

Annual Oscoda Area PFAS Groundwater Monitoring Report October 2019 - July 2020

Michigan Department of Environment, Great Lakes, and Energy

Project number: 60612721

February 12, 2021

Prepared for:

Michigan Department of Environment, Great Lakes, and Energy
Remediation and Redevelopment Division, Bay City District
401 Ketchum Street
Bay City, MI 48708

Prepared by:

AECOM
3950 Sparks Drive Southeast
Grand Rapids, MI 49546
acom.com

Copyright © 2020 by AECOM

All rights reserved. No part of this copyrighted work may be reproduced, distributed, or transmitted in any form or by any means without the prior written permission of AECOM.

Table of Contents

1.	Introduction	1
2.	Methods	2
2.1	Static Groundwater Measurements	2
2.2	Groundwater Sampling	2
2.3	Laboratory Analytical	2
3.	Results and Discussion.....	3
3.1	Groundwater Elevation and Flow Direction	3
3.2	Groundwater Analytical.....	3
4.	References.....	4

Figure

Figure 1. Monitoring Well Locations

Tables

Table 1. Measured Static Water Levels and Groundwater Elevation

Table 2. Monitoring Well Sample Analytical Results

Appendices

Appendix A. Groundwater Sampling Field Forms

Appendix B. Laboratory Analytical Reports

Appendix C. Groundwater Elevation and Flow Direction Figures

1. Introduction

Since 2010, concentrations of compounds included in a class of emerging contaminants, per and polyfluroalkyl substances (PFAS), have been detected in samples of groundwater, surface-water, soil, sediment, and biota at and near the former Wurtsmith Air Force Base (WAFB). PFAS compounds have also been detected in potable water wells beyond the WAFB property boundaries.

The detection of PFAS compounds outside the former base prompted the Michigan Department of Environment Great Lakes and Energy (EGLE) to sample residential drinking water wells, municipal water supply wells, and to perform subsurface investigations. In 2017 and 2018, EGLE led subsurface investigations that included the advancement of soil borings (**Figure 1**) and installation of single and nested monitoring wells (i.e., multiple monitoring wells installed in the same location, but at different depths) to further understand and evaluate the nature and location of PFAS compounds in groundwater beyond the WAFB property boundaries.

In February 2018 PFAS were detected above the Michigan Part 201 and Environmental Protection Agency (EPA) Lifetime Health Advisory (LHA) criterion of 70 ng/L Perfluorooctanoic acid (PFOA) plus Perfluorooctane sulfonic acid (PFOS) in GSU well DEQ-CR-MW002. PFAS had previously been detected at this location below the applicable criterion. This prompted EGLE to conduct two years of quarterly sampling (8 total events) of select monitoring wells in the Oscoda Area to better understand seasonal variation in PFAS concentrations.

On August 3, 2020 EGLE promulgated state drinking water standards for the following seven (7) PFAS developed under section 5 of the State Drinking Water Act, 1976 PA 299 [MCL 325.1005]: Perfluorooctanoic acid (PFOA) 8 ng/L, Perfluorooctanesulfonic acid (PFOS) 16 ng/L, Perfluorononanoic acid (PFNA) 6 ng/L, Perfluorohexane sulfonic acid (PFHxS) 51 ng/L, Perfluoro-2- propoxypropanoic acid (HFPO-DA) 370 ng/L, Perfluorobutane sulfonic acid (PFBS) 420 ng/L, and Perfluorohexanoic acid (PFHxA) 400,000 ng/L. EGLE had previously developed generic cleanup criteria for groundwater used as drinking water for PFOA and PFOS and as established under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended [MCL 324.20120a(5)], the new state drinking water standards become the new PFOA and PFOS generic cleanup criteria. Therefore, the previously developed Part 201 generic cleanup criteria for groundwater used as drinking water for a combined concentration of PFOA and PFOS was lowered from 70 ng/L to 8 ng/L PFOA and 16 ng/L PFOS, individually.

On December 21, 2020, pursuant to Section 20120a(23) of Part 201, EGLE established generic cleanup criteria for groundwater used as drinking water for five (5) additional PFAS compounds including PFNA, PFHxS, HFPO-DA, PFBS, and PFHxA. The generic criteria correspond to the state drinking water standards established for each of these compounds in August. These new criteria will also be used in evaluation of analytical results.

This Annual Report (Report) has been prepared to summarize results from the first year of quarterly groundwater sampling performed between October 2019 to July 2020.

2. Methods

2.1 Static Groundwater Measurements

Prior to each sampling event static water levels were measured from monitoring wells throughout the Oscoda Area to determine groundwater elevation and direction of groundwater flow in relation to the monitoring wells being sampled. **Table 1** presents measured static water levels and calculated groundwater elevation for each quarterly sampling event.

2.2 Groundwater Sampling

Up to 20 monitoring wells were selected by EGLE prior to each sampling event. Monitoring wells were sampled using EGLE-approved, low-flow, groundwater sampling techniques. Water quality parameters (i.e. pH, temperature, specific conductance, ORP, turbidity and DO) were monitored and recorded approximately every 5 minutes during purging. Groundwater samples were collected after water quality parameters stabilized for three consecutive readings. Stabilization parameters were as follows: depth to water drawdown <0.33 feet, pH +/- 0.1, Conductivity +/- 3%, Turbidity +/- 10%, DO +/- 10%, Temperature +/- 5%, and ORP +/- 10mV. If water quality parameters did not stabilize after 45 to 60 minutes of readings, the well was sampled, and this deviation was documented on the groundwater sample record sheet. Water quality parameters were documented on sample-specific log sheets (**Appendix A**).

After purging, groundwater samples were collected in PFAS-free sample containers (provided by the laboratory), labeled, transferred to a cooler on ice, and submitted to the laboratory, under chain-of-custody documentation, for analysis. Detailed sampling and handling procedures are provided in EGLE PFAS Sampling Guidance documents.

2.3 Laboratory Analytical

Vista Analytical Laboratory (Vista) in El Dorado Hills, California conducted the PFAS analysis using Modified Environmental Protection Agency's (EPA) Method 537 with isotope dilution. Currently, a published USEPA reference method is not available for the analysis of PFAS in groundwater. In 2009, USEPA published reference Method 537 for finished drinking water, but this method is not appropriate for more complex aqueous matrices. The Modified Method 537 with isotope dilution is an internal standard method. Internal standardization is a determinative technique where a chemical substance similar to the analytes of interest is added to sample extracts to quantify the target analytes. The Department of Defense's accreditation program using DoD QSM Version 5.1 recognizes that isotope dilution is a better technique for quantifying PFAS at low concentrations especially in complex environmental matrices due to these matrix effects and requires isotope dilution quantification where the isotopically labeled analytes of interest are available, and the target compound concentration is not so high that serial dilution or direct injection is appropriate. Isotope Dilution is widely accepted as a better technique for quantification where matrix interference may be present and/or analyte loss may occur during the sample preparation process.

