pulse	Moth balls	---	---
Dieldrin	N/A	---	N/A	Y	Inh, Con, Abs	Irritation to eyes, nose, throat, skin, death	---	---	---
Endosulfan II (beta)	---	---	---	N	Inh, Ing, Con	N/A (Toxic irritant)	Grayish-white powder (pesticide)	---	N/A



CHEMICAL HAZARD EVALUATION									
Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
	PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
Ethylbenzene	100 ppm	---	100 ppm	Y	Inh, Ing, Con	Irritation to eyes, skin, mucous membranes; dermatitis, narcosis, , trouble breathing, paralysis, headache, nausea, headache, dizziness, coma	Colorless liquid, aromatic odor	0.5	8.77
Indeno(1,2,3-cd)pyrene	0.2 mg/m ³	0.1 mg/m ³	0.1 mg/m ³	Y	Inh, Ing,	N/A	Yellow Crystals	---	---
Lead	0.05 mg/m ³	0.05 mg/m ³	0.05 mg/m ³	Y	Inh, Ing, Con	Poison, abdominal pain, spasms, nausea, vomiting, headache, irritation to eyes; skin, weakness, metallic taste, anorexia/loss of appetite, insomnia, facial pallor, colic, anemia, tremor, "lead line" in gums, constipation, abdominal pain, paralysis in wrists and ankles, encephalopathy (inflammation of brain)	Odorless	---	---



CHEMICAL HAZARD EVALUATION									
Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
	PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
Mercury	0.1 ^{sk} mg/m ³ ceiling	0.1 mg/m ³ ceiling 0.05 mg/m ³ ceiling	0.025 ^{sk} mg/m ³	Y	Inh, Abs, Ing, Con	Severe respiratory tract damage, sore throat, coughing, pain, tightness in chest, breathing difficulties, headache, muscle weakness, anorexia, GI disturbances, ringing in ear, liver changes fever, bronchitis, pneumonitis, burning in mouth, abdominal pain, vomiting, corrosive ulceration, bloody diarrhea, weak & rapid pulse, paleness, exhaustion, tremors, collapse, thirst, burns and irritates skin, eyes, blurred vision, pain in eyes	Silver-white, heavy, odorless liquid metal	---	N/A
Methyl Ethyl Ketone (2-Butanone, MEK)	200 ppm	200 ppm	200 ppm	Y	Inh, Ing, Con	Irritation to eyes, nose; skin, dizziness, nausea, drowsiness, CNS depression, unconsciousness	Mint or acetone-like	0.9	9.51
Silver	0.01 mg/m ³	---	0.1 mg/m ³	Y	Inh, Ing, Con	Blue gray eyes, irritation to nasal septum, throat, skin, ulcerations to skin, GI disturbances	White to gray lustrous/ metallic solid, odorless	---	---
1,1,1-Trichloroethane	350 ppm	---	350 ppm	Y	Inh, Con	Vomiting, nausea, drowsiness, unconsciousness	Slight fruity odor	NR	11



CHEMICAL HAZARD EVALUATION									
Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
	PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
1,2,3-Trichlorobenzene	---	---	---	Y	Inh, Ing	Causes eye, skin, and respiratory tract irritation. Harmful if swallowed.	White solid with a sharp chlorobenzene odor. (mothlike) Insoluble in water and denser than water.	---	
Toluene	200 ppm	100 ppm	20 ppm	Y	Inh, Abs, Ing, Con	Irritation to eyes, skin, nose; upper respiratory tract, fatigue, weak, confusion, dizziness, headache, drowsiness, abdominal spasms, dilated pupils, euphoria	Colorless liquid, sweet pungent, benzene like odor	0.5	8.82
Trichlorobenzene (1,2,4-Trichlorobenzene)	N/A	---	N/A	N	Inh, Abs, Ing, Con	Irritation to eyes, mucous membranes, possible liver, kidney damage	Colorless to white liquid, aromatic odor (@ 63 F turns solid/crystalline)	---	N/A
Trichloroethene* (TCE)	100 ppm (per 6/97 NIOSH Pocket Guide)	25 ppm (per 2005 NIOSH Pocket Guide)	10 ppm	Y	Inh, Abs, Ing, Con	Irritation to eyes, skin, mucous membranes and GI, headache, vertigo, fatigue, giddiness, tremors, vomiting, nausea, may burn skin, visual disturbance, paresthesia, cardiac arrhythmias	Colorless liquid, sometimes dyed blue, chloroform odor	---	9.45



CHEMICAL HAZARD EVALUATION									
Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
	PEL	REL	TLV					Relative Response	Ioniz. Poten. (eV)
Vinyl Chloride*	1 ppm	---	1 ppm	Y	Inh, Con	Dulled auditory and visual response, headache, weakness, frostbite, GI bleeding, pallor or cyanosis of extremities, abdominal pain, bleeding	Colorless liquefied gas, pleasant odor at high concentrations (3000 ppm)	2.0	9.99
Xylenes	100 ppm	100 ppm	100 ppm	Y	Inh, Abs, Ing, Con	Irritation to eyes, nose, throat, skin; nausea, vomiting, headache, ringing in ears, severe breathing difficulties (that may be delayed in onset), substernal pain, coughing, hoarseness, dizziness, excited, burning in mouth, stomach, dermatitis (removes oils from skin), corneal burns	Colorless liquid, aromatic odor (solid below 56 F)	.5	8.44

KEY:

PEL = Permissible Exposure Limit

REL = Recommended Exposure Limit

--- = Information not available

TLV = Threshold Limit Value(ACGIH)

Inh = Inhalation

Ing = Ingestion

mg/m³ = Milligrams per cubic meter

* = Chemical is a known or suspected carcinogen

Abs = Skin Absorption

Con = Skin and/or eye Contact

ppm = Parts per million

sk = Skin notation



4.0 SITE CONTROL MEASURES

4.1 SITE CONTROL

Site control will minimize potential injury and exposure of COCs to workers and visitors. Site control measures also enhance response in emergency situations.

It is anticipated that project work under this program will be conducted following Level D health and safety protocol. In the event that an upgrade to Level C health and safety protocol is necessary, a meeting will be held to prepare for level C health and safety issues and this HASP will be modified.

During soil boring drilling and groundwater well installation activities, a minimum five (5) foot buffer will be cordoned off around the drill rig and work area perimeter with wooden stakes and caution tape. This buffer protection area will be implemented specifically when working near the public river trail.

4.2 SITE SECURITY

The SHSO or designated alternate is responsible for coordinating access to the active work zone with the drilling and field monitoring contractors. The drilling and field monitoring contractors are responsible for securing the drill rig and field equipment during working and non-working hours. When necessary to establish a work zone as defined above, the same will be identified by barricades or a barrier tape which will be placed a minimum of five (5) feet from the perimeter of the drill rig and boring/drilling operation. Unauthorized entry within the five (5) foot buffer should be noted in a daily field report.

4.3 BUDDY SYSTEM

Field activities should be conducted with a buddy who is able to:

- Provide partner with assistance;
- Observe partner for signs of chemical or heat/cold exposure;
- Periodically check the integrity of partner's protective clothing; and
- Notify the SHSO or others if emergency help is needed.

It is noted that Bergmann employees can rely on either the drilling or field monitoring contractors as a buddy.

4.4 SITE COMMUNICATIONS

Communications will be conducted through verbal communications. When out of audible range, field communication will be via cellular phones or a two-way radio.

Communications between workers in various zones shall consist of the standard hand signals, voice, or radio calls. A cellular phone will be used to contact appropriate agencies in the event of an emergency.

4.5 SAFE WORK PRACTICES

Operating procedures consistent with general safety rules should be followed by all workers. Workers will be conscientious of others working around them and check that they are safe, and working in a safe manner.



General safety rules that will be enforced at the project work areas include the following:

- All personnel in the work zone have stop work authority for any health or safety issue until which time the practice or impairment may be corrected;
- Monitor the soil boring and groundwater well installations from the upwind location and periodically from the downwind location;
- Smoking will be prohibited during field activities or around the drill rig;
- Eating and chewing gum will be prohibited during field activities or around the drill rig;
- Field work will be conducted during daylight hours unless adequate light is provided;
- Authorized visitors that enter the site will sign the daily field log and will also be required to read this HASP (as the minimum health and safety requirements) should they not have their own plan;
- Workers must thoroughly wash their hands prior to leaving the work area and decontamination zones and before eating or drinking; and
- Excessive facial hair should be minimized in the event that respiratory equipment is required for Level C project work.

4.6 VISITORS

Visitors may be permitted in the immediate area of active operations with the approval from the SHSO. Visitors will not be allowed to enter in to the work zone and, if applicable, decontamination zones. Site visitors will be briefed on appropriate sections of the HASP that apply to their visit time on-site. Site visitors must utilize the appropriate PPE for the work zone as required at the time of the visit. The presence of visitors will be documented on the daily log maintained by the SHSO or designated alternate during site activities. Visitors will not be allowed in work areas, support zone, and decontamination areas during level C project work.

4.7 NEAREST MEDICAL ASSISTANCE

First Aid supplies will be located near the area of work activity, support zone, or in a field vehicle. Additional medical assistance can be summoned by dialing “911.”

The nearest emergency medical assistance is Highland Hospital, located at 1000 South Avenue, Rochester, New York, (585-473-2200), and is approximately 1.8 miles from the site. The emergency route with directions to the hospital from the Site is shown on Figure 1 – Hospital Emergency Route. Additional information regarding medical assistance, evacuation routes, and emergency procedures is contained in Section 8.0 of this HASP.

Non-urgent care may be obtained at a local Urgent Care Facility. The closest of which is listed on the emergency contact list located within this document. Other urgent care facilities may be obtained by contacting the Bergmann Environmental, Health and Safety Manager at 585.498.7858.

4.8 SAFETY EQUIPMENT

In addition to the PPE necessary to conduct work activities, the following inventory of safety equipment will be available:

- First aid kit;



- Scissors for emergency equipment removal;
- Emergency eye wash (as needed);
- Electrolyte replacement drink and potable water – stored in clean area; and
- Fire extinguisher for Class ABC fires (on contractor's equipment).

5.0 MEDICAL SURVEILLANCE

Bergmann employees and contractors will follow their respective individual in-house medical surveillance procedures.

6.0 PERSONAL PROTECTIVE EQUIPMENT

The SHSO has reviewed the environmental and historical sampling data that is relevant to this proposed soil boring and associated construction work to determine potential exposure to COCs and physical hazards. This review resulted in designating the work area as a construction zone. Level D PPE has been designated as the primary level of personnel protection that should be used during project work where contact with soil and groundwater is possible. Upgrading to Level C will be executed as required in the monitoring guidelines outlined.

6.1 PERSONAL PROTECTIVE EQUIPMENT SELECTION CRITERIA

PPE requirements selected for each project work task are specified in Section 6.3 of this HASP. Equipment selection was based upon the mechanics of the task and the nature of the hazards that are anticipated. The following criteria were used in the selection of PPE equipment:

- Chemical hazards known or suspected to be present;
- Routes of entry through which the chemicals could enter the body, e.g., inhalation, ingestion, skin contact; and
- Potential for contaminant/worker contact while performing the specific task or activity.

Based on available data, we anticipate that most on-site or near-site work activities will be performed at Level D protection. However, Level C protection will be available in the event an upgrade is required.

6.2 SELECTED PERSONAL PROTECTIVE EQUIPMENT ENSEMBLES

The following components of Level D PPE will be available and used as appropriate in accordance with the specifications of this HASP:

- Steel-toe/steel-shank work boots;
- Rubber over-boots (if necessary);
- Safety glasses;
- Insert-type hearing protection or ear muffs (when necessary);
- Hard hats;
- Long sleeve shirts and pants (no shorts);



- Leather gloves when using hand held tools; and
- Latex or nitrile gloves when sampling soil, water or debris.

It is possible that an upgrade to Level C may be required during the tasks identified during this project work. If an inhalation hazard is present or per the guidelines presented in the PPE reassessment program, the following must be added to the protective equipment:

- Half-face respirator equipped with NIOSH/OSHA-approved cartridges suitable for protection against organic vapors, acid gases, and particulates;
- Tyvek disposable coveralls; and
- Or upgraded as necessary

6.2.1 Levels of Protection

The following levels of protection will be used for specific work activities. Adjustments to these levels may be required given the site conditions encountered.

- Soil borings, environmental monitoring, and collection of soil samples – this work may be conducted in Level D; and
- Groundwater monitoring well installation and sampling – this work conducted in Level D.

6.3 PERSONAL PROTECTIVE EQUIPMENT REASSESSMENT PROGRAM

Air monitoring will be conducted during the remediation project work when excavation of COC impacted soils is performed. Such monitoring will be conducted within the work zone utilizing photoionization detection (PID) with a 10.2 eV lamp, or equivalent. Monitoring will consist of determining breathing zone concentrations of total volatile organic vapors. The air monitoring equipment utilized will be calibrated and maintained, in accordance with the manufacturer's instructions. The calibrations and checks will be provided by the vendor of the equipment.

Background readings will be obtained in the work zone, upwind, downwind, and support zone prior to excavation of COC impacted soil. Following the establishment of background PID measurement, air monitoring will be conducted in the work zone during the soil excavation activities. Periodic PID measurements will be obtained at downwind locations. The PID measurements will be utilized for evaluating potential upgrade to Level C, if necessary. This may be accomplished by comparing PID measurements to health and safety action levels. The action levels for the PID air-monitoring measurements in the worker's breathing zone are provided below:

- Upgrade from Level D to Level C if either of the following conditions exist:
- Total Organic Vapor (TOV) – greater or equal to 5 and less than 50 PID units (part per million) with compensation made for background readings sustained for a period of at least 5 minutes.
- Downgrade from Level C to Level D if both of the following conditions exist:
- Total Organic Vapor (TOV) – less than 5 PID units, above background sustained for a period of at least 5 minutes, with subsequent approval to downgrade provided by the Project Manager.

Immediate Evacuation of Area:

- Total Organic Vapor (TOV) – greater or equal to 50 PID units in the workers' breathing zone.
- Excavation of unknown soil type or containers.



If continued evacuation of the area becomes necessary, a meeting will be held to address the air monitoring results and air monitoring may be continued until levels are below evacuation criteria so the area can be reentered. A reassessment of the continuing scope of work, Health and Safety Plan, PPE and afforded protections are required.

7.0 DECONTAMINATION PROCEDURES

Field decontamination of PPE (e.g. boots) will consist of dry brushing soil off the PPE, and if necessary washing contaminated PPE with a mixture of Alconox® soap and water. Modification to the decontamination protocol for PPE will be made on-site as needed.

8.0 EMERGENCY RESPONSE

In the event of an emergency the following procedures will apply:

- Fire – the work area will be evacuated and the fire department will be notified. Telephone 911.
- Injury – Contact emergency medical services (Telephone 911).
- A qualified person will administer first aid. If injury is not a life or death situation, then self-transport to the hospital is acceptable. Directions to the hospital are attached.
- Chemical overexposure – If possible, move the victim to a safe location and contact 911 for emergency services. Have a qualified person administer first aid. If the person is conscious self-transport to the hospital is acceptable. If the person is unconscious, notify the appropriate emergency medical services at telephone number 911.

8.1 AVAILABLE EQUIPMENT AND EMERGENCY AUTHORITIES

Bergmann and the remediation contractor will have a cellular telephone. If additional emergency equipment is required, the following local agencies can be called upon for advice, supplies, or additional manpower:

<u>AGENCY</u>	<u>TELEPHONE NUMBER</u>
City of Rochester Fire Department	911
Highland Hospital	911
NYSDEC – Region 8 Division of Environmental Remediation	(585) 226-5353



9.0 SIGNATURE PAGE

By signing below, I acknowledge that I have been informed of the items covered by this plan.

PRINTED NAME	SIGNATURE	DATE



BERGMANN
ARCHITECTS ENGINEERS PLANNERS

APPENDIX D

Community Air Monitoring Plan

Appendix 1A

New York State Department of Health Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \text{ mcg}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B

Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.
2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.
3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM₁₀) with the following minimum performance standards:
 - (a) Objects to be measured: Dust, mists or aerosols;
 - (b) Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 :ug/m³);
 - (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
 - (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
 - (e) Resolution: 0.1% of reading or 1g/m³, whichever is larger;
 - (f) Particle Size Range of Maximum Response: 0.1-10;
 - (g) Total Number of Data Points in Memory: 10,000;
 - (h) Logged Data: Each data point with average concentration, time/date and data point number
 - (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
 - (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
 - (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
 - (l) Operating Temperature: -10 to 50° C (14 to 122° F);
 - (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.
4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.
5. The action level will be established at 150 ug/m³ (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m³, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m³ above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m³ continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM₁₀ at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m³ action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.



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APPENDIX E

Imported Fill Material Request Form

APPENDIX E
Material Storage Import, or Export MANIFEST
To or From the Corn Hill West River Wall – Segment 1 Site

Project: Corn Hill West River Wall – Segment 1
Location (City and State): Rochester, New York

Date: _____

Construction Contractor (Firm): _____

Form Completed by (name, title, and phone #): _____

	Material Storage Import or Export Area Information
Name of Facility Material Being Transferred To or From	
Address	
Facility Contact Name and Title Mailing Address Phone	
General Description of Storage, Import or Export (i.e. Topsoil/Clay/Sand/Rock)	

1. Party responsible for transport of material? Provide Contact Information:

2. Dates of Storage Import or Export:

Start Date: _____

End Date: _____

3. Material Provided to Site – Total Quantity Estimate (Cubic Yards): _____

or

Material Accepted to Site – Total Quantity Estimate (Cubic Yards): _____

4. The storage, import, export Site is:

Active Construction Site? ☐

Industrial Facility (e.g. Mining)? ☐

Under Active Agricultural Production? ☐

Other(Describe): _____

5. Area of Storage Import or Export (AC)?

Total: _____

Disturbed: _____

The Construction Contractor shall coordinate completion of the Material Storage, Import or Export Agreement found in this Appendix and submit the agreement to the City of Rochester and Bergmann Project Manager's for all occurrences where soil, dirt, rock, fill or other materials are

- 1) Imported for placement on the Corn Hill West River Wall – Segment 1 construction site (with the exception of material obtained from an industrial NPDES and/or SPDES permitted facility); or
- 2) Exported from the Corn Hill West River Wall – Segment 1 construction site for placement on areas off of the Corn Hill West River Wall – Segment 1 construction site (with the exception of material taken to an industrial, NPDES and/or SPDES permitted facility)

The Construction Contractor shall also complete and keep current the Import / Export Material Information box on the project Site Maps.

MATERIAL STORAGE IMPORT OR EXPORT AGREEMENT
("AGREEMENT")

_____, which is the party, entity, or individual that possesses ownership over the real property (as these terms are set forth, defined, or used under applicable laws) (The "Owner" Located at _____ (the "off-Site Area"), and _____ ("Contractor"), enter into this material Storage, Import or Export Agreement ("Agreement"). In consideration of the mutual covenants set forth on this agreement, the parties hereto agree as follows:

1) Definitions:

- A. Stormwater requirements – all Federal State or local laws, regulations, ordinances, permits or other authorizations, approvals or other requirements relating to storm water discharges or the control of erosion or sediment discharges from construction projects, including but not limited to, the Clean Water Act, 33 U.S.C. 1251 et seq. and the July, 2003 NPDES General Permit for Stormwater Discharges Associated with Construction Activities (the "EPA General Permit") and all other applicable federal, state and local laws (collectively the "Stormwater Requirements").
 - B. Material – Rock, soil, or other construction materials obtained from certain real property owned by [City of Rochester] as part of an earth disturbing activity.
 - C. Owner – For a corporation a responsible corporate officer. A responsible corporate officer means: (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principle business function, or any other person who performs similar policy or decision making functions for the corporation; or (2) the manager of one of more operating facilities provided the manager is authorized to make management decisions which, govern the operation of the facility including having the explicit or implicit duty of making major capital investments recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations. For a partnership or sole proprietorship: by a general partner or the proprietor respectively. For a municipality, State, Federal or other public facility by either a principle executive officer or ranking elected official.
- 2) Contractor covenants and agrees to [deliver / export] the Material to Owner, and the owner agrees to accept the Material outlined in Attachment 1, all subject to the terms and conditions of this agreement. Said delivery of material shall be without representation or warranty of any kind whatsoever, including without limitation representation as to composition: and/or acceptability from any particular use or purpose.
- 3) The Owner covenants and agrees through this agreement and by Accepting the Material to comply with all applicable Stormwater Requirements and the Owner further acknowledges and agrees that, from and after delivery of the Material, neither Contractor, nor any other person other than the Owner shall be responsible for such compliance with respect to the Material.

- 4) To the greatest extent permitted by applicable law, the Owner hereby releases, now and forever, Contractor, City of Rochester, and the representatives, agents, consultants, contractors_____ and _____ Subcontractors of either of them, including their respective employees, agents, officers, directors, members and shareholders (collectively, "released Parties"). From any and all known and unknown claims, suits, judgements, orders, costs expenses and damages of any kind or nature (including any attorneys, paralegal, and consultant fees and costs), whether fixed or contingent, now existing or hereafter arising and based on any and every theory of recovery, that the owner may have, suffer, incur or accrue, now or in the future arising from, relating to, or in connection with directly or indirect, (i) in the owners acceptance, receipt, use, handling, and/ or management pf the material or (ii) any third party's subsequent acceptance, receipt, use, handling, and/or management of the material. Owner hereby further irrevocable waives and covenants and agrees to refrain from, directly or indirectly asserting any claim or demand, or commencing instituting or causing the be commenced, any proceeding of any kind against released party based upon any matter purported to be released hereby. Owner acknowledges that is it its attorneys or advisors may hereafter discover pacts in addition or different from those which they now know or believe to be true with respect to the subject matter of this agreement that, if known would materially affect their decision to enter into this agreement. Nevertheless, it is the intention of owner to settle and release the Released parties as to all claims released hereby notwithstanding the discovery of the existence of any additional or different facts.
- 5) To the greatest extent permitted by applicable law, the owner shall indemnify and hold harmless the released Parties, including their respective employees, agents officers directors members and shareholders, from and against any and all claims, suits, judgement, orders, costs, expenses, damages of any kind of nature, remediation and corrective action costs, and penalties (including any attorneys, paralegal and consultant fees and costs) that any released party may have, suffer or incur now or in the future arising from, relating to, or in connection with, directly or indirectly, (i) the owners acceptance, receipt, use handling and/or management of the material or (ii) any third party's subsequent acceptance, receipt, use, handling and/or management of the material. Owner shall promptly and fully comply with its indemnity obligations hereunder upon receipt of notice thereof from any released party, City of Rochester shall be entitled to control and direct defense of, and to accept or reject any offer to compromise or settle any and all such matters subject to indemnity hereunder with counsel satisfactory to City of Rochester in its discretion. Owner shall cooperate, at owner's expense, with City of Rochester and its counsel in all respects in connection with such defense. Owners indemnity obligations hereunder shall survive the acceptance, receipt, use handling and management of the material by owner or any third party until all such matters covered by this indemnity are fully and finally barred by applicable law.
- 6) In accepting and receiving the Material, the Owner acknowledges exclusive control over the Material, and accepts all responsibilities, obligations and duties in connection with such material and with such ownership and control including obligations arising from all storm water Requirements. The Released Parties shall have no ownership or control and shall have no responsibility or obligation whatsoever relating to or in connection with any such material covered by this agreement following the owner's acceptance and receipt of such material. The Owner acknowledges and has been made aware that the Material accepted by the owner is uncontaminated material, and that no contaminated material can leave the site and enter this site.

- 7) To the extent that any third party (other than the Owner) may accept, receive, use handle and or manage any of the Material now or in the future, the owner shall obtain from such third party a written agreement in favor of the released parties, substantially in the same form as this agreement, in which such third party agrees to comply with the terms and conditions hereof and makes the agreements, covenants, waivers and releases set forth herein in favor of the released parties. The released parties shall be named third party beneficiaries of such written agreement.
- 8) This agreement shall be governed by the laws of the state in which the material is located, without reference to the conflicts of law provisions thereof. This agreement shall supersede any other writing, contract or agreement which specifies the timing, amount, or other specifications of delivery of Material unless any changes are specifically outlined in this agreement. This agreement may be modified only by a writing signed by each of the parties. Owner specifically acknowledges and agrees that the released parties are intended third-party beneficiaries of the provisions of this agreement, City of Rochester and the other released parties shall each have all rights and remedies available hereunder, at law and in equity, in the event of any dispute concerning the terms or enforcement of this agreement, the prevailing party shall be entitled to recover costs and attorney fees.
- 9) The Signatories below have the authority to execute this agreement and to bind their respective parties to this agreement, This Agreement may be executed in any number of counterparts, each of which when executed and delivered shall be an original, but all of which together shall constitute one and the same instrument. Executed copies hereof may be delivered by fax or electronically and shall be deemed originals binding upon the parties here to.

OWNER

By: _____

Name: _____

Title: _____

Date: _____

CONTRACTOR

By: _____

Name: _____

Title: _____

Date: _____



APPENDIX F

Petroleum Tank Removal Procedure

PETROLEUM STORAGE TANK REMOVAL

PART 1 – GENERAL

1.1 SCOPE

- A. If petroleum bulk storage tank(s) are encountered as part of the project, work of this Section shall be performed in accordance with the requirements of the Contract Documents and all applicable regulations.
- B. It is noted that to date, no actual storage tank(s) and contents have been located on Site, however, if tanks(s) and contents are encountered during construction the following procedures are to be adhered to.
- C. CONTRACTOR shall provide all labor, materials, services, and equipment necessary for removal, transportation and disposal of the above-noted storage tanks, piping, vent lines and all associated appurtenances, including any tank contents. All tank closures will be done in accordance with applicable state, federal and local regulations and appropriate professional codes (i.e. NFPA).
- D. CONTRACTOR shall provide all labor, materials, services and equipment necessary to provide air monitoring and soil sampling services during the tank closure. All tank closures shall be done in accordance with applicable federal, state and local regulations.
- E. CONTRACTOR shall provide all labor, materials, services, and equipment required for the removal, transportation and disposal of contaminated liquids, and sludges contained in the tanks.
- F. CONTRACTOR shall provide all labor, materials, services and equipment required to remove gravel fill or asphalt surface cover layer and subsequent contaminated soils identified in any of the underground tank excavations. Petroleum-impacted soils removed from the excavations shall be staged on-Site pending disposal. The staging area will be determined by the CONTRACTOR in concurrence with the CONSULTANT. The CONTRACTOR should plan for the use of a truck to transport contaminated soils to the staging area.
- G. CONTRACTOR shall provide all labor, materials, services and equipment required to remove contaminated soils around building foundations and footers. Contaminated soils removed to facilitate demolition shall be staged on-Site pending treatment or disposal. The staging area will be determined by the CONTRACTOR.
- H. CONTRACTOR shall provide all labor, materials, services and equipment required to construct the contaminated soil staging area and an equipment decontamination area.

PETROLEUM STORAGE TANK REMOVAL

1.2 SUBMITTALS

A. Submit the following items in accordance with the General Conditions:

1. Copies of written notifications to state and local regulatory agencies.
2. Written certification of proper transport and final disposal locations of the tank, and any liquids or sludges found in the tank or generated during cleaning operations shall be submitted to the CONSULTANT within one (1) week following transportation of these items off of the Site.
3. Tank closure report for each tank in accordance with the requirements of NYSDEC CP-51.
4. Copies of any permits issued by the City of Rochester, if required.

1.3 BID QUANTITIES

A. The work of this section shall include:

1. Excavation and staging of petroleum-contaminated Soils.
2. Characterization sampling of staged petroleum-contaminated soils.
3. Removal and disposal of unknown size storage tank(s).
4. Removal and disposal of gravel fill and petroleum-impacted soils from within the excavation, if encountered. Quantity of petroleum-impacted soil and gravel fill to be removed is subject to change according to field screening by the CONSULTANT during actual tank(s) removal activities.
5. Removal and disposal of residual tank contents (remaining fuel oil, gasoline, and petroleum-impacted ground or surface waters), rinse water, and/or groundwater in the tank excavations.
6. Sampling and laboratory analysis of the residual tank contents, rinse water, and/or groundwater in tank(s) excavations.
7. Contact and coordination with receiving transport and disposal facilities of removed storage tank and any associated sludges/piping/residual materials, petroleum-contaminated soils, and potentially contaminated residual tank contents, rinse water, and/or groundwater in tank excavations.

PART 2 – PRODUCTS

None specified.

PART 3 – EXECUTION

3.1 REMOVAL OF TANKS, PIPING AND ACCESSORIES

PETROLEUM STORAGE TANK REMOVAL

- A. CONTRACTOR shall remove all designated tanks in accordance with all applicable federal, state, and local regulations.
- B. Asphalt, gravel, or concrete pavement overlying the underground tanks must be removed and disposed of in order to access tanks. Soil beneath the topsoil shall be carefully removed to expose the top of the tank without damaging the piping connections to the extent practicable.
- C. CONTRACTOR shall remove and dispose of all residual liquid, solids and sludges from the tanks and piping. All piping connected to the tank shall be drained into the tank or other containers prior to removal.

