INVENTUM ENGINEERING, PC

June 15, 2020

Megan Kuczka
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, NY 14203

Re: 320 Scajaquada St.
NYSDEC Site No. 915152
Saginaw - Buffalo
Site Management PRR Rev. 1 (May 4, 2019 – May 4, 2020

Dear Ms. Kuczka:

On behalf of East Delavan Property, LLC, Inventum Engineering, P.C. (Inventum) is pleased to submit the attached Site Management (SM) Periodic Review Report (PRR) for the Saginaw – Buffalo site 320 Scajaquada St, Buffalo, New York. The PRR has been prepared pursuant to the February 2, 1995 Order on Consent and Administrative Settlement (Index No. B9-0410-92-09) and Section 6.3(b) of DER-10 *Technical Guidance for Site Investigation and Remediation*.

The attached (Attachment A) report summarizes the SM activities conducted on site between May 4, 2019 and May 4, 2020. The completed Institutional and Engineering Controls Certifications Form is provided as Attachment B.

Copies of this report are being sent to the following:

Krista Anders
New York State Department of Health
Bureau of Environmental Exposure Investigation
Empire State Plaza
Corning Tower Room 1787
Albany, New York 12237
Krista.Anders@idoh.ny.gov

Jennifer Dougherty, Esq.
New York State Department of Environmental Conservation
Office of General Counsel
270 Michigan Avenue
Buffalo, New York 14203-2915
Jennifer.Dougherty@dec.ny.gov

Should you have any questions or if you would like to discuss any aspect of this report, please feel free to contact me at 571.217.3627 or todd.waldrop@inventumeng.com

Sincerely,

Todd Waldrop

cc. J. Williams – East Delavan Property, LLC
J. Yensan – OSC, Inc.
D. Flynn, Phillips Lytle

Attachment A – Periodic Review Report

INVENTUM ENGINEERING, PC

Saginaw – Buffalo Site
320 Scajaquada St
Site Management Periodic Review Report

East Delavan Property, LLC
NYSDEC Site Number 915152

Dates Covered by Report:
May 4, 2019 to May 4, 2020

Rev. 1 – June 15, 2020

Table of Contents

Figures

Figure 1 – Site Layout

Appendices

Appendix A – Engineering Controls – December 2019 Annual Site Wide Inspection Forms

Appendix B – Biennial Groundwater and Annual Storm Sewer Sampling Summary Tables – December 2019

Appendix C – Groundwater Sampling Forms

Appendix D - Laboratory Reports

1 Executive Summary

Inventum Engineering, P.C. (Inventum) has prepared this Site Management (SM) Periodic Review Report (PRR) for the Saginaw-Buffalo Site (Site) located at 320 Scajacuada Street in the City of Buffalo, Erie County. The Site is defined as the former Parking Lot #4 associated with the former General Motors and American Axle & Manufacturing (AAM) facility that manufactured axles and drive-train components for cars and trucks. The Site covers an area of approximately 8.6 acres and is included in the New York Registry of Inactive Hazardous Waste Sites (Site No. 915152). Site Institutional Controls (ICs) and Engineering Controls (ECs) were adhered to over the PRR reporting period and continue to be effective in maintaining the remedial objectives. No changes to the established SMP or recommended during the next PRR reporting period.

1.1 Site Summary

General Motors (GM) purchased several parcels in the mid-1960s and constructed Parking Lot #4 which is the current listed Site. In 1989 during a spill cleanup of industrial oil by GM, excavated soil was found to contain Polychlorinated Biphenyls (PCBs). The Site was sold to AAM in 1994 along with the main facility west of the railroad right of way[1]. As part of this conveyance, a deed restriction was placed on the property limiting it for use for industrial purposes only. GM-Saginaw Division, the previous owner of the Site, entered into a Consent Order in 1995 and a Final Site Investigation Report and Engineering Evaluation Report of Alternatives was completed in 1997. A Record of Decision (ROD) was issued in March 1998 which required: 1) The further removal of PCB contaminated soil, water and oil; 2) Maintenance of the pavement to reduce infiltration and provided a barrier to lead contaminated soil; and 3) Long-term monitoring and maintenance. Remediation (the "removal of PCB contaminated soil, water and oil") of the Site was completed in 1998 and a long-term operation and maintenance (O&M) plan is in place.

The Site is currently utilized periodically by the City of Buffalo for training school bus drivers.

1.2 Effectiveness of the Remedial Program

Remediation of the Site was completed in 1998 and included:

- Dewatering of an approximately 1-acre area surrounding the former Wastewater Treatment Plant[2] and on-site water treatment, confirmatory effluent sampling and analysis, and batch discharge to the Buffalo Sewer Authority (BSA) sanitary sewer system;
- Excavating fill/soil containing greater than the site cleanup goal of 10 parts per million (ppm) PCBs in the OU1 area, and confirmatory sampling;
- Transporting excavated materials off-site for treatment and disposal;
- Backfilling of the OU1 excavation with clay soil; and
- Paving the excavation area (OU1) and repaving of the OU2 area which was the remainder of the Parking Lot No. 4.

[1] The former GM/AAM main facility is now compromised of the East Delavan Ave Brownfield Cleanup Program Site No. 915916B and the 250 Colorado Street Site No. 915961

[2] This 1-acre area was referred to as Operable Unit 1 (OU1) as was the original NYSDEC Registry Listing for the Site

The remedial program was effective and long-term site monitoring requirements were established requiring:

- Pavement inspection and maintenance conducted on an annual basis to ensure that the integrity of the asphalt surface has been maintained;
- Visual inspection of storm sewer manhole covers and manhole risers for structural damage;
- Groundwater sampling of Site monitoring wells for PCBs, Total Lead, and Soluble Lead (Figure 1); and
- Storm sewer sampling from Manhole #2 (Figure 1) for PCBs and Total Lead.

Groundwater and storm sewer sampling were initially conducted on a semi-annual basis and have been conducted on a biennial basis since 2008. Three (3) monitoring wells (MW-1, MW-201, and MW-205) were removed from the groundwater sampling program in 2004 (Figure 1).

Pavement inspection, storm sewer visual inspection, and storm sewer sampling is conducted on an annual basis.

1.2.1 Progress During the Reporting Period

The cover system is intact and functioning. Inventum conducted the annual inspection December 2019 and completed the required inspection form (Appendix A).

Groundwater sampling of the site monitoring wells for PCBs, Total lead, Soluble Lead, and the emerging contaminants PFAS and 1,4-Dioxane was completed in December 2019. A tabular summary of groundwater sampling results is provided in Appendix B. Groundwater sampling forms are provided in Appendix C.

Storm sewer sampling from Manhole #2 for PCBs and Total lead was conducted in December 2019. A summary of the storm sewer results is provided in Appendix B.

1.2.2 Progress to Remedial Objectives for the Site

The Remedial Objectives (ROs) for the Site as established in the March 1998 Record of ROD) have been achieved and the Site has been in long-term monitoring since 2002.

1.3 Compliance

1.3.1 Potential Non-compliance

There were no areas of potential non-compliance identified during the reporting period.

1.3.2 Proposed Steps

There were no areas of potential non-compliance identified during the reporting period that would require a compliance plan.

1.4 Recommendations

1.4.1 Recommended Changes to the SMP

There are no recommended changes to the SMP at this time.

1.4.2 Recommend Changes to the Frequency for Submittal of PRRs

There is no recommended change to the frequency of the PRRs at this time.

1.4.3 Recommend Whether the Requirements for Discontinuing Site Management

It is appropriate to continue Site Management.

2 Site Overview

2.1 Site Location

The Site is located at 320 Scajacuada Street in the City of Buffalo, Erie County. The Site is defined as the former Parking Lot #4 associated with the former General Motors and American Axle & Manufacturing (AAM) facility that manufactured axles and drive-train components for cars and trucks. The Site covers an area of approximately 8.6 acres and is included in the New York Registry of Inactive Hazardous Waste Sites (Site No. 915152).

2.2 Chronology of the Remedial Program

GM and NYSDEC entered on Order on Consent (Index #B9-0410-92-09), effective February 2, 1995, pursuant to which GM performed an Interim Remedial Measure (IRM) at OU1 and conducted a Site Investigation and Engineering Evaluation of Alternatives in both OU1 and OU2. Based upon the Engineering Evaluation of Alternatives Report prepared by Wehran-New York, Inc. (ENCOR), NYSDEC prepared a Proposed Remedial Action Plan, which it submitted for public comment in February 1998.

NYSDEC selected a final remedial alternative for the Site in a ROD that was issued in March 1998. A Remedial Design (RD) Report was prepared by EMCON to implement the ROD-selected remedial alternatives at the Site. The RD Report was approved by the NYSDEC and remedial activities were conducted between July 1998 and March 2000.

3 Evaluate Remedy Performance, Effectiveness, and Protectiveness

The performance, effectiveness, and protectiveness of the remedy are verified through evaluating each of the primary remedial measures.

- The pavement and structural integrity of the sewer system remain in good condition at the Site.
- Groundwater samples in accordance with the O&M plan will be collected between June and December 2021. A schedule for collection of the next biennial sampling event will be provided as part of the next PRR.
- Sewer samples in accordance with the O&M plan will be collected during the next PRR period.

4 IC/EC Plan Compliance Report

4.1 IC/EC Requirements and Compliance

A series of IC have been developed and are being adhered to at the Site and include:

- Inspection and maintenance of Parking Lot #4.
- Groundwater and sewer monitoring in accordance with the April 2001 O&M Manual and subsequent modifications to the O&M Manual in January 2004 and September 2008.

4.1.1 Controls

Engineering controls (ECs) developed for the Site consist of an asphalt pavement cover system.

4.1.2 Status

The Site IC/ECs are all currently active and in force.

4.1.3 Corrective Measures

There are no corrective measures proposed at this time.

4.2 IC/EC Certification

The IC/EC certifications are provided in Enclosure A.

5 Monitoring Plan Compliance Report

5.1 Monitoring Plan Compliance Report

Routine Site Monitoring includes annual pavement inspection, annual visual inspection of sewer structure integrity, annual storm sewer sample collection, biennial groundwater sample collection, and periodic certification.

5.2 Monitoring Completed During Reporting Period

Inventum conducted the annual inspection December 2019 and completed the required inspection form (Appendix A). Photographs of the pavement cover system from the December 2019 inspection are provided in Appendix B.

Groundwater sampling of the site monitoring wells for PCBs, Total lead, Soluble Lead, and the emerging contaminants PFAS and 1,4-Dioxane was completed in December 2019. A tabular summary of

groundwater sampling results is provided in Appendix B. Groundwater sampling forms are provided in Appendix C. Laboratory analytical results are provided in Appendix D and the EDDs formatted for the NYSDEC Environmental Information Management System (EIMS) have been uploaded to the NYSDEC database.

Concentrations of total lead above the Class GA groundwater standard of 25 micrograms per liter (µg/L) were detected in five (5) monitoring wells (MW-5, MW-204, MW-205, MW-206, and MW-211); however, concentrations of both dissolved lead and PCBs were non-detect in all wells (Appendix B; Table 1).

Emerging contaminants (PFAS and 1,4-Dioxane) were sampled from all monitoring wells with the exception of MW-208 (Appendix B; Table 2). Several of the wells went dry during the purging process and MW-208 did not recover enough to produce sufficient sample volume for the analysis. Monitoring wells were purged and sampled using new disposable high-density polyethylene (HDPE) bailers. The collection of samples for PFAS and 1,4-Dioxane analysis was completed before the collection of samples for the remaining SMP constituents. PFOA was detected at concentrations above the 10 nanogram per liter (ng/L) screening value[3] at MW-5, MW-204, MW-205, and MW-211. PFOS was detected at concentrations above the 10 ng/L screening value at MW-202 and MW-204. Inventum notes that the duplicate sample (labeled MW-99) collected at MW-204 did not contain a detectable concentration of PFOS. PFPeA and 6:2FTS were detected at concentrations above the 100 ng/L screening value at MW-204 and MW-211. None of the wells contained total concentrations of PFAS (including PFOA and PFOS) greater than 500 ng/L.

One groundwater sample contained a detection of 1,4-Dioxane (3.61 µg/L at MW-211) above the screening threshold of 1 µg/L.

Storm sewer sampling from Manhole #2 for PCBs and Total lead was conducted in December 2019. All results were non-detect. A summary of the storm sewer results is provided in Table 3 of Appendix B. There were no emergencies or unforeseen failures of established ECs that would require non-routine inspections.

5.3 Monitoring Deficiencies

There were no monitoring deficiencies during the reporting period.

5.4 Conclusions and Recommendations for Changes

No changes to the monitoring program are recommended.

Inventum is proposing to re-sample monitoring wells MW-204 and MW-211 for PFAS during the next PRR period. Inventum notes the variability of the results between the primary and duplicate sample (MW-99) collected at MW-204 (Appendix B, Table 2) as well as the elevated turbidity levels post-purge (Appendix C) from both MW-204 and MW-211. These wells will be resampled using low-flow procedures

[3] NYSDEC. Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs. January 2020

in an effort to minimize turbidity in accordance with the NYSDEC January 2020 guidance. A work plan will be provided to the NYSDEC for approval prior to sampling.