EGLE currently has a recommended list of 28 PFAS to be reported for various environmental matrices (e.g. groundwater, soil, surface water, etc.). This PFAS list was reported for all groundwater samples.

One duplicate sample was collected for every 20 groundwater samples collected. Additionally, field and equipment blanks (if non-disposable equipment were used) were collected at a rate of one per every 20 samples collected. **Appendix B** contains laboratory analytical reports.

3. Results and Discussion

3.1 Groundwater Elevation and Flow Direction

Static water level measurements were collected during each quarterly sampling event (**Table 2**) to observe changes in groundwater elevation and flow direction throughout the year. Due to access issues (e.g. snow cover), or changes in monitoring wells that were sampled from quarter to quarter measured static water levels precluded drafting groundwater contour maps. **Appendix C** includes figures from each quarterly sampling event showing measured groundwater elevations.

General groundwater flow directions from groundwater elevations are consistent with previous investigations and studies (e.g. AECOM Transducer Study, 2019). Groundwater in the vicinity of the High School area flows north toward the Au Sable River. In the Colbath area groundwater flows northeast toward Van Etten Lake. Groundwater flow in the Loud Drive area also flows toward Van Etten Lake on the west side of the groundwater flow divide that extends south from Cedar Lake, and to Lake Huron on the east side of the divide.

3.2 Groundwater Analytical

Analytical results from four quarterly groundwater sampling events are presented in this report: October 2019, January 2020, April 2020, and July 2020 (**Table 2**). Results were compared to both the EPA LHA and the current Michigan PFAS MCLs.

The only sample over the EPA LHA was collected from DEQ-RR-MW005 during the July 2020 sampling event. Previous analytical results from monitoring well DEQ-CR-MW002 in February 2018 were above the EPA LHA. However, during this first year of quarterly sampling analytical results from this well were below the EPA LHA. Concentrations detected in the following monitoring wells exceeded one or more Michigan PFAS Part 201 criteria: DEQ-CR-MW002, DEQ-RR-MW004, DEQ-RR-MW005, DEQ-RR-MW007, DEQ-RR-MW008, RI-MW003 (2-7 ft), RI-MW026 (32-33 ft), RI-MW032 (18-23 ft), RI-MW033 (13-18 ft).

Analyte concentrations over the four quarterly sampling events did not show consistent variation from location to location. While certain locations were relatively consistent (RI-MW008, and DEQ-CR-MW006) others showed increases in PFAS concentrations (e.g. DEQ-RR-MW004, and DEQ-RR-MW005), or decreases in concentrations (e.g. DEQ-RR-MW003, and RI-MW024 [17-18ft]). The additional monitoring data collected during the next year of quarterly sampling will assist in evaluating seasonal variations.

4. References

AECOM. 2020. Groundwater Flow Direction Evaluation East Side of Van Etten Lake Technical Memorandum.

AECOM. 2020. Oscoda Area PFAS Surface Water Sampling Data Summary Report.

Figure

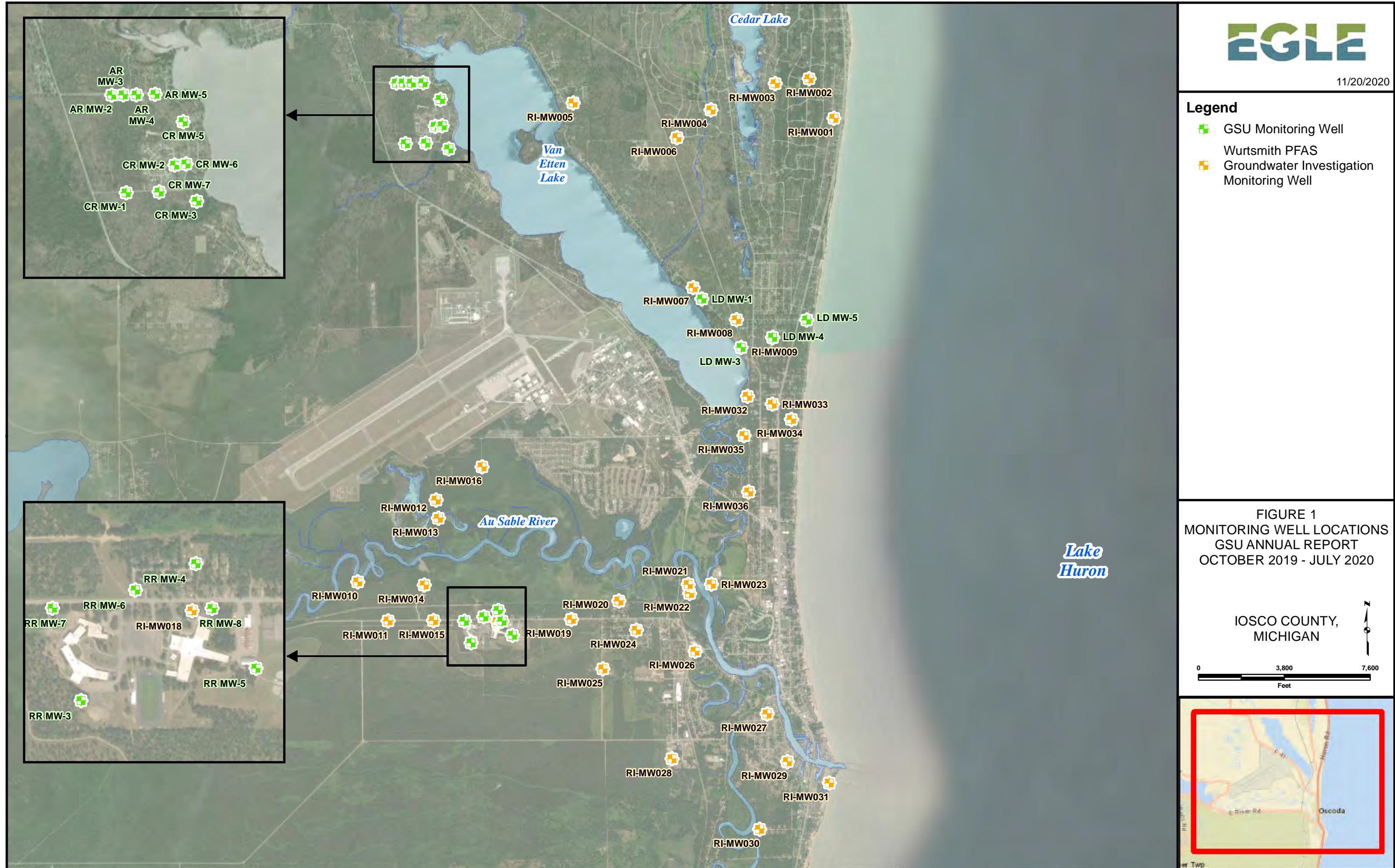
Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well

FIGURE 1
MONITORING WELL LOCATIONS
GSU ANNUAL REPORT
OCTOBER 2019 - JULY 2020

IOSCO COUNTY,
MICHIGAN

0 3,800 7,600
Feet



Tables

Table 1
Annual Report October 2019-July 2020
GSU Monitoring Well Groundwater Elevations
Iosco County, Michigan
60612721