The tank and/or piping shall be made clean, inert and/or non-explosive prior to removal of the tank from the ground and job site. An inerting method similar to one described in API Publication 2015 or NFPA 327 shall be used. The actual method of cleaning and inerting the tank used shall comply with all applicable State and local requirements and shall be appropriate for the substance(s) stored in the tank. Sampling and analysis shall be conducted as required for proper disposal of the sludge and rinsate. Sludge and rinsate shall be contained, removed and disposed of in accordance with all applicable Federal, State and local requirements.

- D. Motors used in the area of the tanks must be "explosion-proof." Proper bonding or grounding shall be used.
- E. CONTRACTOR shall include all costs to properly dispose of tank contents in his base bid. This shall also include the costs for sampling and analysis as required by the Treatment, Storage and Disposal Facility (TSDF) for screening and certification purposes.
- F. CONTRACTOR shall include in his base bid all costs for the removal, testing and disposal of contaminated liquid generated from tank rinsing and cleaning operations. Removal and disposal shall be in accordance with Local, State and Federal regulations.
- G. CONTRACTOR shall excavate and manage all soils in conformance with the NYSDEC Petroleum-Contaminated Soil Guidance Policy and CP-51: Soil Cleanup Guidance.
- H. Excavation around the perimeter of the tank shall be performed in a manner which limits the amount of potentially contaminated soil that could be mixed with previously uncontaminated soil. Excavation of contaminated soil shall be kept to the minimum practical excavation needed to perform the work.
- I. CONTRACTOR is responsible for furnishing safe conditions for workers. Existing structures, surrounding soils, sidewalks, and paving shall be safely supported to prevent

PETROLEUM STORAGE TANK REMOVAL

undermining during excavation. Sheeting, bracing, or shoring shall be installed if there is a need for workers to enter the excavated area.

- J. All piping and appurtenances associated with the tanks shall be removed, unless stated otherwise in the Contract Documents. Excavation shall be performed as necessary to remove tank piping and associated equipment in accordance with the requirements for tank removal.
- K. The CONTRACTOR will check with the local municipality to determine if it is acceptable to cut-up the tanks prior to disposal. If tanks are to be cut, an appropriate method to displace oxygen inside the tank will be used (i.e. dry ice).

3.2 DISPOSAL OF TANKS, PIPING AND ACCESSORIES

- A. After being cleaned and purged of product vapors, the petroleum storage tanks shall be rendered unfit for further use by the CONTRACTOR. This shall be done in accordance with the NYSDEC Memorandum "Permanent Closure of Petroleum Storage Tanks," API 1604, "Removal and Disposal of Used Petroleum Storage Tanks.
- B. The petroleum storage tank, piping and associated equipment shall be recycled by the CONTRACTOR or disposed of, following approval by the CONSULTANT, at a disposal facility permitted to receive wastes of this type. This disposal will be in accordance with the NYSDEC Memorandum "Permanent Closure of Petroleum Storage Tanks," API 1604, "Removal and Disposal of Used Petroleum Storage Tanks. Costs for recycling or disposing of tanks, piping and associated equipment shall be part of the CONTRACTOR'S base bid.
- C. The CONTRACTOR shall retain the rights to salvage value of recycled or reclaimed product and metal not turned over to the OWNER, so long as all applicable Federal, State and local requirements are met. At the end of the contract, and before Final Payment is issued, the CONTRACTOR shall provide documentation on the disposition of salvaged materials.

3.3 REMOVAL OF PETROLEUM CONTAMINATED SOILS

- A. CONTRACTOR shall excavate and stage any petroleum contaminated soils encountered during the removal of the oil storage tank.

3.4 HANDLING OF CONTAMINATED SOILS

PETROLEUM STORAGE TANK REMOVAL

- A. CONTRACTOR shall remove contaminated soils from the tank excavation in accordance with the Contract Documents. The CONTRACTOR shall stockpile all excavated soils until laboratory analysis for contamination is completed. Separate stockpiles for suspected clean (non-contaminated) and suspected contaminated soils may be constructed, however, all excavated materials shall be tested.

Contaminated soils shall be staged on the Site at the locations selected by the CONTRACTOR in concurrence with the CONSULTANT. The CONTRACTOR shall take care during the field work portion of this project to ensure that the contaminated soil is properly isolated from its surrounding environment and is incapable of having its contaminant released into the environment. The soil storage sites shall be designed and constructed to meet these environmental isolation requirements.

- B. The soil storage site shall be at a higher elevation than the surrounding ground to avoid the potential for stormwater run-on and accumulation. Minimum of 6-mil thick polyethylene plastic sheeting shall be used to line the bottom of the soil storage areas and to corner the soil piles. CONTRACTOR shall provide anchoring as needed to hold the sheeting in place. Polyethylene sheeting shall be resistant to UV degradation and shall be of sufficient strength to resist rips and tears. If more than one continuous piece of plastic is used for the liner or cover, it shall be sealed at the edges with an appropriate sealer. The liner and cover should be sufficiently larger than the area of stored soil to cover the stored soil plus two feet of excess on all sides. All material needed to construct the plastic liner and cover shall be provided by the CONTRACTOR and shall remain on the job Site at the end of the job.
- C. Berms surrounding the soil storage areas are required to prevent the soil from coming into contact with surface water runoff. The berms should be of sufficient height and thickness to prevent this runoff and to help prevent the release of contaminated soil or leachate from the sole storage area. Dimensions of one (1) foot thick and one (1) foot high minimum are required. Trenches are not an acceptable substitute for berms. All material needed to construct the berms shall be provided by the CONTRACTOR and shall remain on the job Site at the end of the job.
- D. The removal and stockpiling of petroleum contaminated soil associated with tank removals and building demolition shall be included in the lump sum base bid.

3.5 BACKFILLING

- A. Excavation(s) shall be backfilled within seven (7) calendar days after determining that all contaminated soil has been excavated. Each area shall be restored to its original condition or to the condition indicated in the contract drawings. Surface restoration work shall be coordinated with related work shown on the contract drawings.

PETROLEUM STORAGE TANK REMOVAL

- B. Excavation(s) shall be backfilled with compacted select granular fill to the subgrade level or as required to match adjacent areas.

3.6 TANK CLOSURE REPORTS

- A. The CONTRACTOR shall submit a report at the end of the project including:
 - 1. A log of the work completed.
 - 2. A narrative report describing what was encountered at each Site including the condition of the storage tank, any visible evidence of leaks or stained soils, results of vapor monitoring, actions taken including quantities of materials removed, sample locations, collection data such as time of collection and method of preservation and whether or not groundwater was encountered.
 - 3. Copies of confirmatory laboratory results of soil samples taken after the removal of the tanks will provided to the CONTRACTOR by the CONSULTANT for inclusion in the final report submittal.
 - 4. Copies of all analyses performed for disposal.
 - 5. Copies of all waste analyses or waste profile sheets.
 - 6. Copies of all certifications of final disposal signed by the responsible disposal installation official.
 - 7. Information on who sampled, analyzed, transported, and accepted all wastes encountered, including copies of manifests, waste profile sheets, land disposal restrictions, notification and certification forms and other pertinent documentation.
 - 8. Scaled one-line drawings showing tank locations, limits of excavation, limits of contamination, underground utilities within 50 feet of the tank, sample locations and sample identification numbers.
 - 9. Photographs of the removal operation, excavation after removal, tank, soil stockpile area, fill placement and grading.
 - 10. The report is to be prepared as per the requirements of STARS MEMO #1 and CP-51.
- B. All laboratory testing must be completed by a laboratory certified by the New York State Department of Health.

3.7 TANK PIT SOIL SAMPLING

- A. Confirmatory soil sampling of the underground storage tank pits shall be conducted in accordance with CP-51 by the CONSULTANT.

PETROLEUM STORAGE TANK REMOVAL

- B. If the results of the initial tank pit sampling indicate contaminants above levels found in CP-51, the CONTRACTOR shall excavate additional soil and conduct additional soil sampling and analysis. Excavation, sampling and analysis shall be completed until soils remaining in the tank pit are below contaminant levels found in CP-51.

3.8 SPILLS

Immediate containment actions shall be taken as necessary to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable Federal, State and local laws and regulations. Cleanup costs for spills or leaks which are the result of the CONTRACTOR'S actions shall be borne by the CONTRACTOR.

3.9 DECONTAMINATION OF EQUIPMENT

- A. CONTRACTOR shall decontaminate equipment as necessary to prevent cross contamination on the Site and prior to the equipment leaving the Site.
- B. Decontamination of any equipment that contacts contaminated soil shall consist of steam cleaning within an enclosed pad/temporary structure. The enclosed pad shall be constructed by the CONTRACTOR. The pad shall be constructed such that it contains rinsate and particulate matter removed from the equipment. All decontamination fluids generated shall be removed from the Site and disposed of in accordance with applicable regulations. The CONTRACTOR shall sample the decontamination water for disposal purposes.

END OF SECTION 02 06 65



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APPENDIX G

On and off-Site Beneficial Use Determinations

Mr. Gary Maslanka
 Environmental Engineer
 Division of Solid and Hazardous Materials
 NYSDEC Region 8
 6274 East Avon-Lima Road
 Avon, New York 14414

January 15, 2020

**RE: West River Wall Improvement Project – Segment 1 Corn Hill
 On-Site Beneficial Use Determination (BUD) Petition for on-Site Soil Reuse**

Dear Mr. Maslanka,
 Bergmann, on behalf of the City of Rochester, is seeking approval under a case-specific Beneficial Use Determination for on-Site reuse of surface and subsurface soils to select areas within the West River Wall Improvement Project – Segment 1 Corn Hill in the City of Rochester, Monroe County, New York (Figure 1). The Site is located along the Genesee River, east of Exchange Boulevard and between South Plymouth Avenue and Ford Street, in the City of Rochester, Monroe County, New York.

1.0 Background

The West River Wall Improvement Project Segment 1 Corn Hill (the Site) consists of 3.5 acres of land comprised of 18 separate tax parcels. Current property owners include the City of Rochester and the New York State Canal Corporation (NYSCC) as indicated in the table below and illustrated in Figure 2.

Property Address	Property Tax ID	Property Owner
392 Exchange Boulevard	121.54-3-9	City of Rochester
400 Exchange Boulevard	121.54-3-69	City of Rochester
482 Exchange Boulevard	121.54-3-24.001	City of Rochester
420 Exchange Boulevard	121.54-3-62	City of Rochester
424 Exchange Boulevard	121.54-3-61	City of Rochester
430 Exchange Boulevard	121.54-3-66	City of Rochester
436 Exchange Boulevard	121.54-3-57	City of Rochester
446 Exchange Boulevard	121.54-3-58	City of Rochester
452 Exchange Boulevard	121.54-3-59	City of Rochester
466 Exchange Boulevard	121.62-1-44	City of Rochester
476 Exchange Boulevard	121.62-1-27	City of Rochester
492 Exchange Boulevard	121.62-1-28	City of Rochester
494 Exchange Boulevard	121.62-1-29	City of Rochester
496 Exchange Boulevard	121.62-1-30	City of Rochester
500-504 Exchange Boulevard	121.62-1-31	City of Rochester
508 Exchange Boulevard	121.62-1-32	City of Rochester
102 Violetta Street	121.70-1-39.001	City of Rochester
350 Exchange Boulevard	121.54-3-10	New York State Canal Corporation

Previous investigation findings located several areas of known surface and subsurface soil, as well as potential impacted areas which will be appropriately managed under the Environmental Management Plan (*Bergmann, November 2019*). The following section provides an overview of Phase II Environmental Site Assessment subsurface sampling and analytical findings. The Phase II ESA report is provided as an attached to this document.

1.1 Phase II Environmental Site Assessment Report (Bergmann, 2019)

The following summarizes soil sample screening, observations, and laboratory analytical findings from the Phase II ESA subsurface investigation:

1. Three (3) soil deposits were encountered that include a fill deposit consisting of a sandy topsoil layer at the ground surface that was placed during the most recent landscaping of the Site and underlying historic fill materials of this deposit that consisted of reworked gravel and soil with lesser amounts of cinders, ash, brick, concrete, wood, metal, coal, gravel and other debris. It appears that the historic fill materials were placed to make land during former historic developments, including a section of a former railroad line and as backfill of the river wall. The fill deposit is located throughout the entire Site with thickness ranging from approximately eight (8) to 15 feet.
2. SVOCs and metals are the primary constituents of concern (COCs) in Site soil (surface and subsurface) based on the frequency of detection of elevated levels that exceed 6NYCRR Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives (SCOs) and planned future use SCOs (Restricted-Residential or Active Recreational). The suspected sources of these COCs are from historic fill materials that consist of cinders, ash, metals, gravel, wood, concrete, brick and coal fragments. The historic fill materials such as ash, cinders and slag in fill and in topsoil/surface soil are considered non-hazardous regulated waste and volumes that will be disturbed by excavation during the construction of the West River Wall must be included in the design phase and costs associated with proper NYSDEC Part 360 disposal included.
3. The depth to groundwater ranges from approximately six (6) to 15 feet below ground surface (bgs) and has been impacted by metals that are considered Site COCs (exceeding groundwater standards). The majority of metals detected in Site groundwater samples (overburden groundwater) were also detected in the soil samples. It appears that the source of metal impact in groundwater is from fill deposit soils that are in contact with groundwater.
4. A petroleum-impacted area was identified and delineated in the area of A-6/SB-18. The location of A-6/SB-18 is shown in the attached Figure 5. The petroleum-impacted area may require remediation to close active NYSDEC Spill No. 1805258 (on City-owned property) and 1805259 (on NYSCC-owned property). The depth of petroleum impacts is below the groundwater table from approximately to 20 feet bgs. The approximate size of the petroleum spill area is 54 ft. X 28 ft. X 5 ft. The impacted soils underlie approximately 500 cubic yards of non-petroleum impacted soils located from ground surface to approximately 15 feet. These overlying soils are Fill soils that contain historic fill materials to be managed as regulated non-hazardous solid waste throughout the project area when encountered in excavation areas during future construction activities for rehabilitation of the river wall.

1.2 Phase II Surface Soil Sampling and Analytical Results

Surface soil sampling was conducted on March 20, 2019 and July 2, 2019 to determine if topsoil could be reused on-Site during the construction phase of the project. Samples were collected in accordance with the requirements set forth by DER-10 Table 5.4(e) Recommended Number of Soil Samples for Soil Imported to or Exported from a site. In accordance with this table and accounting for approximately 1,600 CY of topsoil to be removed at the Site, eight (8) discrete sample locations were identified. In addition, three (3) composite samples were collected from five (5) separate locations as detailed in the attached Figure 3. Soil was collected from the top 6-inches of the Site with a hand trowel, field decontaminated between each sample location, then placed into the appropriate sample jars prior to relinquishing to Paradigm Environmental Laboratory. Further information with respect to media sampling is provided in the attached Phase II Sampling and Analysis Plan and Report (Appendices B and C).

Surface soil sample locations had low-level detections for VOCs (below Unrestricted Use SCOs) at three (3) of the discrete sample locations (SS-01, SS-02, and SS-06). Discrete and composite samples analyzed for SVOCs indicated commercial and/or industrial use SCO exceedances in four (4) discrete samples (SS-09, SS-10, SS-11, SS-12) and two (2) of the composited samples (CS-02 and CS-03) collected.

Benzo(a) pyrene (BAP) equivalents (BAPE) were calculated per 6 NYCRR Part 360 using the formula $BAPE = 1 \times \text{conc. Benzo(a)pyrene} + 0.1 \times [\text{conc. Benzo(a)anthracene} + \text{conc. Benzo(b)fluoranthene} + \text{conc. Benzo(k)fluoranthene} + \text{conc. Dibenzo(a,h)anthracene} + \text{conc. Indeno(1,2,3-c,d)pyrene}] + 0.01 \times \text{conc. Chrysene}$. The only surface soil sample with a BAPE in exceedance of 3.0 µg/kg was RRW-CH-SS-09-070219 located near Ford Street bridge in the southern portion of the project. Surface soil at this location will be disposed at a NYSDEC Part 360-approved landfill. Refer to Figure 4 for analytical results.

Composite sample location CS-01 had low-level detections of SVOCs, however below Unrestricted Use SCOs. All three (3) composite sample locations had low-level detections for TAL metals, however, none exceeded future Site use criteria of Restricted-Residential Use SCOs. One (1) discrete sample location (SS-11) did have exceedances above Restricted-Residential Use SCOs for cadmium. CS-01 and CS-02 composite samples had low-level pesticide detections; however, below future Site use criteria of Restricted-Residential Use SCOs. Surface soil analytical results are summarized in Tables 14-17 and all Phase II ESA findings are indicated on the attached Figure 3.

It is noted that per NYSDEC direction, surface soil sampling was completed on November 26, 2019 for Per- and poly-fluorinated compounds (PFAS) and 1,4-dioxane for topsoil to be considered for off-Site reuse at the Former Emerson Street Landfill. Full results have not yet been received as of the date of this petition, however, these results do not impact the soils to remain and be re-used on-Site as part of this BUD.

2.0 Soil Disposition during Project Construction

Soil for on-Site reuse under this BUD will consist of surface and select subsurface soils with minor detections of VOCs, SVOCs, and metals below 6 NYCRR Part 375-6.8(b) Restricted-Residential Use Site Cleanup Objectives (SCOs), or Active Recreational. Surface soil with SVOC material containing COCs in exceedance of 6 NYCRR Part 375-6.8(b) Restricted-Residential Use SCOs will be handled under a separate off-Site BUD and/or as non-hazardous regulated waste (dependent on waste characterization findings) and disposed off-Site pursuant to NYSDEC Part 360.

Soil associated with this BUD, with COCs below Restricted-Residential Use SCOs (Active Recreational), will be covered with new trail, plaza space, and at least one (1) foot of clean cover materials with the exception of two (2) areas expected to be covered with 9-inches of clean cover, as illustrated in Figure 3 and detailed in the below table. This BUD petition specifically addresses the two (2) areas that will be covered with a 9-inch clean cover (Refer to Figure 4). The following table provides an overview of material disposition throughout the project Site and is included in the Environmental Management Plan (EMP).

Material Classification	Material Description	Disposal/Re-use	On-Site Cover Requirements
Class 1	<ul style="list-style-type: none"> Existing Site Fill Materials, impacted material below Restricted-Residential SCOs, PID readings <25 pm. 	<ul style="list-style-type: none"> Can be re-used at the Site, selectively, and with a NYSDEC-approved Beneficial Use Determination (BUD) Can be disposed at a NYSDEC Part 360 approved landfill 	<ul style="list-style-type: none"> Must be covered with a minimum of 12-inches of Class 4 material, imported fill material or with impervious surfaces such as asphalt, concrete slabs except select areas designated in the on-Site BUD to be covered with approximately 9" of clean cover. Cannot be placed within 2-ft. of overburden groundwater.
Class 2	<ul style="list-style-type: none"> Topsoil in exceedance of 6 NYCRR Part 375-6.8(b) Restricted-Residential Use SCOs Subsurface soil in exceedance of Restricted-Residential Use SCOs 	<ul style="list-style-type: none"> Topsoil to be transported to an approved receiving location under a NYSDEC-approved BUD Disposal at a NYSDEC Part 360 permitted landfill 	<ul style="list-style-type: none"> Must be covered with a minimum of 12-inches of Class 4 material, imported fill material or with impervious surfaces such as asphalt, concrete slabs, with the exception of select areas designated in the on-Site BUD to be covered with approximately 9" of clean cover. Cannot be placed within 2-ft. of overburden groundwater.

Material Classification	Material Description	Disposal/Re-use	On-Site Cover Requirements
Class 3	<ul style="list-style-type: none"> ▪ Solid waste physically unacceptable for re-use or recycling (i.e. wood pieces, metal scrap, metal conduit, foundations, crushed concrete or brick, draining piping) ▪ Asphalt from existing trails, concrete from existing river wall, C&D, etc. 	<ul style="list-style-type: none"> ▪ Off-Site disposal at NYS Part360 permitted landfill. No visible or olfactory indications of impacts on steel, concrete, and brick may be transported to a recycling facility. ▪ Asphalt, concrete may be recycled or disposed of as C&D. 	<ul style="list-style-type: none"> ▪ Not suitable for reuse on-Site as part of this project.
Class 4	<ul style="list-style-type: none"> ▪ Layers of native non-impacted soil that does not have indications of impairment. ▪ Topsoil below Restricted-Residential Use SCOs. 	<ul style="list-style-type: none"> ▪ Can be reused anywhere on-Site pending On-Site BUD approval. ▪ Topsoil area below Restricted-Residential Use SCOs may be reused on Site. ▪ If analytical results exceed 6 NYCRR Part 375-6.8(b) Restricted-Residential use SCOs, the material shall be handled following Class 1 materials 	<ul style="list-style-type: none"> ▪ Class 2 Disposal at a NYSDEC Part 360 permitted landfill will require sampling and analysis pursuant to 6 NYCRR Part 360.
Class 5 (if encountered)	<ul style="list-style-type: none"> ▪ Impacted groundwater with visual and/or olfactory indications of impacts or as determined by laboratory analysis. 	<ul style="list-style-type: none"> ▪ Off-Site disposal at a permitted facility or sanitary sewer discharge contingent upon Monroe County Pure Waters. Bergmann approval required. 	N/A
Asbestos Containing Material (if encountered)	<ul style="list-style-type: none"> ▪ Material containing $\geq 1\%$ asbestos. 	<ul style="list-style-type: none"> ▪ Shall be disposed at a NYSDEC Part 360 permitted landfill pursuant to Code Rule 56 and applicable regulations. 	<ul style="list-style-type: none"> ▪ Off-site disposal with Bergmann approval.

3.0 Site Requirements and Material Management under the Site-Specific Environmental Management Plan (EMP)

The EMP was developed to address known and potential environmental conditions associated with the West River Wall Improvement Project. Bergmann will implement the EMP on behalf of and with concurrence and oversight by the City of Rochester, New York State Canal Corporation, and NYSDEC. In accordance with the EMP, Bergmann will provide trained and qualified staff to be present on-Site during intrusive/ground-disturbing activities associated with Site redevelopment. Bergmann personnel will perform field screening (using a photoionization detector and visual/olfactory observations) and implementation of a Community Air Monitoring Plan (CAMP). Bergmann personnel will also supervise the relocation and coverage of soils to designated areas, oversee the removal and

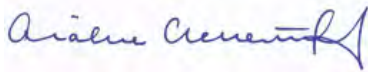
Mr. Gary Maslanka
January 15, 2020
Case-Specific Beneficial Use Determination Petition for On-Site Reuse

transport of impacted soils to a Waste Management regulated waste disposal facility for impacted soils under non-hazardous waste manifest as required, and document and direct the removal and transport of soils under the off-Site BUD. As discussed in the EMP, personnel will be trained in the identification of impacted material, fill material, and Asbestos Containing Material (ACM). A copy of the draft EMP is attached as Appendix D.

It is requested that the NYSDEC provide a response as soon as possible with respect to this Case-Specific BUD petition due to the project schedule and Site space restrictions.

Please feel free to contact Ari Cheremeteff at 585-498-7952 with any questions or additional requirements regarding this request.

Sincerely,



Ariadna Cheremeteff
Bergmann, Environmental Discipline Leader

Attachments:

Figures

- Figure 1 – Site Vicinity Map
- Figure 2 – Parcel Location Map
- Figure 3 – Surface Soil Analytical Results
- Figure 4 – On-Site Beneficial Use Determination 9" Cover Areas

Appendices

- Appendix A – Case Specific BUD Petition
- Appendix B – Phase II Environmental Site Assessment Sampling and Analysis Plan
- Appendix C – Phase II Environmental Site Assessment Report

cc: Kamal Crues, P.E., City of Rochester
Joe Biondolillo, City of Rochester
Todd Caffoe, P.E., NYSDEC
Joe Savoie, P.E., NYSCC
Anthony Borrelli, P.E., Bergmann
Laura Gregor, Bergmann



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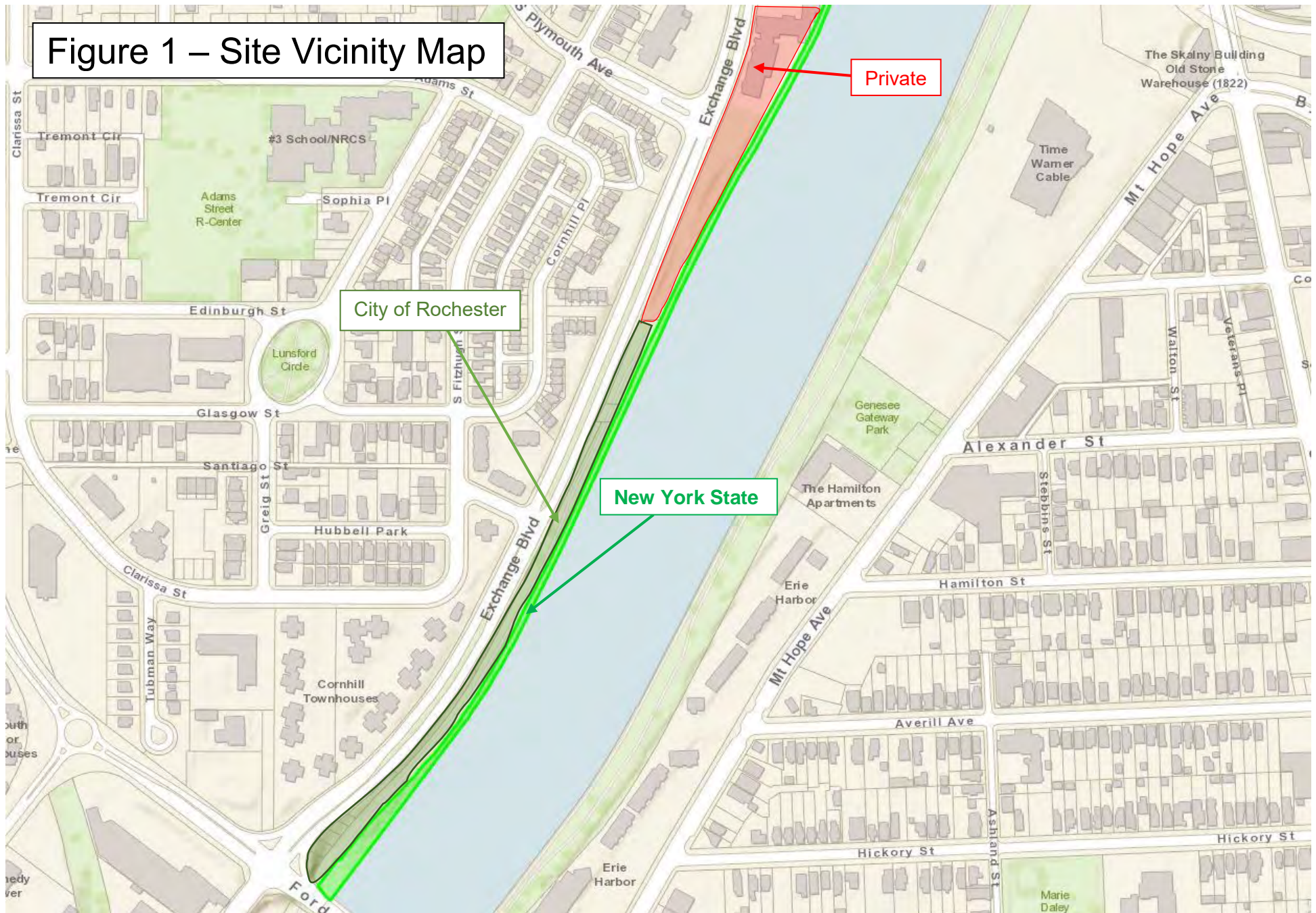
FIGURES



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Figure 1 – Site Vicinity Map