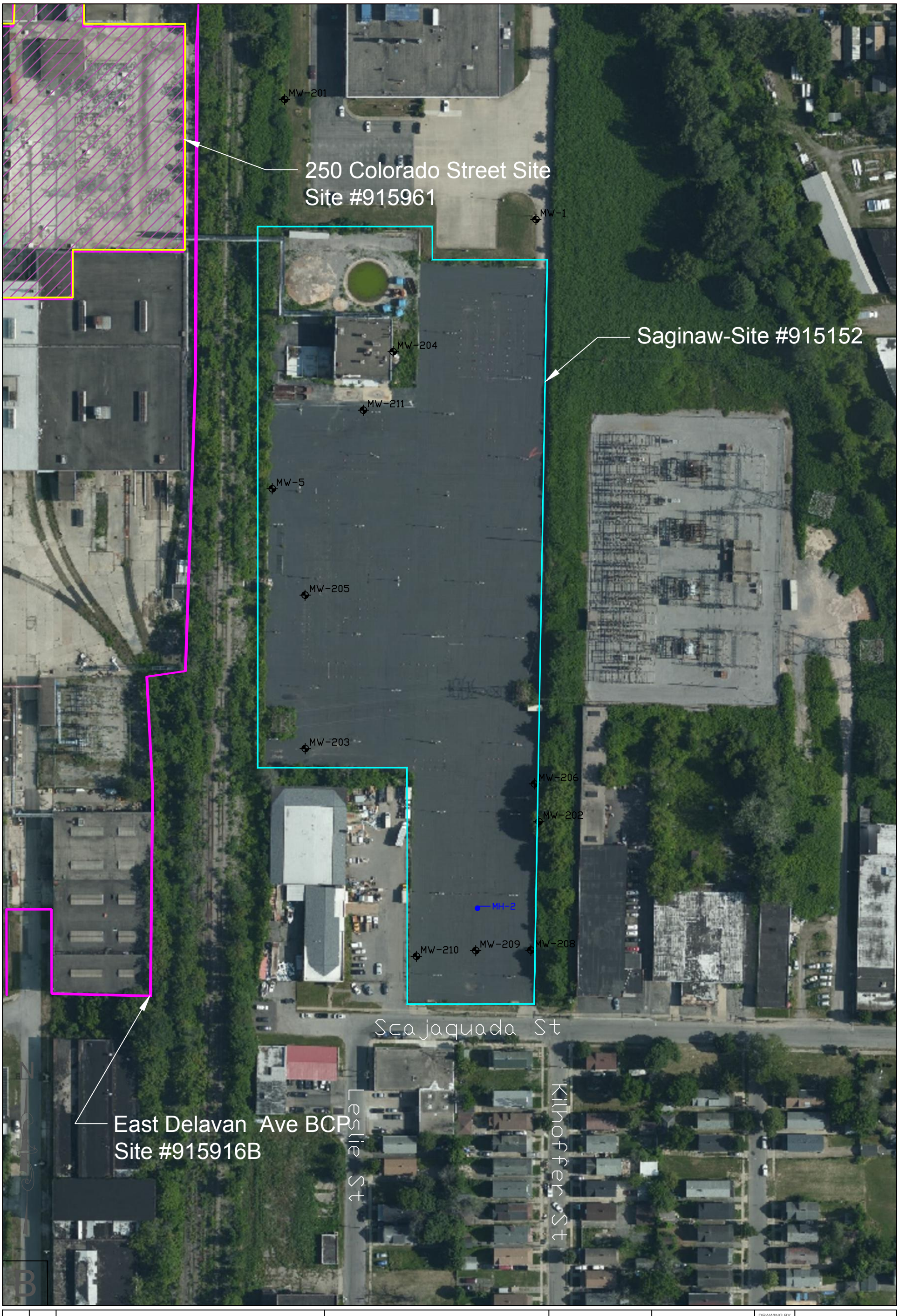
6 Operation & Maintenance (O&M) Plan Compliance Report

The Site remedy does not rely on any mechanical systems to protect public health and the environment; therefore, an O&M Plan Compliance Report is not applicable to this PRR.

7 Overall PRR Conclusions and Recommendations

Site IC/ECs remain in place and effective in maintaining the remedial objectives. No changes to the established SMP or recommended during the next PRR reporting period.

Figure



NOT TO SCALE

FIGURE 1

INVENTUM ENGINEERING
481 CARLISLE DRIVE
SUITE 202
HERNDON, VIRGINIA 20170
(703) 722-6049
www.InventumEng.com

FIGURE 1

Saginaw - Buffalo Site
320 Scajaquada St.
NYSDEC Site No. 915152

DRAWING BY	
CHECKED	
APPROVED	

Appendix A – Engineering Controls – December 2019 Annual Site-Wide Inspection Form

ANNUAL INSPECTION FORM
SAGINAW-BUFFALO SITE

Inspection Date: 12/10/2019
Inspected By: Todd Waldrop (Inventum Engineering)

PAVEMENT (Identify any damaged areas on site sketch)

1. Cracked Areas — Yes ____ No x
2. Settled Areas — Yes ____ No x
3. Potholes — Yes ____ No x
4. Heaving — Yes ____ No x
5. Plow Damage — Yes ____ No x
6. Drainage — Good x Poor ____
   Explain:
7. Condition of Surface Sealing — Good x Poor ____
   Explain: Some linear cracking, but overall in good shape. No deep fissures in sealant. Photos collected.

STORM SEWERS

1. Condition of Manhole Risers — Good x Poor ____
   Explain:
2. Sediment in Main — None x Avg (1-4") ____ High (>4") ____
   Comments: No sediment visible in MH #1 or MH#2. Trickle flow.

MONITORING WELLS

	MW-1	MW-5	MW-201	MW-202	MW-203	MW-204	MW-205	MW-206	MW-208	MW-209	MW-210	MW-211
Is protective casing in good condition?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is flush mount casing in good condition?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are casing labeled?	No	No	No	No	No	No	No	No	No	No	No	No
Is concrete surface seal in good condition?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Is protected pad in good condition?	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Are locks present?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are lock in good condition?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is riser in good condition?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Are J-plugs present?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Comments:
Casing survey/measurement markings are not visible. Re-mark during next semi-annual event.
MW-206 - Pad and well can need replacement.
MW-201 - Abovegrade concrete appears to have slipped and may be displaced. Above grade casing disconnected and displaced from belowgrade casing by at least 0.2".

Appendix B – Biennial Groundwater and Annual Storm Sewer Sampling Summary Tables – December 2019

Table 1
Saginaw Site (Site #915152)
Semi-Annual GW Sampling Results
December 2019
SMP Constituents

	Class GA GW Standards	MW-1		MW-5		MW-202		MW-203		MW-204		MW-99 (a)		MW-205		MW-206		MW-208		MW-209		MW-210		MW-211	
		12/10/2019		12/10/2019		12/10/2019		12/10/2019		12/10/2019				12/10/2019		12/10/2019		12/10/2019		12/10/2019		12/10/2019		12/10/2019	
Metals (mg/L)																									
Lead (Total)	0.025	0.01	U	0.104		0.01	U	0.01	U	0.0487		0.037		0.0513		0.456		0.00746	J	0.01	U	0.01	U	0.256	
Lead (Dissolved)	0.025	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
PCBs (µg/L)																									
PCB-1016	0.09 (b)	1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
PCB-1221		1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
PCB-1232		1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
PCB-1242		1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
PCB-1248		1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
PCB-1254		1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
PCB-1260		1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
PCB-1262		1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
PCB-1268		1.04	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

a/ Duplicate sample collected at MW-204.
Bold text indicates a reportable concentration.
Green highlighted values indicate an exceedances of the standard shown.
b/ Applicable standard is the sum of all cogeners.

Table 2
Saginaw Site (Site #915152)
Biennial GW Sampling Results
December 2019
Emerging Contaminants

	NYSDEC 1,4-Dioxane and PFAS Guidance (b)	MW-1		MW-5		MW-202		MW-203		MW-204		MW-99 (a)		MW-205		MW-206		MW-208		MW-209		MW-210		MW-211	
		12/10/2019		12/10/2019		12/10/2019		12/10/2019		12/10/2019				12/10/2019		12/10/2019		12/10/2019		12/10/2019		12/10/2019		12/10/2019	
SVOCs (µg/L)																									
1,4-Dioxane	1	0.2	U	1.87		0.2	U	0.175	J	0.591		0.56		0.218		0.2	U	NS		0.2	U	0.2	U	3.61	
PFOS/PFAS (ng/L)																									
Perfluorobutanoic Acid (PFBA)	100	0.481	J	28.6		7.25		17.1		28.8		22.2		15.7		4.87		NS		2.73		3.3		40.8	
Perfluoropentanoic Acid (PFPeA)	100	0.412	J	127		4.83		30.6		106		80.1		21.1		2.26		NS		1.79	J	1.24	J	199	
Perfluorobutanesulfonic Acid (PFBS)	100	0.273	J	1.28	J	2.2		0.677	J	5.39		2.37		1.41	J	1.6	J	NS		1.85	J	2.98		2.03	U
Perfluorohexanoic Acid (PFHxA)	100	0.542	J	55		5.98		18.2		60.2		36.8		14.1		2.06		NS		1.24	J	1.52	J	84	
Perfluoroheptanoic Acid (PFHpA)	100	1.92	U	32.8		1.92	J	13.4		42.3		28.5		7.21		1.19	J	NS		0.858	J	1.09	J	62.4	
Perfluorohexanesulfonic Acid (PFHxS)	100	1.92	U	1.89	U	11.5		3.38	B	89.2		1.98	U	3.07		1.86	J	NS		1.87	U	0.901	J	2.03	U
Perfluorooctanoic Acid (PFOA)	10	0.588	J	12.8		6.24		8.22		75.3		17.6		26.7		4.36		NS		1.15	J	3.24		23.1	
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	100	1.92	U	43.9	B	1.96	U	2.02	U	280		114		2.57		1.99	U	NS		1.87	U	2.14	U	173	
Perfluoroheptanesulfonic Acid (PFHpS)	100	1.92	U	1.89	U	1.96	U	2.02	U	4.2		1.98	U	1.97	U	1.99	U	NS		1.87	U	2.14	U	2.03	U
Perfluorononanoic Acid (PFNA)	100	1.92	U	1.31	J	1.96	U	0.944	J	11.3		8.95		0.968	J	1.99	U	NS		1.87	U	0.738	J	7.72	
Perfluorooctanesulfonic Acid (PFOS)	10	1.92	U	2.96	B	11.3		4.67	B	153		1.98	U	7.52		3.1		NS		0.936	J	2.14		9.65	
Perfluorodecanoic Acid (PFDA)	100	1.92	U	1.89	U	1.96	U	2.02	U	1.24	J	0.866	J	1.97	U	1.99	U	NS		1.87	U	2.14	U	0.598	J
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	100	1.92	U	1.89	U	1.96	U	2.02	U	50.1		39.9		1.97	U	1.99	U	NS		1.87	U	2.14	U	21.2	
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	100	1.92	U	1.89	U	1.96	U	2.02	U	2	U	2.02		1.97	U	1.99	U	NS		2.37		2.14	U	2.03	U
Perfluoroundecanoic Acid (PFUnA)	100	1.92	U	1.89	U	1.96	U	2.02	U	2	U	1.98	U	1.97	U	1.99	U	NS		1.87	U	2.14	U	2.03	U
Perfluorodecanesulfonic Acid (PFDS)	100	1.92	U	1.89	U	1.96	U	2.02	U	2	U	1.98	U	1.97	U	1.99	U	NS		1.87	U	2.14	U	2.03	U
Perfluorooctanesulfonamide (FOSA)	100	1.92	U	1.89	U	1.96	U	2.02	U	2	U	1.98	U	1.97	U	1.99	U	NS		1.87	U	2.14	U	2.03	U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	100	1.92	U	1.89	U	1.96	U	2.02	U	2	U	1.98	U	1.97	U	1.99	U	NS		3.22		1.12	J	2.03	U
Perfluorododecanoic Acid (PFDoA)	100	1.92	U	1.89	U	1.96	U	2.02	U	2	U	1.98	U	1.97	U	1.99	U	NS		1.87	U	2.14	U	2.03	U
Perfluorotridecanoic Acid (PFTrDA)	100	1.92	U	1.89	U	1.96	U	2.02	U	2	U	1.98	U	1.97	U	1.99	U	NS		0.416	J	2.14	U	2.03	U
Perfluorotetradecanoic Acid (PFTA)	100	1.92	U	1.89	U	1.96	U	2.02	U	2	U	1.98	U	1.97	U	1.99	U	NS		0.491	J	2.14	U	2.03	U
PFOA/PFOS (Total)	500	0.588	J	15.8	B	17.5		12.9	B	228		17.6		34.2		7.46		NS		2.09	J	5.38		32.8	

a/ Duplicate sample collected at MW-204.
b/ Ambient Water Quality Standards for PFAS are not available. Guidance values shown are from the January 2020 *Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs* .
U = Analyte not detected at reporting limit shown; J = estimated value.
NS = Sample not collected. Insufficient sample volume post-purging and primary sample (SMP Constitutents) collection.
NE = Comparative standard not established
µg/L = micrograms per liter; ng/L = nanograms per liter
B = Method Blank contained PFHxS, 6:2 FTS, and PFOS above reporting limits and sample lacked sufficient volume for re-extraction.

Table 3
Saginaw Site (Site #915152)
Annual Storm Sewer Sampling Results
December 2019
SMP Constituents

	MH-2	
	12/16/2019	
Metals (mg/L)		
Lead (Total)	0.01	U
PCBs (µg/L)		
PCB-1016	1.03	U
PCB-1221	1.03	U
PCB-1232	1.03	U
PCB-1242	1.03	U
PCB-1248	1.03	U
PCB-1254	1.03	U
PCB-1260	1.03	U
PCB-1262	1.03	U
PCB-1268	1.03	U

Bold text indicates a reportable concentration.
"U" = analyte not detected at reporting limit shown.

Appendix C – Groundwater Sampling Forms

GROUNDWATER MONITORING WELL PURGE FORM	
Site:	
Well ID: MW-208	Depth to Water (ft BTOC): 3.88
Inventum Sampler: Todd W.	Depth to Product (ft BTOC): -
Date: 12/10/2019	Total Depth (ft BTOC): 5.6

Purge Details	
Time Start: 1030	Comments/Notes: Well purged dry. Very little recharge. Recharged for 4.5 hrs before sampling. Insufficient sample volume to collect emerging contaminants. SMP parameters only. Well condition and casing are in good shape.
Time Ended: 1040	
Total Purge Volume: ~1 gallon	

Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	6.85	8.81	8.4	1.3	2	9.08
1	6.14	8.62	290	-	-49	11.34
2	DRY	DRY	DRY	DRY	DRY	DRY
3	DRY	DRY	DRY	DRY	DRY	DRY

Sample Details	
Sample Date: 12/10/2019	Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3)
Sample Time: 1455	
Sampled By: Todd W	

GROUNDWATER MONITORING WELL PURGE FORM						
Site:						
Well ID: MW-209			Depth to Water (ft BTOC): 3.36			
Inventum Sampler: Todd W.			Depth to Product (ft BTOC): -			
Date: 12/10/2019			Total Depth (ft BTOC): 5.63			
Purge Details						
Time Start: 1000			Comments/Notes: Well purged dry after 1 full volume. Very little recharge. Collected PFOS/PFAS and PCBs then let recharge for 4 hrs before collecting Total and Dissolved Pb and 1,4-Dioxane. Well Condition and casing are in good shape.			
Time Ended: 1010						
Total Purge Volume: ~1 gallon						
Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	6.73	8.36	21.2	1.28	148	8.75
1	6.7	9.37	64.9	1.19	146	7.31
2	DRY	DRY	DRY	DRY	DRY	DRY
3	DRY	DRY	DRY	DRY	DRY	DRY
Sample Details						
Sample Date: 12/10/2019			Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3); PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).			
Sample Time: 1010						
Sampled By: Todd W						

GROUNDWATER MONITORING WELL PURGE FORM			
Site:			
Well ID:	MW-210	Depth to Water (ft BTOC):	3.42
Inventum Sampler:	Todd W.	Depth to Product (ft BTOC):	-
Date:	12/10/2019	Total Depth (ft BTOC):	5.75

Purge Details	
Time Start:	925
Time Ended:	930
Total Purge Volume:	1.15 gal

Comments/Notes: Well purged dry after 2 full well volumes. Slow recharge. PFOS/PFAS, PCB, and 1,4-Dioxane collected after purged dry and recharged. Total and Dissolved Pb collected after recharging for approx 4 hrs.
Well condition and casing are in good shape.

Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	7.2	9.05	7.9	0.279	61	11.2
1	6.94	9.43	19.6	0.359	83	10.73
2	6.88	9.67	107	0.362	93	10.35
3	DRY	DRY	DRY	DRY	DRY	DRY

Sample Details	
Sample Date:	12/10/2019
Sample Time:	935
Sampled By:	Todd W

Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3}; PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).

GROUNDWATER MONITORING WELL PURGE FORM			
Site:			
Well ID:	MW-204	Depth to Water (ft BTOC):	2.37
Inventum Sampler:	Todd W.	Depth to Product (ft BTOC):	-
Date:	12/10/2019	Total Depth (ft BTOC):	7.23

Purge Details	
Time Start:	1345
Time Ended:	1355
Total Purge Volume:	~2.3 gals

Comments/Notes: Well condition and casing are in good shape.

Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	6.86	6.22	175	0.711	-64	9.28
1	6.92	8.25	92	0.68	-92	9.43
2	6.93	8.7	94.1	0.676	-104	10.17
3	6.89	8.44	70.5	0.689	-107	10.8

Sample Details	
Sample Date:	12/10/2019
Sample Time:	1400
Sampled By:	Todd W

Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3); PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).

Collected duplicate labeled MW-99 w/false time 1436 for same paramters listed above.

GROUNDWATER MONITORING WELL PURGE FORM			
Site:			
Well ID:	MW-1	Depth to Water (ft BTOC):	5.81
Inventum Sampler:	Todd W.	Depth to Product (ft BTOC):	-
Date:	12/10/2019	Total Depth (ft BTOC):	5.5

Purge Details	
Time Start:	1300
Time Ended:	1305
Total Purge Volume:	~1.3 gal

Comments/Notes: Well condition and casing are in good shape.

Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0/1	7.46	6.76	53.5	0.896	95	8.97
2	6.96	9.22	65.9	0.836	93	6.7
3	6.7	9.93	68.3	0.821	84	5.56

Sample Details	
Sample Date:	12/10/2019
Sample Time:	1310
Sampled By:	Todd W

Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3}; PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).

GROUNDWATER MONITORING WELL PURGE FORM			
Site:			
Well ID:	MW-211	Depth to Water (ft BTOC):	2.4
Inventum Sampler:	Todd W.	Depth to Product (ft BTOC):	-
Date:	12/10/2019	Total Depth (ft BTOC):	8.65

Purge Details	
Time Start:	1152
Time Ended:	1157
Total Purge Volume:	~3 gal
Comments/Notes:	Well condition and casing are in good shape.

Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	6.72	9.41	222	1.28	-28	10.17
1	6.82	10.9	691	1.28	-66	10.19
2	6.9	10.98	421	1.25	-81	10.63
3	6.85	11.58	369	1.24	-88	7.87

Sample Details		
Sample Date:	12/10/2019	Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3); PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).
Sample Time:	1205	
Sampled By:	Todd W	

GROUNDWATER MONITORING WELL PURGE FORM						
Site:						
Well ID: MW-5			Depth to Water (ft BTOC): 4.82			
Inventum Sampler: Todd W.			Depth to Product (ft BTOC): -			
Date: 12/10/2019			Total Depth (ft BTOC): 11.68			
Purge Details						
Time Start: 735			Comments/Notes: Well condition and casing are in good shape.			
Time Ended: 745						
Total Purge Volume: ~3.4 gal						
Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	7.37	12.45	77.2	1.68	129	11.88
1	6.97	12.59	85.2	1.55	117	918
2	6.93	12.82	98.5	1.56	100	6.77
3	6.94	12.76	86.3	1.55	105	7.25
Sample Details						
Sample Date: 12/10/2019			Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3}; PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).			
Sample Time: 755						
Sampled By: Todd W						

GROUNDWATER MONITORING WELL PURGE FORM						
Site:						
Well ID: MW-205			Depth to Water (ft BTOC): 3.41			
Inventum Sampler: Todd W.			Depth to Product (ft BTOC): -			
Date: 12/10/2019			Total Depth (ft BTOC): 6.22			
Purge Details						
Time Start: 815			Comments/Notes: Well purged dry after 3 full volumes. Slow recharge, but sufficient to allow samples to be collected after purge.			
Time Ended: 820						
Total Purge Volume: ~1.4 gal			Well condition and casing are in good shape.			
Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	6.83	10.55	16.6	3.23	175	11.15
1	6.7	11.28	NR*	3.26	103	9.75
2	6.66	11.65	NR*	3.43	66	10.03
3	6.67	11.83	NR*	3.68	78	9.05
			*No reading. Sensor error. Horiba recalibrated after purge.			
Sample Details						
Sample Date: 12/10/2019			Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3}; PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).			
Sample Time: 825						
Sampled By: Todd W						

GROUNDWATER MONITORING WELL PURGE FORM			
Site:			
Well ID:	MW-203	Depth to Water (ft BTOC):	3.01
Inventum Sampler:	Todd W.	Depth to Product (ft BTOC):	-
Date:	12/10/2019	Total Depth (ft BTOC):	9.2

Purge Details	
Time Start:	855
Time Ended:	905
Total Purge Volume:	~3 gal
Comments/Notes:	Well condition and casing are in good shape. Very fast recharge compared to all other wells onsite.

Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	8.12	9.63	103	0.451	120	10.44
1	7.54	10.37	41.9	0.509	1	8.3
2	7.06	11.03	28.4	0.676	-29	10.13
3	6.8	11.12	28.3	0.73	-46	6.47

Sample Details	
Sample Date:	12/10/2019
Sample Time:	910
Sampled By:	Todd W
Analysis:	PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3}; PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).

GROUNDWATER MONITORING WELL PURGE FORM			
Site:			
Well ID:	MW-202	Depth to Water (ft BTOC):	3.65
Inventum Sampler:	Todd W.	Depth to Product (ft BTOC):	-
Date:	12/10/2019	Total Depth (ft BTOC):	7.7

Purge Details	
Time Start:	1045
Time Ended:	1055
Total Purge Volume:	~2 gal
Comments/Notes:	Well condition and casing are in good shape.

Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	7.35	9.43	34.9	0.201	32	10.59
1	6.77	10.82	255	0.162	47	10.89
2	6.29	10.5	107	0.266	8	8.69
3	6.3	8.41	47.1	0.463	-20	8.53

Sample Details	
Sample Date:	12/10/2019
Sample Time:	1100
Sampled By:	Todd W
Analysis:	PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3}; PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).

GROUNDWATER MONITORING WELL PURGE FORM			
Site:			
Well ID:	MW-206	Depth to Water (ft BTOC):	3.84
Inventum Sampler:	Todd W.	Depth to Product (ft BTOC):	-
Date:	12/10/2019	Total Depth (ft BTOC):	10.08

Purge Details	
Time Start:	1117
Time Ended:	1130
Total Purge Volume:	~3 gal

Comments/Notes: Well can and pad need replacement. Well casing appears to be in good shape. Some sediment at bottom of well.

Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
0	6.15	6.2	135	0.984	20	9.41
1	6.38	9.09	212	1.04	28	8.94
2	6.34	9.44	293	1.04	7	11.03
3	6.27	10.22	211	1.03	7	8.81

Sample Details	
Sample Date:	12/10/2019
Sample Time:	1130
Sampled By:	Todd W

Analysis: PCBS (8082){1-L Amber unpreserved}; Dissolved Pb (6010){250 mL poly unpreserved; lab filter}; Total Pb (6010){250 mL poly w/HNO_3}; PFOS/PFAS (537) {250 mL poly x 2 unpreserved}; 1,4-Dioxane (8270SIM) {1-L amber unpreserved).

GROUNDWATER MONITORING WELL PURGE FORM						
Site:						
Well ID: MW-201			Depth to Water (ft BTOC): 11.49			
Inventum Sampler: Todd W.			Depth to Product (ft BTOC): -			
Date: 12/10/2019			Total Depth (ft BTOC): 14.32			
Purge Details						
Time Start: NA			Comments/Notes: See notes in field reading section below.			
Time Ended: NA						
Total Purge Volume: NA						
Volume	pH	Temperature	Turbidity	Conductivity	ORP	DO
Stick up well on Niagara Lubricants property and on slight down slope. Abovegrade cylindrical concrete form appears to have slipped as it is cracking. Bailer from previous sampling event left in well and jammed. Bailer was removed and water levels/TD collected. Soft sediment at bottom indicates possible break in upper seal. Was unable to get a bailer down the well to purge. No samples collected.						
Sample Details						
Sample Date: NA			Analysis:			
Sample Time: NA						
Sampled By: NA						

Appendix D – Laboratory Reports

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-208		
Lab Sample ID:	196116-01	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	**0.00746**	mg/L	J	12/19/2019 17:15

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-208
Lab Sample ID: 196116-01 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 01:53
PCB-1221	< 1.00	ug/L		12/14/2019 01:53
PCB-1232	< 1.00	ug/L		12/14/2019 01:53
PCB-1242	< 1.00	ug/L		12/14/2019 01:53
PCB-1248	< 1.00	ug/L		12/14/2019 01:53
PCB-1254	< 1.00	ug/L		12/14/2019 01:53
PCB-1260	< 1.00	ug/L		12/14/2019 01:53
PCB-1262	< 1.00	ug/L		12/14/2019 01:53
PCB-1268	< 1.00	ug/L		12/14/2019 01:53

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**67.0**	14.8 - 92.8		12/14/2019 01:53

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-208		
Lab Sample ID:	196116-01A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 15:46

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-209		
Lab Sample ID:	196116-02	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 17:19

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-209
Lab Sample ID: 196116-02 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 02:18
PCB-1221	< 1.00	ug/L		12/14/2019 02:18
PCB-1232	< 1.00	ug/L		12/14/2019 02:18
PCB-1242	< 1.00	ug/L		12/14/2019 02:18
PCB-1248	< 1.00	ug/L		12/14/2019 02:18
PCB-1254	< 1.00	ug/L		12/14/2019 02:18
PCB-1260	< 1.00	ug/L		12/14/2019 02:18
PCB-1262	< 1.00	ug/L		12/14/2019 02:18
PCB-1268	< 1.00	ug/L		12/14/2019 02:18

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**66.0**	14.8 - 92.8		12/14/2019 02:18

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-209		
Lab Sample ID:	196116-02	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	< 0.200	ug/L		12/17/2019 11:27

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43134.D

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-209		
Lab Sample ID:	196116-02A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 15:50

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-210		
Lab Sample ID:	196116-03	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 17:24

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-210
Lab Sample ID: 196116-03 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 02:41
PCB-1221	< 1.00	ug/L		12/14/2019 02:41
PCB-1232	< 1.00	ug/L		12/14/2019 02:41
PCB-1242	< 1.00	ug/L		12/14/2019 02:41
PCB-1248	< 1.00	ug/L		12/14/2019 02:41
PCB-1254	< 1.00	ug/L		12/14/2019 02:41
PCB-1260	< 1.00	ug/L		12/14/2019 02:41
PCB-1262	< 1.00	ug/L		12/14/2019 02:41
PCB-1268	< 1.00	ug/L		12/14/2019 02:41

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**72.4**	14.8 - 92.8		12/14/2019 02:41

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-210		
Lab Sample ID:	196116-03	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	< 0.200	ug/L		12/17/2019 11:38

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43135.D

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-210		
Lab Sample ID:	196116-03A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 15:55

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-204		
Lab Sample ID:	196116-04	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	**0.0487**	mg/L		12/19/2019 17:28

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-204
Lab Sample ID: 196116-04 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 03:05
PCB-1221	< 1.00	ug/L		12/14/2019 03:05
PCB-1232	< 1.00	ug/L		12/14/2019 03:05
PCB-1242	< 1.00	ug/L		12/14/2019 03:05
PCB-1248	< 1.00	ug/L		12/14/2019 03:05
PCB-1254	< 1.00	ug/L		12/14/2019 03:05
PCB-1260	< 1.00	ug/L		12/14/2019 03:05
PCB-1262	< 1.00	ug/L		12/14/2019 03:05
PCB-1268	< 1.00	ug/L		12/14/2019 03:05

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**60.9**	14.8 - 92.8		12/14/2019 03:05

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-204		
Lab Sample ID:	196116-04	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	**0.591**	ug/L		12/17/2019 11:49

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43136.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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-204		
Lab Sample ID:	196116-04A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 15:59

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-99		
Lab Sample ID:	196116-05	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	**0.0370**	mg/L		12/19/2019 17:33

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-99
Lab Sample ID: 196116-05 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 03:30
PCB-1221	< 1.00	ug/L		12/14/2019 03:30
PCB-1232	< 1.00	ug/L		12/14/2019 03:30
PCB-1242	< 1.00	ug/L		12/14/2019 03:30
PCB-1248	< 1.00	ug/L		12/14/2019 03:30
PCB-1254	< 1.00	ug/L		12/14/2019 03:30
PCB-1260	< 1.00	ug/L		12/14/2019 03:30
PCB-1262	< 1.00	ug/L		12/14/2019 03:30
PCB-1268	< 1.00	ug/L		12/14/2019 03:30

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**55.3**	14.8 - 92.8		12/14/2019 03:30

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-99		
Lab Sample ID:	196116-05	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	**0.560**	ug/L		12/17/2019 12:00

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43137.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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-99		
Lab Sample ID:	196116-05A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 16:04

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-1		
Lab Sample ID:	196116-06	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 17:37

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-1
Lab Sample ID: 196116-06 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.04	ug/L		12/14/2019 03:54
PCB-1221	< 1.04	ug/L		12/14/2019 03:54
PCB-1232	< 1.04	ug/L		12/14/2019 03:54
PCB-1242	< 1.04	ug/L		12/14/2019 03:54
PCB-1248	< 1.04	ug/L		12/14/2019 03:54
PCB-1254	< 1.04	ug/L		12/14/2019 03:54
PCB-1260	< 1.04	ug/L		12/14/2019 03:54
PCB-1262	< 1.04	ug/L		12/14/2019 03:54
PCB-1268	< 1.04	ug/L		12/14/2019 03:54

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**65.0**	14.8 - 92.8		12/14/2019 03:54

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-1		
Lab Sample ID:	196116-06	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	< 0.200	ug/L		12/17/2019 12:11

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43138.D

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-1		
Lab Sample ID:	196116-06A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 16:17

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-211		
Lab Sample ID:	196116-07	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	**0.256**	mg/L		12/19/2019 17:41

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-211
Lab Sample ID: 196116-07 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 04:18
PCB-1221	< 1.00	ug/L		12/14/2019 04:18
PCB-1232	< 1.00	ug/L		12/14/2019 04:18
PCB-1242	< 1.00	ug/L		12/14/2019 04:18
PCB-1248	< 1.00	ug/L		12/14/2019 04:18
PCB-1254	< 1.00	ug/L		12/14/2019 04:18
PCB-1260	< 1.00	ug/L		12/14/2019 04:18
PCB-1262	< 1.00	ug/L		12/14/2019 04:18
PCB-1268	< 1.00	ug/L		12/14/2019 04:18