Well ID	Screened Interval (ft bgs)	Northing (ft)	Easting (ft)	Surface Elevation	TOC ft (AMSL)	Oct-19 DTW	Oct-19 GW Elev	Jan-20 DTW	Jan-20 GW Elev	Apr-20 DTW	Apr-20 GW Elev	Jul-20 DTW	Jul-20 GW Elev	Oct-20 DTW	Oct-20 GW Elev
RI-MW001 (3-8 ft)	3-8	427770.5435	19958183.15	589.035425	588.71	4.05	584.66	4.39	584.32	3.17	585.54	4.01	584.70	4.01	584.70
RI-MW001 (17-18 ft)	17-18				588.69	4.01	584.68	2.89	585.80	3.15	585.54	4.00	584.69	3.98	584.71
RI-MW002 (2-7 ft)	2-7	429519.7761	19957085.73	593.02952	592.80	3.02	589.78	1.68	591.12	NM	NA	3.13	589.67	2.78	590.02
RI-MW002 (12-13 ft)	12-13				592.74	2.98	589.76	1.63	591.11	NM	NA	3.10	589.64	2.75	589.99
RI-MW002 (17-18 ft)	17-18				592.83	3.02	589.81	1.75	591.08	NM	NA	3.21	589.62	2.87	589.96
RI-MW003 (2-7 ft)	2-7	429298.8221	19955589.66	603.2731	602.90	1.68	601.22	0.88	602.02	0.80	602.10	1.80	601.10	1.85	601.05
RI-MW003 (16-17 ft)	16-17				602.92	NM	NA	0.88	602.04	0.77	602.15	1.94	600.98	1.95	600.97
RI-MW003 (26-27 ft)	26-27				602.97	NM	NA	0.91	602.06	0.81	602.16	1.99	600.98	2.00	600.97
RI-MW003 (36-37 ft)	36-37				603.01	NM	NA	0.92	602.09	0.83	602.18	2.01	601.00	2.03	600.98
RI-MW003 (46-47 ft)	46-47				602.96	1.80	601.16	0.86	602.10	0.79	602.17	1.97	600.99	1.95	601.01
RI-MW004 (5-10 ft)	5-10	428139.3353	19952755.47	607.50745	606.85	2.79	604.06	2.25	604.60	NM	NA	2.90	603.95	NM	NA
RI-MW004 (19-20 ft)	19-20				606.80	NM	NA	2.22	604.58	NM	NA	2.76	604.04	NM	NA
RI-MW004 (29-30 ft)	29-30				606.81	NM	NA	2.13	604.68	NM	NA	2.77	604.04	NM	NA
RI-MW004 (39-40 ft)	39-40				606.86	NM	NA	2.15	604.71	NM	NA	2.81	604.05	NM	NA
RI-MW004 (49-50 ft)	49-50				606.86	NM	NA	2.16	604.70	NM	NA	2.81	604.05	NM	NA
RI-MW004 (59-60 ft)	59-60				606.83	2.70	604.13	2.08	604.75	NM	NA	2.77	604.06	NM	NA
RI-MW005 (7-12 ft)	7-12	428439.4657	19946663.17	602.1671	601.71	7.94	593.77	NM	NA	9.76	591.95	NM	NA	NM	NA
RI-MW005 (20-21 ft)	20-21				601.75	NM	NA	NM	NA	Dry	NA	NM	NA	NM	NA
RI-MW005 (30-31 ft)	30-31				601.71	NM	NA	NM	NA	4.77	596.94	NM	NA	NM	NA
RI-MW005 (40-41 ft)	40-41				601.86	NM	NA	NM	NA	4.85	597.01	NM	NA	NM	NA
RI-MW005 (51-52 ft)	51-52				601.85	NM	NA	NM	NA	4.86	596.99	NM	NA	NM	NA
RI-MW005 (60-61 ft)	60-61				601.84	8.10	593.74	NM	NA	4.67	597.17	NM	NA	NM	NA
RI-MW006 (5-10 ft)	5-10	426915.5963	19951256.24	608.0446	607.72	5.20	602.52	3.31	604.41	3.23	604.49	4.10	603.62	NM	NA
RI-MW006 (20-21 ft)	20-21				607.73	NM	NA	3.28	604.45	NM	NA	4.14	603.59	NM	NA
RI-MW006 (30-31 ft)	30-31				607.80	NM	NA	3.35	604.45	NM	NA	4.19	603.61	NM	NA
RI-MW006 (40-41 ft)	40-41				607.65	NM	NA	3.22	604.43	NM	NA	4.05	603.60	NM	NA
RI-MW006 (50-51 ft)	50-51				607.70	5.20	602.50	3.25	604.45	3.23	604.47	4.09	603.61	NM	NA
RI-MW007 (5-10 ft)	5-10	420278.739	19951964.99	598.0695333	597.66	7.82	589.84	9.2	588.46	9.25	588.41	NM	NA	7.90	589.76
RI-MW007 (19-20 ft)	19-20				597.70	NM	NA	9.28	588.42	9.18	588.52	NM	NA	7.92	589.78
RI-MW007 (29-30 ft)	29-30				597.70	NM	NA	9.32	588.38	NM	NA	7.69	590.01	8.00	589.70
RI-MW007 (39-40 ft)	39-40				597.67	NM	NA	9.22	588.45	9.18	588.49	7.63	590.04	7.88	589.79
RI-MW007 (48-49 ft)	48-49				597.67	7.82	589.85	9.31	588.36	9.21	588.46	NM	NA	7.88	589.79
RI-MW008 (3-8 ft)	3-8	418861.0284	19953882.48	597.1924	596.99	6.01	590.98	6.13	590.86	6.32	590.67	5.45	591.54	6.11	590.88
RI-MW008 (18-19 ft)	18-19				596.99	NM	NA	6.15	590.84	NM	NA	5.47	591.52	6.11	590.88
RI-MW008 (27.5-28.5 ft)	27.5-28.5				596.98	NM	NA	6.23	590.75	6.37	590.61	5.47	591.51	6.09	590.89
RI-MW008 (37-38 ft)	37-38				597.01	6.03	590.98	6.2	590.81	6.35	590.66	5.51	591.50	6.12	590.89
RI-MW009 (4-9 ft)	4-9	418064.5265	19955482.94	598.5681333	598.34	6.92	591.42	5.76	592.58	5.71	592.63	5.81	592.53	7.24	591.10
RI-MW009 (15-16 ft)	15-16				598.30	NM	NA	NM	NA	NM	NA	5.79	592.51	7.22	591.08
RI-MW009 (21-22 ft)	21-22				598.34	NM	NA	5.77	592.57	NM	NA	5.81	592.53	7.26	591.08
RI-MW009 (26.5-27.5 ft)	26.5-27.5				598.31	NM	NA	5.75	592.56	NM	NA	5.79	592.52	7.25	591.06
RI-MW009 (32-33 ft)	32-33				598.29	6.89	591.40	NM	NA	5.96	592.33	5.78	592.51	7.16	591.13
RI-MW010 (39-44 ft)	39-44	407270.834	19937142	628.087	627.96	37.65	590.31	NM	NA	37.33	590.63	NM	NA	NM	NA
RI-MW010 (55-56 ft)	55-56				627.76	37.70	590.06	NM	NA	37.35	590.41	NM	NA	NM	NA
RI-MW011 (5-10 ft)	5-10	405543.3771	19938479.47	625.02235	NA	Dry	NA	Dry	NA	Dry	NA	Dry	NA	NM	NA
RI-MW011 (21-22 ft)	21-22				624.84	18.37	606.47	18.15	606.69	17.72	607.12	16.32			