Rochester West River Wall Segment 1- Corn Hill

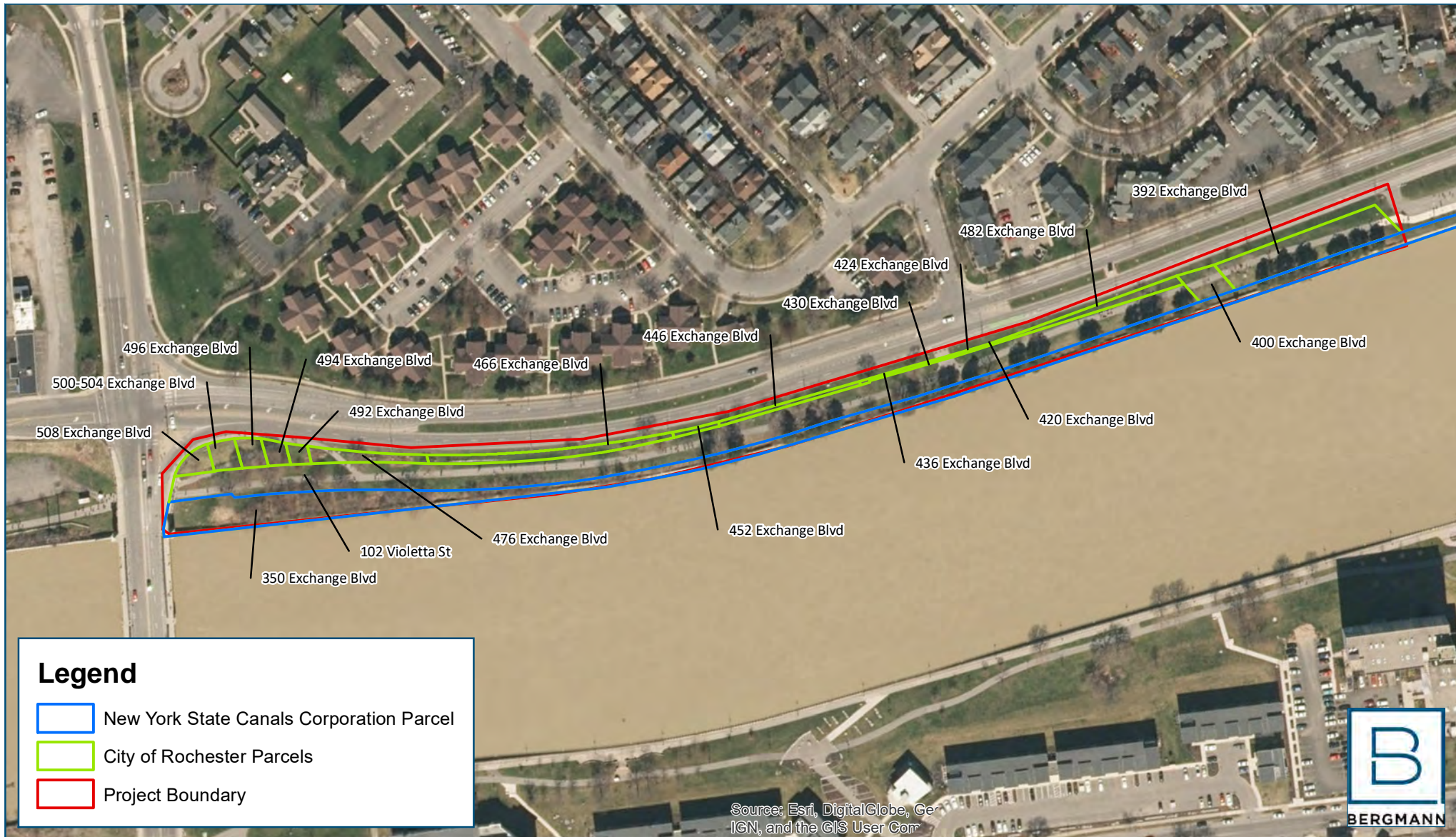
PARCEL LOCATION
MAP

Fig.2

200
Feet



City of Rochester, Monroe County, New York



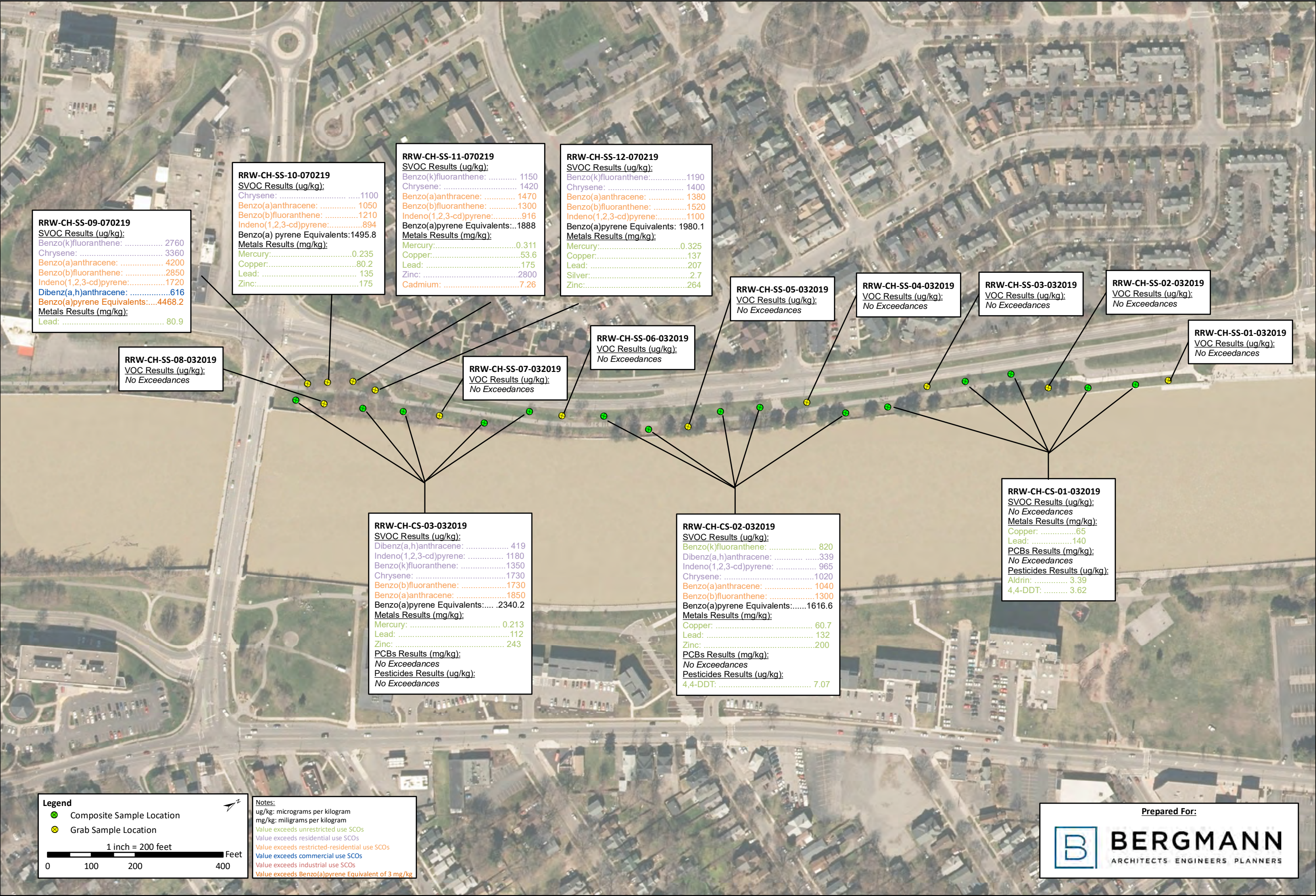


Figure 3. Surface Soil Results-Benzo(a)pyrene Equivalent (BAP)
Beneficial Use Determination (BUD) West River Wall
City of Rochester
Monroe County, NY

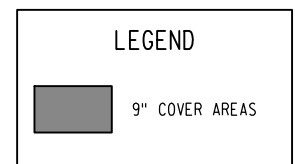
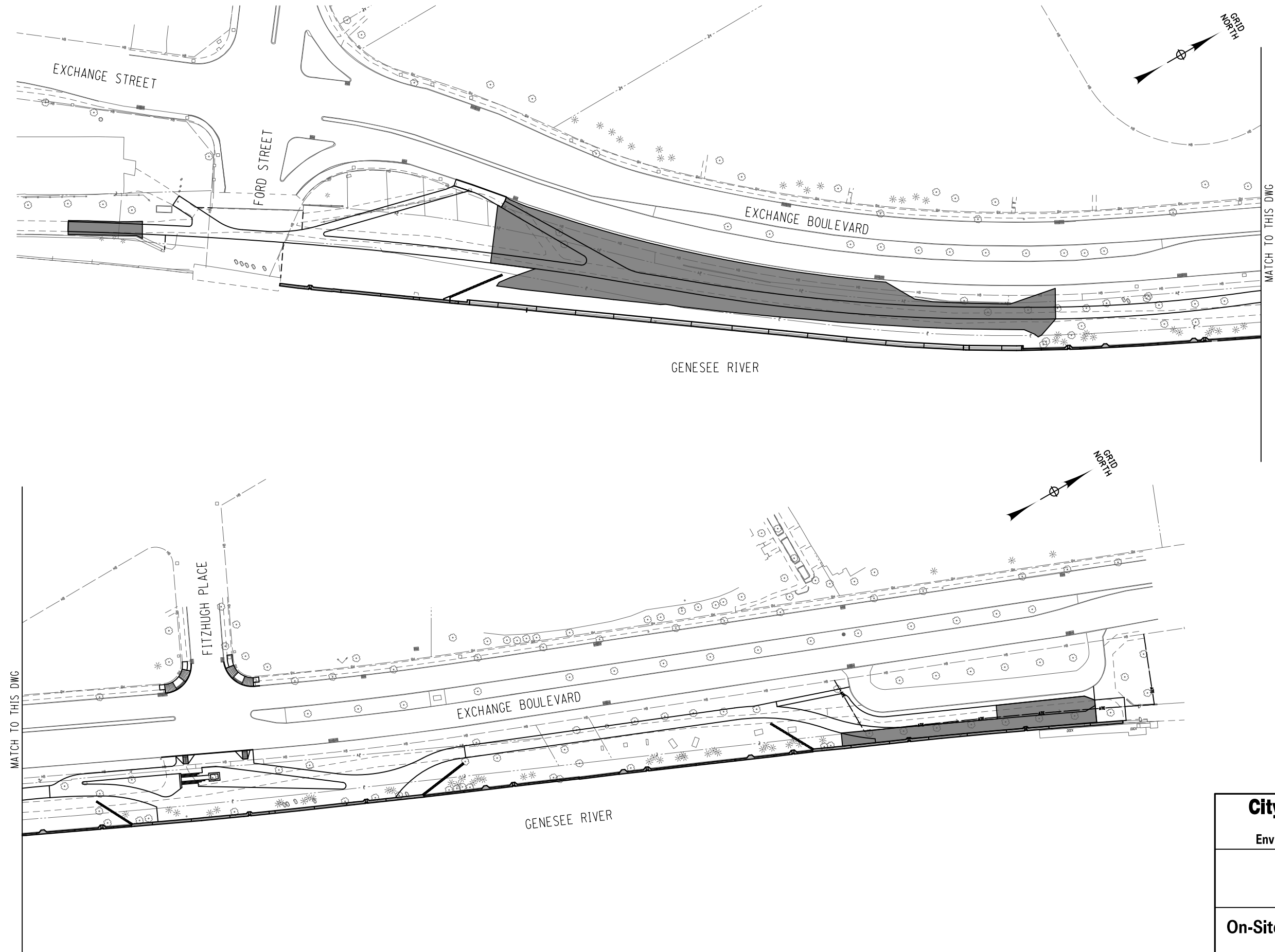
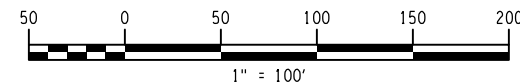




Figure 4



<div>City of Rochester</div> <div>Department of Environmental Services</div>			
West River Wall Improvements			
On-Site Beneficial Use Determination 9" Cover Areas			
SHEET NO. 1	SCALE 1"=100'	DATE 10/19	<div>BERGMANN ARCHITECTS ENGINEERS PLANNERS</div>



APPENDIX A

Case Specific BUD Petition

Beneficial Use Determination Petition – Fill or Cover

OFFICIAL USE ONLY		
DATE RECEIVED		
PROJECT NUMBER		
STAFF INITIALS		
DATE		

6 NYCRR Subdivision 360.12(c) addresses various pre-determined wastes, residual or by-product materials which, when used in the manner noted in that subdivision, are not considered solid wastes (for the purposes of Parts 360-369). In situations where a particular proposed reuse is not specifically identified in that subdivision, material generators and potential users may petition the Department for a case-specific beneficial use determination (BUD) under Subdivision 360.12(d). This form has been developed to assist applicants in obtaining a case-specific BUD for the use of excess excavated materials from construction projects, processed C&D debris and other soil-like wastes to serve as structural or grade adjustment fill, or as ground surface cover material. **This form should be used when petitioners cannot meet criteria of 360.12(c)(ii) or 360.12(c)(iii) for fill material.**

Note: This form is intended to address the requirements of 6 NYCRR 360.12 only and does not cover other federal, state, or local approvals that may be necessary for use of the proposed fill or cover material.

Petitioner Information

Full Name:

<i>Last</i>	<i>First</i>	<i>M.I.</i>

Affiliation:

<i>Company</i>	<i>Title</i>

Primary Address:

<i>Street Address</i>	<i>City/Town</i>
<i>County</i>	<i>Zip Code</i>

Primary Phone: () **Primary Email:** _____

Fill or Cover Material Information

Waste Information:

<i>Type of waste to be used as a fill or cover (excavated fill, C&D or other)</i>	<i>Estimated Total Quantity (in tons or cubic yards)</i>

Source of Generation:

<i>Generator Name</i>	<i>Facility Type (i.e. Construction Site, Processing Facility, etc.)</i>

Generator Location(s) (Address, Town, County); include lot and block numbers if a construction site

Details of Use:

<i>Function (structural fill, embankment, grade adjustment, cover, topsoil)</i>	<i>Duration of project (up to 5 years)</i>

Location(s) of Use:

<i>Location of use, if applicable (Address)</i>	<i>Quantity in tons or cubic yards</i>

<i>Location of use, if applicable (Address)</i>	<i>Quantity in tons or cubic yards</i>

<i>Location of use, if applicable (Address)</i>	<i>Quantity in tons or cubic yards</i>

Petition Attachments Supporting a BUD

Note to Petitioners : The following is a list of attachments which are commonly found in approvable BUD petitions. This list is not intended to be all inclusive. Each BUD petition is unique and the type of information which may be used to support a determination of beneficial use will vary. Petitioners are encouraged to include all relevant documentation showing that the proposed use is truly beneficial (does not constitute disposal), will not pose a risk to the environment or to public health and safety and will not result in nuisance conditions.

Attached N/A

- 1) Mechanical analysis or grain size distribution
- 2) Waste composition analysis (Weight percentage of each waste type in the 2-6 mm fraction)
- 3) Lab data packages for chemical analyses of fill material
- 4) Summary table of lab data comparing results to applicable levels of concern
- 5) Color photographs showing the physical appearance of the bulk fill material and the fraction retained in a 1/4-inch sieve
- 6) A sampling plan describing how physical and chemical data characterizing the fill material was generated including sample locations and depths, sampling methods and analytical methods
- 7) For fill materials generated from processed C&D debris, identification of the C&D processing facility and a copy of the waste control plan used by the facility to exclude contamination from the fill material
- 8) For fill materials generated from a site development project, a map showing the location of the generation site, a site plan showing locations and depths of excavation, locations and depths of pre-excavation samples and any environmental reports, boring logs or testing data documenting site environmental conditions and fill chemistry
- 9) For grade adjustment fill material, a site development plan, including fill material specifications, showing how the fill material will be used and the volume of fill material required
- 10) Documentation showing that the site development plan has been approved by the municipality having jurisdiction
- 11) Describe any other potential adverse effects from use of the material (odors, roots or seeds of invasive species) and measures taken to mitigate such effect
- 12) Description of transportation and storage of fill or cover prior to placement with measures to prevent uncontrolled dispersion
- 13) Description of environmental controls while placing the materials (e.g., dust control, erosion control)
- 14) Additional Information as needed to support a determination that the essential nature of the proposed use of waste constitutes use rather than disposal and that the proposed use will not adversely affect public health or the environment

If Petition Request Attachments are not applicable state why. Attach additional sheets as necessary.

Solid Waste Facility Permit Requirements

Yes No

Will the proposed material require decontamination, special handling or processing before beneficial use as fill or cover?

Will a fee be charged for use of the receiving site for placement of materials as fill or cover, or will the receiving site operate outside the hours of sunrise and sunset?

Certification

I hereby affirm under penalty of perjury that information provided on this form (including attached statements and exhibits) was prepared by me or under my supervision and direction and is true to the best of my knowledge and belief, and that I have authority or am authorized to sign this application pursuant to 6 NYCRR Part 360. I am aware that any false statement made herein is punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law and ECL Section 3-0301(2)(Q).

Signature

Print Name

Date

Before you submit this application, please verify:

- ☐ All fields of the application are complete (indicate N/A (not applicable) if appropriate).
- ☐ You have signed and dated above.
- ☐ You have enclosed all supporting information.

Send this completed form and any supporting attachments to the **Materials Management Supervisor** in your DEC Region (for help, see <http://www.dec.ny.gov/about/50230.html>), with a copy to:

Kathleen Prather, P.E.
Bureau of Permitting and Planning
Division of Materials Management
NYSDEC
625 Broadway, 9th Floor
Albany, NY 12233-7260

Please contact Ms. Prather at (518) 402-8678 or benuse@dec.ny.gov if you have any questions about petitioning for a case-specific BUD.



APPENDIX B

Phase II Environmental Site Assessment Sampling and Analysis Plan



BERGMANN

ARCHITECTS ENGINEERS PLANNERS

Draft Sampling and Analysis Plan

ROCHESTER RIVER WALL SEGMENT I – CORNHILL



Prepared by:

Bergmann

Office:

280 East Broad Street, Suite 200

Rochester, NY 14604

Phone: 585.232.5135

www.bergmannpc.com

Issued: March 6, 2018



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FIGURES

Figure 1	Site Vicinity Map
Figure 2	Subsurface Exploration Plan

TABLE

Table 1	Sample Identification
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ATTACHMENT

Attachment 1	Project Specific Health and Safety Plan
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1.0 INTRODUCTION

On behalf of the City of Rochester (City), Bergmann Associates, Inc. (Bergmann) prepared this Sampling and Analysis Plan (SAP) for Rochester River Wall Phase I Cornhill soil boring and monitoring well installations. The soil borings and monitoring wells are for collection of environmental soil and groundwater samples from the area of the River Wall in the area of Cornhill. This SAP was prepared in general accordance with the documents listed below:

- NYSDEC DER - 10 Technical Guidance for Site Investigation and Remediation, dated May 3, 2010; and
- EPA Sampling and Analysis Guidance and Template v.4 –General Projects 04/2014.

This SAP describes the methods that will be implemented to characterize soil and groundwater quality for environmental constituents at environmental soil boring locations. The sample results will be used to assist in the management of soil and groundwater in design and construction for rehabilitation of the river wall.

1.1 BACKGROUND

The Site consists of the area of alignment of the River wall in Phase I of the Cornhill area from approximately Ford Street to the developed area of Cornhill Landing on the Genesee River front and to the lands owned by Mark IV Construction. The City of Rochester and NYS Canal Corporation currently own the site; see Figure 1 – Site Vicinity Map. Areas of the site appear to have historically been backfilled to make land adjoin properties that were used commercially and or for industrial purposes. Therefore, the locations of Environmental soil borings have been placed based on a review of City of Rochester Platt Maps and on a review of an Environmental Data Resources, report dated February 27, 2018.

1.2 OBJECTIVE

The objective of the scope of work outlined herein is to complete subsurface investigations (Environmental borings) for environmental evaluations during the planned geotechnical soil borings (structural / environmental borings). The results of the environmental samples will be used to characterize soil and groundwater quality for environmental constituents at design and construction areas for rehabilitation of the River Wall.



2.0 SCOPE OF WORK

The following section describes the scope of work that will be implemented to fulfill the objective of the study described in Section 1.2.

2.1 HEALTH AND SAFETY PLAN

The Health and Safety Plan (HASP), included as Attachment 1, has been developed for execution of the work that is outlined in this SAP for Bergmann employees. The HASP contains the following table of project contacts, which will be kept on-site while field activities are being completed under this SAP.

Contact Name	Title	Entity	Office Number	Mobile Number
Emergency Services			911	--
Tom Hanks	Director	City	(585) 428-6649	(585) 314-1617
Tony Borrelli	Project Manager	Bergmann	(585) 498-7777	
Jim Marschner	Health and Safety officer	Bergmann	(585) 498-7858	(585) 455-7043
Stephen DeMeo	Sr. Geologist	Bergmann	(585) 498-7805	(585) 233-2396
Cash Bleier	Environmental Scientist	Bergmann	(585) 498-9750	

Note: TBD =to be determined

The HASP also contains a map showing the nearest route to the hospital, a list of potential hazards for injury and exposure, personal protective equipment to be used for sampling operations, and measures for site control to prevent the general public from entering work areas.

2.2 BORING INSTALLATION

2.3 MONITORING WELL INSTALLATION

2.4 SOIL SAMPLING PROCEDURES

Soil samples will be collected in accordance with NYSDEC DER-10 guidance. Provided below is a brief synopsis of the soil and sample collection procedures that will be utilized in the field. Bergmann will retain the services of Nature's Way Environmental Consultants and Contractors (Nature's way) for up to three weeks to advance 14 Environmental borings and 7 Structural /Environmental borings using rotary drilling method ASTM D5876 and sampling methods. The Bergmann Geologist (Professional Geologist) or environmental scientist supervised by the Professional Geologist will visually examine the recovered soil samples in the split spoon sampler for evidence of suspect contamination. The ambient air above the soil samples in the breaching zone will be screened with a photoionization detector (PID). Portions of soil samples from each sample depth interval will be placed in new, clean ziplock-type bags, and the ambient headspace air in for these soil samples will also be screened with the PID



and this measurement will be recorded on the test boring logs at the sample interval with a description of the soil sample.

As appropriate, based on the proposed sample depths and observations of the soil and/or PID screening results, discrete portions of the recovered soil samples will be placed in clean laboratory containers for possible analytical laboratory testing.

A subsurface explorations plan was prepared that presents the proposed sample locations shown on Figure 2 – Subsurface Exploration Plan. Fourteen (14) Environmental / Structural soil borings and seven (7) Structural borings will be completed during this phase of initial River wall investigations. Monitoring wells will be installed at 10 Environmental / Structural soil borings locations based on the field conditions revealed in soil boring and bedrock core holes. Soil samples will also be field screened with the PID from Structural boring locations designated A1 through A7, see Figure 2. Approximately 10 to 25 feet of bedrock will be cored in structural borings A1 through A5 and A7.

Discrete soil samples will be collected from the sample depth intervals at each Environmental / Structural soil boring location based on the results of the PID screening and visual observations.

Fourteen (14) soil samples will be generally selected for analysis from depth intervals above the groundwater table based on PID field screen measurements and visual observations of stained soils. Selected samples for laboratory testing will be from depths above the top of the groundwater table, if encountered. In the event that elevated field screening measurements are not detected, the soil sample interval above the top of the groundwater table observed during the installation or from the bottom of the boreholes will be collected for laboratory testing.

The sample identification names for each of the discrete samples that will be collected are provided in Table 1. Composite samples are not planned for this project. The discrete samples will be submitted to the analytical laboratory. Each discrete soil sample will be analyzed for 8260, 8270, Metals, Pesticides and PCB's as described below in Section 2.4. Procedures for the collection of groundwater samples from monitoring wells is presented in section 2.3.

2.5 GROUNDWATER SAMPLING PROCEDURES

After removing the well cap for sampling, the depth to water in each well will be measured to the nearest hundredth of a foot using an electronic water-level indicator and recorded on a well sampling log. The probe indicator will be decontaminated between measurements with a solution of Alconox (non-phosphate detergent) and potable water, followed by a distilled water rinse to avoid cross contamination between wells. Wash and rinse water will be drummed and consolidated with the monitoring well development water.

After collection of the depth to groundwater measurements the well will be checked for the presence of light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL). The bailer will be lowered across the top of the water level in the well and removed so observe if LNAPL is present. Observations for the presence of DNAPL will be completed by lowering the bailer to the bottom of the well and removing it to observe if DNAPL is present.

Monitoring wells will be purged immediately prior to sampling by using bailers to purge each well. The wells will be purged until three well volumes were removed, or until dry. Field parameters including pH, temperature, specific conductivity, and turbidity, of the discharge water will be recorded for each well volume using a field calibrated meter. Prior to making measurements, the instruments will be calibrated according to the manufacturer's instructions. After each use, the probe/meter will be decontaminated. The field measurements will be recorded on a groundwater sampling log. After the purging is complete, a disposable bailer will be used to collect the groundwater samples. The bailer will be slowly lowered into the well using new polypropylene or nylon rope. The line will be lowered and raised by hand with the slack portion of the line left to lie on a plastic tarp or in



a clean container placed next to the well. The bailer will be slowly lowered until it is immersed within the well. Care will be taken not to agitate the water in the well to avoid possible volatilization of contaminants. Since the bailers and rope are disposable, they will be discarded after sampling each well.

New disposable gloves will be worn during sample collection and be discarded after use. Water from the bailer or sample tubing will be carefully transferred to the sample bottles to minimize aeration of the sample. The VOC containers will be filled first, followed by metals. Special care will be taken in filling and capping the VOC vials, so that no headspace or air bubbles are present. All sample bottle caps will be secured snugly, but not over-tightened.

2.6 ANALYTICAL LABORATORY TESTING AND QA/QC

Discrete soil and groundwater samples will be submitted under chain-of-custody control to Chemtech, Inc. (Chemtech), a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified analytical laboratory (ELAP ID #11376). Chemtech will perform the necessary laboratory preparations of the samples as necessary, and subsequently perform the analytical laboratory program listed below:

- Fourteen soil samples will be collected from soil boring locations for laboratory analysis in accordance with methods EPA 8260 plus STARS, EPA 8270 base naturals (BN), TAL Metals, EPA 8082 Polychlorinated Biphenyls (PCBs) and Pesticides 8080.
- One blind duplicate soil sample will be collected for each of the analysis noted above for QA/QC purposes.
- Ten groundwater samples will be collected from the monitoring wells for laboratory analysis in accordance with methods EPA 8260 plus STARS, EPA 8270 (BN), TAL Metals, PCBs and pesticides. TAL Metals using methods United States Environmental Protection Agency (USEPA) Methods 6010 and 7471 (mercury).
 - One trip blank for EPA 8260 plus STARS will be submitted per batch of groundwater samples submitted with groundwater samples; and
- One blind duplicate groundwater sample will be collected for each of the analysis noted above for QA/QC purposes.

Within approximately 10 business days of sample receipt, Chemtech will provide an analytical report containing data tabulation of results and supporting QC information.

2.7 REPORT

After receipt of the laboratory results, Bergmann will prepare a subsurface investigation report and submit a draft report to the City of Rochester Department of Environmental Quality (DEQ) for review. The report will include the items listed below:

- A summary of the sampling efforts and methods used;
- Brief description of site subsurface conditions, soil types, and any fill materials encountered based on drilling and soil sampling performed;
- Table summarizing laboratory analytical results for samples and analyses tested, including a comparison to Unrestricted Use SCOs and CP-51 SCOs should petroleum compounds be detected as the primary contaminant of concern;
- Discussion of the environmental laboratory analytical results, and the contaminant distribution, as needed;



- Recommendations for any additional soil sampling and laboratory analysis; application of restrictions to portions of the Site, as needed; and/or remedial measures or other corrective actions in order to facilitate the soil and groundwater management of impacted soil and groundwater during construction / rehabilitation;
- A scaled figure using showing sample locations, property lines and river wall footprint;
- Test boring logs showing detailed subsurface logging information;
- A copy of the laboratory report; and
- Select photographs of the site and work performed.

3.0 PROJECT SCHEDULE

Upon the City DEQ approval of this SAP, it is anticipated that the scope of work outlined in Section 2.0 can be completed by about May 12, 2018. The anticipated schedule is detail for key tasks as provided below:

- Fieldwork - 3/26/18 through 4/10/18
- Analytical Laboratory Testing - 4/10/18 through 4/20/18
- Prepare / Submit Draft Report to the City- 4/20/17 through 5/4/18
- Final Report - 5/12/18



4.0 ACRONYM

bgs	below grade surface
City	City of Rochester
ELAP	Environmental Laboratory Approval Program
HASP	Health and Safety Plan
NYSDOH	New York State Department of Health
NYSDEC	New York State Department of Environmental Conservation
PAHs	Polycyclic Aromatic Hydrocarbons
ESC Labs	Environmental Laboratory Services
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
SCOs	Soil Cleanup Objective
SAP	Soil Sampling and Analysis Plan
SVOC	Semi-Volatile Organic Compound
TBD	to be determined
TCL	Target Compound List
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound



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APPENDIX C

Phase II Environmental Site Assessment

(included as Appendix B of EMP)

Mr. Todd Caffoe, P.E.
 Division of Environmental Remediation
 NYSDEC Region 8
 6274 East Avon-Lima Road
 Avon, New York 14414

January 27, 2020

**RE: West River Wall Improvement Project
 Off-Site Beneficial Use Determination (BUD) Petition**

Dear Mr. Caffoe,

Bergmann, on behalf of the City of Rochester, is seeking approval under a Case-Specific Beneficial Use Determination (BUD) for off-Site relocation of surface soil (top soil) as part of the West River Wall Improvement Project – Segment 1 Corn Hill in the City of Rochester, Monroe County, New York (Figure 1). The Site is located along the Genesee River, east of Exchange Boulevard and between South Plymouth Avenue and Ford Street, in the City of Rochester, Monroe County, New York. Bergmann is seeking to relocate surface soil from the Project Site to the City of Rochester-owned Former Emerson Street Landfill (FESL) (Figure 2). The Former Emerson Street Landfill is located in the western portion of Rochester and is bounded by Colfax Street to the east, Lexington Avenue to the north, Lee Road to the west, and Ferrano Street to the south.

1.0 Background

The West River Wall Improvement Project (the Site) consists of 3.5 acres of land comprised of 18 separate tax parcels. Current property owners include the City of Rochester and the New York State Canals Corporation (NYSCC) as indicated in the table below. Figure 3 illustrates parcel addresses, location, and respective owners.