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**48.4**	14.8 - 92.8		12/14/2019 04:18

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-211		
Lab Sample ID:	196116-07	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	**3.61**	ug/L		12/18/2019 21:07

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/17/2019
Data File: B43212.D

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-211		
Lab Sample ID:	196116-07A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 16:22

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-5		
Lab Sample ID:	196116-08	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	**0.104**	mg/L		12/19/2019 17:55

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-5
Lab Sample ID: 196116-08 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 04:43
PCB-1221	< 1.00	ug/L		12/14/2019 04:43
PCB-1232	< 1.00	ug/L		12/14/2019 04:43
PCB-1242	< 1.00	ug/L		12/14/2019 04:43
PCB-1248	< 1.00	ug/L		12/14/2019 04:43
PCB-1254	< 1.00	ug/L		12/14/2019 04:43
PCB-1260	< 1.00	ug/L		12/14/2019 04:43
PCB-1262	< 1.00	ug/L		12/14/2019 04:43
PCB-1268	< 1.00	ug/L		12/14/2019 04:43

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**61.2**	14.8 - 92.8		12/14/2019 04:43

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-5		
Lab Sample ID:	196116-08	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	**1.87**	ug/L		12/18/2019 21:18

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/17/2019
Data File: B43213.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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-5		
Lab Sample ID:	196116-08A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 16:26

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-205		
Lab Sample ID:	196116-09	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	**0.0513**	mg/L		12/19/2019 17:59

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-205
Lab Sample ID: 196116-09 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 05:08
PCB-1221	< 1.00	ug/L		12/14/2019 05:08
PCB-1232	< 1.00	ug/L		12/14/2019 05:08
PCB-1242	< 1.00	ug/L		12/14/2019 05:08
PCB-1248	< 1.00	ug/L		12/14/2019 05:08
PCB-1254	< 1.00	ug/L		12/14/2019 05:08
PCB-1260	< 1.00	ug/L		12/14/2019 05:08
PCB-1262	< 1.00	ug/L		12/14/2019 05:08
PCB-1268	< 1.00	ug/L		12/14/2019 05:08

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**67.0**	14.8 - 92.8		12/14/2019 05:08

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-205		
Lab Sample ID:	196116-09	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	**0.218**	ug/L		12/17/2019 12:44

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43141.D

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-205		
Lab Sample ID:	196116-09A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 16:30

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-203		
Lab Sample ID:	196116-10	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 18:04

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-203
Lab Sample ID: 196116-10 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 05:32
PCB-1221	< 1.00	ug/L		12/14/2019 05:32
PCB-1232	< 1.00	ug/L		12/14/2019 05:32
PCB-1242	< 1.00	ug/L		12/14/2019 05:32
PCB-1248	< 1.00	ug/L		12/14/2019 05:32
PCB-1254	< 1.00	ug/L		12/14/2019 05:32
PCB-1260	< 1.00	ug/L		12/14/2019 05:32
PCB-1262	< 1.00	ug/L		12/14/2019 05:32
PCB-1268	< 1.00	ug/L		12/14/2019 05:32

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**114**	14.8 - 92.8	*	12/14/2019 05:32

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-203		
Lab Sample ID:	196116-10	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	**0.175**	ug/L	J	12/17/2019 12:55

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43142.D

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-203		
Lab Sample ID:	196116-10A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 16:35

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-202		
Lab Sample ID:	196116-11	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 18:08

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-202
Lab Sample ID: 196116-11 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 05:56
PCB-1221	< 1.00	ug/L		12/14/2019 05:56
PCB-1232	< 1.00	ug/L		12/14/2019 05:56
PCB-1242	< 1.00	ug/L		12/14/2019 05:56
PCB-1248	< 1.00	ug/L		12/14/2019 05:56
PCB-1254	< 1.00	ug/L		12/14/2019 05:56
PCB-1260	< 1.00	ug/L		12/14/2019 05:56
PCB-1262	< 1.00	ug/L		12/14/2019 05:56
PCB-1268	< 1.00	ug/L		12/14/2019 05:56

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**141**	14.8 - 92.8	*	12/14/2019 05:56

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-202		
Lab Sample ID:	196116-11	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	< 0.200	ug/L		12/17/2019 13:06

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43143.D

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-202		
Lab Sample ID:	196116-11A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 16:39

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-206		
Lab Sample ID:	196116-12	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	**0.456**	mg/L		12/19/2019 18:13

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier: MW-206
Lab Sample ID: 196116-12 **Date Sampled:** 12/10/2019
Matrix: Aq Liquid **Date Received:** 12/12/2019

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.00	ug/L		12/14/2019 06:20
PCB-1221	< 1.00	ug/L		12/14/2019 06:20
PCB-1232	< 1.00	ug/L		12/14/2019 06:20
PCB-1242	< 1.00	ug/L		12/14/2019 06:20
PCB-1248	< 1.00	ug/L		12/14/2019 06:20
PCB-1254	< 1.00	ug/L		12/14/2019 06:20
PCB-1260	< 1.00	ug/L		12/14/2019 06:20
PCB-1262	< 1.00	ug/L		12/14/2019 06:20
PCB-1268	< 1.00	ug/L		12/14/2019 06:20

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**95.8**	14.8 - 92.8	*	12/14/2019 06:20

Method Reference(s): EPA 8082A
EPA 3510C
Preparation Date: 12/13/2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-206		
Lab Sample ID:	196116-12	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dioxane

Analyte	Result	Units	Qualifier	Date Analyzed
1,4-Dioxane	< 0.200	ug/L		12/17/2019 13:17

Method Reference(s): EPA 8270D SIM
EPA 3510C
Preparation Date: 12/16/2019
Data File: B43144.D

Report Prepared Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196116

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw

Sample Identifier:	MW-206		
Lab Sample ID:	196116-12A	**Date Sampled:**	12/10/2019
Matrix:	Aq Liquid	**Date Received:**	12/12/2019

Dissolved Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	< 0.0100	mg/L		12/19/2019 16:44

Method Reference(s): EPA 6010C
EPA 3005A
Preparation Date: 12/13/2019
Data File: 191219B

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 Monday, December 23, 2019

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report Appendix

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

Each page of this document is part of a multipage report. This document may not be reproduced except in its entirety, without the prior consent of Paradigm Environmental Services, Inc.

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.

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, tern 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 wi 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 th 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.

179 Lake Avenue, Rochester, NY 14608 Office (585) 647-2530 Fax (585) 647-3311

PARADIGM
ENVIRONMENTAL SERVICES, INC

CHAIN OF CUSTODY

1 of 3

REPORT TO:		INVOICE TO:		
CLIENT: Inventum Engineering		CLIENT:		LAB PROJECT ID: 196116
ADDRESS: 481 Carlisle Dr., Ste 202		ADDRESS:		
CITY: Herndon STATE: VA ZIP: 20170		CITY: STATE: ZIP:		Quotation #:
PHONE: 571-217-3627		PHONE:		Email: todd.walotup@inventumeng.com
ATTN: Todd Walotup		ATTN:		

PROJECT REFERENCE: Saginaw

Matrix Codes:
AQ - Aqueous Liquid; NQ - Non-Aqueous Liquid; WA - Water; WG - Groundwater; DW - Drinking Water; WW - Wastewater; SO - Soil; SL - Sludge; SD - Solid; PT - Paint; WP - Wipe; CK - Caulk; OL - Oil; AR - Air

REQUESTED ANALYSIS

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX CODES	NUMBER OF CONTAINERS	PCBs (8082)	Total Lead	Dissolved Lead	1,4 Dioxane	REMARKS	PARADIGM LAB SAMPLE NUMBER
12/10/19	1455		X	MW-208	AQ	3	X	X	X		* LAB FILTER	01A
	1010		X	MW-209	AQ	4	X	X	X	X	"	02A
	0935		X	MW-210	AQ	4	X	X	X	X	"	03A
	1400		X	MW-204	AQ	4	X	X	X	X	"	04A
	1436		X	MW-99	AQ	4	X	X	X	X	"	05A
	1310		X	MW-1	AQ	4	X	X	X	X	"	06A
	1205		X	MW-211	AQ	4	X	X	X	X		07A
	0755		X	MW-5	AQ	4	X	X	X	X	A for Dissolved Metals.	08A
	0825		X	MW-205	AQ	4	X	X	X	X	CP 12/12/19	09A
	0910		X	MW-203	AQ	4	X	X	X	X		10A

Turnaround Time		Report Supplements			
Availability contingent upon lab approval; additional fees may apply.					
Standard 5 day	X	None Required		None Required	
10 day		Batch QC		Basic EDD	
Rush 3 day		Category A		NYSDEC EDD	X
Rush 2 day		Category B	X		
Rush 1 day					
Date Needed _____ please indicate date needed:		Other please indicate package needed:		Other EDD please indicate EDD needed :	

6°C iced 12/11/19 1626 hrs
No custody seals not signed

Sampled By: Todd Walotup	Date/Time: 12/10/19 1610	Total Cost:
Relinquished By: Todd Walotup	Date/Time: 12/10/19 1656	
Received By: [signature]	Date/Time: 12/10/19	P.I.F.
Received @ Lab By: [signature]	Date/Time: 12/12/19 09:13	

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

See additional page for sample conditions.

179 Lake Avenue, Rochester, NY 14608 Office (585) 647-2530 Fax (585) 647-3311

2 of 3

CHAIN OF CUSTODY

PARADIGM ENVIRONMENTAL SERVICES, INC.

REPORT TO:			INVOICE TO:			
CLIENT: Inventum Eng.			CLIENT:			LAB PROJECT ID: 196116
ADDRESS:			ADDRESS:			
CITY:	STATE:	ZIP	CITY:	STATE:	ZIP:	Quotation #:
PHONE:			PHONE:			Email: todd.waldrop@inventumeng.com
ATTN:			ATTN:			

PROJECT REFERENCE

SAG-NAW

Matrix Codes:

AQ - Aqueous Liquid; NQ - Non-Aqueous Liquid; WA - Water; WG - Groundwater; DW - Drinking Water; WW - Wastewater; SO - Soil; SL - Sludge; SD - Solid; PT - Paint; WP - Wipe; CK - Caulk; OL - Oil; AR - Air

REQUESTED ANALYSIS

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX CODES	NUMBER OF CONTAINERS	VOCs (8260 8260)	TCLP Lead	Dissolved Lead *	1-4 Dioxane	REMARKS	PARADIGM LAB SAMPLE NUMBER
12/10/19	1100		X	MW-202	AQ	4	X	X	X	X	* LAB FILTER DISSOLVED PB. *	11A
12/10/19	1130		X	MW-206	AQ	4	X	X	X	X		12A

Page 2 of 2

Turnaround Time		Report Supplements			
Availability contingent upon lab approval; additional fees may apply.					
Standard 5 day	☐	None Required	☐	None Required	☐
10 day	☐	Batch QC	☐	Basic EDD	☐
Rush 3 day	☐	Category A	☐	NYSDEC EDD	☐
Rush 2 day	☐	Category B	☐		
Rush 1 day	☐				
Date Needed _____ please indicate date needed: _____		Other ☐ please indicate package needed: _____		Other EDD ☐ please indicate EDD needed: _____	

Sampled By: Todd	Date/Time: 12/10/19 1610	Total Cost:
Relinquished By: Todd	Date/Time: 12/10/19 1654	
Received By:	Date/Time: 12/10/19	P.I.F.
Received @ Lab By: JP	Date/Time: 12/12/19 09:13	

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

See additional page for sample conditions.

PARADIGM

Chain of Custody Supplement

Client: Inventum Engineering **Completed by:** Glenn Pezzulo

Lab Project ID: 196116 **Date:** 12/12/19

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	X		
Comments			
Transferred to method-compliant container			X
Headspace (<1 mL)			X
Comments			
Preservation	X Total Metals		X
Comments			
Chlorine Absent (<0.10 ppm per test strip)			X
Comments			
Holding Time	X		
Comments			
Temperature	X		X Metals
Comments	6°C iced		
Compliant Sample Quantity/Type	X		
Comments			

ANALYTICAL REPORT

Lab Number:	L1959200
Client:	Paradigm Environmental Services 179 Lake Avenue Rochester, NY 14608
ATTN:	Jane Daloia
Phone:	(585) 647-2530
Project Name:	SAGINAW
Project Number:	SAGINAW
Report Date:	01/24/20

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).

Six Park Row, Mansfield, MA 02048
508-261-7467 (Fax) -- -- - emccarter@mansfieldma.com

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1959200-01	MW-209	WATER	Not Specified	12/10/19 10:10	12/11/19
L1959200-02	MW-210	WATER	Not Specified	12/10/19 09:35	12/11/19
L1959200-03	MW-204	WATER	Not Specified	12/10/19 14:00	12/11/19
L1959200-04	MW-99	WATER	Not Specified	12/10/19 14:36	12/11/19
L1959200-05	MW-1	WATER	Not Specified	12/10/19 13:10	12/11/19
L1959200-06	MW-211	WATER	Not Specified	12/10/19 12:05	12/11/19
L1959200-07	MW-5	WATER	Not Specified	12/10/19 07:55	12/11/19
L1959200-08	MW-205	WATER	Not Specified	12/10/19 08:25	12/11/19
L1959200-09	MW-203	WATER	Not Specified	12/10/19 09:10	12/11/19
L1959200-10	MW-202	WATER	Not Specified	12/10/19 11:00	12/11/19
L1959200-11	MW-206	WATER	Not Specified	12/10/19 11:30	12/11/19
L1959200-12	TRIP BLANK	WATER	Not Specified	12/10/19 00:00	12/11/19

Project Name:	SAGINAW	**Lab Number:**	L1959200
Project Number:	SAGINAW	**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:	SAGINAW	**Lab Number:**	L1959200
Project Number:	SAGINAW	**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.

Perfluorinated Alkyl Acids by Isotope Dilution

L1959200-03, -04, -06, -07, -08, and -09: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

The WG1321572-1 Method Blank, associated with L1959200-01 through -12, has concentrations above the reporting limits for PFHxS, 6:2 FTS, and PFOS. Samples L1959200-07 and -09 have concentrations above the reporting limits for PFHxS, 6:2 FTS, and PFOS; however, re-extraction could not be performed due to lack of additional sample volume. The results of the original analyses are reported and are qualified with a "B".

Samples L1959200-01, -02, -04, -05, -06, -08, -10 and -11 were re-extracted with the method required holding time exceeded and the method blank was non-detect for these target compounds. The results of both extractions are reported, along with the re-extract QC. The original sample result is reported with B qualifier.

Sample L1959200-03 has concentrations greater than 10x the blank concentration for these analytes, no corrective action is required. The results of the original analysis are reported. Sample L1959200-12 was non-detect to the RL for these target analytes, no further actions were taken. The results of the original analysis are reported.