Table 1
Annual Report October 2019-July 2020
GSU Monitoring Well Groundwater Elevations
Iosco County, Michigan
60612721

Well ID	Screened Interval (ft bgs)	Northing (ft)	Easting (ft)	Surface Elevation	TOC ft (AMSL)	Oct-19 DTW	Oct-19 GW Elev	Jan-20 DTW	Jan-20 GW Elev	Apr-20 DTW	Apr-20 GW Elev	Jul-20 DTW	Jul-20 GW Elev	Oct-20 DTW	Oct-20 GW Elev
RI-MW013 (2-7 ft)	2-7	410089.439	19940717.31	593.063	592.64	1.29	591.35	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW013 (13.5-14.5 ft)	13.5-14.5				592.60	NM	NA	NA	NA	NM	NA	NM	NA	NM	NA
RI-MW013 (24-25 ft)	24-25				593.01	NM	NA								
RI-MW013 (34-35 ft)	34-35				592.79	3.99	588.80	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW014 (13-18 ft)	13-18	407132.494	19940085.61	606.615	606.44	7.65	598.79	NM	NA	7.04	599.40	NM	NA	7.86	598.58
RI-MW014 (25-26 ft)	25-26				606.41	NM	NA	NA	NA	7.02	599.39	NM	NA	7.85	598.56
RI-MW014 (33-34 ft)	33-34				606.43	NM	NA	NM	NA	6.98	599.45	NM	NA	7.80	598.63
RI-MW014 (42-43 ft)	42-43				606.49	7.62	598.87	NM	NA	7.03	599.46	NM	NA	7.78	598.71
RI-MW015 (5-10 ft)	5-10	405558.7155	19940486.42	622.186575	NA	9.87	NA	Dry	NA	Dry	NA	9.86	NA	9.86	NA
RI-MW015 (17-18 ft)	17-18				621.92	16.18	605.74	15.58	606.34	15.2	606.72	NM	NA	16.51	605.41
RI-MW015 (27-28 ft)	27-28				NA	NM	NA	15.62	NA	15.26	NA	NM	NA	16.58	NA
RI-MW015 (37-38 ft)	37-38				NA	NM	NA	15.48	NA	15.22	NA	NM	NA	16.53	NA
RI-MW015 (47-48 ft)	47-48	412360.719	19942636.34	630.282	NA	16.21	NA	15.51	NA	15.24	NA	14.49	NA	16.57	NA
RI-MW016 (18-23 ft)	18-23				629.78	Dry	NA	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW016 (30-31 ft)	30-31				629.88	28.69	601.19	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW016 (45-46 ft)	45-46				629.90	28.64	601.26	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW016 (60-61 ft)	60-61	405512.7045	19943309.68	616.30966	629.92	NM	NA								
RI-MW016 (75-76 ft)	75-76				629.92	NM	NA								
RI-MW016 (90-91 ft)	90-91				629.87	28.60	601.27	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW018 (8-13 ft)	8-13				616.07	12.28	603.79	11.46	604.61	11.42	604.65	NM	NA	12.53	603.54
RI-MW018 (17-18 ft)	17-18	405613.9099	19946589.89	610.559	616.09	NM	NA	11.61	604.48	11.46	604.63	NM	NA	12.55	603.54
RI-MW018 (27-28 ft)	27-28				616.07	NM	NA	11.45	604.62	11.38	604.69	NM	NA	12.52	603.55
RI-MW018 (37-38 ft)	37-38				616.09	NM	NA	11.52	604.57	11.34	604.75	NM	NA	12.48	603.61
RI-MW018 (47-48 ft)	47-48				616.01	12.20	603.81	11.55	604.46	11.33	604.68	NM	NA	12.44	603.57
RI-MW019 (5-10 ft)	5-10	406424.436	19948682.63	596.48	610.35	Dry	NA	8.74	601.61	Dry	NA	Dry	NA	Dry	NA
RI-MW019 (19-20 ft)	19-20				610.36	11.11	599.25	NM	NA	10.15	600.21	10.33	600.03	11.25	599.11
RI-MW019 (29-30 ft)	29-30				610.35	NM	NA	NM	NA	10.15	600.20	NM	NA	11.24	599.11
RI-MW019 (39-40 ft)	39-40				610.33	NM	NA	NM	NA	10.12	600.21	NM	NA	11.20	599.13
RI-MW019 (49-50 ft)	49-50	407155.4913	19951754.31	587.7623	610.33	11.09	599.24	NM	NA	10.12	600.21	10.33	600.00	11.21	599.12
RI-MW020 (5-10 ft)	5-10				596.06	5.01	591.05	NM	NA	4.7	591.36	NM	NA	NM	NA
RI-MW020 (18-19 ft)	18-19				596.08	NM	NA	NM	NA	4.62	591.46	NM	NA	NM	NA
RI-MW020 (28-29 ft)	28-29				596.15	NM	NA	NM	NA	4.63	591.52	NM	NA	NM	NA
RI-MW020 (38-39 ft)	38-39	406764.3145	19951812.51	589.9070667	596.13	4.97	591.16	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW021 (3-8 ft)	3-8				587.45	4.47	582.98	NM	NA	NM	NA	NM	NA	4.81	582.64
RI-MW021 (12.5-13.5 ft)	12.5-13.5				587.53	4.49	583.04	NM	NA	NM	NA	NM	NA	4.84	582.69
RI-MW022 (7-12 ft)	7-12				589.63	7.29	582.34	NM	NA	NM	NA	NM	NA	7.35	582.28
RI-MW022 (25-26 ft)	25-26	407171.232	19952766.78	585.83965	589.62	7.63	581.99	NM	NA	NM	NA	NM	NA	7.36	582.26
RI-MW023 (4-9 ft)	4-9				585.49	3.61	581.88	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW023 (21-22 ft)	21-22				585.48	3.61	581.87	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW024 (5-10 ft)	5-10	405135.6834	19949462.8	606.0873667	605.89	Dry	NA	NM	NA	Dry	NA	Dry	NA	Dry	NA
RI-MW024 (17-18 ft)	17-18				605.87	12.28	593.59	11.26	594.61	11.14	594.73	10.93	594.94	12.48	593.39
RI-MW024 (26-27 ft)	26-27				605.81	NM	NA	NM	NA	11.09	594.72	NM	NA	12.43	593.38
RI-MW024 (36-37 ft)	36-37				605.84	NM	NA	NM	NA	11.12	594.72	NM	NA	12.44	593.40
RI-MW024 (46-47 ft)	46-47	403419.9597	19947973.72	609.251675	605.83	12.21	593.62	NM	NA	11.15	594.68	10.85	594.98	12.46	593.37
RI-MW025 (5.5-10.5 ft)	5.5-10.5				608.81	7.08	601.73	5.72	603.09	5.41	603.40	5.35	603.46	7.40	601.41
RI-MW025 (1															