Property Address	Property Tax ID	Property Owner
392 Exchange Boulevard	121.54-3-9	City of Rochester
400 Exchange Boulevard	121.54-3-69	City of Rochester
482 Exchange Boulevard	121.54-3-24.001	City of Rochester
420 Exchange Boulevard	121.54-3-62	City of Rochester
424 Exchange Boulevard	121.54-3-61	City of Rochester
430 Exchange Boulevard	121.54-3-66	City of Rochester
436 Exchange Boulevard	121.54-3-57	City of Rochester
446 Exchange Boulevard	121.54-3-58	City of Rochester
452 Exchange Boulevard	121.54-3-59	City of Rochester
466 Exchange Boulevard	121.62-1-44	City of Rochester
476 Exchange Boulevard	121.62-1-27	City of Rochester
492 Exchange Boulevard	121.62-1-28	City of Rochester
494 Exchange Boulevard	121.62-1-29	City of Rochester
496 Exchange Boulevard	121.62-1-30	City of Rochester
500-504 Exchange Boulevard	121.62-1-31	City of Rochester
508 Exchange Boulevard	121.62-1-32	City of Rochester
102 Violetta Street	121.70-1-39.001	City of Rochester
350 Exchange Boulevard	121.54-3-10	New York State Canal Corporation

Previous investigation findings located several areas of impacted surface and subsurface soil as well as potential impacted areas which will be appropriately managed under the Environmental Management Plan (*Bergmann*,

January 2020). The following section provides an overview of Phase II Environmental Site Assessment analytical findings. The Phase II ESA report, including analytical tables and reports, is provided as an attached to this document.

1.1 Phase II Environmental Site Assessment Report (Bergmann, 2019)

The following summarizes soil sample screening, observations, and laboratory analytical findings from the Phase II ESA subsurface investigation. Section 1.2 details surface soil analytical results.

1. Three (3) soil deposits were encountered that include a fill deposit consisting of a sandy topsoil layer at the ground surface that was placed during the most recent landscaping of the Site and underlying historic fill materials of this deposit that consisted of reworked gravel and soil with lesser amounts of cinders, ash, brick, concrete, wood, metal, coal, gravel and other debris. It appears that the historic fill materials were placed to make land during former historic developments, including a section of a former railroad line and as backfill of the river wall. The fill deposit is located throughout the entire Site with thickness ranging from approximately eight (8) to 15 feet.
2. SVOCs and metals are the primary constituents of concern (COCs) in Site soil (surface and subsurface) based on the frequency of detection of elevated levels that exceed 6NYCRR Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives (SCOs) and planned future use SCOs (6 NYCRR Part 375-6.8(b) Restricted-Residential or Active Recreational). The suspected sources of these COCs are from historic fill materials that consist of cinders, ash, metals, gravel, wood, concrete, brick and coal fragments. The historic fill materials such as ash, cinders and slag in fill and in topsoil/surface soil are considered non-hazardous regulated waste and volumes that will be disturbed by excavation during the construction of the West River Wall. These materials must be included in the design phase and costs associated with proper NYSDEC Part 360 disposal included.
3. The depth to groundwater ranges from approximately six (6) to 15 feet below ground surface (bgs) and has been impacted by metals that are considered Site COCs (exceeding groundwater standards). The majority of metals detected in Site groundwater samples (overburden groundwater) were also detected in the soil samples. It appears that the source of metal impact in groundwater is from fill deposit soils that are in contact with groundwater.
4. A petroleum-impacted area was identified and delineated in the area of A-6/SB-18. The location of A-6/SB-18 is shown in the attached Figure 5. Per NYSDEC, no active remediation is required for the petroleum-impacted area (NYSDEC Spill No. 1805258 (on City-owned property) and 1805259 (on NYSCC-owned property)). The depth of petroleum impacts is below the groundwater table from approximately 15 to 20 feet bgs. The approximate size of the petroleum spill area is 54 ft. X 28 ft. X 5 ft. The impacted soils underlie approximately 500 cubic yards of non-petroleum impacted soils located from ground surface to approximately 15 feet. These overlying soils are Fill soils that contain historic fill materials to be managed as regulated non-hazardous solid waste throughout the project area when encountered in excavation areas during future construction activities for rehabilitation of the river wall.

1.2 Phase II Surface Soil Sampling and Analytical Results

Surface soil sampling was conducted on March 20, 2019 and July 2, 2019 to determine if topsoil could be reused on-Site during the construction phase of the project. Samples were collected in accordance with the requirements set forth by DER-10 Table 5.4(e) Recommended Number of Soil Samples for Soil Imported to or Exported from a site. In accordance with this table and accounting for approximately 2,200 CY of topsoil to be removed at the Site, eight (8) discrete sample locations were identified. In addition, three (3) composite samples were collected from five (5) separate locations as detailed in the attached Figure 3. Soil was collected from the top 6-inches of the Site

with a hand trowel, field decontaminated between each sample location, then placed into the appropriate sample jars prior to relinquishing to Paradigm Environmental Laboratory. Further information with respect to media sampling is provided in the attached Phase II Sampling and Analysis Plan and Report (Appendices B and C)

Surface soil sample locations had low-level detections for VOCs (below Unrestricted Use SCOs) at three (3) of the discrete sample locations (SS-01, SS-02, and SS-06). Discrete and composite samples analyzed for SVOCs indicated commercial and/or industrial use SCO exceedances in four (4) discrete samples (SS-09, SS-10, SS-11, SS-12) and two (2) of the composited samples (CS-02 and CS-03) collected.

Benzo(a)pyrene (BAP) equivalents (BAPE) were calculated per 6 NYCRR Part 360 using the formula $BAPE = 1 \times \text{concentration (conc.) Benzo(a)pyrene} + 0.1 \times [\text{conc. Benzo(a)anthracene} + \text{conc. Benzo(b)fluoranthene} + \text{conc. Benzo(k)fluoranthene} + \text{conc. Dibenzo(a,h)anthracene} + \text{conc. Indeno(1,2,3-c,d)pyrene}] + 0.01 \times \text{conc. Chrysene}$. The only surface soil sample with a BAPE in exceedance of 3.0 µg/kg was RRW-CH-SS-09-070219 located near the Ford Street bridge, in the southern portion of the project. Surface soil at this location will be transported and disposed of at a NYSDEC Part 360-approved landfill. Refer to Figure 4 for analytical results.

Composite sample location CS-01 had low-level detections of SVOCs, however below Unrestricted Use SCOs. All three (3) composite sample locations had low-level detections for TAL metals, however, none exceeded future Site use criteria of Restricted-Residential Use SCOs (Active Recreational). One (1) discrete sample location (SS-11) did have exceedances above Restricted-Residential Use SCOs for cadmium. CS-01 and CS-02 composite samples had low-level pesticide detections; however, below future Site use criteria of Restricted-Residential Use SCOs. Surface soil analytical results are summarized in Tables 14-17 and all Phase II ESA findings are indicated on the attached Figure 4.

It is noted that per NYSDEC direction, surface soil sampling was completed on October 11, 2019 and November 26, 2019 for Per- and poly-fluorinated compounds (PFAS) and 1,4-dioxane. Initial results indicated exceedances over the NYSDEC Guidance Criteria for PFAS at several sample locations. Surface soils were resampled and submitted for Synthetic Precipitation Leachate Procedure (SPLP) stimulating the natural leaching process that would occur to the PFAS concentrations in the topsoil as a result of precipitation and to determine the concentration levels that could potentially impact groundwater. SPLP results indicate the levels are below the 1 ppb guidance level established by the NYSDEC for soils. Initial and SPLP results for the topsoil materials to be transferred to FESL under this Case-Specific BUD are presented in Tables 1 and 1a.

2.0 Soil Disposition during Project Construction

Soil requiring off-Site relocation to the Former Emerson Street Landfill under this BUD will consist of surface soil with detections of SVOCs, and metals in exceedance of 6 NYCRR Part 375-6.8(b) Restricted-Residential Use Site Cleanup Objectives (SCOs) or Active Recreational, but below Industrial Use SCOs (FESL established soil criteria). Surface soil with SVOC levels in exceedance of 6 NYCRR Part 375-6.8(b) Industrial Use SCOs will be waste characterized and handled as non-hazardous regulated waste and disposed off-Site pursuant to NYSDEC Part 360 or as hazardous waste and disposed at an appropriate facility. It is estimated that approximately 1,700 CY of topsoil will be relocated to the FESL under this Case-Specific BUD.

Soil with COCs below 6 NYCRR Part 375-6.8(b) Restricted-Residential Use SCOs (or Active-Recreational) will be covered with new trail, plaza space, and at least one (1) foot of clean cover materials except for two (2) areas expected to be covered with 9-inches of clean cover, as indicated by Figure 3 and in the below table. An on-Site

BUD petition has been prepared separately for the two (2) areas that will be covered with a 9-inch clean cover (Refer to Figure 4).

The following table provides an overview of anticipated material disposition for the project, including surface soil that would be relocated under this BUD.

Material Classification	Material Description	Disposal/Re-use	On-Site Cover Requirements
Class 1	<ul style="list-style-type: none"> Existing Site Fill Materials, impacted material below Restricted-Residential SCOs, PID readings <25 pm. 	<ul style="list-style-type: none"> Can be re-used at the Site, selectively, and with a NYSDEC-approved Beneficial Use Determination (BUD) Can be disposed at a NYSDEC Part 360 approved landfill 	<ul style="list-style-type: none"> Must be covered with a minimum of 12-inches of Class 4 material, imported fill material or with impervious surfaces such as asphalt, concrete slabs except select areas designated in the on-Site BUD to be covered with approximately 9" of clean cover. Cannot be placed within 2-ft. of overburden groundwater.
Class 2	<ul style="list-style-type: none"> Topsoil in exceedance of 6 NYCRR Part 375-6.8(b) Restricted-Residential Use SCOs Subsurface soil in exceedance of Restricted-Residential Use SCOs 	<ul style="list-style-type: none"> Topsoil to be transported to an approved receiving location under a NYSDEC-approved BUD Disposal at a NYSDEC Part 360 permitted landfill 	<ul style="list-style-type: none"> Must be covered with a minimum of 12-inches of Class 4 material, imported fill material or with impervious surfaces such as asphalt, concrete slabs, with the exception of select areas designated in the on-Site BUD to be covered with approximately 9" of clean cover. Cannot be placed within 2-ft. of overburden groundwater.

Material Classification	Material Description	Disposal/Re-use	On-Site Cover Requirements
Class 3	<ul style="list-style-type: none"> ▪ Solid waste physically unacceptable for re-use or recycling (i.e. wood pieces, metal scrap, metal conduit, foundations, crushed concrete or brick, draining piping) ▪ Asphalt from existing trails, concrete from existing river wall, C&D, etc. 	<ul style="list-style-type: none"> ▪ Off-Site disposal at NYS Part360 permitted landfill. No visible or olfactory indications of impacts on steel, concrete, and brick may be transported to a recycling facility. ▪ Asphalt, concrete may be recycled or disposed of as C&D. 	<ul style="list-style-type: none"> ▪ Not suitable for reuse on-Site as part of this project.
Class 4	<ul style="list-style-type: none"> ▪ Layers of native non-impacted soil that does not have indications of impairment. ▪ Topsoil below Restricted-Residential Use SCOs. 	<ul style="list-style-type: none"> ▪ Can be reused anywhere on-Site pending on-Site BUD approval. ▪ Topsoil area below Restricted-Residential Use SCOs may be reused on Site. ▪ If analytical results exceed 6 NYCRR Part 375-6.8(b) Restricted-Residential use SCOs, the material shall be handled following Class 2 materials 	<ul style="list-style-type: none"> ▪ Class 2 Disposal at a NYSDEC Part 360 permitted landfill will require sampling and analysis pursuant to 6 NYCRR Part 360.
Class 5 (if encountered)	<ul style="list-style-type: none"> ▪ Impacted groundwater with visual and/or olfactory indications of impacts or as determined by laboratory analysis. 	<ul style="list-style-type: none"> ▪ Off-Site disposal at a permitted facility or sanitary sewer discharge contingent upon Monroe County Pure Waters. Bergmann approval required. 	N/A
Asbestos Containing Material (if encountered)	<ul style="list-style-type: none"> ▪ Material containing $\geq 1\%$ asbestos. 	<ul style="list-style-type: none"> ▪ Shall be disposed at a NYSDEC Part 360 permitted landfill pursuant to Code Rule 56 and applicable regulations. 	<ul style="list-style-type: none"> ▪ Off-site disposal with Bergmann approval.

3.0 Site Requirements and Material Management under the Site-Specific Environmental Management Plan (EMP)

The Environmental Management Plan (EMP) was developed to address known and potential environmental conditions associated with the West River Wall Improvement Project. Bergmann will implement the EMP on behalf of and with concurrence and oversight by the City of Rochester, New York State Canals Corporation, and NYSDEC. In accordance with the EMP, Bergmann will provide trained and qualified staff to be present on-Site during intrusive/ground-disturbing activities associated with Site redevelopment. Bergmann personnel will perform field screening (using a photoionization detector and visual/olfactory observations) and Community Air Monitoring Plan (CAMP). Bergmann personnel will also supervise the relocation and coverage of soils to designated areas and

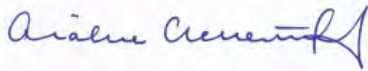
Mr. Todd Caffoe
January 27, 2020
Case-Specific Beneficial Use Determination Petition
Off-Site Soil Reuse – City of Rochester West River Wall Project

oversee the removal and transport of impacted soils to a Waste Management regulated waste disposal facility for impacted soils under non-hazardous waste manifest as required, and document and direct the removal and transport of soils under the off-Site BUD. As discussed in the EMP, personnel will be trained in the identification of impacted material, fill material, and Asbestos Containing Material (ACM). A copy of the draft EMP is attached as Appendix D.

It is requested that the NYSDEC provide a response as soon as possible with respect to this Case-Specific BUD petition due to the project schedule and Site space restrictions.

Please feel free to contact Ari Cheremeteff at 585-498-7952 with any questions or additional requirements regarding this request.

Sincerely,



Ariadna Cheremeteff
Bergmann Environmental Discipline Leader

Attachments:

Tables

Table 1 – Per-fluorinated Compounds and 1,4-Dioxane Detected in Surface Soil

Table 1a – Equipment Rinsate

Figures

Figure 1 – Site Vicinity Map

Figure 2 – Former Emerson Street Landfill

Figure 3 – Parcel Layout Plan

Figure 4 – Surface Soil Analytical Results

Appendices

Appendix A – Case Specific BUD Petition

Appendix B – Phase II Environmental Site Assessment Sampling and Analysis Plan

Appendix C – Phase II Environmental Site Assessment Report

Appendix D – PFAS Analytical Reports

cc: Kamal Crues, P.E., City of Rochester
Joe Biondolillo, City of Rochester
Joe Savoie, P.E., NYSCC
Gary Maslanka, NYSDEC
Anthony Borrelli, P.E., Bergmann
Laura Gregor, Bergmann



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TABLES

1,4-Dioxane and PFAS Surface Soil Sample Analytical Results
West River Wall Improvement Project- Segment I Corn Hill City
of Rochester

Table 1- Perfluorinated Compounds and 1,4-Dioxane Detected in Surface Soil

Parameter List	USEPA Method	Applicable NYSDEC Criteria ³	RRW-CH-SS-13-101119	RRW-CH-SS-14-101119	RRW-CH-SS-14-112619 SPLP Method 1312	RRW-CH-SS-15-101119	RRW-CH-SS-15-112619 SPLP Method 1312	Field Duplicate	RRW-CH-SS-111219(Field Duplicate) SPLP Method 1312
	-	-	10/11/2019	10/11/2019	11/26/2019	10/11/2019	11/26/2019	10/11/2019	11/26/2019
Volatile Organics¹									
1,4-Dioxane	8270D SIM	100	< 32.9	< 37.4	NA	< 33.6	NA	< 33.1	NA
Perfluorinated Compounds²									
Perfluorobutanoic Acid (PFBA)	EPA 537	1	0.175 J	0.693 J	0.0156	0.498 J	0.0137	0.572 J	0.00135
Perfluoropentanoic Acid (PFPeA)	EPA 537	1	0.073 J	0.323 J	0.0068	0.238 J	0.00403	0.264 J	0.00433
Perfluorobutanesulfonic Acid (PFBS)	EPA 537	1	ND	ND	0.000705 J	0.045 J	0.000992 J	0.055 J	0.000914 J
1H, 1H, 2H, 2H- Perfluorohexanesulfonic Acid (4:2 FTS)	EPA 537	1	NA	NA	ND	NA	ND	NA	ND
Perfluorohexanoic Acid (PFHxA)	EPA 537	1	0.106 J	0.354 J	0.00596	0.312 J	0.00375	0.340 J	0.00378
Perfluoropentanesulfonic Acid (PFPeS)	EPA 537	1	NA	NA	ND	NA	ND	NA	ND
Perfluoroheptanoic Acid (PFHpA)	EPA 537	1	0.083 J	0.274 J	0.00425	0.265 J	0.00317	0.283 J	0.00316
Perfluorohexanesulfonic Acid (PFHxS)	EPA 537	1	ND	ND	0.000483 J	ND	0.000457 J	ND	0.000572 J
Perfluorooctanoic Acid (PFOA)	EPA 537	1	0.348 J	1.81	0.0164	1.24	0.00984	1.32	0.0114
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	EPA 537	1	ND	ND	ND	ND	ND	ND	ND
Perfluoroheptanesulfonic Acid (PFHpS)	EPA 537	1	ND	ND	ND	ND	ND	ND	ND
Perfluorononanoic Acid (PFNA)	EPA 537	1	0.156 J	0.418 J	0.00239	0.345 J	0.00186 J	0.403 J	0.00215
Perfluorooctanesulfonic Acid (PFOS)	EPA 537	1	0.946 J	9.55	0.0149	3.55	0.0115	4.75	0.0147
Perfluorodecanoic Acid (PFDA)	EPA 537	1	0.097 J	0.486 J	0.000506 J	0.516 J	0.000543 J	0.561 J	0.000736 J
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	EPA 537	1	ND	ND	ND	ND	ND	ND	ND
Perfluoronanesulfonic Acid (PFNS)	EPA 537	1	NA	NA	ND	NA	ND	NA	ND
N-Methyl Perfluorooctanesulfonamidoacetic Acid	EPA 537	1	ND	ND	0.00134 J	ND	ND	ND	ND
Perfluoroundecanoic Acid (PFUnA)	EPA 537	1	0.097 J	0.182 J	ND	0.174 J	ND	0.198 J	ND
Perfluorodecanesulfonic Acid (PFDS)	EPA 537	1	ND	ND	ND	ND	ND	ND	ND
Perfluorooctanesulfonamide (FOSA)	EPA 537	1	ND	ND	ND	ND	ND	ND	ND
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	EPA 537	1	ND	0.145 J	0.00102 J	0.177 J	ND	0.120 J	ND
Perfluorododecanoic Acid (PFDoA)	EPA 537	1	ND	0.222 J	ND	0.225 J	ND	0.240 J	ND
Perfluorotridecanoic Acid (PFTDA)	EPA 537	1	ND	ND	ND	ND	ND	ND	ND
Perfluorotetradecanoic Acid (PFTA)	EPA 537	1	ND	0.116 J	ND	0.099 J	ND	0.078 J	ND
PFOA/PFOS, Total	EPA 537	1	0.00129 J	0.0114	0.0313	0.00479	0.0213	0.00607	0.0261
PFAS, Total (5)	EPA 537	1	NA	NA	0.0384 J	NA	0.0268 J	NA	0.032 J

Table 1a- Equipment Rinstate

Parameter List	USEPA Method	Applicable NYSDEC Criteria ³	Equipment Blank-01 10/11/2019	Equipment Blank-02 10/11/2019	Equipment Blank-03 10/11/2019	Equipment Blank-112619 11/26/2019
	-	-	10/11/2019	10/11/2019	10/11/2019	11/26/2019
Volatile Organics¹						
1,4-Dioxane	8270D SIM	5*	NA	NA	<0.201	NA
Perfluorinated Compounds²						
Perfluorobutanoic Acid (PFBA)	EPA 537	--	1.09	1.12	NA	ND
Perfluoropentanoic Acid (PFPeA)	EPA 537	--	1.22	1.11	NA	ND
Perfluorobutanesulfonic Acid (PFBS)	EPA 537	--	ND	ND	NA	ND
Perfluorohexanoic Acid (PFHxA)	EPA 537	--	0.75	0.698	NA	0.390 J
Perfluoroheptanoic Acid (PFHpA)	EPA 537	--	ND	ND	NA	ND
Perfluorohexanesulfonic Acid (PFHxS)	EPA 537	--	ND	ND	NA	ND
Perfluorooctanoic Acid (PFOA)	EPA 537	--	ND	0.325	NA	ND
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	EPA 537	--	ND	ND	NA	ND
Perfluoroheptanesulfonic Acid (PFHpS)	EPA 537	--	ND	ND	NA	ND
Perfluorononanoic Acid (PFNA)	EPA 537	--	ND	ND	NA	ND
Perfluorooctanesulfonic Acid (PFOS)	EPA 537	--	ND	ND	NA	ND
Perfluorodecanoic Acid (PFDA)	EPA 537	--	ND	ND	NA	ND
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	EPA 537	--	ND	ND	NA	ND
N-Methyl Perfluorooctanesulfonamidoacetic Acid	EPA 537	--	ND	ND	NA	ND
Perfluoroundecanoic Acid (PFUnA)	EPA 537	--	ND	ND	NA	ND
Perfluorodecanesulfonic Acid (PFDS)	EPA 537	--	ND	ND	NA	ND
Perfluorooctanesulfonamide (FOSA)	EPA 537	--	ND	ND	NA	ND
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	EPA 537	--	ND	ND	NA	ND
Perfluorododecanoic Acid (PFDoA)	EPA 537	--	ND	ND	NA	ND
Perfluorotridecanoic Acid (PFTDA)	EPA 537	--	ND	ND	NA	ND
Perfluorotetradecanoic Acid (PFTA)	EPA 537	--	ND	ND	NA	ND

1-Results indicated in parts per billion 2-Results indicated in parts per trillion 3-Sampling for 1,4-dioxane and Per- and Polyfluoroalkyl Substances (PFAS) per 6 NYCRR Part 375 Remedial Programs; June 2019

* Indicates principal organic contaminant standard for groundwater per 6 NYCRR Part 703.5 NYS Groundwater Quality Standards

J: Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL)

Value Exceeds Applicable Standards



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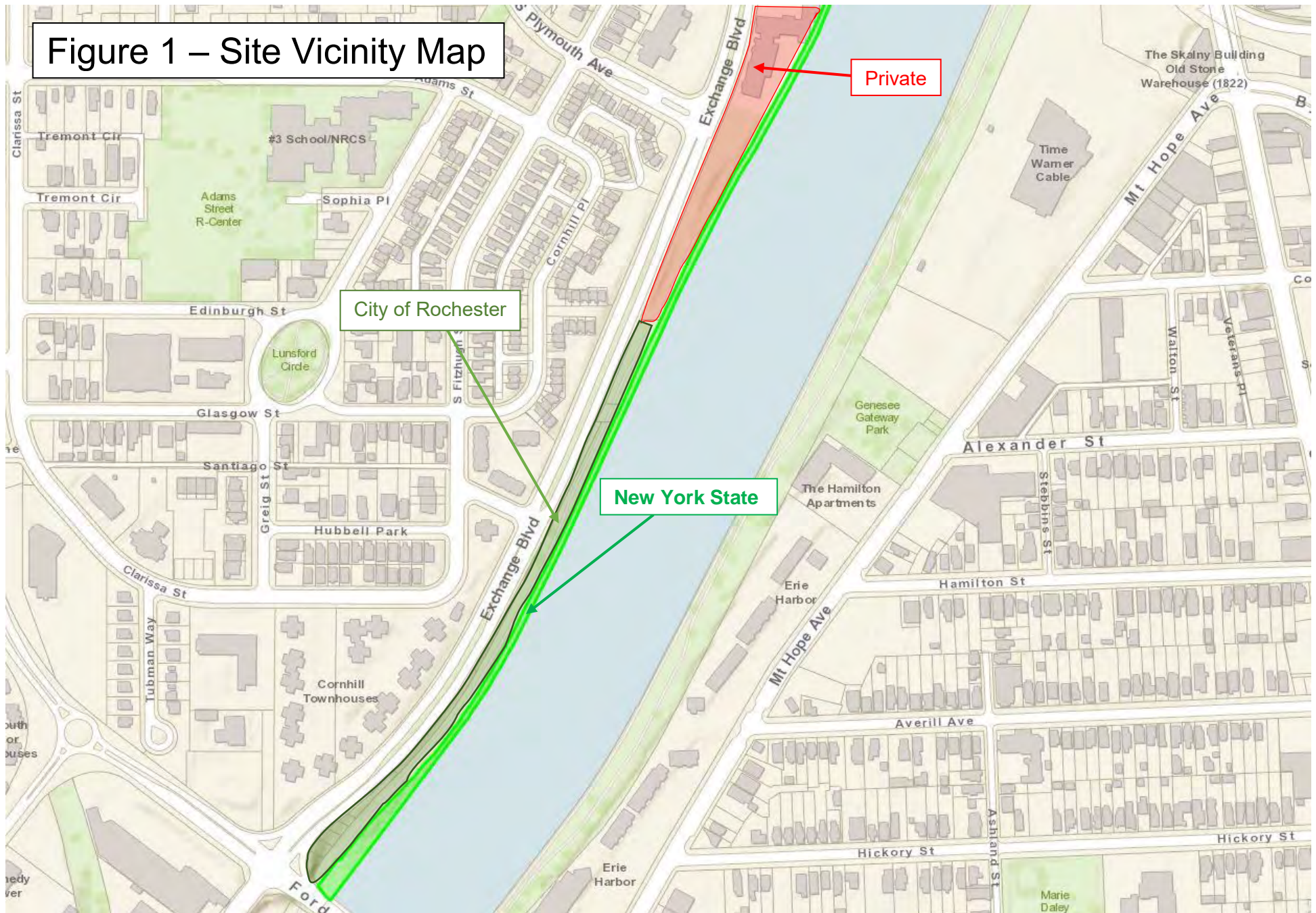
FIGURES



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Figure 1 – Site Vicinity Map