WG1321572-4 and -5: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

WG1333098-3: The continuing calibration standard had the response for Perfluorohexanesulfonic Acid-Branched (br-PFHxS) outside of acceptance criteria. The response for Perfluorohexanesulfonic Acid (PFHxS) was within acceptance criteria; therefore, no further action was taken.

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 E O'Neil Susan O' Neil

Title: Technical Director/Representative Date: 01/24/20

ORGANICS

SEMIVOLATILES

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-01
Client ID: MW-209
Sample Location: Not Specified

Date Collected: 12/10/19 10:10
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 16:24
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	3.70		ng/l	1.97	0.402	1
Perfluoropentanoic Acid (PFPeA)	3.63		ng/l	1.97	0.390	1
Perfluorobutanesulfonic Acid (PFBS)	2.09		ng/l	1.97	0.234	1
Perfluorohexanoic Acid (PFHxA)	4.66		ng/l	1.97	0.323	1
Perfluoroheptanoic Acid (PFHpA)	1.38	J	ng/l	1.97	0.222	1
Perfluorohexanesulfonic Acid (PFHxS)	3.14	B	ng/l	1.97	0.370	1
Perfluorooctanoic Acid (PFOA)	2.94		ng/l	1.97	0.232	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	4.74	B	ng/l	1.97	1.31	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.97	0.677	1
Perfluorononanoic Acid (PFNA)	0.378	J	ng/l	1.97	0.307	1
Perfluorooctanesulfonic Acid (PFOS)	5.71	B	ng/l	1.97	0.496	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.97	0.299	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.97	1.19	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.97	0.638	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.97	0.256	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.97	0.964	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.97	0.571	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.97	0.791	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.97	0.366	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.97	0.322	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.97	0.244	1
PFOA/PFOS, Total	8.65	B	ng/l	1.97	0.232	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-01 Date Collected: 12/10/19 10:10

Client ID: MW-209 Date Received: 12/11/19

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)	77		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	98		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	69		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	96		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	79		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	155		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	87		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		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)	134		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	55		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	84		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	17		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	65		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	80		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	72		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-01 RE
Client ID: MW-209
Sample Location: Not Specified

Date Collected: 12/10/19 10:10
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 16:38
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	2.73		ng/l	1.87	0.382	1
Perfluoropentanoic Acid (PFPeA)	1.79	J	ng/l	1.87	0.371	1
Perfluorobutanesulfonic Acid (PFBS)	1.85	J	ng/l	1.87	0.223	1
Perfluorohexanoic Acid (PFHxA)	1.24	J	ng/l	1.87	0.307	1
Perfluoroheptanoic Acid (PFHpA)	0.858	J	ng/l	1.87	0.211	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.87	0.352	1
Perfluorooctanoic Acid (PFOA)	1.15	J	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)	ND		ng/l	1.87	0.292	1
Perfluorooctanesulfonic Acid (PFOS)	0.936	J	ng/l	1.87	0.472	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.87	0.285	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.87	1.13	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2.37		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)	3.22		ng/l	1.87	0.753	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.87	0.348	1
Perfluorotridecanoic Acid (PFTrDA)	0.416	J	ng/l	1.87	0.306	1
Perfluorotetradecanoic Acid (PFTA)	0.491	J	ng/l	1.87	0.232	1
PFOA/PFOS, Total	2.09	J	ng/l	1.87	0.221	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-01 RE Date Collected: 12/10/19 10:10

Client ID: MW-209 Date Received: 12/11/19

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)	98		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	120		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	111		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	83		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	81		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	119		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	96		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	117		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	101		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	113		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	96		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)	95		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	44		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	43		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	70		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	58		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-02
Client ID: MW-210
Sample Location: Not Specified

Date Collected: 12/10/19 09:35
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 16:41
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	3.65		ng/l	1.96	0.400	1
Perfluoropentanoic Acid (PFPeA)	2.26		ng/l	1.96	0.388	1
Perfluorobutanesulfonic Acid (PFBS)	3.22		ng/l	1.96	0.233	1
Perfluorohexanoic Acid (PFHxA)	3.03		ng/l	1.96	0.322	1
Perfluoroheptanoic Acid (PFHpA)	1.58	J	ng/l	1.96	0.221	1
Perfluorohexanesulfonic Acid (PFHxS)	3.57	B	ng/l	1.96	0.369	1
Perfluorooctanoic Acid (PFOA)	5.18		ng/l	1.96	0.231	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	3.89	B	ng/l	1.96	1.30	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.96	0.674	1
Perfluorononanoic Acid (PFNA)	0.796	J	ng/l	1.96	0.306	1
Perfluorooctanesulfonic Acid (PFOS)	6.99	B	ng/l	1.96	0.494	1
Perfluorodecanoic Acid (PFDA)	0.337	J	ng/l	1.96	0.298	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.96	1.19	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.96	0.635	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.96	0.255	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.96	0.961	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.96	0.569	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.96	0.788	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.96	0.365	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.96	0.321	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.96	0.243	1
PFOA/PFOS, Total	12.2	B	ng/l	1.96	0.231	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-02 Date Collected: 12/10/19 09:35

Client ID: MW-210 Date Received: 12/11/19

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)	99		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	124		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	90		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	72		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	75		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	149		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	98		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	95		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	87		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	125		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)	97		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	17		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	82		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	88		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	80		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-02 RE
Client ID: MW-210
Sample Location: Not Specified

Date Collected: 12/10/19 09:35
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 16:54
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	3.30		ng/l	2.14	0.438	1
Perfluoropentanoic Acid (PFPeA)	1.24	J	ng/l	2.14	0.425	1
Perfluorobutanesulfonic Acid (PFBS)	2.98		ng/l	2.14	0.255	1
Perfluorohexanoic Acid (PFHxA)	1.52	J	ng/l	2.14	0.352	1
Perfluoroheptanoic Acid (PFHpA)	1.09	J	ng/l	2.14	0.242	1
Perfluorohexanesulfonic Acid (PFHxS)	0.901	J	ng/l	2.14	0.403	1
Perfluorooctanoic Acid (PFOA)	3.24		ng/l	2.14	0.253	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.14	1.43	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.14	0.738	1
Perfluorononanoic Acid (PFNA)	0.738	J	ng/l	2.14	0.335	1
Perfluorooctanesulfonic Acid (PFOS)	2.14		ng/l	2.14	0.541	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.14	0.326	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.14	1.30	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.14	0.695	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.14	0.279	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.14	1.05	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.14	0.622	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	1.12	J	ng/l	2.14	0.863	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.14	0.399	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.14	0.351	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.14	0.266	1
PFOA/PFOS, Total	5.38		ng/l	2.14	0.253	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-02 RE
Client ID: MW-210
Sample Location: Not Specified

Date Collected: 12/10/19 09:35
Date Received: 12/11/19
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)	84		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	102		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	96		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	77		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	77		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	98		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	84		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	89		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	85		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	92		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	81		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	73		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	33		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	73		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	30		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	33		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	59		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	52		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-03
Client ID: MW-204
Sample Location: Not Specified

Date Collected: 12/10/19 14:00
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 16:57
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	28.8		ng/l	2.00	0.408	1
Perfluoropentanoic Acid (PFPeA)	106		ng/l	2.00	0.396	1
Perfluorobutanesulfonic Acid (PFBS)	5.39		ng/l	2.00	0.238	1
Perfluorohexanoic Acid (PFHxA)	60.2		ng/l	2.00	0.328	1
Perfluoroheptanoic Acid (PFHpA)	42.3		ng/l	2.00	0.225	1
Perfluorohexanesulfonic Acid (PFHxS)	89.2		ng/l	2.00	0.376	1
Perfluorooctanoic Acid (PFOA)	75.3		ng/l	2.00	0.236	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	280		ng/l	2.00	1.33	1
Perfluoroheptanesulfonic Acid (PFHpS)	4.20		ng/l	2.00	0.688	1
Perfluorononanoic Acid (PFNA)	11.3		ng/l	2.00	0.312	1
Perfluorooctanesulfonic Acid (PFOS)	153		ng/l	2.00	0.504	1
Perfluorodecanoic Acid (PFDA)	1.24	J	ng/l	2.00	0.304	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	50.1		ng/l	2.00	1.21	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.648	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.260	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	0.980	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	0.580	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.804	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.372	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	0.327	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.248	1
PFOA/PFOS, Total	228		ng/l	2.00	0.236	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-03 Date Collected: 12/10/19 14:00

Client ID: MW-204 Date Received: 12/11/19

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)	91		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	85		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	90		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	75		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	83		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**304**	Q	1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	91		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88		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)	**249**	Q	7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	83		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	91		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	31		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	107		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	96		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	90		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-04
Client ID: MW-99
Sample Location: Not Specified

Date Collected: 12/10/19 14:36
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 17:31
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	27.6		ng/l	1.94	0.395	1
Perfluoropentanoic Acid (PFPeA)	112		ng/l	1.94	0.384	1
Perfluorobutanesulfonic Acid (PFBS)	3.06		ng/l	1.94	0.231	1
Perfluorohexanoic Acid (PFHxA)	47.6		ng/l	1.94	0.318	1
Perfluoroheptanoic Acid (PFHpA)	36.3		ng/l	1.94	0.218	1
Perfluorohexanesulfonic Acid (PFHxS)	18.3	B	ng/l	1.94	0.364	1
Perfluorooctanoic Acid (PFOA)	31.0		ng/l	1.94	0.229	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	143		ng/l	1.94	1.29	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.94	0.667	1
Perfluorononanoic Acid (PFNA)	11.1		ng/l	1.94	0.302	1
Perfluorooctanesulfonic Acid (PFOS)	38.3		ng/l	1.94	0.488	1
Perfluorodecanoic Acid (PFDA)	1.20	J	ng/l	1.94	0.294	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	49.2		ng/l	1.94	1.17	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	1.45	J	ng/l	1.94	0.628	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.94	0.252	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.94	0.950	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.94	0.562	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	1.12	J	ng/l	1.94	0.779	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.94	0.360	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.94	0.317	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.94	0.240	1
PFOA/PFOS, Total	69.3		ng/l	1.94	0.229	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-04 Date Collected: 12/10/19 14:36

Client ID: MW-99 Date Received: 12/11/19

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)	82		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	74		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	77		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	61		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	70		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	83		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	79		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**253**	Q	1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	84		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	80		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)	**206**	Q	7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	79		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	84		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	32		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	103		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	87		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	84		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-04 RE
Client ID: MW-99
Sample Location: Not Specified

Date Collected: 12/10/19 14:36
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 17:11
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	22.2		ng/l	1.98	0.403	1
Perfluoropentanoic Acid (PFPeA)	80.1		ng/l	1.98	0.391	1
Perfluorobutanesulfonic Acid (PFBS)	2.37		ng/l	1.98	0.235	1
Perfluorohexanoic Acid (PFHxA)	36.8		ng/l	1.98	0.324	1
Perfluoroheptanoic Acid (PFHpA)	28.5		ng/l	1.98	0.222	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.98	0.372	1
Perfluorooctanoic Acid (PFOA)	17.6		ng/l	1.98	0.233	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	114		ng/l	1.98	1.32	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.98	0.680	1
Perfluorononanoic Acid (PFNA)	8.95		ng/l	1.98	0.308	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.98	0.498	1
Perfluorodecanoic Acid (PFDA)	0.866	J	ng/l	1.98	0.300	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39.9		ng/l	1.98	1.20	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2.02		ng/l	1.98	0.640	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.98	0.257	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.98	0.968	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.98	0.573	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.98	0.794	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.98	0.368	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.98	0.323	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.98	0.245	1
PFOA/PFOS, Total	17.6		ng/l	1.98	0.233	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-04 RE
Client ID: MW-99
Sample Location: Not Specified

Date Collected: 12/10/19 14:36
Date Received: 12/11/19
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)	93		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	83		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	96		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	70		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	80		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	109		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	222		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	88		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	74		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	150		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	60		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	74		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	38		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	70		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	67		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	62		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-05
Client ID: MW-1
Sample Location: Not Specified

Date Collected: 12/10/19 13:10
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 17:47
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.760	J	ng/l	1.91	0.389	1
Perfluoropentanoic Acid (PFPeA)	0.931	J	ng/l	1.91	0.378	1
Perfluorobutanesulfonic Acid (PFBS)	0.668	J	ng/l	1.91	0.227	1
Perfluorohexanoic Acid (PFHxA)	2.16		ng/l	1.91	0.313	1
Perfluoroheptanoic Acid (PFHpA)	0.912	J	ng/l	1.91	0.215	1
Perfluorohexanesulfonic Acid (PFHxS)	10.4	B	ng/l	1.91	0.359	1
Perfluorooctanoic Acid (PFOA)	12.9		ng/l	1.91	0.225	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	18.6	B	ng/l	1.91	1.27	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.91	0.656	1
Perfluorononanoic Acid (PFNA)	0.340	J	ng/l	1.91	0.298	1
Perfluorooctanesulfonic Acid (PFOS)	18.0	B	ng/l	1.91	0.481	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.91	0.290	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.91	1.16	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.91	0.618	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.91	0.248	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.91	0.935	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.91	0.553	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.91	0.767	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.91	0.355	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.91	0.312	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.91	0.237	1
PFOA/PFOS, Total	30.9	B	ng/l	1.91	0.225	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-05 Date Collected: 12/10/19 13:10

Client ID: MW-1 Date Received: 12/11/19

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)	70		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	82		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	85		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	57		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	61		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	73		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	170		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	92		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)	136		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)	78		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	21		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	67		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	73		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	71		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-05 RE
Client ID: MW-1
Sample Location: Not Specified

Date Collected: 12/10/19 13:10
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 17:27
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.481	J	ng/l	1.92	0.392	1
Perfluoropentanoic Acid (PFPeA)	0.412	J	ng/l	1.92	0.381	1
Perfluorobutanesulfonic Acid (PFBS)	0.273	J	ng/l	1.92	0.229	1
Perfluorohexanoic Acid (PFHxA)	0.542	J	ng/l	1.92	0.315	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.92	0.216	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.92	0.362	1
Perfluorooctanoic Acid (PFOA)	0.588	J	ng/l	1.92	0.227	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	0.662	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.92	0.300	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.92	0.485	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.92	0.292	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.92	1.16	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.92	0.623	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.92	0.250	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.92	0.942	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.92	0.558	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.92	0.773	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.92	0.358	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.92	0.315	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.92	0.238	1
PFOA/PFOS, Total	0.588	J	ng/l	1.92	0.227	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-05 RE
Client ID: MW-1
Sample Location: Not Specified

Date Collected: 12/10/19 13:10
Date Received: 12/11/19
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)	90		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	104		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	98		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	72		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	70		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	103		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	121		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	85		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	95		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	75		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)	31		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	70		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	35		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	34		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	55		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	48		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-06
Client ID: MW-211
Sample Location: Not Specified