Table 1
Annual Report October 2019-July 2020
GSU Monitoring Well Groundwater Elevations
Iosco County, Michigan
60612721

Well ID	Screened Interval (ft bgs)	Northing (ft)	Easting (ft)	Surface Elevation	TOC ft (AMSL)	Oct-19 DTW	Oct-19 GW Elev	Jan-20 DTW	Jan-20 GW Elev	Apr-20 DTW	Apr-20 GW Elev	Jul-20 DTW	Jul-20 GW Elev	Oct-20 DTW	Oct-20 GW Elev
RI-MW026 (16-21 ft)	16-21	404208.8112	19952052.23	603.991525	603.67	18.61	585.06	NM	NA	NM	NA	17.62	586.05	18.70	584.97
RI-MW026 (32-33 ft)	32-33				603.60	NM	NA	18	585.60	NM	NA	17.62	585.98	18.70	584.90
RI-MW026 (45-46 ft)	45-46				603.60	18.60	585.00	NM	NA	NM	NA	17.6	586.00	NM	NA
RI-MW027 (8-13 ft)	8-13	401436.4124	19955234.38	595.983675	595.74	Dry	NA	NM	NA	NM	NA	NM	NA	NM	NA
RI-MW027 (20-21 ft)	20-21				595.73	12.92	582.81	NM	NA	NM	NA	NM	NA	13.16	582.57
RI-MW027 (34.5-35.5 ft)	34.5-35.5				595.63	12.83	582.80	NM	NA	NM	NA	NM	NA	12.97	582.66
RI-MW028 (5-10 ft)	5-10	399449.9951	19951037.04	605.4391	605.19	8.54	596.65	NM	NA	NM	NA	6.79	598.40	8.95	596.24
RI-MW028 (20-21 ft)	20-21				605.10	NM	NA	NM	NA	NM	NA	NM	NA	8.88	596.22
RI-MW028 (31-32 ft)	31-32				605.23	NM	NA								
RI-MW028-4	NA				605.20	NM	NA								
RI-MW028 (48-49 ft)	48-49				605.18	8.58	596.60	NM	NA	NM	NA	6.77	598.41	NM	NA
RI-MW030 (7-12 ft)	7-12	396340.6852	19954910.66	595.222325	594.98	9.27	585.71	8.75	586.23	8.84	586.14	NM	NA	NM	NA
RI-MW030 (24.5-25.5 ft)	24.5-25.5				594.92	NM	NA	8.71	586.21	8.86	586.06	NM	NA	NM	NA
RI-MW030 (36.5-37.5 ft)	36.5-37.5				594.92	NM	NA	8.7	586.22	8.77	586.15	NM	NA	NM	NA
RI-MW030 (45-46 ft)	45-46				594.94	9.21	585.73	8.73	586.21	8.78	586.16	NM	NA	NM	NA
RI-MW032 (18-23 ft)	18-23	415479.341	19954378.23	604.893	604.27	15.31	588.96	16.88	587.39	15.92	588.35	14.93	589.34	15.5	588.77
RI-MW032 (29-30 ft)	29-30				604.36	NM	NA	16.92	587.44	NM	NA	NM	NA	NM	NA
RI-MW032 (37-38 ft)	37-38				604.36	NM	NA	15.92	588.44	NM	NA	NM	NA	NM	NA
RI-MW032 (46-47 ft)	46-47				604.36	15.23	589.13	15.69	588.67	15.62	588.74	14.4	589.96	NM	NA
RI-MW033 (13-18 ft)	13-18	415129.083	19955470.16	599.165	598.79	10.29	588.50	9.41	589.38	9.33	589.46	9.31	589.48	10.56	588.23
RI-MW033 (27.5-28.5 ft)	27.5-28.5				598.75	NM	NA	9.28	589.47	NM	NA	NM	NA	NM	NA
RI-MW033 (35-36 ft)	35-36				598.72	10.78	587.94	9.78	588.94	9.87	588.85	9.81	588.91	NM	NA
RI-MW034 (7.5-12.5 ft)	7.5-12.5	414449.537	19956313.79	589.77	589.18	4.58	584.60	NM	NA	3.45	585.73	4	585.18	4.49	584.69
RI-MW035 (19-24 ft)	19-24	413740.316	19954220.7	609.505	609.04	23.46	585.58	23.17	585.87	23.26	585.78	NM	NA	23.64	585.40
RI-MW035 (30-31 ft)	30-31				609.07	NM	NA	28.31	580.76	NM	NA	NM	NA	23.72	585.35
RI-MW035 (39-40 ft)	39-40				609.11	NM	NA	24.1	585.01	NM	NA	NM	NA	23.7	585.41
RI-MW035 (49-50 ft)	49-50				609.09	23.50	585.59	23.21	585.88	23.3	585.79	NM	NA	23.67	585.42
RI-MW036 (29-34 ft)	29-34	411241.497	19954428.48	614.648	614.49	29.44	585.05	NM	NA	29.75	584.74	NM	NA	NM	NA
RI-MW036 (45-46 ft)	45-46				614.44	NM	NA								
RI-MW036 (55-56 ft)	55-56				614.45	29.70	584.75	NM	NA	28.93	585.52	NM	NA	NM	NA
DEQ-AR-MW005	NA	NA	NA	NA	NA	NA	NA	19.02	NA	18.98	NA	NA	NA	19.46	NA
DEQ-CR-MW001	12-17	440108.93	707175.13	614.9	617.62	NM	NA	NM	NA	NM	NA	18.15	599.47	NM	NA
DEQ-CR-MW002	20-25	427411.50	19940573.30	613.47	613.34	NM	NA	16.2	597.14	16.17	597.17	15.71	597.63	16.84	596.50
DEQ-CR-MW003	12-17	426419.90	19941172.90	610.28	610.25	NM	NA	10.85	599.40	10.91	599.34	10.86	599.39	11.1	599.15
DEQ-CR-MW005	19-24	428596.10	19940800.10	613.47	613.04	NM	NA	18.64	594.40	18.11	594.93	17.35	595.69	18.45	594.59
DEQ-CR-MW006	NA	427441.68	19940879.46	NA	NA	NM	NA	18.46	NA	NM	NA	17.84	NA	18.81	NA
DEQ-LD-MW001	9-14	19952346.10	419783.10	597.69	597.13	NM	NA	8.96	588.17	9.02	588.11	7.37	589.76	7.61	589.52
DEQ-LD-MW003	11-16	19954082.70	417633.70	597.87	597.29	NM	NA	NM	NA	11.23	586.06	9.06	588.23	9.32	587.97
DEQ-LD-MW004	10-15	19955485.00	418076.20	598.82	598.74	NM	NA	NM	NA	5.63	593.11	NM	NA	7.06	591.68
DEQ-LD-MW005	5-10	19956986.60	418855.10	586.91	586.64	NM	NA	NM	NA	0.5	586.14	NM	NA	NM	NA
DEQ-RR-MW003	NA	404572.70	19942151.4	619.69	618.93	NM	NA	10.48	608.45	10.23	608.70	9.84	609.09	11.79	607.14
DEQ-RR-MW004	16-21	406006.30	19943351.8	917.08	616.82	NM	NA	14.41	602.41	14.38	602.44	14.44	602.38	15.23	601.59
DEQ-RR-MW005	13.5-18.5	404911.90	19943977.4	619.63	619.37	NM	NA	11.35	608.02	11.3	608.07	11.28	608.09	12.76	606.61
DEQ-RR-MW006	16-21	405729.20	19942718.8	619.64	618.88	NM	NA	14.73	604.15	14.68	604.20	14.5	604		