Rochester West River Wall Off-Site Beneficial Use Determination

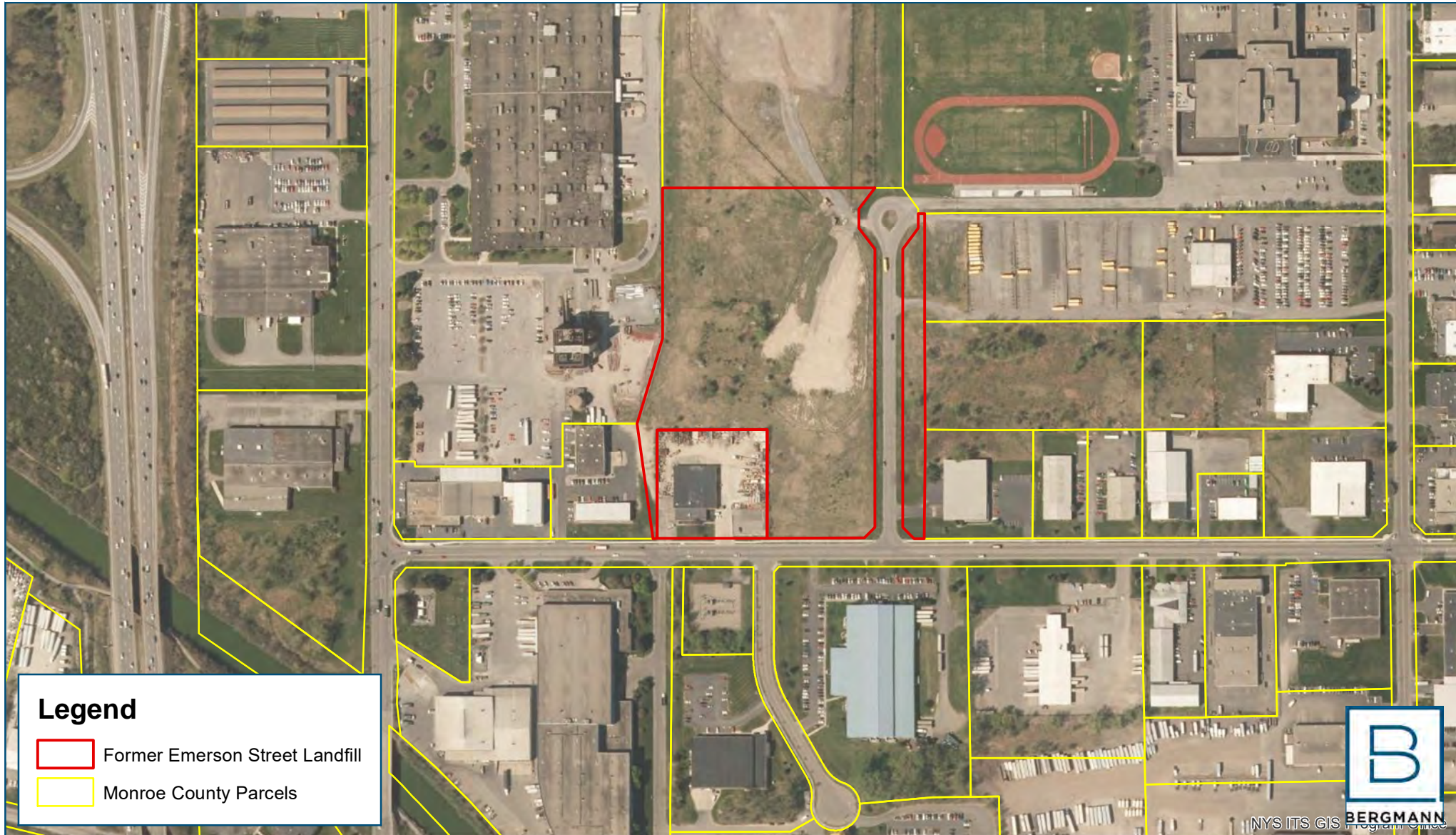
FORMER EMERSON STREET
LANDFILL

Fig.2

400
Feet



City of Rochester, Monroe County, New York



Rochester West River Wall Segment 1- Corn Hill

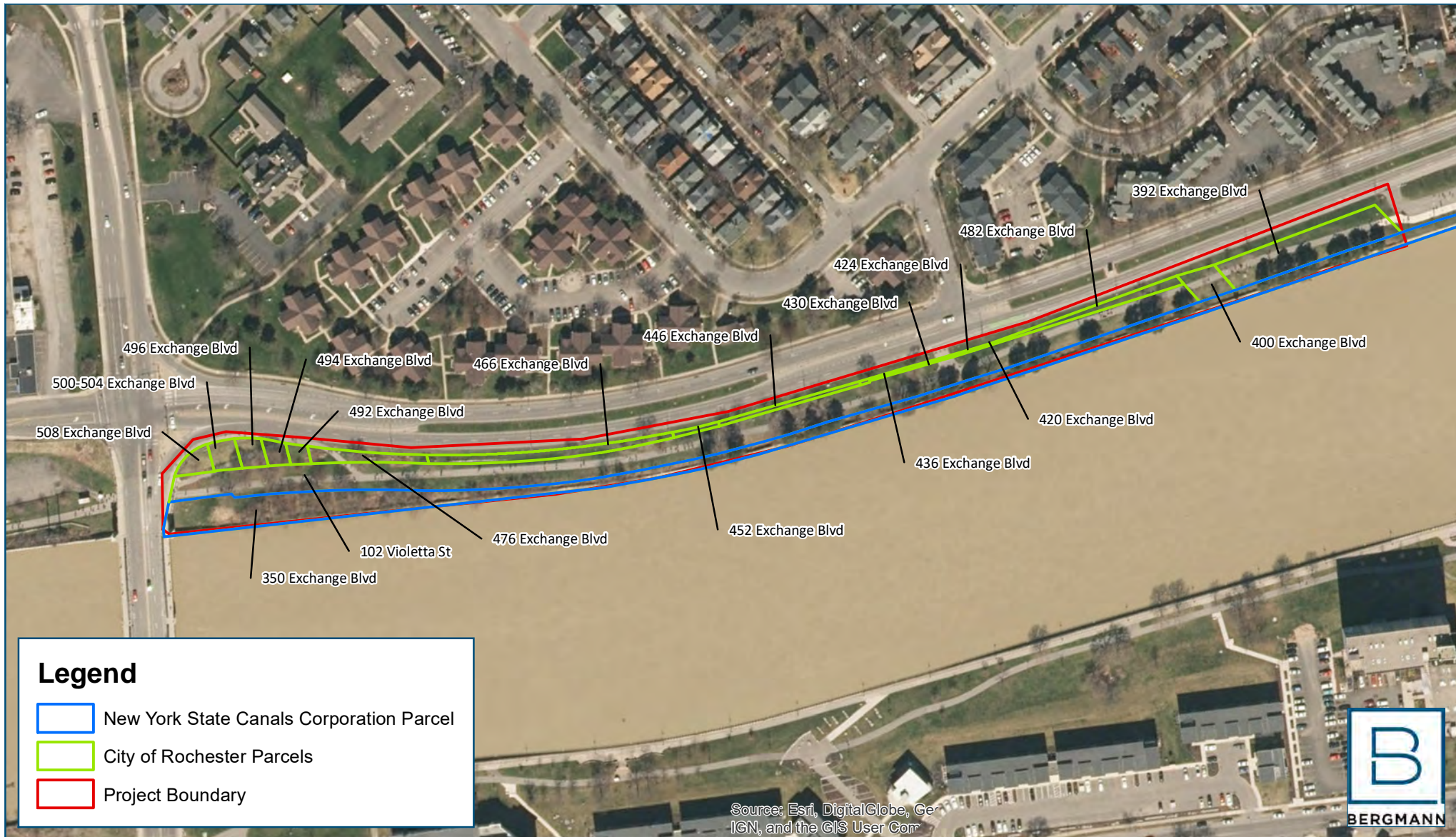
PARCEL LOCATION
MAP

Fig.3

200
Feet



City of Rochester, Monroe County, New York



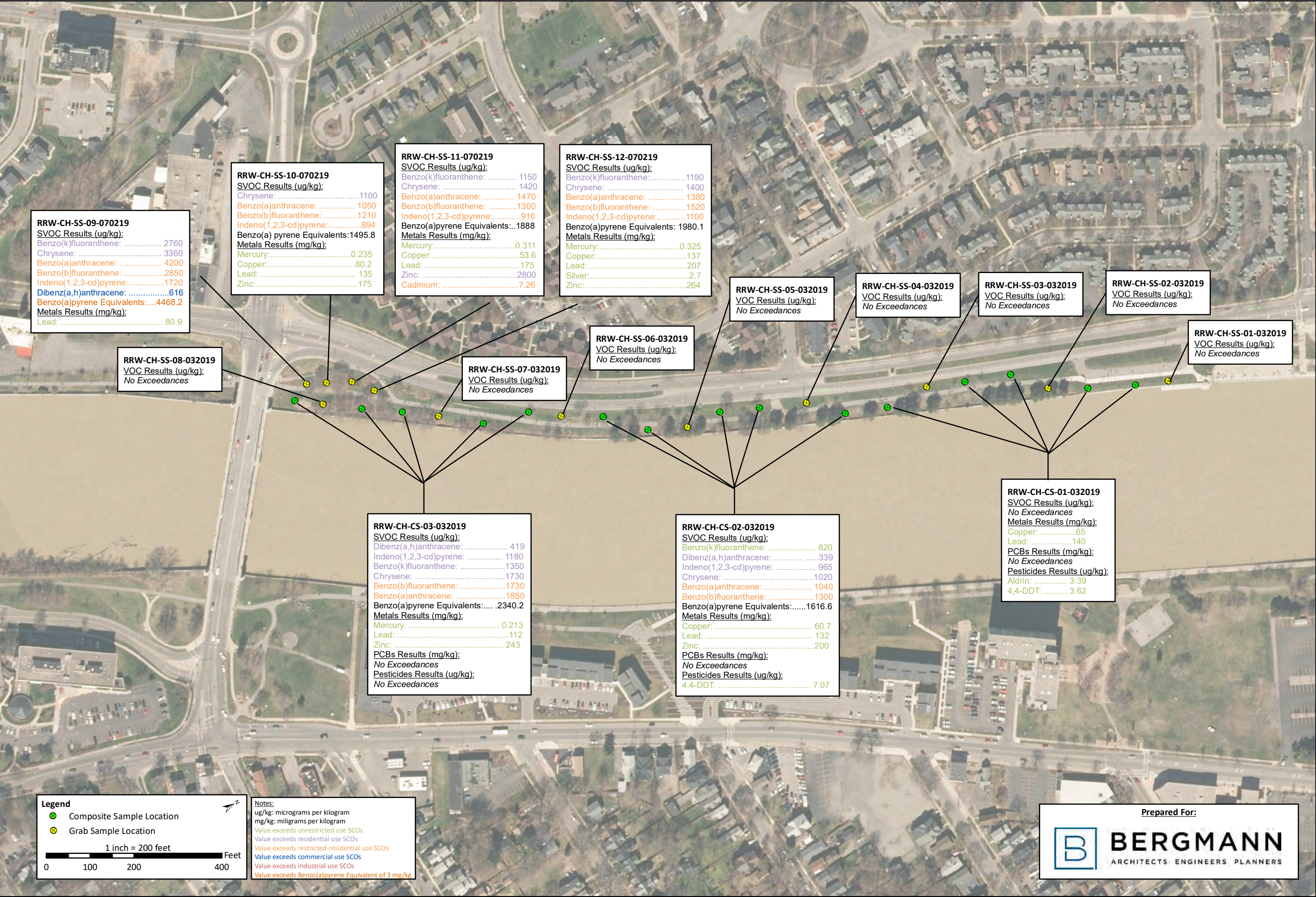


Figure 4. Surface Soil Results-Benzo(a)pyrene Equivalent (BAP)
Beneficial Use Determination (BUD) West River Wall
City of Rochester
Monroe County, NY



APPENDIX A

Case Specific BUD Petition

Beneficial Use Determination Petition – Fill or Cover

OFFICIAL USE ONLY		
DATE RECEIVED		
PROJECT NUMBER		
STAFF INITIALS		
DATE		

6 NYCRR Subdivision 360.12(c) addresses various pre-determined wastes, residual or by-product materials which, when used in the manner noted in that subdivision, are not considered solid wastes (for the purposes of Parts 360-369). In situations where a particular proposed reuse is not specifically identified in that subdivision, material generators and potential users may petition the Department for a case-specific beneficial use determination (BUD) under Subdivision 360.12(d). This form has been developed to assist applicants in obtaining a case-specific BUD for the use of excess excavated materials from construction projects, processed C&D debris and other soil-like wastes to serve as structural or grade adjustment fill, or as ground surface cover material. **This form should be used when petitioners cannot meet criteria of 360.12(c)(ii) or 360.12(c)(iii) for fill material.**

Note: This form is intended to address the requirements of 6 NYCRR 360.12 only and does not cover other federal, state, or local approvals that may be necessary for use of the proposed fill or cover material.

Petitioner Information

Full Name:

Last First M.I.

Affiliation:

Company Title

**Primary
Address:**

Street Address City/Town

County Zip Code

Primary Phone: () _____ **Primary Email:** _____

Fill or Cover Material Information

**Waste
Information:**

Type of waste to be used as a fill or cover (excavated fill, C&D or other) Estimated Total Quantity (in tons or cubic yards)

**Source of
Generation:**

Generator Name Facility Type (i.e. Construction Site, Processing Facility, etc.)

Generator Location(s) (Address, Town, County); include lot and block numbers if a construction site

Details of Use:

Function (structural fill, embankment, grade adjustment, cover, topsoil) Duration of project (up to 5 years)

**Location(s) of
Use:**

Location of use, if applicable (Address) Quantity in tons or cubic yards

Location of use, if applicable (Address) Quantity in tons or cubic yards

Location of use, if applicable (Address) Quantity in tons or cubic yards

Petition Attachments Supporting a BUD

Note to Petitioners : The following is a list of attachments which are commonly found in approvable BUD petitions. This list is not intended to be all inclusive. Each BUD petition is unique and the type of information which may be used to support a determination of beneficial use will vary. Petitioners are encouraged to include all relevant documentation showing that the proposed use is truly beneficial (does not constitute disposal), will not pose a risk to the environment or to public health and safety and will not result in nuisance conditions.

Attached N/A

- 1) Mechanical analysis or grain size distribution
- 2) Waste composition analysis (Weight percentage of each waste type in the 2-6 mm fraction)
- 3) Lab data packages for chemical analyses of fill material
- 4) Summary table of lab data comparing results to applicable levels of concern
- 5) Color photographs showing the physical appearance of the bulk fill material and the fraction retained in a 1/4-inch sieve
- 6) A sampling plan describing how physical and chemical data characterizing the fill material was generated including sample locations and depths, sampling methods and analytical methods
- 7) For fill materials generated from processed C&D debris, identification of the C&D processing facility and a copy of the waste control plan used by the facility to exclude contamination from the fill material
- 8) For fill materials generated from a site development project, a map showing the location of the generation site, a site plan showing locations and depths of excavation, locations and depths of pre-excavation samples and any environmental reports, boring logs or testing data documenting site environmental conditions and fill chemistry
- 9) For grade adjustment fill material, a site development plan, including fill material specifications, showing how the fill material will be used and the volume of fill material required
- 10) Documentation showing that the site development plan has been approved by the municipality having jurisdiction
- 11) Describe any other potential adverse effects from use of the material (odors, roots or seeds of invasive species) and measures taken to mitigate such effect
- 12) Description of transportation and storage of fill or cover prior to placement with measures to prevent uncontrolled dispersion
- 13) Description of environmental controls while placing the materials (e.g., dust control, erosion control)
- 14) Additional Information as needed to support a determination that the essential nature of the proposed use of waste constitutes use rather than disposal and that the proposed use will not adversely affect public health or the environment

If Petition Request Attachments are not applicable state why. Attach additional sheets as necessary.

Solid Waste Facility Permit Requirements

Yes No

Will the proposed material require decontamination, special handling or processing before beneficial use as fill or cover?

Will a fee be charged for use of the receiving site for placement of materials as fill or cover, or will the receiving site operate outside the hours of sunrise and sunset?

Certification

I hereby affirm under penalty of perjury that information provided on this form (including attached statements and exhibits) was prepared by me or under my supervision and direction and is true to the best of my knowledge and belief, and that I have authority or am authorized to sign this application pursuant to 6 NYCRR Part 360. I am aware that any false statement made herein is punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law and ECL Section 3-0301(2)(Q).

Signature

Print Name

Date

Before you submit this application, please verify:

- ☐ All fields of the application are complete (indicate N/A (not applicable) if appropriate).
- ☐ You have signed and dated above.
- ☐ You have enclosed all supporting information.

Send this completed form and any supporting attachments to the **Materials Management Supervisor** in your DEC Region (for help, see <http://www.dec.ny.gov/about/50230.html>), with a copy to:

Kathleen Prather, P.E.
Bureau of Permitting and Planning
Division of Materials Management
NYSDEC
625 Broadway, 9th Floor
Albany, NY 12233-7260

Please contact Ms. Prather at (518) 402-8678 or benuse@dec.ny.gov if you have any questions about petitioning for a case-specific BUD.



APPENDIX B

Phase II Environmental Site Assessment Sampling and Analysis Plan



BERGMANN

ARCHITECTS ENGINEERS PLANNERS

Draft Sampling and Analysis Plan

ROCHESTER RIVER WALL SEGMENT I – CORNHILL



Prepared by:

Bergmann

Office:

280 East Broad Street, Suite 200

Rochester, NY 14604

Phone: 585.232.5135

www.bergmannpc.com

Issued: March 6, 2018



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FIGURES

Figure 1	Site Vicinity Map
Figure 2	Subsurface Exploration Plan

TABLE

Table 1	Sample Identification
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ATTACHMENT

Attachment 1	Project Specific Health and Safety Plan
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1.0 INTRODUCTION

On behalf of the City of Rochester (City), Bergmann Associates, Inc. (Bergmann) prepared this Sampling and Analysis Plan (SAP) for Rochester River Wall Phase I Cornhill soil boring and monitoring well installations. The soil borings and monitoring wells are for collection of environmental soil and groundwater samples from the area of the River Wall in the area of Cornhill. This SAP was prepared in general accordance with the documents listed below:

- NYSDEC DER - 10 Technical Guidance for Site Investigation and Remediation, dated May 3, 2010; and
- EPA Sampling and Analysis Guidance and Template v.4 –General Projects 04/2014.

This SAP describes the methods that will be implemented to characterize soil and groundwater quality for environmental constituents at environmental soil boring locations. The sample results will be used to assist in the management of soil and groundwater in design and construction for rehabilitation of the river wall.

1.1 BACKGROUND

The Site consists of the area of alignment of the River wall in Phase I of the Cornhill area from approximately Ford Street to the developed area of Cornhill Landing on the Genesee River front and to the lands owned by Mark IV Construction. The City of Rochester and NYS Canal Corporation currently own the site; see Figure 1 – Site Vicinity Map. Areas of the site appear to have historically been backfilled to make land adjoin properties that were used commercially and or for industrial purposes. Therefore, the locations of Environmental soil borings have been placed based on a review of City of Rochester Platt Maps and on a review of an Environmental Data Resources, report dated February 27, 2018.

1.2 OBJECTIVE

The objective of the scope of work outlined herein is to complete subsurface investigations (Environmental borings) for environmental evaluations during the planned geotechnical soil borings (structural / environmental borings). The results of the environmental samples will be used to characterize soil and groundwater quality for environmental constituents at design and construction areas for rehabilitation of the River Wall.



2.0 SCOPE OF WORK

The following section describes the scope of work that will be implemented to fulfill the objective of the study described in Section 1.2.

2.1 HEALTH AND SAFETY PLAN

The Health and Safety Plan (HASP), included as Attachment 1, has been developed for execution of the work that is outlined in this SAP for Bergmann employees. The HASP contains the following table of project contacts, which will be kept on-site while field activities are being completed under this SAP.

Contact Name	Title	Entity	Office Number	Mobile Number
Emergency Services			911	--
Tom Hanks	Director	City	(585) 428-6649	(585) 314-1617
Tony Borrelli	Project Manager	Bergmann	(585) 498-7777	
Jim Marschner	Health and Safety officer	Bergmann	(585) 498-7858	(585) 455-7043
Stephen DeMeo	Sr. Geologist	Bergmann	(585) 498-7805	(585) 233-2396
Cash Bleier	Environmental Scientist	Bergmann	(585) 498-9750	

Note: TBD =to be determined

The HASP also contains a map showing the nearest route to the hospital, a list of potential hazards for injury and exposure, personal protective equipment to be used for sampling operations, and measures for site control to prevent the general public from entering work areas.

2.2 BORING INSTALLATION

2.3 MONITORING WELL INSTALLATION

2.4 SOIL SAMPLING PROCEDURES

Soil samples will be collected in accordance with NYSDEC DER-10 guidance. Provided below is a brief synopsis of the soil and sample collection procedures that will be utilized in the field. Bergmann will retain the services of Nature's Way Environmental Consultants and Contractors (Nature's way) for up to three weeks to advance 14 Environmental borings and 7 Structural /Environmental borings using rotary drilling method ASTM D5876 and sampling methods. The Bergmann Geologist (Professional Geologist) or environmental scientist supervised by the Professional Geologist will visually examine the recovered soil samples in the split spoon sampler for evidence of suspect contamination. The ambient air above the soil samples in the breaching zone will be screened with a photoionization detector (PID). Portions of soil samples from each sample depth interval will be placed in new, clean ziplock-type bags, and the ambient headspace air in for these soil samples will also be screened with the PID



and this measurement will be recorded on the test boring logs at the sample interval with a description of the soil sample.

As appropriate, based on the proposed sample depths and observations of the soil and/or PID screening results, discrete portions of the recovered soil samples will be placed in clean laboratory containers for possible analytical laboratory testing.

A subsurface explorations plan was prepared that presents the proposed sample locations shown on Figure 2 – Subsurface Exploration Plan. Fourteen (14) Environmental / Structural soil borings and seven (7) Structural borings will be completed during this phase of initial River wall investigations. Monitoring wells will be installed at 10 Environmental / Structural soil borings locations based on the field conditions revealed in soil boring and bedrock core holes. Soil samples will also be field screened with the PID from Structural boring locations designated A1 through A7, see Figure 2. Approximately 10 to 25 feet of bedrock will be cored in structural borings A1 through A5 and A7.

Discrete soil samples will be collected from the sample depth intervals at each Environmental / Structural soil boring location based on the results of the PID screening and visual observations.

Fourteen (14) soil samples will be generally selected for analysis from depth intervals above the groundwater table based on PID field screen measurements and visual observations of stained soils. Selected samples for laboratory testing will be from depths above the top of the groundwater table, if encountered. In the event that elevated field screening measurements are not detected, the soil sample interval above the top of the groundwater table observed during the installation or from the bottom of the boreholes will be collected for laboratory testing.

The sample identification names for each of the discrete samples that will be collected are provided in Table 1. Composite samples are not planned for this project. The discrete samples will be submitted to the analytical laboratory. Each discrete soil sample will be analyzed for 8260, 8270, Metals, Pesticides and PCB's as described below in Section 2.4. Procedures for the collection of groundwater samples from monitoring wells is presented in section 2.3.

2.5 GROUNDWATER SAMPLING PROCEDURES

After removing the well cap for sampling, the depth to water in each well will be measured to the nearest hundredth of a foot using an electronic water-level indicator and recorded on a well sampling log. The probe indicator will be decontaminated between measurements with a solution of Alconox (non-phosphate detergent) and potable water, followed by a distilled water rinse to avoid cross contamination between wells. Wash and rinse water will be drummed and consolidated with the monitoring well development water.

After collection of the depth to groundwater measurements the well will be checked for the presence of light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL). The bailer will be lowered across the top of the water level in the well and removed so observe if LNAPL is present. Observations for the presence of DNAPL will be completed by lowering the bailer to the bottom of the well and removing it to observe if DNAPL is present.

Monitoring wells will be purged immediately prior to sampling by using bailers to purge each well. The wells will be purged until three well volumes were removed, or until dry. Field parameters including pH, temperature, specific conductivity, and turbidity, of the discharge water will be recorded for each well volume using a field calibrated meter. Prior to making measurements, the instruments will be calibrated according to the manufacturer's instructions. After each use, the probe/meter will be decontaminated. The field measurements will be recorded on a groundwater sampling log. After the purging is complete, a disposable bailer will be used to collect the groundwater samples. The bailer will be slowly lowered into the well using new polypropylene or nylon rope. The line will be lowered and raised by hand with the slack portion of the line left to lie on a plastic tarp or in



a clean container placed next to the well. The bailer will be slowly lowered until it is immersed within the well. Care will be taken not to agitate the water in the well to avoid possible volatilization of contaminants. Since the bailers and rope are disposable, they will be discarded after sampling each well.

New disposable gloves will be worn during sample collection and be discarded after use. Water from the bailer or sample tubing will be carefully transferred to the sample bottles to minimize aeration of the sample. The VOC containers will be filled first, followed by metals. Special care will be taken in filling and capping the VOC vials, so that no headspace or air bubbles are present. All sample bottle caps will be secured snugly, but not over-tightened.

2.6 ANALYTICAL LABORATORY TESTING AND QA/QC

Discrete soil and groundwater samples will be submitted under chain-of-custody control to Chemtech, Inc. (Chemtech), a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified analytical laboratory (ELAP ID #11376). Chemtech will perform the necessary laboratory preparations of the samples as necessary, and subsequently perform the analytical laboratory program listed below:

- Fourteen soil samples will be collected from soil boring locations for laboratory analysis in accordance with methods EPA 8260 plus STARS, EPA 8270 base naturals (BN), TAL Metals, EPA 8082 Polychlorinated Biphenyls (PCBs) and Pesticides 8080.
- One blind duplicate soil sample will be collected for each of the analysis noted above for QA/QC purposes.
- Ten groundwater samples will be collected from the monitoring wells for laboratory analysis in accordance with methods EPA 8260 plus STARS, EPA 8270 (BN), TAL Metals, PCBs and pesticides. TAL Metals using methods United States Environmental Protection Agency (USEPA) Methods 6010 and 7471 (mercury).
 - One trip blank for EPA 8260 plus STARS will be submitted per batch of groundwater samples submitted with groundwater samples; and
- One blind duplicate groundwater sample will be collected for each of the analysis noted above for QA/QC purposes.

Within approximately 10 business days of sample receipt, Chemtech will provide an analytical report containing data tabulation of results and supporting QC information.

2.7 REPORT

After receipt of the laboratory results, Bergmann will prepare a subsurface investigation report and submit a draft report to the City of Rochester Department of Environmental Quality (DEQ) for review. The report will include the items listed below:

- A summary of the sampling efforts and methods used;
- Brief description of site subsurface conditions, soil types, and any fill materials encountered based on drilling and soil sampling performed;
- Table summarizing laboratory analytical results for samples and analyses tested, including a comparison to Unrestricted Use SCOs and CP-51 SCOs should petroleum compounds be detected as the primary contaminant of concern;
- Discussion of the environmental laboratory analytical results, and the contaminant distribution, as needed;



- Recommendations for any additional soil sampling and laboratory analysis; application of restrictions to portions of the Site, as needed; and/or remedial measures or other corrective actions in order to facilitate the soil and groundwater management of impacted soil and groundwater during construction / rehabilitation;
- A scaled figure using showing sample locations, property lines and river wall footprint;
- Test boring logs showing detailed subsurface logging information;
- A copy of the laboratory report; and
- Select photographs of the site and work performed.

3.0 PROJECT SCHEDULE

Upon the City DEQ approval of this SAP, it is anticipated that the scope of work outlined in Section 2.0 can be completed by about May 12, 2018. The anticipated schedule is detail for key tasks as provided below:

- Fieldwork - 3/26/18 through 4/10/18
- Analytical Laboratory Testing - 4/10/18 through 4/20/18
- Prepare / Submit Draft Report to the City- 4/20/17 through 5/4/18
- Final Report - 5/12/18



4.0 ACRONYM

bgs	below grade surface
City	City of Rochester
ELAP	Environmental Laboratory Approval Program
HASP	Health and Safety Plan
NYSDOH	New York State Department of Health
NYSDEC	New York State Department of Environmental Conservation
PAHs	Polycyclic Aromatic Hydrocarbons
ESC Labs	Environmental Laboratory Services
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
SCOs	Soil Cleanup Objective
SAP	Soil Sampling and Analysis Plan
SVOC	Semi-Volatile Organic Compound
TBD	to be determined
TCL	Target Compound List
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound



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APPENDIX C

Phase II Environmental Site Assessment

Included as Appendix B of EMP



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APPENDIX D

PFAS ANALYTICAL REPORTS



ANALYTICAL REPORT

Lab Number:	L1956982
Client:	Lu Engineers 339 East Avenue Suite 200 Rochester, NY 14604
ATTN:	Ben Seifert
Phone:	(585) 385-7417
Project Name:	Not Specified
Project Number:	50378-02
Report Date:	01/24/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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



Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1956982-01	RRW-CH-SS-14-112619	SOIL	WEST RIVER WALL	11/26/19 11:15	11/26/19
L1956982-02	RRW-CH-SS-15-112619	SOIL	WEST RIVER WALL	11/26/19 11:45	11/26/19
L1956982-03	EQUIPMENT BLANK-112619	WATER	WEST RIVER WALL	11/26/19 11:00	11/26/19
L1956982-04	RRW-CH-SS-112619(FIELD DUP.)	SOIL	WEST RIVER WALL	11/26/19 00:00	11/26/19
L1956982-05	TRIP BLANK-112619		WEST RIVER WALL	11/26/19 00:00	11/26/19

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

SPLP Perfluorinated Alkyl Acids by Isotope Dilution

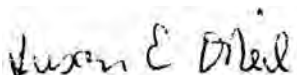
The WG1319083-1 Method Blank, associated with L1956982-01, -02, and -04, has a concentration above the reporting limits for PFOS. The samples were re-extracted with the method required holding time exceeded and the method blank was non-detect for this target compound. The results of both extractions are reported, along with the re-extract QC. The original sample result is reported with a "B" qualifier.

WG1319083-6, WG1319083-7 and WG1319083-8: These blanks represent the SPLP tumbling blanks associated with L1956982-01, -02, and -04.