Date Collected: 12/10/19 12:05
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 18:04
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	53.3		ng/l	1.97	0.402	1
Perfluoropentanoic Acid (PFPeA)	241		ng/l	1.97	0.390	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.97	0.234	1
Perfluorohexanoic Acid (PFHxA)	100		ng/l	1.97	0.323	1
Perfluoroheptanoic Acid (PFHpA)	74.6		ng/l	1.97	0.222	1
Perfluorohexanesulfonic Acid (PFHxS)	19.0	B	ng/l	1.97	0.370	1
Perfluorooctanoic Acid (PFOA)	33.1		ng/l	1.97	0.232	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	206		ng/l	1.97	1.31	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.97	0.677	1
Perfluorononanoic Acid (PFNA)	9.09		ng/l	1.97	0.307	1
Perfluorooctanesulfonic Acid (PFOS)	28.6	B	ng/l	1.97	0.496	1
Perfluorodecanoic Acid (PFDA)	0.685	J	ng/l	1.97	0.299	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	23.8		ng/l	1.97	1.19	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.97	0.638	1
Perfluoroundecanoic Acid (PFUnA)	0.264	J	ng/l	1.97	0.256	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.97	0.964	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.97	0.571	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.97	0.791	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.97	0.366	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.97	0.322	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.97	0.244	1
PFOA/PFOS, Total	61.7		ng/l	1.97	0.232	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-06 Date Collected: 12/10/19 12:05

Client ID: MW-211 Date Received: 12/11/19

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)	86		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	68		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	82		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	63		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	73		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	87		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**338**	Q	1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	91		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	86		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)	**286**	Q	7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	91		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	90		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	32		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	106		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	88		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	96		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-06 RE
Client ID: MW-211
Sample Location: Not Specified

Date Collected: 12/10/19 12:05
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 17:44
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	40.8		ng/l	2.03	0.415	1
Perfluoropentanoic Acid (PFPeA)	199		ng/l	2.03	0.402	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.03	0.242	1
Perfluorohexanoic Acid (PFHxA)	84.0		ng/l	2.03	0.333	1
Perfluoroheptanoic Acid (PFHpA)	62.4		ng/l	2.03	0.229	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.03	0.382	1
Perfluorooctanoic Acid (PFOA)	23.1		ng/l	2.03	0.240	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	173		ng/l	2.03	1.35	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.03	0.699	1
Perfluorononanoic Acid (PFNA)	7.72		ng/l	2.03	0.317	1
Perfluorooctanesulfonic Acid (PFOS)	9.65		ng/l	2.03	0.512	1
Perfluorodecanoic Acid (PFDA)	0.598	J	ng/l	2.03	0.309	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	21.2		ng/l	2.03	1.23	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.03	0.658	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.03	0.264	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.03	0.996	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.03	0.589	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.03	0.817	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.03	0.378	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.03	0.332	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.03	0.252	1
PFOA/PFOS, Total	32.8		ng/l	2.03	0.240	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-06 RE Date Collected: 12/10/19 12:05

Client ID: MW-211 Date Received: 12/11/19

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		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	77		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	99		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	75		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	88		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	108		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	101		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**357**	Q	1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	110		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	98		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	91		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**217**	Q	7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	66		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	84		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	36		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	83		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	58		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	49		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-07
Client ID: MW-5
Sample Location: Not Specified

Date Collected: 12/10/19 07:55
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 18:20
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	28.6		ng/l	1.89	0.386	1
Perfluoropentanoic Acid (PFPeA)	127		ng/l	1.89	0.375	1
Perfluorobutanesulfonic Acid (PFBS)	1.28	J	ng/l	1.89	0.225	1
Perfluorohexanoic Acid (PFHxA)	55.0		ng/l	1.89	0.311	1
Perfluoroheptanoic Acid (PFHpA)	32.8		ng/l	1.89	0.213	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.89	0.356	1
Perfluorooctanoic Acid (PFOA)	12.8		ng/l	1.89	0.223	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	43.9	B	ng/l	1.89	1.26	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.89	0.652	1
Perfluorononanoic Acid (PFNA)	1.31	J	ng/l	1.89	0.295	1
Perfluorooctanesulfonic Acid (PFOS)	2.96	B	ng/l	1.89	0.477	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.89	0.288	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.89	1.15	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.89	0.614	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.89	0.246	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.89	0.928	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.89	0.549	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.89	0.761	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.89	0.352	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.89	0.310	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.89	0.235	1
PFOA/PFOS, Total	15.8	B	ng/l	1.89	0.223	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-07 Date Collected: 12/10/19 07:55

Client ID: MW-5 Date Received: 12/11/19

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)	93		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	83		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	77		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	57		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	69		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	88		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	84		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	241		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	95		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	82		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**211**	Q	7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	87		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	39		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	94		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	83		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	74		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-08
Client ID: MW-205
Sample Location: Not Specified

Date Collected: 12/10/19 08:25
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 18:53
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	19.7		ng/l	1.99	0.406	1
Perfluoropentanoic Acid (PFPeA)	24.6		ng/l	1.99	0.394	1
Perfluorobutanesulfonic Acid (PFBS)	1.86	J	ng/l	1.99	0.237	1
Perfluorohexanoic Acid (PFHxA)	14.4		ng/l	1.99	0.327	1
Perfluoroheptanoic Acid (PFHpA)	7.95		ng/l	1.99	0.224	1
Perfluorohexanesulfonic Acid (PFHxS)	3.14	B	ng/l	1.99	0.374	1
Perfluorooctanoic Acid (PFOA)	28.3		ng/l	1.99	0.235	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	2.08	B	ng/l	1.99	1.33	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.99	0.685	1
Perfluorononanoic Acid (PFNA)	1.03	J	ng/l	1.99	0.311	1
Perfluorooctanesulfonic Acid (PFOS)	9.75	B	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	38.1	B	ng/l	1.99	0.235	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-08 Date Collected: 12/10/19 08:25

Client ID: MW-205 Date Received: 12/11/19

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)	94		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	75		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	72		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	53		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	70		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	91		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	242		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	102		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	91		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**246**	Q	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)	103		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	48		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	110		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	92		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	84		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-08 RE
Client ID: MW-205
Sample Location: Not Specified

Date Collected: 12/10/19 08:25
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 18:01
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	15.7		ng/l	1.97	0.402	1
Perfluoropentanoic Acid (PFPeA)	21.1		ng/l	1.97	0.390	1
Perfluorobutanesulfonic Acid (PFBS)	1.41	J	ng/l	1.97	0.234	1
Perfluorohexanoic Acid (PFHxA)	14.1		ng/l	1.97	0.323	1
Perfluoroheptanoic Acid (PFHpA)	7.21		ng/l	1.97	0.222	1
Perfluorohexanesulfonic Acid (PFHxS)	3.07		ng/l	1.97	0.370	1
Perfluorooctanoic Acid (PFOA)	26.7		ng/l	1.97	0.232	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	2.57		ng/l	1.97	1.31	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.97	0.677	1
Perfluorononanoic Acid (PFNA)	0.968	J	ng/l	1.97	0.307	1
Perfluorooctanesulfonic Acid (PFOS)	7.52		ng/l	1.97	0.496	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.97	0.299	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.97	1.19	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.97	0.638	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.97	0.256	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.97	0.964	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.97	0.571	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.97	0.791	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.97	0.366	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.97	0.322	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.97	0.244	1
PFOA/PFOS, Total	34.2		ng/l	1.97	0.232	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-08 RE
Client ID: MW-205
Sample Location: Not Specified

Date Collected: 12/10/19 08:25
Date Received: 12/11/19
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)	99		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	76		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	78		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	60		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	79		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	101		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	97		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	209		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	109		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	101		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	96		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**191**	Q	7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	65		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	102		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	58		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	78		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	81		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	57		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-09
Client ID: MW-203
Sample Location: Not Specified

Date Collected: 12/10/19 09:10
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 19:10
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	17.1		ng/l	2.02	0.411	1
Perfluoropentanoic Acid (PFPeA)	30.6		ng/l	2.02	0.399	1
Perfluorobutanesulfonic Acid (PFBS)	0.677	J	ng/l	2.02	0.240	1
Perfluorohexanoic Acid (PFHxA)	18.2		ng/l	2.02	0.331	1
Perfluoroheptanoic Acid (PFHpA)	13.4		ng/l	2.02	0.227	1
Perfluorohexanesulfonic Acid (PFHxS)	3.38	B	ng/l	2.02	0.379	1
Perfluorooctanoic Acid (PFOA)	8.22		ng/l	2.02	0.238	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.02	1.34	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.02	0.694	1
Perfluorononanoic Acid (PFNA)	0.944	J	ng/l	2.02	0.314	1
Perfluorooctanesulfonic Acid (PFOS)	4.67	B	ng/l	2.02	0.508	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.02	0.306	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.02	1.22	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.02	0.653	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.02	0.262	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.02	0.988	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.02	0.585	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.02	0.810	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.02	0.375	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.02	0.330	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.02	0.250	1
PFOA/PFOS, Total	12.9	B	ng/l	2.02	0.238	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-09 Date Collected: 12/10/19 09:10

Client ID: MW-203 Date Received: 12/11/19

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)	82		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	96		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	86		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	62		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	66		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	83		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	221		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)	80		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**209**	Q	7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	77		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	86		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	30		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	82		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	80		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	71		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-10
Client ID: MW-202
Sample Location: Not Specified

Date Collected: 12/10/19 11:00
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 19:43
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	8.54		ng/l	2.06	0.420	1
Perfluoropentanoic Acid (PFPeA)	5.94		ng/l	2.06	0.407	1
Perfluorobutanesulfonic Acid (PFBS)	2.40		ng/l	2.06	0.245	1
Perfluorohexanoic Acid (PFHxA)	7.28		ng/l	2.06	0.337	1
Perfluoroheptanoic Acid (PFHpA)	2.47		ng/l	2.06	0.232	1
Perfluorohexanesulfonic Acid (PFHxS)	13.3	B	ng/l	2.06	0.387	1
Perfluorooctanoic Acid (PFOA)	7.05		ng/l	2.06	0.243	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.06	1.37	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.06	0.708	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.06	0.321	1
Perfluorooctanesulfonic Acid (PFOS)	15.4	B	ng/l	2.06	0.518	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.06	0.313	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.06	1.25	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.06	0.667	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.06	0.267	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.06	1.01	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.06	0.597	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.06	0.827	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.06	0.383	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.06	0.337	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.06	0.255	1
PFOA/PFOS, Total	22.5	B	ng/l	2.06	0.243	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-10 Date Collected: 12/10/19 11:00

Client ID: MW-202 Date Received: 12/11/19

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)	87		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	105		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	84		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	65		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	71		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	83		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	150		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	87		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	86		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	80		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	137		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	77		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	90		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	25		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	80		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	87		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	78		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-10 RE
Client ID: MW-202
Sample Location: Not Specified

Date Collected: 12/10/19 11:00
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 18:17
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	7.25		ng/l	1.96	0.400	1
Perfluoropentanoic Acid (PFPeA)	4.83		ng/l	1.96	0.388	1
Perfluorobutanesulfonic Acid (PFBS)	2.20		ng/l	1.96	0.233	1
Perfluorohexanoic Acid (PFHxA)	5.98		ng/l	1.96	0.322	1
Perfluoroheptanoic Acid (PFHpA)	1.92	J	ng/l	1.96	0.221	1
Perfluorohexanesulfonic Acid (PFHxS)	11.5		ng/l	1.96	0.369	1
Perfluorooctanoic Acid (PFOA)	6.24		ng/l	1.96	0.231	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.96	1.30	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.96	0.674	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.96	0.306	1
Perfluorooctanesulfonic Acid (PFOS)	11.3		ng/l	1.96	0.494	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.96	0.298	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.96	1.19	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.96	0.635	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.96	0.255	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.96	0.961	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.96	0.569	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.96	0.788	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.96	0.365	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.96	0.321	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.96	0.243	1
PFOA/PFOS, Total	17.5		ng/l	1.96	0.231	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-10 RE
Client ID: MW-202
Sample Location: Not Specified

Date Collected: 12/10/19 11:00
Date Received: 12/11/19
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)	96		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	108		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	101		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	85		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	84		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	104		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	94		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	113		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	92		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	94		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	79		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	66		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	34		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	65		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	39		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	33		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	52		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	48		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-11
Client ID: MW-206
Sample Location: Not Specified

Date Collected: 12/10/19 11:30
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 20:00
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	5.37		ng/l	1.87	0.382	1
Perfluoropentanoic Acid (PFPeA)	2.64		ng/l	1.87	0.371	1
Perfluorobutanesulfonic Acid (PFBS)	1.76	J	ng/l	1.87	0.223	1
Perfluorohexanoic Acid (PFHxA)	2.37		ng/l	1.87	0.307	1
Perfluoroheptanoic Acid (PFHpA)	1.33	J	ng/l	1.87	0.211	1
Perfluorohexanesulfonic Acid (PFHxS)	2.34	B	ng/l	1.87	0.352	1
Perfluorooctanoic Acid (PFOA)	4.83		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)	ND		ng/l	1.87	0.292	1
Perfluorooctanesulfonic Acid (PFOS)	4.62	B	ng/l	1.87	0.472	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.87	0.285	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.87	1.13	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	9.45	B	ng/l	1.87	0.221	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-11 Date Collected: 12/10/19 11:30

Client ID: MW-206 Date Received: 12/11/19

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)	91		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	98		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	86		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	65		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	70		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	206		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	91		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		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)	147		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	72		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	85		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	34		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	78		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	79		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	73		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-11 RE
Client ID: MW-206
Sample Location: Not Specified

Date Collected: 12/10/19 11:30
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 18:34
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	4.87		ng/l	1.99	0.406	1
Perfluoropentanoic Acid (PFPeA)	2.26		ng/l	1.99	0.394	1
Perfluorobutanesulfonic Acid (PFBS)	1.60	J	ng/l	1.99	0.237	1
Perfluorohexanoic Acid (PFHxA)	2.06		ng/l	1.99	0.327	1
Perfluoroheptanoic Acid (PFHpA)	1.19	J	ng/l	1.99	0.224	1
Perfluorohexanesulfonic Acid (PFHxS)	1.86	J	ng/l	1.99	0.374	1
Perfluorooctanoic Acid (PFOA)	4.36		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)	3.10		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	7.46		ng/l	1.99	0.235	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-11 RE Date Collected: 12/10/19 11:30

Client ID: MW-206 Date Received: 12/11/19

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		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	108		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	83		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	85		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	110		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	102		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	156		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	109		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	102		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	91		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	83		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	34		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	75		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	46		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	36		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	56		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	46		33-143

Project Name: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-12
Client ID: TRIP BLANK
Sample Location: Not Specified

Date Collected: 12/10/19 00:00
Date Received: 12/11/19
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 15:02
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.02	0.411	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.02	0.399	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.02	0.240	1
Perfluorohexanoic Acid (PFHxA)	0.468	J	ng/l	2.02	0.331	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.02	0.227	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.02	0.379	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.02	0.238	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.02	1.34	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.02	0.694	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.02	0.314	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.02	0.508	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.02	0.306	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.02	1.22	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.02	0.653	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.02	0.262	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.02	0.988	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.02	0.585	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.02	0.810	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.02	0.375	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.02	0.330	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.02	0.250	1
PFOA/PFOS, Total	ND		ng/l	2.02	0.238	1