PFAS Nomenclature
 GSU Monitoring Well Sampling Analytical Results
 October 2019 - July 2020
 Iosco County, Michigan
 60612721

Chemical Name	Abbreviation	Cas Number
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorononanoic acid	PFNA	375-95-1
Perfluorodecanoic acid	PFDA	335-76-2
Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluorotetradecanoic acid	PFTeDA	376-06-7
11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
Perfluoro-2-propoxypropanoic acid	HFPO-DA	13252-13-6
Perfluorodecane sulfonic acid	PFDS	335-77-3
Perfluorobutane sulfonic acid	PFBS	375-73-5
Perfluoropentane sulfonic acid	PFPeS	2706-91-4
Perfluorohexane sulfonic acid	PFHxS	355-46-4
Perfluoroheptane sulfonic acid	PFHpS	375-92-8
Perfluorooctane sulfonic acid	PFOS	1763-23-1
Perfluorononane sulfonic acid	PFNS	68259-12-1
Perfluorooctanesulfonamide	PFOSA	754-91-6
4:2 Fluorotelomer sulfonic acid	4:2 FTS	757124-72-4
6:2 Fluorotelomer sulfonic acid	6:2 FTS	27619-97-2
8:2 Fluorotelomer sulfonic acid	8:2FTS	39108-34-4
N-Ethyl Perfluorooctane sulfonamido acetic acid	EtFOSAA	2991-50-6
N-Methyl Perfluorooctane sulfonamide	MeFOSAA	2355-31-9

	Perfluoroalkyl Carboxylic Acids (PFCAs)
	Perfluoropolyether carboxylic acids (PFPE)
	Perfluoroalkane Sulfonic Acids (PFSAs)
	Perfluoroalkane Sulfonamides (FASAs)
	Fluorotelomer Sulfonic Acids (FTSAs)
	N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (EtFASAs)
	N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (MeFASAs)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Well Screen Interval (bgs)	Location	DEO-CR-MW002				DEO-CR-MW005				DEO-CR-MW006				
		20 - 25 ft				18 - 23 ft				20 - 25 ft				
		Sample	Sample Date	Lab Report	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.11	2.39 J	1.62 J	2.84 J	< 2.05	< 2.05	< 2.03						
PPPeA	ng/l	< 2.11	< 2.02	< 2.02	1.5 J	< 2.05	< 2.05	< 2.03						
PFHxA	ng/l	< 2.11	< 2.02	2.97 J	1.8 J	< 2.05	< 2.05	< 2.03						
PFHpA	ng/l	< 2.11	3.03 J, Q	4.69 Q	2.07 J	< 2.05	< 2.05	< 2.03						
PFOA	ng/l	2.12 J	7.31	7.65	4.37	< 2.05	< 2.05	< 2.03						
PFNA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFDA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFUnA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFDoA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFTrDA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PTeDA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
11CI-PF3OUdS	ng/l	---	< 2.02	< 2.02	< 2.15	---	< 2.05	< 2.03						
9CI-PF3ONS	ng/l	---	< 2.02	< 2.02	< 2.15	---	< 2.05	< 2.03						
ADONA	ng/l	---	< 2.02	< 2.02	< 2.15	---	< 2.05	< 2.03						
HFPO-DA	ng/l	---	< 3.02	< 3.04	< 3.22	---	< 3.07	< 3.05						
PFDS	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFBS	ng/l	< 2.11	1.93 J	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PPPeS	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFHxS	ng/l	< 2.11	4.93	4.5	1.85 J	< 2.05	< 2.05	< 2.03						
PFHpS	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFOS	ng/l	12.9	41.5	43.9	25.4	< 2.05	< 2.05	< 2.03						
PFNS	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFOSA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
4:2 FTS	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
6:2 FTS	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
8:2 FTS	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
EtFOSAA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03	2.24 J					
MeFOSAA	ng/l	< 2.11	< 2.02	< 2.02	< 2.15	< 2.05	< 2.05	< 2.03						
PFOA+PFOS	ng/L	15.02	48.81	51.55	29.77	ND	ND	ND	2.24					
Total PFAS	ng/l	15.02	61.09	65.33	39.83	ND	ND	2.24						