WG1327604-1, WG1327604-2 and WG1327604-6: These blanks represent the SPLP tumbling blanks associated with L1956982-01RE, -02RE and -04RE.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 01/24/20

ORGANICS

SEMIVOLATILES

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-01
 Client ID: RRW-CH-SS-14-112619
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 11:15
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/06/20 08:19
 Analyst: JW

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

TCLP/SPLP Ext. Date: 11/27/19 14:37

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	14.9		ng/l	1.86	0.380	1
Perfluoropentanoic Acid (PFPeA)	6.64		ng/l	1.86	0.369	1
Perfluorobutanesulfonic Acid (PFBS)	0.996	J	ng/l	1.86	0.222	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.86	0.422	1
Perfluorohexanoic Acid (PFHxA)	5.68		ng/l	1.86	0.306	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.86	0.229	1
Perfluoroheptanoic Acid (PFHpA)	3.92		ng/l	1.86	0.210	1
Perfluorohexanesulfonic Acid (PFHxS)	1.01	J	ng/l	1.86	0.351	1
Perfluorooctanoic Acid (PFOA)	16.2		ng/l	1.86	0.220	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.86	1.24	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.86	0.642	1
Perfluorononanoic Acid (PFNA)	2.19		ng/l	1.86	0.291	1
Perfluorooctanesulfonic Acid (PFOS)	12.4	B	ng/l	1.86	0.470	1
Perfluorodecanoic Acid (PFDA)	0.545	J	ng/l	1.86	0.284	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.86	1.13	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.86	1.04	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	1.17	J	ng/l	1.86	0.604	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.86	0.242	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.86	0.914	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.86	0.541	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	0.951	J	ng/l	1.86	0.750	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.86	0.347	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.86	0.305	1
Perfluorotetradecanoic Acid (PFTA)	0.362	J	ng/l	1.86	0.231	1
PFOA/PFOS, Total	28.6	B	ng/l	1.86	0.220	1
PFAS, Total (5)	35.7	JB	ng/l	1.86	0.210	1

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-01
 Client ID: RRW-CH-SS-14-112619
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 11:15
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	74		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	81		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	80		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	67		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	73		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	72		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	75		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	81		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	79		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	95		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	78		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	86		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	48		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	85		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	39		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	51		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	83		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	81		33-143

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-01 RE
 Client ID: RRW-CH-SS-14-112619
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 11:15
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/24/20 01:11
 Analyst: JW

Extraction Method: ALPHA 23528
 Extraction Date: 01/07/20 12:39

TCLP/SPLP Ext. Date: 11/27/19 14:37

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	15.6		ng/l	1.92	0.391	1
Perfluoropentanoic Acid (PFPeA)	6.80		ng/l	1.92	0.379	1
Perfluorobutanesulfonic Acid (PFBS)	0.705	J	ng/l	1.92	0.228	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.92	0.433	1
Perfluorohexanoic Acid (PFHxA)	5.96		ng/l	1.92	0.314	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.92	0.235	1
Perfluoroheptanoic Acid (PFHpA)	4.25		ng/l	1.92	0.216	1
Perfluorohexanesulfonic Acid (PFHxS)	0.483	J	ng/l	1.92	0.360	1
Perfluorooctanoic Acid (PFOA)	16.4		ng/l	1.92	0.226	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.92	1.28	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.92	0.659	1
Perfluorononanoic Acid (PFNA)	2.39		ng/l	1.92	0.299	1
Perfluorooctanesulfonic Acid (PFOS)	14.9		ng/l	1.92	0.483	1
Perfluorodecanoic Acid (PFDA)	0.506	J	ng/l	1.92	0.291	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.92	1.16	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.92	1.07	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	1.34	J	ng/l	1.92	0.621	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.92	0.249	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.92	0.939	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.92	0.556	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	1.02	J	ng/l	1.92	0.770	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.92	0.356	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.92	0.313	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.92	0.238	1
PFOA/PFOS, Total	31.3		ng/l	1.92	0.226	1
PFAS, Total (5)	38.4	J	ng/l	1.92	0.216	1

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-01 RE

Date Collected: 11/26/19 11:15

Client ID: RRW-CH-SS-14-112619

Date Received: 11/26/19

Sample Location: WEST RIVER WALL

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	76		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	82		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	63		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	65		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	68		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	70		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	58		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	71		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	76		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	63		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	37		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	81		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	29		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	41		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	72		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	66		33-143

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-02
 Client ID: RRW-CH-SS-15-112619
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 11:45
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/06/20 08:35
 Analyst: JW

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

TCLP/SPLP Ext. Date: 11/27/19 14:37

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	12.8		ng/l	1.87	0.382	1
Perfluoropentanoic Acid (PFPeA)	3.98		ng/l	1.87	0.371	1
Perfluorobutanesulfonic Acid (PFBS)	1.26	J	ng/l	1.87	0.223	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.87	0.423	1
Perfluorohexanoic Acid (PFHxA)	3.78		ng/l	1.87	0.307	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.87	0.230	1
Perfluoroheptanoic Acid (PFHpA)	3.12		ng/l	1.87	0.211	1
Perfluorohexanesulfonic Acid (PFHxS)	1.89		ng/l	1.87	0.352	1
Perfluorooctanoic Acid (PFOA)	9.48		ng/l	1.87	0.221	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.87	1.25	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.87	0.644	1
Perfluorononanoic Acid (PFNA)	1.87		ng/l	1.87	0.292	1
Perfluorooctanesulfonic Acid (PFOS)	13.7	B	ng/l	1.87	0.472	1
Perfluorodecanoic Acid (PFDA)	0.438	J	ng/l	1.87	0.285	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.87	1.13	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.87	1.05	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.87	0.607	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.87	0.243	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.87	0.918	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.87	0.543	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.87	0.753	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.87	0.348	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.87	0.306	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.87	0.232	1
PFOA/PFOS, Total	23.2	B	ng/l	1.87	0.221	1
PFAS, Total (5)	30.1	B	ng/l	1.87	0.211	1

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-02
 Client ID: RRW-CH-SS-15-112619
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 11:45
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	93		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	105		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	86		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	84		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	94		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	94		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	101		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	101		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	104		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	97		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	104		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	53		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	99		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	41		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	62		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	89		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	83		33-143

Project Name: Not Specified**Lab Number:** L1956982**Project Number:** 50378-02**Report Date:** 01/24/20**SAMPLE RESULTS**

Lab ID: L1956982-02 RE
 Client ID: RRW-CH-SS-15-112619
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 11:45
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/24/20 01:27
 Analyst: JW

Extraction Method: ALPHA 23528
 Extraction Date: 01/07/20 12:39

TCLP/SPLP Ext. Date: 11/27/19 14:37

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	13.7		ng/l	1.89	0.385	1
Perfluoropentanoic Acid (PFPeA)	4.03		ng/l	1.89	0.374	1
Perfluorobutanesulfonic Acid (PFBS)	0.992	J	ng/l	1.89	0.224	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.89	0.426	1
Perfluorohexanoic Acid (PFHxA)	3.75		ng/l	1.89	0.309	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.89	0.231	1
Perfluoroheptanoic Acid (PFHpA)	3.17		ng/l	1.89	0.212	1
Perfluorohexanesulfonic Acid (PFHxS)	0.457	J	ng/l	1.89	0.355	1
Perfluorooctanoic Acid (PFOA)	9.84		ng/l	1.89	0.223	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.89	1.26	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.89	0.649	1
Perfluorononanoic Acid (PFNA)	1.86	J	ng/l	1.89	0.294	1
Perfluorooctanesulfonic Acid (PFOS)	11.5		ng/l	1.89	0.475	1
Perfluorodecanoic Acid (PFDA)	0.543	J	ng/l	1.89	0.287	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.89	1.14	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.89	1.06	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.89	0.611	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.89	0.245	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.89	0.924	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.89	0.547	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.89	0.758	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.89	0.351	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.89	0.309	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.89	0.234	1
PFOA/PFOS, Total	21.3		ng/l	1.89	0.223	1
PFAS, Total (5)	26.8	J	ng/l	1.89	0.212	1

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-02 RE

Date Collected: 11/26/19 11:45

Client ID: RRW-CH-SS-15-112619

Date Received: 11/26/19

Sample Location: WEST RIVER WALL

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	68		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	73		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	77		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	61		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	67		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	56		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	71		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	77		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	72		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	56		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	44		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	77		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	41		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	47		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	69		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	61		33-143

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-03
 Client ID: EQUIPMENT BLANK-112619
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 11:00
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/06/20 20:52
 Analyst: JW

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 09:50

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.71	0.349	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.71	0.339	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.71	0.204	1
Perfluorohexanoic Acid (PFHxA)	0.390	J	ng/l	1.71	0.281	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.71	0.193	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.71	0.322	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.71	0.202	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.71	1.14	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.71	0.589	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.71	0.267	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.71	0.432	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.71	0.260	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.71	1.04	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.71	0.555	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.71	0.223	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.71	0.839	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.71	0.496	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.71	0.688	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.71	0.318	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.71	0.280	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.71	0.212	1
PFOA/PFOS, Total	ND		ng/l	1.71	0.202	1

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-03
 Client ID: EQUIPMENT BLANK-112619
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 11:00
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	108		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	129		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	110		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	104		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	107		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	120		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	109		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	87		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	107		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	106		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	99		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	92		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	62		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	107		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	54		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	70		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	97		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	91		33-143

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-04
 Client ID: RRW-CH-SS-112619(FIELD DUP.)
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 00:00
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/06/20 09:27
 Analyst: JW

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

TCLP/SPLP Ext. Date: 11/27/19 14:37

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	12.8		ng/l	1.77	0.360	1
Perfluoropentanoic Acid (PFPeA)	4.02		ng/l	1.77	0.350	1
Perfluorobutanesulfonic Acid (PFBS)	1.06	J	ng/l	1.77	0.210	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.77	0.399	1
Perfluorohexanoic Acid (PFHxA)	3.86		ng/l	1.77	0.290	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.77	0.217	1
Perfluoroheptanoic Acid (PFHpA)	3.22		ng/l	1.77	0.199	1
Perfluorohexanesulfonic Acid (PFHxS)	0.982	J	ng/l	1.77	0.332	1
Perfluorooctanoic Acid (PFOA)	11.3		ng/l	1.77	0.208	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.77	1.18	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.77	0.608	1
Perfluorononanoic Acid (PFNA)	2.00		ng/l	1.77	0.276	1
Perfluorooctanesulfonic Acid (PFOS)	12.9	B	ng/l	1.77	0.445	1
Perfluorodecanoic Acid (PFDA)	0.671	J	ng/l	1.77	0.268	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.77	1.07	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.77	0.989	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.77	0.572	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.77	0.230	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.77	0.866	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.77	0.512	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.77	0.710	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.77	0.329	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.77	0.289	1
Perfluorotetradecanoic Acid (PFTa)	ND		ng/l	1.77	0.219	1
PFOA/PFOS, Total	24.2	B	ng/l	1.77	0.208	1
PFAS, Total (5)	30.4	JB	ng/l	1.77	0.199	1

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-04

Date Collected: 11/26/19 00:00

Client ID: RRW-CH-SS-112619(FIELD DUP.)

Date Received: 11/26/19

Sample Location: WEST RIVER WALL

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	78		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	88		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	84		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	75		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	79		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	82		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	83		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	89		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	86		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	89		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	50		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	88		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	35		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	57		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	78		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	69		33-143

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-04 RE
 Client ID: RRW-CH-SS-112619(FIELD DUP.)
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 00:00
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/24/20 01:44
 Analyst: JW

Extraction Method: ALPHA 23528
 Extraction Date: 01/07/20 12:39

TCLP/SPLP Ext. Date: 11/27/19 14:37

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	13.5		ng/l	1.86	0.379	1
Perfluoropentanoic Acid (PFPeA)	4.33		ng/l	1.86	0.368	1
Perfluorobutanesulfonic Acid (PFBS)	0.914	J	ng/l	1.86	0.221	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.86	0.420	1
Perfluorohexanoic Acid (PFHxA)	3.78		ng/l	1.86	0.305	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.86	0.228	1
Perfluoroheptanoic Acid (PFHpA)	3.16		ng/l	1.86	0.209	1
Perfluorohexanesulfonic Acid (PFHxS)	0.572	J	ng/l	1.86	0.349	1
Perfluorooctanoic Acid (PFOA)	11.4		ng/l	1.86	0.219	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.86	1.24	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.86	0.639	1
Perfluorononanoic Acid (PFNA)	2.15		ng/l	1.86	0.290	1
Perfluorooctanesulfonic Acid (PFOS)	14.7		ng/l	1.86	0.468	1
Perfluorodecanoic Acid (PFDA)	0.736	J	ng/l	1.86	0.282	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.86	1.13	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.86	1.04	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.86	0.602	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.86	0.242	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.86	0.911	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.86	0.539	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.86	0.747	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.86	0.346	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.86	0.304	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.86	0.230	1
PFOA/PFOS, Total	26.1		ng/l	1.86	0.219	1
PFAS, Total (5)	32.0	J	ng/l	1.86	0.209	1

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1956982-04 RE
 Client ID: RRW-CH-SS-112619(FIELD DUP.)
 Sample Location: WEST RIVER WALL

Date Collected: 11/26/19 00:00
 Date Received: 11/26/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	69		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	74		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	80		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	62		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	67		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	71		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	72		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	63		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	84		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	76		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	62		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	41		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	79		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	42		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	48		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	68		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	56		33-143

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/06/20 19:13
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/10/19 09:50

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 03 Batch: WG1318745-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.408
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.396
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.238
Perfluorohexanoic Acid (PFHxA)	0.404	J	ng/l	2.00	0.328
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.225
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.376
Perfluorooctanoic Acid (PFOA)	0.388	J	ng/l	2.00	0.236
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	1.33
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.688
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.312
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.504
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.304
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	1.21
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.648
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.260
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	0.980
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	0.580
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.804
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.372
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	0.327
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.248
PFOA/PFOS, Total	0.388	J	ng/l	2.00	0.236

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/06/20 19:13
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/10/19 09:50

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 03 Batch: WG1318745-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	110		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	127		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	106		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	103		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	108		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	112		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	112		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	85		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	113		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	114		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	109		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	91		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	76		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	116		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	54		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	80		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	106		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	97		33-143

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/05/20 17:09
 Analyst: JW
 TCLP/SPLP Extraction Date:

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1319083-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.408
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.396
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.238
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.452
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.328
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.245
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.225
Perfluorohexanesulfonic Acid (PFHxS)	1.17	J	ng/l	2.00	0.376
Perfluorooctanoic Acid (PFOA)	1.08	J	ng/l	2.00	0.236
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	1.33
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.688
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.312
Perfluorooctanesulfonic Acid (PFOS)	2.95		ng/l	2.00	0.504
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.304
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	1.21
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	2.00	1.12
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.648
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.260
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	0.980
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	0.580
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.804
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.372
Perfluorotridecanoic Acid (PFTTrDA)	ND		ng/l	2.00	0.327
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.248
PFOA/PFOS, Total	4.03	J	ng/l	2.00	0.236
PFAS, Total (5)	5.20	J	ng/l	2.00	0.225

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/05/20 17:09
 Analyst: JW
 TCLP/SPLP Extraction Date:

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1319083-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	115		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	128		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	111		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	78		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	111		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	115		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	114		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	117		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	84		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	117		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	123		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	113		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	98		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	84		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	119		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	45		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	88		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	109		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	102		33-143

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/05/20 17:25
 Analyst: JW
 TCLP/SPLP Extraction Date: 12/05/19 16:52

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1319083-6					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.78	0.363
Perfluoropentanoic Acid (PFPeA)	0.502	J	ng/l	1.78	0.352
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.78	0.212
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.78	0.402
Perfluorohexanoic Acid (PFHxA)	0.818	J	ng/l	1.78	0.292
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.78	0.218
Perfluoroheptanoic Acid (PFHpA)	0.288	J	ng/l	1.78	0.200
Perfluorohexanesulfonic Acid (PFHxS)	1.32	J	ng/l	1.78	0.334
Perfluorooctanoic Acid (PFOA)	1.11	J	ng/l	1.78	0.210
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.78	1.18
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.78	0.612
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.78	0.278
Perfluorooctanesulfonic Acid (PFOS)	1.64	J	ng/l	1.78	0.448
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.78	0.270
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.78	1.08
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.78	0.996
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.78	0.576
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.78	0.231
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.78	0.872
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.78	0.516
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.78	0.715
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.78	0.331
Perfluorotridecanoic Acid (PFTTrDA)	ND		ng/l	1.78	0.291
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.78	0.221
PFOA/PFOS, Total	2.75	J	ng/l	1.78	0.210
PFAS, Total (5)	4.36	J	ng/l	1.78	0.200

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/05/20 17:25
 Analyst: JW
 TCLP/SPLP Extraction Date: 12/05/19 16:52

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1319083-6					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	60		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	68		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	100		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	57		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	63		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	100		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	67		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	75		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	73		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	102		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	76		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	77		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	42		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	79		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	5		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	53		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	81		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	78		33-143

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/05/20 17:42
 Analyst: JW
 TCLP/SPLP Extraction Date: 12/06/19 15:27

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1319083-7					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.72	0.352
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.72	0.341
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.72	0.205
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.72	0.390
Perfluorohexanoic Acid (PFHxA)	0.459	J	ng/l	1.72	0.283
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.72	0.211
Perfluoroheptanoic Acid (PFHpA)	0.255	J	ng/l	1.72	0.194
Perfluorohexanesulfonic Acid (PFHxS)	0.507	J	ng/l	1.72	0.324
Perfluorooctanoic Acid (PFOA)	0.886	J	ng/l	1.72	0.203
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.72	1.15
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.72	0.593
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.72	0.269
Perfluorooctanesulfonic Acid (PFOS)	1.40	J	ng/l	1.72	0.434
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.72	0.262
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.72	1.04
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.72	0.966
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.72	0.559
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.72	0.224
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.72	0.845
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.72	0.500
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.72	0.693
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.72	0.321
Perfluorotridecanoic Acid (PFTTrDA)	ND		ng/l	1.72	0.282
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.72	0.214
PFOA/PFOS, Total	2.29	J	ng/l	1.72	0.203
PFAS, Total (5)	3.05	J	ng/l	1.72	0.194

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/05/20 17:42
 Analyst: JW
 TCLP/SPLP Extraction Date: 12/06/19 15:27

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1319083-7					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	75		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	84		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	64		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	70		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	80		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	75		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	82		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	99		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	83		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	84		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	48		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	87		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	17		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	49		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	80		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	81		33-143

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID

Extraction Method: ALPHA 23528

Analytical Date: 01/05/20 17:59

Extraction Date: 12/10/19 19:30

Analyst: JW

TCLP/SPLP Extraction Date: 11/27/19 14:37

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1319083-8					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.83	0.374
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.83	0.363
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.83	0.218
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.83	0.414
Perfluorohexanoic Acid (PFHxA)	0.729	J	ng/l	1.83	0.300
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.83	0.224
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.83	0.206
Perfluorohexanesulfonic Acid (PFHxS)	0.806	J	ng/l	1.83	0.344
Perfluorooctanoic Acid (PFOA)	0.820	J	ng/l	1.83	0.216
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.83	1.22
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.83	0.630
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.83	0.286
Perfluorooctanesulfonic Acid (PFOS)	1.36	J	ng/l	1.83	0.462
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.83	0.278
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.83	1.11
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.83	1.02
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.83	0.593
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.83	0.238
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.83	0.897
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.83	0.531
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.83	0.736
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.83	0.341
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.83	0.300
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.83	0.227
PFOA/PFOS, Total	2.18	J	ng/l	1.83	0.216
PFAS, Total (5)	2.99	J	ng/l	1.83	0.206

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/05/20 17:59
 Analyst: JW
 TCLP/SPLP Extraction Date: 11/27/19 14:37

Extraction Method: ALPHA 23528
 Extraction Date: 12/10/19 19:30

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1319083-8					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	74		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	84		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	71		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	65		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	73		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	103		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	74		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	83		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	106		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	73		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	89		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	40		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	77		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	19		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	47		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	73		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	72		33-143

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 23:48
Analyst: JW
TCLP/SPLP Extraction Date:

Extraction Method: ALPHA 23528
Extraction Date: 01/07/20 12:39

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1327604-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.408
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.396
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.238
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.452
Perfluorohexanoic Acid (PFHxA)	0.376	J	ng/l	2.00	0.328
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.245
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.225
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.376
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.236
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	1.33
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.688
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.312
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.504
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.304
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	1.21
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	2.00	1.12
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.648
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.260
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	0.980
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	0.580
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.804
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.372
Perfluorotridecanoic Acid (PFTTrDA)	ND		ng/l	2.00	0.327
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.248
PFOA/PFOS, Total	ND		ng/l	2.00	0.236
PFAS, Total (5)	ND		ng/l	2.00	0.225

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/23/20 23:48
 Analyst: JW
 TCLP/SPLP Extraction Date:

Extraction Method: ALPHA 23528
 Extraction Date: 01/07/20 12:39

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1327604-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	85		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	90		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	86		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	81		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	84		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	83		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	84		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	72		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	88		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	82		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	85		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	81		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	52		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	86		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	51		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	54		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	76		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	65		33-143

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/24/20 00:04
 Analyst: JW
 TCLP/SPLP Extraction Date: 11/27/19 14:37

Extraction Method: ALPHA 23528
 Extraction Date: 01/07/20 12:39

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1327604-2					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.89	0.385
Perfluoropentanoic Acid (PFPeA)	0.562	J	ng/l	1.89	0.374
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.89	0.224
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.89	0.426
Perfluorohexanoic Acid (PFHxA)	0.457	J	ng/l	1.89	0.309
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.89	0.231
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.89	0.212
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.89	0.355
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.89	0.223
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.89	1.26
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.89	0.649
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.89	0.294
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.89	0.475
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.89	0.287
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.89	1.14
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.89	1.06
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.89	0.611
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.89	0.245
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.89	0.924
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.89	0.547
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.89	0.758
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.89	0.351
Perfluorotridecanoic Acid (PFTTrDA)	ND		ng/l	1.89	0.309
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.89	0.234
PFOA/PFOS, Total	ND		ng/l	1.89	0.223
PFAS, Total (5)	ND		ng/l	1.89	0.212

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/24/20 00:04
 Analyst: JW
 TCLP/SPLP Extraction Date: 11/27/19 14:37

Extraction Method: ALPHA 23528
 Extraction Date: 01/07/20 12:39

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1327604-2					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	44		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	55		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	84		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	71		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	47		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	56		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	62		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	65		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	69		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	86		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	70		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	71		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	37		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	75		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	26		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	39		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	69		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	62		33-143

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/24/20 00:21
 Analyst: JW
 TCLP/SPLP Extraction Date: 01/01/20 14:59

Extraction Method: ALPHA 23528
 Extraction Date: 01/07/20 12:39

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1327604-6					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.78	0.364
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.78	0.354
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.78	0.212
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.78	0.404
Perfluorohexanoic Acid (PFHxA)	0.407	J	ng/l	1.78	0.293
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.78	0.219
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.78	0.201
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.78	0.336
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.78	0.211
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.78	1.19
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.78	0.614
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.78	0.278
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.78	0.450
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.78	0.271
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.78	1.08
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.78	1.00
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.78	0.578
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.78	0.232
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.78	0.875
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.78	0.518
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.78	0.718
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.78	0.332
Perfluorotridecanoic Acid (PFTTrDA)	ND		ng/l	1.78	0.292
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.78	0.221
PFOA/PFOS, Total	ND		ng/l	1.78	0.211
PFAS, Total (5)	ND		ng/l	1.78	0.201

Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
 Analytical Date: 01/24/20 00:21
 Analyst: JW
 TCLP/SPLP Extraction Date: 01/01/20 14:59

Extraction Method: ALPHA 23528
 Extraction Date: 01/07/20 12:39

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 01-02,04 Batch: WG1327604-6					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	74		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	80		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	87		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	59		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	64		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	69		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	71		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	57		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	77		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	77		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	64		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	38		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	85		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	32		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	42		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	77		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	69		33-143

Lab Control Sample Analysis **Batch Quality Control**

Project Name: Not Specified

Project Number: 50378-02

Lab Number: L1956982

Report Date: 01/24/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03 Batch: WG1318745-2 WG1318745-3								
Perfluorobutanoic Acid (PFBA)	105		109		67-148	4		30
Perfluoropentanoic Acid (PFPeA)	108		112		63-161	4		30
Perfluorobutanesulfonic Acid (PFBS)	102		103		65-157	1		30
Perfluorohexanoic Acid (PFHxA)	107		110		69-168	3		30
Perfluoroheptanoic Acid (PFHpA)	105		110		58-159	5		30
Perfluorohexanesulfonic Acid (PFHxS)	108		105		69-177	3		30
Perfluorooctanoic Acid (PFOA)	107		109		63-159	2		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	125		123		49-187	2		30
Perfluoroheptanesulfonic Acid (PFHpS)	113		120		61-179	6		30
Perfluorononanoic Acid (PFNA)	104		112		68-171	7		30
Perfluorooctanesulfonic Acid (PFOS)	109		110		52-151	1		30
Perfluorodecanoic Acid (PFDA)	108		107		63-171	1		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	126		128		56-173	2		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	120		117		60-166	3		30
Perfluoroundecanoic Acid (PFUnA)	109		110		60-153	1		30
Perfluorodecanesulfonic Acid (PFDS)	102		122		38-156	18		30
Perfluorooctanesulfonamide (FOSA)	95		106		46-170	11		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	107		107		45-170	0		30
Perfluorododecanoic Acid (PFDoA)	107		111		67-153	4		30
Perfluorotridecanoic Acid (PFTTrDA)	110		114		48-158	4		30
Perfluorotetradecanoic Acid (PFTA)	112		114		59-182	2		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: Not Specified

Project Number: 50378-02

Lab Number: L1956982

Report Date: 01/24/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 03 Batch: WG1318745-2 WG1318745-3								

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	110		114		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	123		129		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	112		116		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	105		109		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	106		111		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	110		121		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	110		117		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	94		94		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	110		110		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	109		110		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	104		110		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	90		97		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	70		80		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	109		117		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	54		55		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	77		79		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	103		111		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	94		100		33-143

Lab Control Sample Analysis Batch Quality Control

Project Name: Not Specified

Project Number: 50378-02

Lab Number: L1956982

Report Date: 01/24/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab Associated sample(s): 01-02,04 Batch: WG1319083-2 WG1319083-3								
Perfluorobutanoic Acid (PFBA)	106		105		67-148	1		30
Perfluoropentanoic Acid (PFPeA)	111		109		63-161	2		30
Perfluorobutanesulfonic Acid (PFBS)	118		116		65-157	2		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	126		119		37-219	6		30
Perfluorohexanoic Acid (PFHxA)	109		105		69-168	4		30
Perfluoropentanesulfonic Acid (PFPeS)	108		110		52-156	2		30
Perfluoroheptanoic Acid (PFHpA)	110		108		58-159	2		30
Perfluorohexanesulfonic Acid (PFHxS)	116		120		69-177	3		30
Perfluorooctanoic Acid (PFOA)	116		112		63-159	4		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	124		123		49-187	1		30
Perfluoroheptanesulfonic Acid (PFHpS)	112		117		61-179	4		30
Perfluorononanoic Acid (PFNA)	108		107		68-171	1		30
Perfluorooctanesulfonic Acid (PFOS)	105		113		52-151	7		30
Perfluorodecanoic Acid (PFDA)	110		104		63-171	6		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	145		117		56-173	21		30
Perfluorononanesulfonic Acid (PFNS)	112		108		48-150	4		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	120		125		60-166	4		30
Perfluoroundecanoic Acid (PFUnA)	108		109		60-153	1		30
Perfluorodecanesulfonic Acid (PFDS)	107		119		38-156	11		30
Perfluorooctanesulfonamide (FOSA)	106		106		46-170	0		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	121		113		45-170	7		30
Perfluorododecanoic Acid (PFDoA)	113		116		67-153	3		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: Not Specified

Lab Number: L1956982

Project Number: 50378-02

Report Date: 01/24/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab Associated sample(s): 01-02,04 Batch: WG1319083-2 WG1319083-3								
Perfluorotridecanoic Acid (PFTrDA)	117		121		48-158	3		30
Perfluorotetradecanoic Acid (PFTA)	112		117		59-182	4		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	115		107		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	127		118		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	114		102		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	81		75		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	109		102		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	114		107		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	115		102		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	113		107		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	87		81		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	116		110		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	117		104		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	110		103		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	92		89		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	76		73		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	118		108		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	48		38		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	78		88		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	108		101		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	99		92		33-143

Lab Control Sample Analysis **Batch Quality Control**

Project Name: Not Specified

Project Number: 50378-02

Lab Number: L1956982

Report Date: 01/24/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab Associated sample(s): 01-02,04 Batch: WG1327604-3 WG1327604-4								
Perfluorobutanoic Acid (PFBA)	109		114		67-148	4		30
Perfluoropentanoic Acid (PFPeA)	117		120		63-161	3		30
Perfluorobutanesulfonic Acid (PFBS)	108		115		65-157	6		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	119		120		37-219	1		30
Perfluorohexanoic Acid (PFHxA)	111		116		69-168	4		30
Perfluoropentanesulfonic Acid (PFPeS)	110		114		52-156	4		30
Perfluoroheptanoic Acid (PFHpA)	113		116		58-159	3		30
Perfluorohexanesulfonic Acid (PFHxS)	104		109		69-177	5		30
Perfluorooctanoic Acid (PFOA)	118		121		63-159	3		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	127		142		49-187	11		30
Perfluoroheptanesulfonic Acid (PFHpS)	118		130		61-179	10		30
Perfluorononanoic Acid (PFNA)	114		117		68-171	3		30
Perfluorooctanesulfonic Acid (PFOS)	106		121		52-151	13		30
Perfluorodecanoic Acid (PFDA)	110		115		63-171	4		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	122		133		56-173	9		30
Perfluorononanesulfonic Acid (PFNS)	109		127		48-150	15		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	129		132		60-166	2		30
Perfluoroundecanoic Acid (PFUnA)	110		112		60-153	2		30
Perfluorodecanesulfonic Acid (PFDS)	119		121		38-156	2		30
Perfluorooctanesulfonamide (FOSA)	110		110		46-170	0		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	117		122		45-170	4		30
Perfluorododecanoic Acid (PFDoA)	114		117		67-153	3		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: Not Specified

Project Number: 50378-02

Lab Number: L1956982

Report Date: 01/24/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab Associated sample(s): 01-02,04 Batch: WG1327604-3 WG1327604-4								
Perfluorotridecanoic Acid (PFTrDA)	124		126		48-158	2		30
Perfluorotetradecanoic Acid (PFTA)	117		118		59-182	1		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	83		84		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	86		89		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	81		81		31-159
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	61		65		1-313
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	80		83		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	82		86		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	83		83		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	79		86		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	59		65		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	83		87		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	81		77		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	79		84		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	68		74		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	47		53		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	81		89		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	52		55		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	50		59		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	72		79		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	65		71		33-143

Project Name: Not Specified**Lab Number:** L1956982**Project Number:** 50378-02**Report Date:** 01/24/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1956982-01A	Plastic 8oz unpreserved	A	NA		2.9	Y	Absent		-
L1956982-01B	Plastic 2oz unpreserved for TS	A	NA		2.9	Y	Absent		HOLD-WETCHEM()
L1956982-01X	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-01X1	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-01X2	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-01X3	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-01X9	Tumble Vessel	A	NA		2.9	Y	Absent		-
L1956982-02A	Plastic 8oz unpreserved	A	NA		2.9	Y	Absent		-
L1956982-02A1	Plastic 8oz unpreserved	A	NA		2.9	Y	Absent		-
L1956982-02A2	Plastic 8oz unpreserved	A	NA		2.9	Y	Absent		-
L1956982-02B	Plastic 2oz unpreserved for TS	A	NA		2.9	Y	Absent		HOLD-WETCHEM()
L1956982-02B1	Plastic 2oz unpreserved for TS	A	NA		2.9	Y	Absent		HOLD-WETCHEM()
L1956982-02B2	Plastic 2oz unpreserved for TS	A	NA		2.9	Y	Absent		HOLD-WETCHEM()
L1956982-02X	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-02X1	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-02X2	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-02X3	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-02X4	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-02X9	Tumble Vessel	A	NA		2.9	Y	Absent		-
L1956982-03A	Plastic 250ml unpreserved	A	NA		2.9	Y	Absent		A2-NY-537-ISOTOPE(14)
L1956982-03B	Plastic 250ml unpreserved	A	NA		2.9	Y	Absent		A2-NY-537-ISOTOPE(14)
L1956982-04A	Plastic 8oz unpreserved	A	NA		2.9	Y	Absent		-
L1956982-04B	Plastic 2oz unpreserved for TS	A	NA		2.9	Y	Absent		HOLD-WETCHEM()

Project Name: Not Specified
Project Number: 50378-02

Serial_No:01242017:02
Lab Number: L1956982
Report Date: 01/24/20

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1956982-04X	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-04X1	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-04X2	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-04X3	Plastic 250ml unpreserved Extracts	A	NA		2.9	Y	Absent		A2-SPLP-537-ISOTOPE(28)
L1956982-04X9	Tumble Vessel	A	NA		2.9	Y	Absent		-

Project Name: Not Specified
Project Number: 50378-02

Serial_No:01242017:02
Lab Number: L1956982
Report Date: 01/24/20

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA	376-06-7
Perfluorotridecanoic Acid	PFTTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1

Project Name: Not Specified**Lab Number:** L1956982**Project Number:** 50378-02**Report Date:** 01/24/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: DU Report with 'J' Qualifiers

Project Name: Not Specified**Lab Number:** L1956982**Project Number:** 50378-02**Report Date:** 01/24/20

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)-(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e., co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Report Format: DU Report with 'J' Qualifiers



Project Name: Not Specified**Lab Number:** L1956982**Project Number:** 50378-02**Report Date:** 01/24/20**Data Qualifiers**

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Report Format: DU Report with 'J' Qualifiers



Project Name: Not Specified
Project Number: 50378-02

Lab Number: L1956982
Report Date: 01/24/20

REFERENCES

- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.