Project Name: SAGINAW **Lab Number:** L1959200

Project Number: SAGINAW **Report Date:** 01/24/20

SAMPLE RESULTS

Lab ID: L1959200-12 Date Collected: 12/10/19 00:00

Client ID: TRIP BLANK Date Received: 12/11/19

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		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	112		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	74		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	81		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	76		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	81		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	79		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)	86		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	59		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	79		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	30		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	64		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	77		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	67		33-143

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 13:38
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-12 Batch: WG1321572-1					
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)	0.764	J	ng/l	2.00	0.328
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.225
Perfluorohexanesulfonic Acid (PFHxS)	2.05		ng/l	2.00	0.376
Perfluorooctanoic Acid (PFOA)	1.50	J	ng/l	2.00	0.236
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	4.94		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)	3.25		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	4.75	J	ng/l	2.00	0.236

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/10/20 13:38
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 12/17/19 06:19

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-12 Batch: WG1321572-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	92		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	111		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	82		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	91		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	124		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	96		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	90		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)	139		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	80		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	95		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	35		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	90		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	86		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	80		33-143

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 14:59
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02,04-06,08,10-11 Batch: WG1329599-1					
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)	0.360	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 (PFTrDA)	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: SAGINAW
Project Number: SAGINAW
Lab Number: L1959200
Report Date: 01/24/20

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 01/23/20 14:59
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 01/13/20 18:15

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02,04-06,08,10-11 Batch: WG1329599-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	103		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	111		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	99		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	98		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	107		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	105		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	104		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	103		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	109		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	100		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	101		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	113		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	61		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	102		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	63		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	66		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	89		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	74		33-143

Lab Control Sample Analysis

Batch Quality Control

Project Name: SAGINAW

Project Number: SAGINAW

Lab Number: L1959200

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): 01-12 Batch: WG1321572-2 WG1321572-3								
Perfluorobutanoic Acid (PFBA)	106		112		67-148	6		30
Perfluoropentanoic Acid (PFPeA)	108		116		63-161	7		30
Perfluorobutanesulfonic Acid (PFBS)	99		104		65-157	5		30
Perfluorohexanoic Acid (PFHxA)	108		117		69-168	8		30
Perfluoroheptanoic Acid (PFHpA)	107		115		58-159	7		30
Perfluorohexanesulfonic Acid (PFHxS)	106		113		69-177	6		30
Perfluorooctanoic Acid (PFOA)	111		121		63-159	9		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	132		131		49-187	1		30
Perfluoroheptanesulfonic Acid (PFHpS)	108		116		61-179	7		30
Perfluorononanoic Acid (PFNA)	107		114		68-171	6		30
Perfluorooctanesulfonic Acid (PFOS)	116		117		52-151	1		30
Perfluorodecanoic Acid (PFDA)	103		115		63-171	11		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	128		124		56-173	3		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	118		124		60-166	5		30
Perfluoroundecanoic Acid (PFUnA)	102		114		60-153	11		30
Perfluorodecanesulfonic Acid (PFDS)	121		115		38-156	5		30
Perfluorooctanesulfonamide (FOSA)	99		110		46-170	11		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	101		128		45-170	24		30
Perfluorododecanoic Acid (PFDoA)	107		117		67-153	9		30
Perfluorotridecanoic Acid (PFTrDA)	112		120		48-158	7		30
Perfluorotetradecanoic Acid (PFTA)	114		121		59-182	6		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
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): 01-12 Batch: WG1321572-2 WG1321572-3								

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	93		90		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	107		104		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		87		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	84		81		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89		87		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	99		93		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	92		88		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	109		108		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	96		94		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	95		91		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	89		85		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	117		114		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	71		73		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	98		98		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	42		29		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	87		81		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	92		92		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	77		81		33-143

Lab Control Sample Analysis
Batch Quality Control

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02,04-06,08,10-11 Batch: WG1329599-2 WG1329599-3

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorobutanoic Acid (PFBA)	121		120		67-148	1		30
Perfluoropentanoic Acid (PFPeA)	126		126		63-161	0		30
Perfluorobutanesulfonic Acid (PFBS)	116		116		65-157	0		30
Perfluorohexanoic Acid (PFHxA)	121		122		69-168	1		30
Perfluoroheptanoic Acid (PFHpA)	120		119		58-159	1		30
Perfluorohexanesulfonic Acid (PFHxS)	118		113		69-177	4		30
Perfluorooctanoic Acid (PFOA)	130		126		63-159	3		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	143		138		49-187	4		30
Perfluoroheptanesulfonic Acid (PFHpS)	126		123		61-179	2		30
Perfluorononanoic Acid (PFNA)	123		126		68-171	2		30
Perfluorooctanesulfonic Acid (PFOS)	116		109		52-151	6		30
Perfluorodecanoic Acid (PFDA)	120		120		63-171	0		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	136		148		56-173	8		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	147		136		60-166	8		30
Perfluoroundecanoic Acid (PFUnA)	121		124		60-153	2		30
Perfluorodecanesulfonic Acid (PFDS)	117		113		38-156	3		30
Perfluorooctanesulfonamide (FOSA)	126		126		46-170	0		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	135		120		45-170	12		30
Perfluorododecanoic Acid (PFDoA)	127		132		67-153	4		30
Perfluorotridecanoic Acid (PFTrDA)	143		140		48-158	2		30
Perfluorotetradecanoic Acid (PFTA)	129		122		59-182	6		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
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): 01-02,04-06,08,10-11 Batch: WG1329599-2 WG1329599-3								

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	100		99		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	108		106		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103		101		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	96		98		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	100		104		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	110		108		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	102		103		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	116		114		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	104		106		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	107		105		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		97		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	132		112		7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	64		62		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	101		96		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	69		66		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	66		69		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	82		81		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	73		73		33-143

Matrix Spike Analysis

Batch Quality Control

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

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): 01-12 QC Batch ID: WG1321572-4 QC Sample: L1959200-07 Client ID: MW-5												
Perfluorobutanoic Acid (PFBA)	28.6	37.3	67.4	104		-	-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	127	37.3	167	107		-	-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	1.28J	33	31.7	96		-	-		65-157	-		30
Perfluorohexanoic Acid (PFHxA)	55.0	37.3	94.4	106		-	-		69-168	-		30
Perfluoroheptanoic Acid (PFHpA)	32.8	37.3	72.6	107		-	-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	34	35.1	103		-	-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	12.8	37.3	51.9	105		-	-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	43.9B	35.4	80.8	104		-	-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	35.4	38.7	109		-	-		61-179	-		30
Perfluorononanoic Acid (PFNA)	1.31J	37.3	41.2	110		-	-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	2.96B	34.6	40.1	107		-	-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	ND	37.3	38.2	102		-	-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	35.8	38.0	106		-	-		56-173	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	37.3	40.7	109		-	-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	37.3	37.2	100		-	-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	36	38.1	106		-	-		38-156	-		30
Perfluorooctanesulfonamide (FOSA)	ND	37.3	38.4	103		-	-		46-170	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	37.3	37.2	100		-	-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	ND	37.3	39.1	105		-	-		67-153	-		30
Perfluorotridecanoic Acid (PFTrDA)	ND	37.3	39.8	107		-	-		48-158	-		30
Perfluorotetradecanoic Acid (PFTA)	ND	37.3	40.1	107		-	-		59-182	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: SAGINAW

Project Number: SAGINAW

Lab Number: L1959200

Report Date: 01/24/20

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): 01-12 QC Batch ID: WG1321572-4 QC Sample: L1959200-07 Client ID: MW-5												

Surrogate (Extracted Internal Standard)	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1H,1H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**209**	Q			7-170
1H,1H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**245**	Q			1-244
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	98				23-146
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	89				1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	92				40-144
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	82				38-144
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	58				21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	68				30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93				47-153
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	83				24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	75				33-143
Perfluoro[13C4]Butanoic Acid (MPFBA)	93				2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	82				16-173
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	43				1-87
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	86				42-146
Perfluoro[13C8]Octanoic Acid (M8PFOA)	84				36-149
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	92				34-146
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	79				31-159

Lab Duplicate Analysis
Batch Quality Control

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-12 QC Batch ID: WG1321572-5 QC Sample: L1959200-09 Client ID: MW-203						
Perfluorobutanoic Acid (PFBA)	17.1	18.1	ng/l	6		30
Perfluoropentanoic Acid (PFPeA)	30.6	28.8	ng/l	6		30
Perfluorobutanesulfonic Acid (PFBS)	0.677J	0.706J	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	18.2	16.8	ng/l	8		30
Perfluoroheptanoic Acid (PFHpA)	13.4	12.5	ng/l	7		30
Perfluorohexanesulfonic Acid (PFHxS)	3.38B	2.77	ng/l	20		30
Perfluorooctanoic Acid (PFOA)	8.22	7.78	ng/l	6		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	1.36J	ng/l	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/l	NC		30
Perfluorononanoic Acid (PFNA)	0.944J	0.977J	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	4.67B	4.40	ng/l	6		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonamide (FOSA)	ND	ND	ng/l	NC		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30
Perfluorotridecanoic Acid (PFTrDA)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
Report Date: 01/24/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-12 QC Batch ID: WG1321572-5 QC Sample: L1959200-09 Client ID: MW-203						
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/l	NC		30
PFOA/PFOS, Total	12.9B	12.2	ng/l	6		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	82		89		2-156
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	96		102		16-173
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	86		82		31-159
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	62		64		21-145
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	66		69		30-139
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		91		47-153
Perfluoro[13C8]Octanoic Acid (M8PFOA)	83		86		36-149
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	221		228		1-244
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	89		90		34-146
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		97		42-146
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	80		85		38-144
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**209**	Q	**213**	Q	7-170
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	77		84		1-181
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	86		91		40-144
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	30		34		1-87
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	82		98		23-146
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	80		84		24-161
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	71		77		33-143

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
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(*)
L1959200-01A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-01B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-02A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-02B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-03A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-03B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-04A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-04B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-05A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-05B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-06A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-06B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-07A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-07B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-08A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-08B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-09A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-09B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-10A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-10B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-11A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-11B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)
L1959200-12A	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		A2-NY-537-ISOTOPE(14)

*Values in parentheses indicate holding time in days

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
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(*)
L1959200-12B	2 Plastic/1 Plastic/1 H20 Plastic	A	NA		4.0	Y	Absent		-

*Values in parentheses indicate holding time in days

Project Name: SAGINAW
Project Number: SAGINAW

Lab Number: L1959200
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	PFTrDA	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:	SAGINAW	**Lab Number:**	L1959200
Project Number:	SAGINAW	**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:	SAGINAW	**Lab Number:**	L1959200
Project Number:	SAGINAW	**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:	SAGINAW	**Lab Number:**	L1959200
Project Number:	SAGINAW	**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:	SAGINAW	**Lab Number:**	L1959200
Project Number:	SAGINAW	**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.

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.

179 Lake Avenue, Rochester, NY 14608 Office (585) 647-2530 Fax (585) 647-3311

PARADIGM

CHAIN OF CUSTODY

L1959200

REPORT TO:		INVOICE TO:	
CLIENT:	Paradigm Environmental	CLIENT:	Same
ADDRESS:	179 Lake Avenue	ADDRESS:	
CITY:	Rochester STATE: NY ZIP 14608	CITY: STATE: ZIP:	
PHONE:	585-647-2530	PHONE:	
ATTN:	reporting@paradigmenv.com	ATTN:	accpay@paradigmenv.com

LAB PROJECT ID

Results by 3 PM

Email:

PROJECT REFERENCE

Saginaw

Matrix Codes:
AQ - Aqueous Liquid, NQ - Non-Aqueous Liquid, WA - Water, WG - Groundwater, DW - Drinking Water, WW - Wastewater, SO - Soil, SL - Sludge, SD - Solid, PT - Paint, WP - Wipe, CK - Caulk, OL - Oil, AR - Air

REQUESTED ANALYSIS

	DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX CODES	NUMBER OF CONTAINERS	PFOS/PFAS	REMARKS	PARADIGM LAB SAMPLE NUMBER
-01	12/10/19	1010		X	MW-209	AQ	2	X		
-02	12/10/19	935		X	MW-210	AQ	2	X		
-03	12/10/19	1400		X	MW-204	AQ	2	X		
-04	12/10/19	1436		X	MW-99	AQ	2	X		
-05	12/10/19	1310		X	MW-1	AQ	2	X		
-06	12/10/19	1205		X	MW-211	AQ	2	X		
-07	12/10/19	755		X	MW-5	AQ	2	X		
-08	12/10/19	825		X	MW-205	AQ	2	X		
-09	12/10/19	910		X	MW-203	AQ	2	X		
-10	12/10/19	1100		X	MW-202	AQ	2	X		

Turnaround Time		Report Supplements			
Standard 5 day	☐	None Required	☐	None Required	☐
10 day	☒	Batch QC	☐	Basic EDD	☐
Rush 3 day	☐	Category A	☐	NYSDEC EDD	☒
Rush 2 day	☐	Category B	☒		
Rush 1 day	☐				
Other	☐	Other	☐	Other EDD	☐

Client

Sampled By: John Hoff — Date/Time: 12/10/19

Relinquished By: [signature] AIR — Date/Time: 12/11/19 0915

Received By: [signature] AIR — Date/Time: 12/11/19 0915

Received @ Lab By: Relinquished by: — Date/Time: 12/12/19 0005

[signature] — 12/12/19

179 Lake Avenue, Rochester, NY 14608 Office (585) 647-2530 Fax (585) 647-3311

CHAIN OF CUSTODY

L1959200

PARADIGM

REPORT TO:		INVOICE TO:	
CLIENT:	Paradigm Environmental	CLIENT:	Same
ADDRESS:	179 Lake Avenue	ADDRESS:	
CITY:	Rochester STATE: NY ZIP 14608	CITY: STATE: ZIP:	
PHONE:	585-647-2530	PHONE:	
ATTN:	reporting@paradigmenv.com	ATTN:	accpay@paradigmenv.com

LAB PROJECT ID

Results by 3 PM

Email:

PROJECT REFERENCE

Saginaw

Matrix Codes:
AQ - Aqueous Liquid; NQ - Non-Aqueous Liquid; WA - Water; WG - Groundwater; DW - Drinking Water; WW - Wastewater; SO - Soil; SL - Sludge; SD - Solid; PT - Paint; WP - Wipe; CK - Caulk; OL - Oil; AR - Air

REQUESTED ANALYSIS

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX CODES	NUMBER OF CONTAINERS	PFOS/PFAS	REMARKS	PARADIGM LAB SAMPLE NUMBER
12/10/19	1130		X	MW-206	AQ	2	X		
12/10/19	935		X	Trip Blank	AQ	1	X		

Turnaround Time		Report Supplements			
Standard 5 day	☐	None Required	☐	None Required	☐
10 day	X	Batch QC	☐	Basic EDD	☐
Rush 3 day	☐	Category A	☐	NYSDEC EDD	X
Rush 2 day	☐	Category B	X		
Rush 1 day	☐				
Other	☐	Other	☐	Other EDD	☐

Client Sampled By — Date/Time: 12/10/19

Relinquished By — Date/Time: 12/11/19 0915

Received By — Date/Time: 12/11/19 0915

~~Received @ Lab By~~ Relinquished By: — Date/Time: 12/12/19 0705

12/12/19 0410

12/12/19 0410

179 Lake Avenue, Rochester, NY 14608 Office (585) 647-2530 Fax (585) 647-3311

CHAIN OF CUSTODY

PARADIGM ENVIRONMENTAL SERVICES, INC.