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. **Highlight** - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. **Highlight** - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Location Well Screen Interval (bgs)	DEO-LD-MW001								DEO-LD-MW003				DEO-LD-MW005				Year 1, Quarter 4 Not Sampled
	10 - 15 ft				10-15 ft				5 - 10 ft								
	Sample Date	GW1910091100RAP	GW2001221215RAP	GW2004151505RL	GW2007151325RL	GW1910091215RAP	GW2001221350RAP	GW2004151350RL	FD2004151350RL	GW2007151240RL	GW1910081710RAP	GW2001221650RAP	GW2004151605RL				
Compound	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result		
PFBA	ng/l	5.93	1.67 J	< 2.04	1.79 J	< 2.17	3.43 J	2.83 J	3.02 J	3.45 J	14.5	13.1	11.9				
PPPeA	ng/l	4.55	< 2.06	< 2.04	< 1.98	1.7 J	6.97	4.5	5.25	7.06	< 2.16	< 2.01	< 2.02				
PFHxA	ng/l	6.81	1.66 J	< 2.04	< 1.98	2.56 J	7.95	4.96	4.59 Q	6.63	< 2.16	< 2.01	< 2.02				
PFHpA	ng/l	2.33 J, Q	< 2.06	< 2.04	< 1.98	< 2.17	2.22 J	1.72 J, Q	1.58 J, Q	< 2.07	< 2.16	< 2.01	< 2.02				
PFOA	ng/l	3.44 J	3.12 J	2.56 J	3.24 J	2.57 J	6.25	4.09	4.68	4.4	2.77 J	2.6 J	2.78 J				
PFNA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFDA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFUnA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFDoA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFTrDA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PTeDA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
11CI-PF3OUdS	ng/l	---	< 2.06	< 2.04	< 1.98	---	< 2.01	< 2.02	< 2.02	< 2.07	---	< 2.01	< 2.02				
9CI-PF3ONS	ng/l	---	< 2.06	< 2.04	< 1.98	---	< 2.01	< 2.02	< 2.02	< 2.07	---	< 2.01	< 2.02				
ADONA	ng/l	---	< 2.06	< 2.04	< 1.98	---	< 2.01	< 2.02	< 2.02	< 2.07	---	< 2.01	< 2.02				
HFPO-DA	ng/l	---	< 3.09	< 3.06	< 2.96	---	< 3.01	< 3.02	< 3.02	< 3.10	---	< 3.01	< 3.04				
PFDS	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFBS	ng/l	3.32 J	2.36 J	2.23 J	2.63 J	1.66 J	2.73 J	2.3 J	2.64 J, Q	3.29 J	9.29	7.79	10.3				
PPPeS	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFHxS	ng/l	3.33 J	1.82 J	1.71 J	3.53 J	< 2.17	2.36 J	1.4 J	1.57 J	2.23 J	4.96	9.49	6.28				
PFHpS	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFOS	ng/l	2.05 J, Q	2.66 J	< 2.04	2.26 J	< 2.17	2.6 J	< 2.02	< 2.02	< 2.07	3.1 J, Q	3.08 J	2.51 J				
PFNS	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFOSA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
4:2 FTS	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
6:2 FTS	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
8:2 FTS	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
EtFOSAA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
MeFOSAA	ng/l	< 2.07	< 2.06	< 2.04	< 1.98	< 2.17	< 2.01	< 2.02	< 2.02	< 2.07	< 2.16	< 2.01	< 2.02				
PFOA+PFOS	ng/L	5.49	5.78	2.56	5.5	2.57	8.85	4.09	4.68	4.4	5.87	5.68	5.29				
Total PFAS	ng/l	31.76	13.29	6.5	13.45	8.49	34.51	21.8	23.33	27.06	34.62	36.06	33.77				

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. **Highlight** - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. **Highlight** - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Well Screen Interval (bgs)	Location	DEO-RR-MW003				DEO-RR-MW004				DEO-RR-MW005												
		12 - 17 ft		17 - 22 ft		13 - 18 ft																
		Sample Date	Lab Report	Sample Date	Lab Report	Sample Date	Lab Report	Sample Date	Lab Report	Sample Date	Lab Report	Sample Date	Lab Report									
PFBA	ng/l	2.09 J		2.38 J		< 1.99		1.49 J		9.59		6.1		4.05		23.5		7.92		24.1		174
PPPeA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		2.66 J		3.07 J		1.82 J		22.6		13.1		14.7		502
PFHxA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		1.91 J		1.67 J, Q		< 2.01		13.7		9.27		10.6		215
PFHpA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		1.41 J		< 2.03		< 2.01		1.62 J		1.99 J, Q		1.93 J, Q		18.7
PFOA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		3.96 J		2.88 J		2.00 J		4.36		8.96		5.17		33.7
PFNA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		6.13
PFDA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		6.86
PFUnA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
PFDoA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
PFTrDA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
PTeDA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
11CI-PF3OUdS	ng/l	---		< 2.02		< 1.99		---		< 2.02		< 2.03		< 2.01		---		< 2.12		< 1.97		< 2.10
9CI-PF3ONS	ng/l	---		< 2.02		< 1.99		---		< 2.02		< 2.03		< 2.01		---		< 2.12		< 1.97		< 2.10
ADONA	ng/l	---		< 2.02		< 1.99		---		< 2.02		< 2.03		< 2.01		---		< 2.12		< 1.97		< 2.10
HFPO-DA	ng/l	---		< 3.02		< 2.99		---		< 3.02		< 3.05		< 3.01		---		< 3.18		< 2.95		< 3.15
PFDS	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		3.16 J		4.32		4.87		11.2 Q
PFBS	ng/l	47.6		8.68		< 1.99		99.1		103		399		611		328		93.7		357		819
PPPeS	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
PFHxS	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		2.87 J		1.69 J		< 2.01		1.98 J		< 2.12		< 1.97		2.14 J
PFHpS	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
PFOS	ng/l	< 2.02		1.87 J		< 1.99		11		18.9		27.5		9.86		39.7		46.5		21.3		150
PFNS	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
PFOSA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		24		12.6		17.1		30.1
4:2 FTS	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
6:2 FTS	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		4.93
8:2 FTS	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
EtFOSAA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
MeFOSAA	ng/l	< 2.02		< 2.02		< 1.99		< 2.09		< 2.02		< 2.03		< 2.01		< 2.03		< 2.12		< 1.97		< 2.10
PFOA+PFOS	ng/L	ND		1.87		ND		11		22.86		30.38		11.86		44.06		55.46		26.47		183.7
Total PFAS	ng/l	49.69		12.93		ND		111.59		144.3		441.91		628.73		462.62		201.84		462.71		1981.4

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. Highlight - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. Highlight - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Well Screen Interval (bgs)	Location	DEO-RR-MW006				DEO-RR-MW007				DEO-RR-MW008			
		11 - 16 ft		10 - 15 ft		8 - 13 ft							
		Sample Date	Lab Report	Sample Date	Lab Report	Sample Date	Lab Report	Sample Date	Lab Report	Sample Date	Lab Report	Sample Date	Lab Report
PFBA	ng/l	3.43 J	2.2 J	< 2.06	< 2.07	1.66 J	2.48 J	< 1.95	< 2.01	9.53	3.3 J	4.2	3.4 J
PPPeA	ng/l	3.36 J	2.73 J	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	41.1	16.1	12.1	10.1
PFHxA	ng/l	3.1 J	2.52 J	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	23.3	10.6	12.5	11.1
PFHpA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	1.77 J	< 2.01	4.93	2.02 J, Q	3.59 J	< 2.04
PFOA	ng/l	1.57 J	1.4 J	< 2.06	< 2.07	5.65	6.7	6.73	4.18	16.8	16	13.9	10.1
PFNA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFDA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFUnA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFDaA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFTrDA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PTeDA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
11CI-PF3OUdS	ng/l	---	< 2.00	< 2.06	< 2.07	---	< 2.11	< 1.95	< 2.01	---	< 2.05	< 1.98	< 2.04
9CI-PF3ONS	ng/l	---	< 2.00	< 2.06	< 2.07	---	< 2.11	< 1.95	< 2.01	---	< 2.05	< 1.98	< 2.04
ADONA	ng/l	---	< 2.00	< 2.06	< 2.07	---	< 2.11	< 1.95	< 2.01	---	< 2.05	< 1.98	< 2.04
HFPO-DA	ng/l	---	< 3.00	< 3.09	< 3.11	---	< 3.16	< 2.93	< 3.01	---	< 3.07	< 2.96	< 3.06
PFDS	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFBS	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	14	22.9	51.6	10.5
PPPeS	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFHxS	ng/l	1.79 J	2.03 J	< 2.06	1.75 J	1.64 J	3.36 J	3.42 J	1.87 J	5.98	4.94	5.34	3.28 J
PFHpS	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFOS	ng/l	6	8.72	3.36 J	< 2.07	41.4	35.9	57.9	39.7	11.6	16	8.56	11.7
PFNS	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFOSA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
4:2 FTS	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
6:2 FTS	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
8:2 FTS	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
EtFOSAA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
MeFOSAA	ng/l	< 2.05	< 2.00	< 2.06	< 2.07	< 2.12	< 2.11	< 1.95	< 2.01	< 2.16	< 2.05	< 1.98	< 2.04
PFOA+PFOS	ng/L	7.57	10.12	3.36	ND	47.05	42.6	64.63	43.88	28.4	32	22.46	21.8
Total PFAS	ng/l	19.25	19.6	3.36	1.75	50.35	48.44	69.82	45.75	127.24	91.86	111.79	60.18