ID No.:17873

Facility: **Company-wide**

Revision 15

Department: **Quality Assurance**

Published Date: 8/15/2019 9:53:42 AM

Title: **Certificate/Approval Program Summary**

Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,****SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.**EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1** Hg.**SM2340B**

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

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Lab Project ID: 195025

Client: Lu Engineers, Inc.

Project Reference: 50378-02

Sample Identifier: RRW-CH-SS-13-101119

Lab Sample ID: 195025-01

Date Sampled: 10/11/2019

Matrix: Soil

Date Received: 10/11/2019

Dioxane

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
1,4-Dioxane	< 32.9	ug/Kg		10/14/2019 15:36

Method Reference(s): EPA 8270D SIM

EPA 3546

Preparation Date: 10/14/2019

Data File: B41486.D

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

Report Prepared Wednesday, November 6, 2019



Lab Project ID: 195025

Client: Lu Engineers, Inc.

Project Reference: 50378-02

Sample Identifier: RRW-CH-SS-14-101119

Lab Sample ID: 195025-02

Date Sampled: 10/11/2019

Matrix: Soil

Date Received: 10/11/2019

Dioxane

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
1,4-Dioxane	< 37.4	ug/Kg		10/14/2019 15:46

Method Reference(s): EPA 8270D SIM

EPA 3546

Preparation Date: 10/14/2019

Data File: B41487.D

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

Report Prepared Wednesday, November 6, 2019



Lab Project ID: 195025

Client: **Lu Engineers, Inc.**

Project Reference: 50378-02

Sample Identifier: RRW-CH-SS-15-101119

Lab Sample ID: 195025-03

Date Sampled: 10/11/2019

Matrix: Soil

Date Received: 10/11/2019

Dioxane

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
1,4-Dioxane	< 33.6	ug/Kg	M	10/14/2019 15:57

Method Reference(s): EPA 8270D SIM

EPA 3546

Preparation Date: 10/14/2019

Data File: B41488.D

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

Report Prepared Wednesday, November 6, 2019



Lab Project ID: 195025

Client: Lu Engineers, Inc.

Project Reference: 50378-02

Sample Identifier: RRW-CH-SS-101119 (Field Duplicate)

Lab Sample ID: 195025-04

Date Sampled: 10/11/2019

Matrix: Soil

Date Received: 10/11/2019

Dioxane

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
1,4-Dioxane	< 33.1	ug/Kg		10/14/2019 16:30

Method Reference(s): EPA 8270D SIM

EPA 3546

Preparation Date: 10/14/2019

Data File: B41491.D

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Report Prepared Wednesday, November 6, 2019



Lab Project ID: 195025

Client: Lu Engineers, Inc.

Project Reference: 50378-02

Sample Identifier: Equipment Blank-03-101119

Lab Sample ID: 195025-08

Date Sampled: 10/11/2019

Matrix: Water

Date Received: 10/11/2019

Dioxane

<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Qualifier</u>	<u>Date Analyzed</u>
1,4-Dioxane	< 0.201	ug/L		10/14/2019 15:25

Method Reference(s): EPA 8270D SIM

EPA 3510C

Preparation Date: 10/14/2019

Data File: B41485.D

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Report Prepared Wednesday, November 6, 2019



Analytical Report Appendix

The reported results relate only to the samples as they have been received by the laboratory.

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All soil/sludge samples have been reported on a dry weight basis, unless qualified "reported as received". Other solids are reported as received.

Low level Volatiles blank reports for soil/solid matrix are based on a nominal 5 gram weight. Sample results and reporting limits are based on actual weight, which may be more or less than 5 grams.

The Chain of Custody provides additional information, including compliance with sample condition requirements upon receipt. Sample condition requirements are defined under the 2003 NELAC Standard, sections 5.5.8.3.1 and 5.5.8.3.2.

NYSDOH ELAP does not certify for all parameters. Paradigm Environmental Services or the indicated subcontracted laboratory does hold certification for all analytes where certification is offered by ELAP unless otherwise specified. Aliquots separated for certain tests, such as TCLP, are indicated on the Chain of Custody and final reports with an "A" suffix.

Data qualifiers are used, when necessary, to provide additional information about the data. This information may be communicated as a flag or as text at the bottom of the report. Please refer to the following list of analyte-specific, frequently used data flags and their meaning:

"<" = Analyzed for but not detected at or above the quantitation limit.

"E" = Result has been estimated, calibration limit exceeded.

"Z" = See case narrative.

"D" = Sample, Laboratory Control Sample, or Matrix Spike Duplicate results above Relative Percent Difference limit.

"M" = Matrix spike recoveries outside QC limits. Matrix bias indicated.

"B" = Method blank contained trace levels of analyte. Refer to included method blank report.

"J" = Result estimated between the quantitation limit and half the quantitation limit.

"L" = Laboratory Control Sample recovery outside accepted QC limits.

"P" = Concentration differs by more than 40% between the primary and secondary analytical columns.

"NC" = Not calculable. Applicable to RPD if sample or duplicate result is non-detect or estimated (see primary report for data flags). Applicable to MS if sample is greater or equal to ten times the spike added. Applicable to sample surrogates or MS if sample dilution is 10x or higher.

"" = Indicates any recoveries outside associated acceptance windows. Surrogate outliers in samples are presumed matrix effects. LCS demonstrates method compliance unless otherwise noted.*

"(1)" = Indicates data from primary column used for QC calculation.

"A" = denotes a parameter for which ELAP does not offer approval as part of their laboratory certification program.

"F" = denotes a parameter for which Paradigm does not carry certification, the results for which should therefore only be used where ELAP certification is not required, such as personal exposure assessment.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.

GENERAL TERMS AND CONDITIONS

LABORATORY SERVICES

These Terms and Conditions embody the whole agreement of the parties in the absence of a signed and executed contract between the Laboratory (LAB) and Client. They shall supersede all previous communications, representations, or agreements, either verbal or written, between the parties. The LAB specifically rejects all additional, inconsistent, or conflicting terms, whether printed or otherwise set forth in any purchase order or other communication from the Client to the LAB. The invalidity or unenforceability in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder of the Terms and Conditions. No waiver by LAB of any provision, term, or condition hereof or of any breach by or obligation of the Client hereunder shall constitute a waiver of such provision, term, or condition on any other occasion or a waiver of any other breach by or obligation of the Client. This agreement shall be administered and interpreted under the laws of the state which services are procured.

Warranty.

Recognizing that the nature of many samples is unknown and that some may contain potentially hazardous components, LAB warrants only that it will perform testing services, obtain findings, and prepare reports in accordance with generally accepted analytical laboratory principles and practices at the time of performance of services. LAB makes no other warranty, express or implied.

Scope and Compensation.

LAB agrees to perform the services described in the chain of custody to which these terms and conditions are attached. Unless the parties agree in writing to the contrary, the duties of LAB shall not be construed to exceed the services specifically described. LAB will use LAB default method for all tests unless specified otherwise on the Work Order.

Payment terms are net 30 days from the date of invoice. All overdue payments are subject to an interest charge of one and one-half percent (1-1/2%) per month or a portion thereof. Client shall also be responsible for costs of collection, including payment of reasonable attorney fees if such expense is incurred. The prices, unless stated, do not include any sale, use or other taxes. Such taxes will be added to invoice prices when required.

Prices.

Compensation for services performed will be based on the current Lab Analytical Fee Schedule or on quotations agreed to in writing by the parties. Turnaround time based charges are determined from the time of resolution of all work order questions. Testimony, court appearances or data compilation for legal action will be charged separately. Evaluation and reporting of initial screening runs may incur additional fees.

Limitations of Liability.

In the event of any error, omission, or other professional negligence, the sole and exclusive responsibility of LAB shall be to re-perform the deficient work at its own expense and LAB shall have no other liability whatsoever. All claims shall be deemed waived unless made in writing and received by LAB within ninety (90) days following completion of services.

LAB shall have no liability, obligation, or responsibility of any kind for losses, costs, expenses, or other damages (including but not limited to any special, direct, incidental or consequential damages) with respect to LAB's services or results.

All results provided by LAB are strictly for the use of its clients and LAB is in no way responsible for the use of such results by clients or third parties. All reports should be considered in their entirety, and LAB is not responsible for the separation, detachment, or other use of any portion of these reports. Client may not assign the lab report without the written consent of the LAB.

Client covenants and agrees, at its/his/her sole expense, to indemnify, protect, defend, and save harmless the LAB from and against any and all damages, losses, liabilities, obligations, penalties, claims, litigation, demands, defenses, judgments, suits, actions, proceedings, costs, disbursements and/or expenses (including, without limitation attorneys' and experts' fees and disbursements) of any kind whatsoever which may at any time be imposed upon, incurred by or asserted or awarded against client relating to, resulting from or arising out of (a) the breach of this agreement by this client, (b) the negligence of the client in handling, delivering or disclosing any hazardous substance, (c) the violation of the Client of any applicable law, (d) non-compliance by the Client with any environmental permit or (e) a material misrepresentation in disclosing the materials to be tested.

Hazard Disclosure.

Client represents and warrants that any sample delivered to LAB will be preceded or accompanied by complete written disclosure of the presence of any hazardous substances known or suspected by Client. Client further warrants that any sample containing any hazardous substance that is to be delivered to LAB will be packaged, labeled, transported, and delivered properly and in accordance with applicable laws.

Sample Handling.

Prior to LAB's acceptance of any sample (or after any revocation of acceptance), the entire risk of loss or of damage to such sample remains with Client. Samples are accepted when receipt is acknowledged on chain of custody documentation. In no event will LAB have any responsibility for the action or inaction of any carrier shipping or delivering any sample to or from LAB premises.

Client authorizes LAB to proceed with the analysis of samples as received by the laboratory, recognizing that any samples not in compliance with all current DOH-ELAP-NELAP requirements for containers, preservation or holding time will be noted as such on the final report.

Disposal of hazardous waste samples is the responsibility of the Client. If the Client does not wish such samples returned, LAB may add storage and disposal fees to the final invoice. Maximum storage time for samples is 30 days after completion of analysis unless modified by applicable state or federal laws. Client will be required to give the LAB written instructions concerning disposal of these samples.

LAB reserves the absolute right, exercisable at any time, to refuse to receive delivery of, refuse to accept, or revoke acceptance of any sample, which, in the sole judgment of LAB (a) is of unsuitable volume, (b) may be or become unsuitable for or may pose a risk in handling, transport, or processing for any health, safety, environmental or other reason whether or not due to the presence in the sample of any hazardous substance, and whether or not such presence has been disclosed to LAB by Client or (c) if the condition or sample date make the sample unsuitable for analysis.

Legal Responsibility.

LAB is solely responsible for performance of this contract, and no affiliated company, director, officer, employee, or agent shall have any legal responsibility hereunder, whether in contract or tort including negligence.

Assignment.

LAB may assign its performance obligations under this contract to other parties, as it deems necessary. LAB shall disclose to Client any assignee (subcontractor) by ELAP ID # on the submitted final report.

Force Majeure.

LAB shall have no responsibility or liability to the Client for any failure or delay in performance by LAB, which results in whole or in part from any cause or circumstance beyond the reasonable control of LAB. Such causes and circumstances shall include, but not limited to, acts of God, acts or orders of any government authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, difficulties or delays in transportation, mail or delivery services, inability to obtain sufficient services or supplies from LAB's usual suppliers, or any other cause beyond LAB's reasonable control.

Law.

This contract shall be continued under the laws of the State of New York without regard to its conflicts of laws provision.

This report is part of a multipage document and should only be evaluated in its entirety. The Chain of Custody provides additional sample information, including compliance with the sample condition requirements upon receipt.



ANALYTICAL REPORT

Lab Number:	L1947886
Client:	Paradigm Environmental Services 179 Lake Avenue Rochester, NY 14608
ATTN:	Jane Daloia
Phone:	(585) 647-2530
Project Name:	195025
Project Number:	195025
Report Date:	11/05/19

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1947886-01	RRW-CH-SS-13-101119 195025-01	SOIL	Not Specified	10/11/19 10:15	10/11/19
L1947886-02	RRW-CH-SS-14-101119 195025-02	SOIL	Not Specified	10/11/19 10:45	10/11/19
L1947886-03	RRW-CH-SS-15-101119 195025-03	SOIL	Not Specified	10/11/19 11:10	10/11/19
L1947886-04	RRW-CH-SS-101119 (FIELD DUPLICATE) 195025-04	SOIL	Not Specified	10/11/19 00:00	10/11/19
L1947886-05	TRIP BLANK-101119 19025-05	WATER	Not Specified	10/11/19 10:08	10/11/19
L1947886-06	EQUIPMENT BLANK-01- 101119 19025-06	WATER	Not Specified	10/11/19 10:40	10/11/19
L1947886-07	EQUIPMENT BLANK-02- 101119 19025-07	WATER	Not Specified	10/11/19 11:05	10/11/19



Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Perfluorinated Alkyl Acids by Isotope Dilution

L1947886-01: The reporting limit was elevated for Perfluorooctanesulfonamide (FOSA) due to low recovery of the extracted internal standard Perfluoro[13C8]Octanesulfonamide (M8FOSA). The low recovery was attributed to the sample matrix.

L1947886-01, WG1296029-2, WG1296029-3, and WG1296029-4: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

The WG1296029-2 LCS recovery, associated with L1947886-01 through -04, is above the acceptance criteria for 1h,1h,2h,2h-perfluorodecanesulfonic acid (8:2fts) (138%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

The WG1296029-3 LCSD recoveries, associated with L1947886-01 through -04, are below the acceptance criteria for perfluorooctanesulfonamide (fosa) (168%); however, it has been identified as a "difficult" analyte. The results of the associated samples are reported.

The WG1296029-2/-3 LCS/LCSD RPD(s), associated with L1947886-01 through -04, are above the acceptance criteria for perfluorooctanesulfonamide (fosa) (42%).

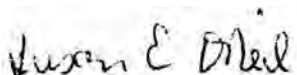
The WG1296029-4 MS recoveries, performed on L1947886-03, are outside the acceptance criteria for 1h,1h,2h,2h-perfluorooctanesulfonic acid (6:2fts) (149%), perfluorooctanesulfonic acid (pfos) (182%), 1h,1h,2h,2h-perfluorodecanesulfonic acid (8:2fts) (138%) and perfluorotridecanoic acid (pftrda) (142%).

The WG1296029-5 MSD recoveries, performed on L1947886-03, are outside the acceptance criteria for perfluorooctanesulfonic acid (pfos) (230%), 1h,1h,2h,2h-perfluorodecanesulfonic acid (8:2fts) (152%), perfluorooctanesulfonamide (fosa) (177%) and perfluorotridecanoic acid (pftrda) (140%).

The WG1296029-4/-5 MS/MSD RPD, performed on L1947886-03, is outside the acceptance criteria for perfluorooctanesulfonamide (fosa) (59%).

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Susan O'Neil

Title: Technical Director/Representative

Date: 11/05/19

ORGANICS

SEMIVOLATILES

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-01
 Client ID: RRW-CH-SS-13-101119 195025-01
 Sample Location: Not Specified

Date Collected: 10/11/19 10:15
 Date Received: 10/11/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 10/17/19 12:01
 Analyst: JW
 Percent Solids: 87%

Extraction Method: EPA 537(M)
 Extraction Date: 10/14/19 16:47

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.175	J	ug/kg	1.11	0.025	1
Perfluoropentanoic Acid (PFPeA)	0.073	J	ug/kg	1.11	0.051	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ug/kg	1.11	0.043	1
Perfluorohexanoic Acid (PFHxA)	0.106	J	ug/kg	1.11	0.058	1
Perfluoroheptanoic Acid (PFHpA)	0.083	J	ug/kg	1.11	0.050	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ug/kg	1.11	0.067	1
Perfluorooctanoic Acid (PFOA)	0.348	J	ug/kg	1.11	0.047	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ug/kg	1.11	0.199	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ug/kg	1.11	0.151	1
Perfluorononanoic Acid (PFNA)	0.156	J	ug/kg	1.11	0.083	1
Perfluorooctanesulfonic Acid (PFOS)	0.946	J	ug/kg	1.11	0.144	1
Perfluorodecanoic Acid (PFDA)	0.097	J	ug/kg	1.11	0.074	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ug/kg	1.11	0.318	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ug/kg	1.11	0.223	1
Perfluoroundecanoic Acid (PFUnA)	0.097	J	ug/kg	1.11	0.052	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ug/kg	1.11	0.170	1
Perfluorooctanesulfonamide (FOSA)	ND		ug/kg	11.1	0.109	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ug/kg	1.11	0.094	1
Perfluorododecanoic Acid (PFDoA)	ND		ug/kg	1.11	0.078	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ug/kg	1.11	0.227	1
Perfluorotetradecanoic Acid (PFTA)	ND		ug/kg	1.11	0.060	1
PFOA/PFOS, Total	1.29	J	ug/kg	1.11	0.047	1

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-01

Date Collected: 10/11/19 10:15

Client ID: RRW-CH-SS-13-101119 195025-01

Date Received: 10/11/19

Sample Location: Not Specified

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	85		60-153
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	100		65-182
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	101		70-151
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	92		61-147
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96		62-149
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	109		63-166
Perfluoro[13C8]Octanoic Acid (M8PFOA)	99		62-152
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	106		32-182
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	105		61-154
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	109		65-151
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	103		65-150
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	114		25-186
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	83		45-137
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	110		64-158
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	0	Q	1-125
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	77		42-136
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	111		56-148
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	87		26-160

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-02
 Client ID: RRW-CH-SS-14-101119 195025-02
 Sample Location: Not Specified

Date Collected: 10/11/19 10:45
 Date Received: 10/11/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 10/17/19 12:18
 Analyst: JW
 Percent Solids: 79%

Extraction Method: EPA 537(M)
 Extraction Date: 10/14/19 16:47

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.693	J	ug/kg	1.24	0.028	1
Perfluoropentanoic Acid (PFPeA)	0.323	J	ug/kg	1.24	0.057	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ug/kg	1.24	0.048	1
Perfluorohexanoic Acid (PFHxA)	0.354	J	ug/kg	1.24	0.065	1
Perfluoroheptanoic Acid (PFHpA)	0.274	J	ug/kg	1.24	0.056	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ug/kg	1.24	0.075	1
Perfluorooctanoic Acid (PFOA)	1.81		ug/kg	1.24	0.052	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ug/kg	1.24	0.222	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ug/kg	1.24	0.169	1
Perfluorononanoic Acid (PFNA)	0.418	J	ug/kg	1.24	0.093	1
Perfluorooctanesulfonic Acid (PFOS)	9.55		ug/kg	1.24	0.161	1
Perfluorodecanoic Acid (PFDA)	0.486	J	ug/kg	1.24	0.083	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ug/kg	1.24	0.356	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ug/kg	1.24	0.250	1
Perfluoroundecanoic Acid (PFUnA)	0.182	J	ug/kg	1.24	0.058	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ug/kg	1.24	0.190	1
Perfluorooctanesulfonamide (FOSA)	ND		ug/kg	1.24	0.121	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	0.145	J	ug/kg	1.24	0.105	1
Perfluorododecanoic Acid (PFDoA)	0.222	J	ug/kg	1.24	0.087	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ug/kg	1.24	0.253	1
Perfluorotetradecanoic Acid (PFTA)	0.116	J	ug/kg	1.24	0.067	1
PFOA/PFOS, Total	11.4		ug/kg	1.24	0.052	1

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-02

Date Collected: 10/11/19 10:45

Client ID: RRW-CH-SS-14-101119 195025-02

Date Received: 10/11/19

Sample Location: Not Specified

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	101		60-153
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	115		65-182
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	105		70-151
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	101		61-147
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	104		62-149
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	118		63-166
Perfluoro[13C8]Octanoic Acid (M8PFOA)	103		62-152
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	123		32-182
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	106		61-154
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	116		65-151
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	104		65-150
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	129		25-186
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	85		45-137
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	116		64-158
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	11		1-125
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	82		42-136
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	115		56-148
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	97		26-160

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-03
 Client ID: RRW-CH-SS-15-101119 195025-03
 Sample Location: Not Specified

Date Collected: 10/11/19 11:10
 Date Received: 10/11/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 10/17/19 12:34
 Analyst: JW
 Percent Solids: 86%

Extraction Method: EPA 537(M)
 Extraction Date: 10/14/19 16:47

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.498	J	ug/kg	1.06	0.024	1
Perfluoropentanoic Acid (PFPeA)	0.238	J	ug/kg	1.06	0.049	1
Perfluorobutanesulfonic Acid (PFBS)	0.045	J	ug/kg	1.06	0.042	1
Perfluorohexanoic Acid (PFHxA)	0.312	J	ug/kg	1.06	0.056	1
Perfluoroheptanoic Acid (PFHpA)	0.265	J	ug/kg	1.06	0.048	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ug/kg	1.06	0.065	1
Perfluorooctanoic Acid (PFOA)	1.24		ug/kg	1.06	0.045	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ug/kg	1.06	0.191	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ug/kg	1.06	0.145	1
Perfluorononanoic Acid (PFNA)	0.345	J	ug/kg	1.06	0.080	1
Perfluorooctanesulfonic Acid (PFOS)	3.55		ug/kg	1.06	0.138	1
Perfluorodecanoic Acid (PFDA)	0.516	J	ug/kg	1.06	0.071	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ug/kg	1.06	0.306	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ug/kg	1.06	0.215	1
Perfluoroundecanoic Acid (PFUnA)	0.174	J	ug/kg	1.06	0.050	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ug/kg	1.06	0.163	1
Perfluorooctanesulfonamide (FOSA)	ND		ug/kg	1.06	0.104	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	0.177	J	ug/kg	1.06	0.090	1
Perfluorododecanoic Acid (PFDoA)	0.225	J	ug/kg	1.06	0.075	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ug/kg	1.06	0.218	1
Perfluorotetradecanoic Acid (PFTA)	0.099	J	ug/kg	1.06	0.058	1
PFOA/PFOS, Total	4.79		ug/kg	1.06	0.045	1

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-03

Date Collected: 10/11/19 11:10

Client ID: RRW-CH-SS-15-101119 195025-03

Date Received: 10/11/19

Sample Location: Not Specified

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	101		60-153
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	114		65-182
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	110		70-151
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	102		61-147
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	103		62-149
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	117		63-166
Perfluoro[13C8]Octanoic Acid (M8PFOA)	103		62-152
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	119		32-182
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	108		61-154
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	112		65-151
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	107		65-150
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	124		25-186
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	86		45-137
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	116		64-158
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	1		1-125
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	79		42-136
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	119		56-148
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	91		26-160

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-04
 Client ID: RRW-CH-SS-101119 (FIELD DUPLICATE) 195025-04
 Sample Location: Not Specified

Date Collected: 10/11/19 00:00
 Date Received: 10/11/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 10/17/19 12:51
 Analyst: JW
 Percent Solids: 85%

Extraction Method: EPA 537(M)
 Extraction Date: 10/14/19 16:47

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.572	J	ug/kg	1.03	0.023	1
Perfluoropentanoic Acid (PFPeA)	0.264	J	ug/kg	1.03	0.048	1
Perfluorobutanesulfonic Acid (PFBS)	0.055	J	ug/kg	1.03	0.040	1
Perfluorohexanoic Acid (PFHxA)	0.340	J	ug/kg	1.03	0.054	1
Perfluoroheptanoic Acid (PFHpA)	0.283	J	ug/kg	1.03	0.047	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ug/kg	1.03	0.062	1
Perfluorooctanoic Acid (PFOA)	1.32		ug/kg	1.03	0.043	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ug/kg	1.03	0.185	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ug/kg	1.03	0.141	1
Perfluorononanoic Acid (PFNA)	0.403	J	ug/kg	1.03	0.077	1
Perfluorooctanesulfonic Acid (PFOS)	4.75		ug/kg	1.03	0.134	1
Perfluorodecanoic Acid (PFDA)	0.561	J	ug/kg	1.03	0.069	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ug/kg	1.03	0.296	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ug/kg	1.03	0.208	1
Perfluoroundecanoic Acid (PFUnA)	0.198	J	ug/kg	1.03	0.048	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ug/kg	1.03	0.158	1
Perfluorooctanesulfonamide (FOSA)	ND		ug/kg	1.03	0.101	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	0.120	J	ug/kg	1.03	0.087	1
Perfluorododecanoic Acid (PFDoA)	0.240	J	ug/kg	1.03	0.072	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ug/kg	1.03	0.211	1
Perfluorotetradecanoic Acid (PFTA)	0.078	J	ug/kg	1.03	0.056	1
PFOA/PFOS, Total	6.07		ug/kg	1.03	0.043	1

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-04

Date Collected: 10/11/19 00:00

Client ID: RRW-CH-SS-101119 (FIELD DUPLICATE) 195025-04

Date Received: 10/11/19

Sample Location: Not Specified

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	106		60-153
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	121		65-182
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	105		70-151
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	106		61-147
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	110		62-149
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	113		63-166
Perfluoro[13C8]Octanoic Acid (M8PFOA)	109		62-152
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	103		32-182
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	114		61-154
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	114		65-151
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	112		65-150
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	129		25-186
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	83		45-137
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	117		64-158
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	1		1-125
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	89		42-136
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	122		56-148
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	92		26-160

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-05
 Client ID: TRIP BLANK-101119 19025-05
 Sample Location: Not Specified

Date Collected: 10/11/19 10:08
 Date Received: 10/11/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 122,537(M)
 Analytical Date: 11/05/19 06:04
 Analyst: JW