REPORT TO:		INVOICE TO:		
CLIENT:	Inventum Engineering.	CLIENT:		LAB PROJECT ID: 196115
ADDRESS:	491 Carlisle Dr, Ste 202	ADDRESS:		
CITY:	Herndon STATE: VA ZIP: 20170	CITY: STATE: ZIP:		Quotation #:
PHONE:	(571.217.3627)	PHONE:		Email: todd.waldrop@inventumeng.com
ATTN:	Todd Waldrop	ATTN:		

PROJECT REFERENCE: Sag. NAW

Matrix Codes:
AQ - Aqueous Liquid; NQ - Non-Aqueous Liquid; WA - Water; WG - Groundwater; DW - Drinking Water; WW - Wastewater; SO - Soil; SL - Sludge; SD - Solid; PT - Paint; WP - Wipe; CK - Caulk; OL - Oil; AR - Air

REQUESTED ANALYSIS: PFOS/PFAS

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX CODES	NUMBER OF CONTAINERS	PFOS/PFAS	REMARKS	PARADIGM LAB SAMPLE NUMBER
12/10/19	1010		X	MW-209	AQ	2	X		01
	0935		X	MW-210					02
	1400		X	MW-204					03
	1436		X	MW-99					04
	1310		X	MW-1					05
	1205		X	MW-211					06
	0755		X	MW-5					07
	0825		X	MW-205					08
	0910		X	MW-203				Sent directly to	09
	1100		X	MW-202				Sub lab. GP 12/12/19	10

Turnaround Time		Report Supplements			
Availability contingent upon lab approval; additional fees may apply.					
Standard 5 day PFOS/PFAS	☑	None Required	☐	None Required	☐
10 day	☐	Batch QC	☐	Basic EDD	☐
Rush 3 day	☐	Category A	☐	NYSDEC EDD	☑
Rush 2 day	☐	Category B	☑		
Rush 1 day	☐				
Date Needed _____ please indicate date needed: _____	☐	Other please indicate package needed: _____	☐	Other EDD please indicate EDD needed: _____	☐

Sampled By: Todd	Date/Time: 12/10/19 1618	Total Cost:
Relinquished By: Todd	Date/Time: 12/10/19	
Received By: [signature]	Date/Time: 12/10/19	P.I.F.
Received @ Lab By: [signature]	Date/Time: 12/12/19 08:45	

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

See additional page for sample conditions.

179 Lake Avenue, Rochester, NY 14608 Office (585) 647-2530 Fax (585) 647-3311

CHAIN OF CUSTODY

PARADIGM ENVIRONMENTAL SERVICES, INC.

REPORT TO:		INVOICE TO:		
CLIENT: Inventum Engineering		CLIENT:		LAB PROJECT ID
ADDRESS:		ADDRESS:		
CITY: STATE: ZIP		CITY: STATE: ZIP		Quotation #:
PHONE:		PHONE:		Email:
ATTN:		ATTN:		

PROJECT REFERENCE

Saginaw

Matrix Codes:

AQ - Aqueous Liquid; **NQ** - Non-Aqueous Liquid; **WA** - Water; **WG** - Groundwater; **DW** - Drinking Water; **WW** - Wastewater; **SO** - Soil; **SL** - Sludge; **SD** - Solid; **PT** - Paint; **WP** - Wipe; **CK** - Caulk; **OL** - Oil; **AR** - Air

REQUESTED ANALYSIS

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX CODES	NUMBER OF CONTAINERS	PFOS/PFAS										REMARKS	PARADIGM LAB SAMPLE NUMBER
12/10/19	1130		X	MW-206	AQ	2	X	X										11
				TRIP BLANK	AQ	1	X											12
				Page 2 of 2														

Turnaround Time		Report Supplements			
Availability contingent upon lab approval; additional fees may apply.					
Standard 5 day	☐	None Required	☐	None Required	☐
10 day	☐	Batch QC	☐	Basic EDD	☐
Rush 3 day	☐	Category A	☐	NYSDEC EDD	☐
Rush 2 day	☐	Category B	☐		
Rush 1 day	☐				
Date Needed _____ please indicate date needed: _____		Other ☐ please indicate package needed: _____		Other EDD ☐ please indicate EDD needed: _____	

Sampled By	Date/Time 12/10/19 1416	Total Cost:
Relinquished By	Date/Time 12/10/19 1655	
Received By	Date/Time 12/10/19	P.I.F.
Received @ Lab By	Date/Time 12/12/19 0814 5	

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

See additional page for sample conditions.

Chain of Custody Supplement

Client: Inventum Engineering **Completed by:** Glenn Pezzulo

Lab Project ID: 196115 **Date:** 12/12/19

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	☐	☐	☒
Comments			
Transferred to method-compliant container	☐	☐	☐
Headspace (<1 mL)	☐	☐	☐
Comments			
Preservation	☐	☐	☐
Comments			
Chlorine Absent (<0.10 ppm per test strip)	☐	☐	☐
Comments			
Holding Time	☐	☐	☐
Comments			
Temperature	☐	☐	☐
Comments			
Compliant Sample Quantity/Type	☐	☐	☒
Comments	Samples sent directly to sub lab.		

PARADIGM

PARADIGM
ENVIRONMENTAL SERVICES, INC.

Analytical Report For

Inventum Engineering, P.C.

For Lab Project ID

196213

Referencing

Saginaw Site

Prepared

Tuesday, December 24, 2019

Any noncompliant QC parameters or other notes impacting data interpretation are flagged or documented on the final report or are noted below.

Certifies that this report has been approved by the Technical Director or Designee

179 Lake Avenue • Rochester, NY 14608 • (585) 647-2530 • Fax (585) 647-3311 • ELAP ID# 10958

PARADIGM ENVIRONMENTAL SERVICES, INC.

Lab Project ID: 196213

Client: **Inventum Engineering, P.C.**

Project Reference: Saginaw Site

Sample Identifier:	MH-2		
Lab Sample ID:	196213-01	**Date Sampled:**	12/16/2019
Matrix:	Water	**Date Received:**	12/17/2019

Metals

Analyte	Result	Units	Qualifier	Date Analyzed
Lead	<0.010	mg/L		12/23/2019

Method Reference(s): EPA 6010D
EPA 3005A
Subcontractor ELAP ID: 11627

PCBs

Analyte	Result	Units	Qualifier	Date Analyzed
PCB-1016	< 1.03	ug/L		12/19/2019 16:27
PCB-1221	< 1.03	ug/L		12/19/2019 16:27
PCB-1232	< 1.03	ug/L		12/19/2019 16:27
PCB-1242	< 1.03	ug/L		12/19/2019 16:27
PCB-1248	< 1.03	ug/L		12/19/2019 16:27
PCB-1254	< 1.03	ug/L		12/19/2019 16:27
PCB-1260	< 1.03	ug/L		12/19/2019 16:27

Surrogate	Percent Recovery	Limits	Outliers	Date Analyzed
Tetrachloro-m-xylene	**58.9**	14.8 - 92.8		12/19/2019 16:27

Method Reference(s): EPA 608.3
Preparation Date: 12/19/2019

Analytical Report Appendix

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

Each page of this document is part of a multipage report. This document may not be reproduced except in its entirety, without the prior consent of Paradigm Environmental Services, Inc.

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.

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 wi 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 th 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.

179 Lake Avenue, Rochester, NY 14608 Office (585) 647-2530 Fax (585) 647-3311

PARADIGM
ENVIRONMENTAL SERVICES, INC

CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:		
CLIENT:	Inventum	CLIENT:		LAB PROJECT ID: 196213
ADDRESS:	481 Carlisle Dr., Suite 202	ADDRESS:	SAME	
CITY:	Herndon STATE: VA ZIP: 20170	CITY:	STATE: ZIP:	Quotation #:
PHONE:	571-217-3627	PHONE:		Email: todd.waldrop@inventum.com
ATTN:	Todd Waldrop	ATTN:		

PROJECT REFERENCE: Saginaw Site

Matrix Codes:
AQ - Aqueous Liquid; NQ - Non-Aqueous Liquid; WA - Water; WG - Groundwater; DW - Drinking Water; WW - Wastewater; SO - Soil; SL - Sludge; SD - Solid; PT - Paint; WP - Wipe; CK - Caulk; OL - Oil; AR - Air

REQUESTED ANALYSIS

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX CODES	NUMBER OF CONTAINERS	PCBs (608)	T. Lead (6010)								REMARKS	PARADIGM LAB SAMPLE NUMBER
12/16/19	1500		X	MH-2	WA	2	1	1									01

Turnaround Time		Report Supplements			
Availability contingent upon lab approval; additional fees may apply.					
Standard 5 day	X	None Required	☐	None Required	☐
10 day	☐	Batch QC	☐	Basic EDD	☐
Rush 3 day	☐	Category A	☐	NYSDEC EDD	☐
Rush 2 day	☐	Category B	☐		
Rush 1 day	☐				
Date Needed _____ please indicate date needed: _____	☐	Other please indicate package needed: _____	☐	Other EDD please indicate EDD needed: _____	☐

Sampled By	12/16/19 Date/Time	Total Cost:
Relinquished By	12/16/19 Date/Time	
Received By	12/16/19 Date/Time	P.I.F.
Received @ Lab By	12/17/19 15:20 Date/Time	

5 °C iced 12/17/19 15:06

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

See additional page for sample conditions.

PARADIGM ENVIRONMENTAL SERVICES, INC.

Chain of Custody Supplement

Client: Inventum **Completed by:** Glenn Pezzulo

Lab Project ID: 196213 **Date:** 12/18/19

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	X		
Comments			
Transferred to method-compliant container			X
Headspace (<1 mL)			X
Comments			
Preservation	X Metals		X
Comments			
Chlorine Absent (<0.10 ppm per test strip)			X
Comments			
Holding Time	X		
Comments			
Temperature	X		X Metals
Comments	5 °C iced		
Compliant Sample Quantity/Type	X		
Comments			

Serial_No:12241908:39

179 Lake Avenue, Rochester, NY 14608 Office (585) 647-2530 Fax (585) 647-3311

1 of 1

11148

CHAIN OF CUSTODY

NEC

L1960516

REPORT TO:		INVOICE TO:			
COMPANY:	Paradigm Environmental	COMPANY:	Same	LAB PROJECT #:	CLIENT PROJECT #:
ADDRESS:	179 Lake Avenue	ADDRESS:			
CITY: Rochester STATE: NY ZIP: 14608		CITY: STATE: ZIP:		TURNAROUND TIME: (WORKING DAYS)	
PHONE: FAX:		PHONE: FAX:		STD OTHER	
PROJECT NAME/SITE NAME:	ATTN: Reporting	ATTN:	Accounts Payable	☐1 ☐2 ☐3 ☒5	
	COMMENTS: Please email results to reporting@paradigmenv.com			Date Due: 12/26/19	

REQUESTED ANALYSIS

	DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	NUMBER CONTAINERS	Lead	6010	REMARKS	PARADIGM LAB SAMPLE NUMBER
1	12/16/19	15:00		X	196213-01	W	1	X			
2											
3											
4											
5											
6											
7											
8											
9											
10											

LAB USE ONLY BELOW THIS LINE

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

Receipt Parameter	NELAC Compliance	
Container Type:	Y ☐	N ☐
Comments:		
Preservation:	Y ☐	N ☐
Comments:		
Holding Time:	Y ☐	N ☐
Comments:		
Temperature:	Y ☐	N ☐
Comments: Temp 5.8°C		

SRC 12/24/19

Client

Sampled By	Date/Time	12/17/19 16:00
Relinquished By	Date/Time	12/17/19 1730
Received By	Date/Time	12/18/19 01:45
Received By	Date/Time	
Received @ Lab By	Date/Time	

Total Cost:

P.I.F.

Attachment B – IC-EC Forms

Enclosure 2

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

Site No. 915152

Site Name Saginaw - Buffalo

Site Address: 320 Scajaquada St. Zip Code: 14215
City/Town: Buffalo
County: Erie
Site Acreage: 8.631

Reporting Period: ~~May 04, 2018 to May 04, 2019~~
May 04, 2019 to May 04, 2020

YES NO

1. Is the information above correct?

   If NO, include handwritten above or on a separate sheet.

2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period? NO

3. Has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))? NO

4. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period? NO

   If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.

5. Is the site currently undergoing development? NO

Box 2

YES NO

6. Is the current site use consistent with the use(s) listed below?
   COMMERCIAL INDUSTRIAL

7. Are all ICs/ECs in place and functioning as designed? YES

IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

Signature of Owner, Remedial Party or Designated Representative Date

SITE NO. 915152 **Box 3**

Description of Institutional Controls

Parcel	Owner	Institutional Control
101.24-1-3	East Delavan Property, LLC	

i) Inspection and Maintenance of Parking Lot #4.
ii) Groundwater and Sewer Monitoring according to the Operation and Maintenance Manual, dated April 2, 2001.
iii) Modification to O&M Frequency Dated January 4, 2004.
iv) Modification to O&M Frequency Dated September 22, 2008.

Box 4

Description of Engineering Controls

Parcel	Engineering Control
101.24-1-3	Cover System

Box 5

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

   b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

   YES NO

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   (a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

   YES NO

IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

Signature of Owner, Remedial Party or Designated Representative

Date

IC CERTIFICATIONS
SITE NO. 915152

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Jon M. Williams (print name) at East Delavan Property, LLC; 333 Ganson Street (print business address),

am certifying as Owner (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

Signature of Owner, Remedial Party, or Designated Representative Rendering Certification

6/8/2020
Date

IC/EC CERTIFICATIONS

Box 7

Professional Engineer Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I John Black at 481 Carlisle Dr. # 202 Herndon, Virginia 20170
print name print business address

am certifying as a Professional Engineer for the _____
(Owner or Remedial Party)

John P. Black 6/5/2020
Signature of Professional Engineer, for the Owner or Remedial Party, Rendering Certification — Stamp (Required for PE) — Date

STATE OF NEW YORK
JOHN P. BLACK
No. 062818
LICENSED PROFESSIONAL ENGINEER