Extraction Method: EPA 537
 Extraction Date: 10/25/19 12:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.99	0.406	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.99	0.394	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.99	0.237	1
Perfluorohexanoic Acid (PFHxA)	0.398	J	ng/l	1.99	0.327	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.99	0.224	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.99	0.374	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.99	0.235	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.99	1.33	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.99	0.685	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.99	0.311	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.99	0.502	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.99	0.303	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.99	1.21	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.99	0.645	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.99	0.259	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.99	0.976	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.99	0.578	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.99	0.801	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.99	0.370	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.99	0.326	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.99	0.247	1
PFOA/PFOS, Total	ND		ng/l	1.99	0.235	1

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-05

Date Collected: 10/11/19 10:08

Client ID: TRIP BLANK-101119 19025-05

Date Received: 10/11/19

Sample Location: Not Specified

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	48		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	48		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	80		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	38		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	52		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	88		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	65		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	96		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	76		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	80		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	70		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	71		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	102		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	82		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	5		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	104		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	83		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	87		33-143

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-06
 Client ID: EQUIPMENT BLANK-01-101119 19025-06
 Sample Location: Not Specified

Date Collected: 10/11/19 10:40
 Date Received: 10/11/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 122,537(M)
 Analytical Date: 11/05/19 06:20
 Analyst: JW

Extraction Method: EPA 537
 Extraction Date: 10/25/19 12:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	1.09	J	ng/l	1.84	0.375	1
Perfluoropentanoic Acid (PFPeA)	1.22	J	ng/l	1.84	0.364	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.84	0.219	1
Perfluorohexanoic Acid (PFHxA)	0.750	J	ng/l	1.84	0.301	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.84	0.207	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.84	0.346	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.84	0.217	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.84	1.22	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.84	0.632	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.84	0.287	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.84	0.463	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.84	0.279	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.84	1.11	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.84	0.596	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.84	0.239	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.84	0.901	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.84	0.533	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.84	0.739	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.84	0.342	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.84	0.301	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.84	0.228	1
PFOA/PFOS, Total	ND		ng/l	1.84	0.217	1

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-06
 Client ID: EQUIPMENT BLANK-01-101119 19025-06
 Sample Location: Not Specified

Date Collected: 10/11/19 10:40
 Date Received: 10/11/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	46		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	51		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	84		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	36		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	50		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	89		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	60		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	112		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	76		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	80		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	65		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	75		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	85		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	73		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	3		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	75		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	73		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	84		33-143

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-07
 Client ID: EQUIPMENT BLANK-02-101119 19025-07
 Sample Location: Not Specified

Date Collected: 10/11/19 11:05
 Date Received: 10/11/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 122,537(M)
 Analytical Date: 11/05/19 06:37
 Analyst: JW

Extraction Method: EPA 537
 Extraction Date: 10/25/19 12:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	1.12	J	ng/l	1.69	0.346	1
Perfluoropentanoic Acid (PFPeA)	1.11	J	ng/l	1.69	0.336	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.69	0.202	1
Perfluorohexanoic Acid (PFHxA)	0.698	J	ng/l	1.69	0.278	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.69	0.191	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.69	0.319	1
Perfluorooctanoic Acid (PFOA)	0.325	J	ng/l	1.69	0.200	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.69	1.13	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.69	0.583	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.69	0.264	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.69	0.427	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.69	0.258	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.69	1.03	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.69	0.549	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.69	0.220	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.69	0.830	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.69	0.492	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.69	0.681	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.69	0.315	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.69	0.277	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.69	0.210	1
PFOA/PFOS, Total	0.325	J	ng/l	1.69	0.200	1

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-07

Date Collected: 10/11/19 11:05

Client ID: EQUIPMENT BLANK-02-101119 19025-07

Date Received: 10/11/19

Sample Location: Not Specified

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	46		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	51		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	84		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	36		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	49		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	88		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	59		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	104		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	73		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	87		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	71		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	76		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	94		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	81		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	2		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	104		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	85		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	87		33-143

Project Name: 195025

Project Number: 195025

Lab Number: L1947886

Report Date: 11/05/19

Method Blank Analysis Batch Quality Control

Analytical Method: 122,537(M)
 Analytical Date: 10/17/19 06:30
 Analyst: JW

Extraction Method: EPA 537(M)
 Extraction Date: 10/14/19 16:47

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04 Batch: WG1296029-1					
Perfluorobutanoic Acid (PFBA)	0.119	J	ug/kg	1.00	0.023
Perfluoropentanoic Acid (PFPeA)	ND		ug/kg	1.00	0.046
Perfluorobutanesulfonic Acid (PFBS)	ND		ug/kg	1.00	0.039
Perfluorohexanoic Acid (PFHxA)	ND		ug/kg	1.00	0.053
Perfluoroheptanoic Acid (PFHpA)	ND		ug/kg	1.00	0.045
Perfluorohexanesulfonic Acid (PFHxS)	ND		ug/kg	1.00	0.061
Perfluorooctanoic Acid (PFOA)	ND		ug/kg	1.00	0.042
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ug/kg	1.00	0.180
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ug/kg	1.00	0.136
Perfluorononanoic Acid (PFNA)	ND		ug/kg	1.00	0.075
Perfluorooctanesulfonic Acid (PFOS)	ND		ug/kg	1.00	0.130
Perfluorodecanoic Acid (PFDA)	ND		ug/kg	1.00	0.067
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ug/kg	1.00	0.287
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ug/kg	1.00	0.202
Perfluoroundecanoic Acid (PFUnA)	ND		ug/kg	1.00	0.047
Perfluorodecanesulfonic Acid (PFDS)	ND		ug/kg	1.00	0.153
Perfluorooctanesulfonamide (FOSA)	ND		ug/kg	1.00	0.098
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ug/kg	1.00	0.085
Perfluorododecanoic Acid (PFDoA)	ND		ug/kg	1.00	0.070
Perfluorotridecanoic Acid (PFTrDA)	ND		ug/kg	1.00	0.204
Perfluorotetradecanoic Acid (PFTA)	ND		ug/kg	1.00	0.054
PFOA/PFOS, Total	ND		ug/kg	1.00	0.042

Project Name: 195025

Project Number: 195025

Lab Number: L1947886

Report Date: 11/05/19

Method Blank Analysis Batch Quality Control

Analytical Method: 122,537(M)
 Analytical Date: 10/17/19 06:30
 Analyst: JW

Extraction Method: EPA 537(M)
 Extraction Date: 10/14/19 16:47

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04 Batch: WG1296029-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	71		60-153
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	89		65-182
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	100		70-151
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	80		61-147
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	88		62-149
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	106		63-166
Perfluoro[13C8]Octanoic Acid (M8PFOA)	93		62-152
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	114		32-182
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	98		61-154
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	100		65-151
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	99		65-150
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	125		25-186
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	92		45-137
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	106		64-158
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	0	Q	1-125
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	80		42-136
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	110		56-148
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	84		26-160

Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

Method Blank Analysis Batch Quality Control

Analytical Method: 122,537(M)
 Analytical Date: 11/05/19 02:45
 Analyst: JW

Extraction Method: EPA 537
 Extraction Date: 10/25/19 12:17

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-07 Batch: WG1300694-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.408
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.396
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.238
Perfluorohexanoic Acid (PFHxA)	0.376	J	ng/l	2.00	0.328
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.225
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.376
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.236
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	1.33
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.688
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.312
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.504
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.304
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	1.21
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.648
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.260
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	0.980
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	0.580
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.804
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.372
Perfluorotridecanoic Acid (PFTTrDA)	ND		ng/l	2.00	0.327
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.248
PFOA/PFOS, Total	ND		ng/l	2.00	0.236

Project Name: 195025

Project Number: 195025

Lab Number: L1947886

Report Date: 11/05/19

Method Blank Analysis Batch Quality Control

Analytical Method: 122,537(M)
 Analytical Date: 11/05/19 02:45
 Analyst: JW

Extraction Method: EPA 537
 Extraction Date: 10/25/19 12:17

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-07 Batch: WG1300694-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	88		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	69		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	80		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	71		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	100		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	83		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	88		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	62		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	90		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	95		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	36		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	94		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	102		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	94		33-143

Lab Control Sample Analysis
Batch Quality Control

Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Parameter	LCS		LCSD		%Recovery		RPD	RPD	
	%Recovery	Qual	%Recovery	Qual	Limits		Qual	Limits	
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1296029-2 WG1296029-3									
Perfluorobutanoic Acid (PFBA)	108		110		71-135	2		30	
Perfluoropentanoic Acid (PFPeA)	100		101		69-132	1		30	
Perfluorobutanesulfonic Acid (PFBS)	107		107		72-128	0		30	
Perfluorohexanoic Acid (PFHxA)	108		108		70-132	0		30	
Perfluorooheptanoic Acid (PFHpA)	112		111		71-131	1		30	
Perfluorohexanesulfonic Acid (PFHxS)	116		109		67-130	6		30	
Perfluorooctanoic Acid (PFOA)	113		113		69-133	0		30	
1H, 1H,2H,2H-Perfluorooctanesulfonic Acid (6:2:FTS)	111		140		64-140	23		30	
Perfluorooheptanesulfonic Acid (PFHpS)	104		120		70-132	14		30	
Perfluorononanoic Acid (PFNA)	111		113		72-129	2		30	
Perfluorooctanesulfonic Acid (PFOS)	112		118		68-136	5		30	
Perfluorodecanoic Acid (PFDA)	107		114		69-133	6		30	
1H, 1H,2H,2H-Perfluorodecanesulfonic Acid (8:2:FTS)	138	Q	126		65-137	9		30	
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	119		127		63-144	7		30	
Perfluoroundecanoic Acid (PFUnA)	112		111		64-136	1		30	
Perfluorodecanesulfonic Acid (PFDS)	114		120		59-134	5		30	
Perfluorooctanesulfonamide (FOSA)	110		168	Q	67-137	42	Q	30	
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	105		128		61-139	20		30	
Perfluorododecanoic Acid (PFDoA)	112		120		69-135	7		30	
Perfluorotridecanoic Acid (PFTDA)	133		138		66-139	4		30	
Perfluorotetradecanoic Acid (PFTA)	111		111		69-133	0		30	



Lab Control Sample Analysis
Batch Quality Control

Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

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

Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1296029-2 WG1296029-3

Surrogate (Extracted Internal Standard)	LCS		LCSD		%Recovery		RPD		Acceptance
	%Recovery	Qual	%Recovery	Qual	Limits		RPD	Qual	Criteria
Perfluorol13C4]Butanoic Acid (MPFBA)			66				60		60-153
Perfluorol13C5]Pentanoic Acid (M5PFPEA)			84				81		65-182
Perfluorol2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			103				121		70-151
Perfluorol1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			79				79		61-147
Perfluorol1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			84				89		62-149
Perfluorol1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			107				132		63-166
Perfluorol13C8]Octanoic Acid (M8PFOA)			89				98		62-152
1H,1H,2H,2H-Perfluorol1,2-13C2]Octanesulfonic Acid (M2-6,2FTS)			101				108		32-182
Perfluorol13C9]Nonanoic Acid (M9PFNA)			96				108		61-154
Perfluorol13C8]Octanesulfonic Acid (M8PFOS)			111				124		65-151
Perfluorol1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			100				108		65-150
1H,1H,2H,2H-Perfluorol1,2-13C2]Decanesulfonic Acid (M2-8,2FTS)			117				158		25-186
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMleFOSAA)			89				89		45-137
Perfluorol1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			109				118		64-158
Perfluorol13C8]Octanesulfonamide (M8FOSA)			0		Q		0		1-125
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEleFOSAA)			77				78		42-136
Perfluorol1,2-13C2]Dodecanoic Acid (MPFDA)			118				124		56-148
Perfluorol1,2-13C2]Tetradecanoic Acid (M2PTEDA)			95				102		26-160

Lab Control Sample Analysis
Batch Quality Control

Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Parameter	LCS		LCSD		%Recovery		RPD	RPD	
	%Recovery	Qual	%Recovery	Qual	Limits	RPD		Qual	Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-07 Batch: WG1300694-2 WG1300694-3									
Perfluorobutanoic Acid (PFBA)	103		98		67-148	5			30
Perfluoropentanoic Acid (PFPeA)	104		99		63-161	5			30
Perfluorobutanesulfonic Acid (PFBS)	104		96		65-157	8			30
Perfluorohexanoic Acid (PFHxA)	106		100		69-168	6			30
Perfluorooheptanoic Acid (PFHpA)	104		101		58-159	3			30
Perfluorohexanesulfonic Acid (PFHxS)	99		96		69-177	3			30
Perfluorooctanoic Acid (PFOA)	102		101		63-159	1			30
1H, 1H,2H,2H-Perfluorooctanesulfonic Acid (6:2:FTS)	116		118		49-187	2			30
Perfluorooheptanesulfonic Acid (PFHpS)	107		96		61-179	11			30
Perfluorononanoic Acid (PFNA)	104		99		68-171	5			30
Perfluorooctanesulfonic Acid (PFOS)	100		92		52-151	8			30
Perfluorodecanoic Acid (PFDA)	101		98		63-171	3			30
1H, 1H,2H,2H-Perfluorodecanesulfonic Acid (8:2:FTS)	144		145		56-173	1			30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	106		102		60-166	4			30
Perfluoroundecanoic Acid (PFUnA)	105		95		60-153	10			30
Perfluorodecanesulfonic Acid (PFDS)	107		96		38-156	11			30
Perfluorooctanesulfonamide (FOSA)	105		98		46-170	7			30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	99		116		45-170	16			30
Perfluorododecanoic Acid (PFDoA)	110		103		67-153	7			30
Perfluorotridecanoic Acid (PFTDA)	127		127		48-158	0			30
Perfluorotetradecanoic Acid (PFTA)	110		108		59-182	2			30



Lab Control Sample Analysis
Batch Quality Control

Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD Limits
	%Recovery	Qual	%Recovery	Qual			
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-07 Batch: WG1300694-2 WG1300694-3							

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria	
	%Recovery	Qual	%Recovery	Qual		
Perfluorol13C4]Butanoic Acid (MPFBA)	85		85		2-156	
Perfluorol13C5]Pentanoic Acid (M5PFPEA)	68		68		16-173	
Perfluorol2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		89		31-159	
Perfluorol1,2,3,4,6-13C5]Hexanoic Acid (M5PFHXA)	64		64		21-145	
Perfluorol1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	78		78		30-139	
Perfluorol1,2,3-13C3]Hexanesulfonic Acid (M3PFHXS)	88		87		47-153	
Perfluorol13C8]Octanoic Acid (M8PFOA)	86		83		36-149	
1H,1H,2H,2H-Perfluorol1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	70		69		1-244	
Perfluorol13C9]Nonanoic Acid (M9PFNA)	97		93		34-146	
Perfluorol13C8]Octanesulfonic Acid (M8PFOS)	85		86		42-146	
Perfluorol1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	84		79		38-144	
1H,1H,2H,2H-Perfluorol1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	59		62		7-170	
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMleFOSAA)	89		81		1-181	
Perfluorol1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	92		88		40-144	
Perfluorol13C8]Octanesulfonamide (M8FOSA)	39		32		1-87	
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEleFOSAA)	98		83		23-146	
Perfluorol1,2-13C2]Dodecanoic Acid (MPFDA)	95		88		24-161	
Perfluorol1,2-13C2]Tetradecanoic Acid (M2PTEDA)	88		88		33-143	



Matrix Spike Analysis
Batch Quality Control

Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1296029-4 WG1296029-5 QC Sample: L1947886-03 Client ID: RRW-CH-SS-15-101119 195025-03												
Perfluorobutanoic Acid (PFBA)	0.498J	5.61	6.60	118		6.29	121		71-135	5		30
Perfluoropentanoic Acid (PFPeA)	0.238J	5.61	5.96	106		5.55	107		69-132	7		30
Perfluorobutanesulfonic Acid (PFBS)	0.045J	4.97	5.56	112		4.96	108		72-128	11		30
Perfluorohexanoic Acid (PFHxA)	0.312J	5.61	6.30	112		5.96	115		70-132	6		30
Perfluoroheptanoic Acid (PFHpA)	0.265J	5.61	6.53	116		6.12	118		71-131	6		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	5.12	5.67	111		4.94	104		67-130	14		30
Perfluorooctanoic Acid (PFOA)	1.24	5.61	7.85	118		7.70	124		69-133	2		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	5.33	7.96	149	Q	5.95	120		64-140	29		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	5.33	5.76	108		5.34	108		70-132	8		30
Perfluorononanoic Acid (PFNA)	0.345J	5.61	6.80	121		6.22	120		72-129	9		30
Perfluorooctanesulfonic Acid (PFOS)	3.55	5.19	13.0	182	Q	14.6	230	Q	68-136	12		30
Perfluorodecanoic Acid (PFDA)	0.516J	5.61	6.71	120		6.32	122		69-133	6		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	5.38	7.43	138	Q	7.58	152	Q	65-137	2		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	5.61	6.38	114		5.80	112		63-144	10		30
Perfluoroundecanoic Acid (PFUnA)	0.174J	5.61	6.54	117		5.95	114		64-136	9		30
Perfluorodecanesulfonic Acid (PFDS)	ND	5.42	6.37	118		5.58	111		59-134	13		30
Perfluorooctanesulfonamide (FOSA)	ND	5.61	5.02	90		9.21	177	Q	67-137	59	Q	30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEFOSAA)	0.177J	5.61	6.56	117		5.83	112		61-139	12		30
Perfluorododecanoic Acid (PFDoA)	0.225J	5.61	6.87	122		6.29	121		69-135	9		30
Perfluorotridecanoic Acid (PFTriDA)	ND	5.61	7.97	142	Q	7.28	140	Q	66-139	9		30
Perfluorotetradecanoic Acid (PFTA)	0.099J	5.61	6.45	115		5.86	113		69-133	10		30



Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Matrix Spike Analysis
Batch Quality Control

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1296029-4 WG1296029-5 QC Sample: L1947886-03
Client ID: RRRW-CH-SS-15-101119 195025-03

Surrogate (Extracted Internal Standard)	MS			MSD			Acceptance		
	% Recovery	Qualifier		% Recovery	Qualifier		Criteria		
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	136			116			25-186		
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	110			97			32-182		
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	87			87			42-136		
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	93			90			45-137		
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	107			112			64-158		
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	102			104			65-150		
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	92			96			61-147		
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96			98			62-149		
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	112			110			63-166		
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDA)	112			113			56-148		
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	94			94			26-160		
Perfluoro[13C4]Butanoic Acid (MPFBA)	89			97			60-153		
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	107			112			65-182		
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	0	Q		1			1-125		
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	110			98			65-151		
Perfluoro[13C8]Octanoic Acid (M8PFOA)	96			98			62-152		
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	100			104			61-154		
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	104			95			70-151		



INORGANICS & MISCELLANEOUS

Project Name: 195025**Project Number:** 195025**Lab Number:** L1947886**Report Date:** 11/05/19**SAMPLE RESULTS****Lab ID:** L1947886-01**Client ID:** RRW-CH-SS-13-101119 195025-01**Sample Location:** Not Specified**Date Collected:** 10/11/19 10:15**Date Received:** 10/11/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	86.5		%	0.100	0.100	1	-	10/25/19 07:20	121,2540G	CC



Project Name: 195025

Lab Number: L1947886

Project Number: 195025

Report Date: 11/05/19

SAMPLE RESULTS

Lab ID: L1947886-02

Date Collected: 10/11/19 10:45

Client ID: RRW-CH-SS-14-101119 195025-02

Date Received: 10/11/19

Sample Location: Not Specified

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	79.1		%	0.100	0.100	1	-	10/25/19 07:20	121,2540G	CC



Project Name: 195025**Project Number:** 195025**Lab Number:** L1947886**Report Date:** 11/05/19**SAMPLE RESULTS****Lab ID:** L1947886-03**Client ID:** RRW-CH-SS-15-101119 195025-03**Sample Location:** Not Specified**Date Collected:** 10/11/19 11:10**Date Received:** 10/11/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	85.5		%	0.100	0.100	1	-	10/25/19 07:20	121,2540G	CC



Project Name: 195025**Project Number:** 195025**Lab Number:** L1947886**Report Date:** 11/05/19**SAMPLE RESULTS****Lab ID:** L1947886-04**Client ID:** RRW-CH-SS-101119 (FIELD DUPLICATE) 195025-04**Sample Location:** Not Specified**Date Collected:** 10/11/19 00:00**Date Received:** 10/11/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	84.8		%	0.100	0.100	1	-	10/25/19 07:20	121,2540G	CC



Lab Duplicate Analysis
Batch Quality Control

Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1300538-1 QC Sample: L1947841-01 Client ID: DUP Sample						
Solids, Total	77.4	77.3	%	0		10



Project Name: 195025
Project Number: 195025

Serial_No:11051918:41
Lab Number: L1947886
Report Date: 11/05/19

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information
Cooler **Custody Seal**
A Absent

Container Information		Initial	Final	Temp	Pres	Seal	Frozen	Analysis(*)
Container ID	Container Type	Cooler	pH	pH			Date/Time	
L1947886-01A	Plastic 8oz unpreserved	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(28)
L1947886-01B	Plastic 2oz unpreserved for TS	A	NA	2.5	Y	Absent		A2-TS(7)
L1947886-02A	Plastic 8oz unpreserved	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(28)
L1947886-02B	Plastic 2oz unpreserved for TS	A	NA	2.5	Y	Absent		A2-TS(7)
L1947886-03A	Plastic 8oz unpreserved	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(28)
L1947886-03A1	Plastic 8oz unpreserved	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(28)
L1947886-03A2	Plastic 8oz unpreserved	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(28)
L1947886-03B	Plastic 2oz unpreserved for TS	A	NA	2.5	Y	Absent		A2-TS(7)
L1947886-03B1	Glass 60mL/2oz unpreserved	A	NA	2.5	Y	Absent		A2-TS(7)
L1947886-03B2	Glass 60mL/2oz unpreserved	A	NA	2.5	Y	Absent		A2-TS(7)
L1947886-04A	Plastic 8oz unpreserved	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(28)
L1947886-04B	Plastic 2oz unpreserved for TS	A	NA	2.5	Y	Absent		A2-TS(7)
L1947886-05A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(14)
L1947886-06A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(14)
L1947886-07A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA	2.5	Y	Absent		A2-NY-537-1ISOTOPE(14)

*Values in parentheses indicate holding time in days



Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
	Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: DU Report with 'J' Qualifiers



Project Name: 195025**Lab Number:** L1947886**Project Number:** 195025**Report Date:** 11/05/19

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedances are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Report Format: DU Report with 'J' Qualifiers



Project Name: 195025
Project Number: 195025

Lab Number: L1947886
Report Date: 11/05/19

REFERENCES

- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 122 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 537, EPA/600/R-08/092. Version 1.1, September 2009.
- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility**EPA 624/624.1:** m/p-xylene, o-xylene**EPA 8260C:** NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.**EPA 8270D:** NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.**SM4500:** NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.**Mansfield Facility****SM 2540D:** TSS**EPA 8082A:** NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.**EPA TO-15:** Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:**Drinking Water****EPA 300.0:** Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,****EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B****EPA 332:** Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.**Microbiology:** **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.****Non-Potable Water****SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH:** Ammonia-N and Kjeldahl-N, **EPA 350.1:**Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,****SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.**EPA 624.1:** Volatile Halocarbons & Aromatics,**EPA 608.3:** Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs**EPA 625.1:** SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.**Microbiology:** **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.****Mansfield Facility:****Drinking Water****EPA 200.7:** Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.**EPA 522.****Non-Potable Water****EPA 200.7:** Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.**EPA 200.8:** Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.**EPA 245.1** Hg.**SM2340B**

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



Serial_No:11051918:41

4448

ATTN:	Reporting	Account
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STD	OTHER
<input checked="" type="checkbox"/> 1	
<input type="checkbox"/> 2	
<input type="checkbox"/> 3	
<input type="checkbox"/> 4	
<input type="checkbox"/> 5	

Report J FilesPARADIGM LAB SAMPLE NUMBER

Sample Condition: Par NELAC/ELAP 210/241/242/243/244

Total Cost

Temperature	Y	Z
10		
20		
30		
40		
50		
60		
70		
80		
90		
100		

180

PARADIGM

PROJECT REFERENCE

56378-02

list analyst
BGS

REMARKS

PARADIGM LAB
SAMPLE
NUMBER

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRADES	SAMPLE IDENTIFIER	MCATDRES	CONCENTRATION OF	REMARKS	PARADIGM LAB SAMPLE NUMBER
10/11/19	10:15		✓	RRW-CH-SS-13-101119	SO	3		01
	10:45		✓	RRW-CH-SS-14-101119	SO	3	Please call Ben Seibert @ (716) 225-1493 with any questions or concerns.	02
	11:10		✓	RRW-CH-SS-15-101119	SO	3		03
	11:10		✓	RRW-CH-SS-15-101119 (MS)	SO	3		
	11:10		✓	RRW-CH-SS-15-101119 (MSB)	SO	3		
			✓	RRW-CH-SS-101119 (Field Duplicate)	SO	3		04
	10:08		✓	Trip Blank-101119	WT	1		05
	10:40		✓	Equipment Blank-01-101119	WA	1		06
	11:05		✓	Equipment Blank-02-101119	WA	1		07
	11:05		✓	Equipment Blank-03-101119	WA	1		08

Turnaround Time	Report Supplements
Availability contingent upon lab approval; additional fees may apply.	
Standard 5 day <input checked="" type="checkbox"/>	None Required <input type="checkbox"/>
10 day <input type="checkbox"/>	Batch QC <input type="checkbox"/>
Rush 3 day <input type="checkbox"/>	Category A <input type="checkbox"/>
Rush 2 day <input type="checkbox"/>	Category B <input checked="" type="checkbox"/>
Rush 1 day <input type="checkbox"/>	
Date Needed _____ please indicate date needed:	Other <input type="checkbox"/> please indicate package needed: _____
	Other EDD <input checked="" type="checkbox"/> please indicate EDD needed : <u>10/28</u>

Sampled By	<i>SCF</i>	Date/Time	<i>10/11/19 12:44</i>
Relinquished By	<i>SCF</i>	Date/Time	<i>10/11/19 3:54 pm</i>
Received By	<i>Michael</i>	Date/Time	<i>10/11/19 1559</i>
P.I.F.		<input type="checkbox"/>	

By signing this form, client agrees to Paradigm Terms and Conditions (reverse)

See additional page for sample conditions.



Chain of Custody Supplement

Client: Lu Eng Completed by: Molytail
Lab Project ID: 195025 Date: 10/11/19

Sample Condition Requirements

Per NELAC/ELAP 210/241/242/243/244

Condition	NELAC compliance with the sample condition requirements upon receipt		
	Yes	No	N/A
Container Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments			
Transferred to method-compliant container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Headspace (<1 mL)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments			
Preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments			
Chlorine Absent (<0.10 ppm per test strip)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments			
Holding Time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments			
Temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	<u>5°C in cool</u>		
Compliant Sample Quantity/Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments			

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 8
6274 East Avon-Lima Road, Avon, NY 14414-9516
P: (585) 226-5353 | F: (585) 226-8139
www.dec.ny.gov

February 27, 2020

Mr. Joe Biondolillo
City of Rochester
Department of Environmental Services
30 Church Street - Room 300B
Rochester, New York 14614-1278

**RE: BUD – 828023-3 Request
Soils Reuse-Genesee West River Wall Project
Former Emerson Street Dump (Site# 828023)
Rochester(C), Monroe(C)**

Dear Mr. Biondolillo:

Staff at the New York State Department of Environmental Conservation (the Department) has reviewed the request dated January 27, 2020 to reuse up to 1,700 cubic yards of soil from the referenced project as fill material beneath the final site cover at the Emerson Street Dump site. Based on the information provided, the request is hereby approved.

This approval is subject to the following conditions:

- Stockpiled material shall be subject to erosion controls and run-off protection using silt fence, straw bales or equivalent;
- Stockpiled material shall either be covered or have a vegetative cover established to minimize wind erosion;
- Materials exceeding industrial SCOs for metals or SVOCs shall be prohibited;
- Materials contaminated with site-related chlorinated VOCs shall be prohibited;
- Materials that would be considered a hazardous waste shall be prohibited;
- Total quantities of imported material shall not exceed 1,700 cubic yards;
- An interim letter report documenting stockpile size, location, and placement of erosion controls shall be provided to the Department within twelve months of the commencement of stockpiling. Final quantities and disposition of all imported material will be provided in a final engineering report after implementation of the final site remedy. **This information may be combined with the previous two BUD determinations into one report;**
- The stockpiles shall be inspected on a regular basis to ensure that erosion controls are in place and functioning properly;
- Final disposition of all imported material exceeding the commercial SCOs shall have one-foot of cover material meeting the commercial SCOs; and
- The Department reserves the right to rescind or modify this BUD at any time if it finds pursuant to 6 NYCRR 360-1.15(d)(4) that any information serving as the basis for this BUD is incorrect or no longer valid, or the Department finds there has been a violation of the conditions of this BUD.

Please let me know if you have any questions. Thank you for your continued cooperation.

Sincerely,

Todd M. Caffoe, P.E.

Division of Environmental Remediation

New York State Department of Environmental Conservation

6274 East Avon-Lima Road, Avon, NY 14414

P: (585) 226-5350 | Todd.Caffoe@dec.ny.gov

www.dec.ny.gov |  | 

cc: D. Pratt
M. Doroski
A. Cheremeteff
D. Noll