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. **Highlight** - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. **Highlight** - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Location Well Screen Interval (bgs)	RI-MW003 2 - 7 ft				RI-MW004 5 - 10 ft				RI-MW007 39 - 40 ft					
	Sample Date	GW1910091430RAP 10/9/2019 1903624	GW2001221710MK 1/22/2020 2000166	GW2004151325GSC 4/15/2020 2000899	GW2007151830RL 7/15/2020 2001522	Sample Date	GW2007151735RL 7/15/2020 2001522	GW1910090935RAP 10/9/2019 1903624	GW1910090935RAP-FD 10/9/2019 1903624	GW2001221255MK 1/22/2020 2000165	GW2001221255MK-FD 1/22/2020 2000165	GW2004151110GSC 4/15/2020 2000899	GW2007160910RL 7/16/2020 2001523	
	Lab Report					Result	Result	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	8.98	3.04 J	6.27	9.96									
PPPeA	ng/l	7.18	2.02 J	5.77	13.5									
PFHxA	ng/l	8.7	2.87 J	5.73 O	15.5									
PFHpA	ng/l	2.87 J, O	< 2.02	1.37 J, O	3.61 J									
PFOA	ng/l	8.7	3.54 J	3.45 J	7.42									
PFNA	ng/l	1.59 J	< 2.02	< 2.00	1.87 J									
PFDA	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFUnA	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFDoA	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFTrDA	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFTeDA	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
11CI-PF3OUdS	ng/l	---	< 2.02	< 2.00	< 1.99									
9CI-PF3ONS	ng/l	---	< 2.02	< 2.00	< 1.99									
ADONA	ng/l	---	< 2.02	< 2.00	< 1.99									
HFPO-DA	ng/l	---	< 3.02	< 3.00	< 2.99									
PFDS	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFBS	ng/l	3.05 J	< 2.02	2.52 J	3.8 J									
PPPeS	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFHxS	ng/l	4.55	1.45 J	1.66 J	5.17									
PFHpS	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFOS	ng/l	3.75 J	3.76 J	2.26 J	7.6									
PFNS	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFOSA	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
4:2 FTS	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
6:2 FTS	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
8:2 FTS	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
EtFOSAA	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
MeFOSAA	ng/l	< 2.07	< 2.02	< 2.00	< 1.99									
PFOA+PFOS	ng/L	12.45	7.3	5.71	15.02									
Total PFAS	ng/l	49.37	16.68	29.03	68.43									

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. **Highlight** - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. **Highlight** - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Location Well Screen Interval (bgs)	RI-MW008						RI-MW024						RI-MW024					
	27.5 - 28.5 ft						17 - 18 ft						26 - 27 ft					
	Sample Date	GW1910091525RAP	GW2001221500RAP	GW2004151005GSC	GW2007160945RL	GW1910100900GSC	GW1910100900GSC-FD	GW2004141605GSC	GW2007151400GSC	GW2007151400GSC-F	GW1910100945GSC	GW2001231215RAP	GW2004141640GSC					
Compound	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	
PFBA	ng/l	1.98 J	3.7 J	1.56 J	1.85 J	< 2.07	< 2.02	3.55 J	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PPPeA	ng/l	2.67 J	5.26	4.63	4.37	< 2.07	< 2.02	1.67 J	< 1.97	< 2.04	2 J	< 1.96	2.36 J					
PFHxA	ng/l	4.14	10.2	8.88	6.9	< 2.07	< 2.02	2.55 J, Q	< 1.97	< 2.04	3.88 J	2.33 J, Q	3.61 J					
PFHpA	ng/l	1.46 J, Q	4.48 Q	4.54	4.19	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	2.04 J, Q	< 1.96	< 1.99					
PFOA	ng/l	3.08 J	6.05	4.03	3.95 J	2.31 J	2.5 J	3.96 J	1.57 J	< 2.04	1.65 J	2.77 J	3.07 J					
PFNA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFDA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFUnA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFDoA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFTrDA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PTeDA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
11CI-PF3OUdS	ng/l	---	< 1.98	< 1.96	< 2.03	---	---	< 1.99	< 1.97	< 2.04	---	< 1.96	< 1.99					
9CI-PF3ONS	ng/l	---	< 1.98	< 1.96	< 2.03	---	---	< 1.99	< 1.97	< 2.04	---	< 1.96	< 1.99					
ADONA	ng/l	---	< 1.98	< 1.96	< 2.03	---	---	< 1.99	< 1.97	< 2.04	---	< 1.96	< 1.99					
HFPO-DA	ng/l	---	< 2.98	< 2.94	< 3.05	---	---	< 2.99	< 2.95	< 3.06	---	< 2.94	< 2.99					
PFDS	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFBS	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	8.07	7.91	15.3	5.49	4.5	3.98 J	2.69 J	3.74 J, Q					
PPPeS	ng/l	< 2.02	1.56 J, Q	1.54 J, Q	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFHxS	ng/l	4.22	7.91	7	7.59	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	7.07	1.49 J	1.7 J					
PFHpS	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFOS	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFNS	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFOSA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
4:2 FTS	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
6:2 FTS	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
8:2 FTS	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
EtFOSAA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.98	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
MeFOSAA	ng/l	< 2.02	< 1.98	< 1.96	< 2.03	< 2.07	< 2.02	< 1.99	< 1.97	< 2.04	< 2.02	< 1.96	< 1.99					
PFOA+PFOS	ng/L	3.08	6.05	4.03	3.95	2.31	2.5	3.96	1.57	ND	1.65	2.77	3.07					
Total PFAS	ng/l	17.55	39.16	32.18	28.85	10.38	10.41	27.03	7.06	4.5	20.62	9.28	14.48					

Year 1, Quarter 4
Not Sampled

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. **Highlight** - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. **Highlight** - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Location Well Screen Interval (bgs)	RI-MW025			RI-MW026			RI-MW028		
	5.5 - 10.5 ft			32 - 33 ft			5 - 10 ft		
Sample Date	GW2007151315GSC 7/15/2020 2001522	Result	GW2001231320RAP 1/23/2020 2000166	Result	GW2007151440GSC 7/15/2020 2001522	Result	GW2007151515GSC 7/15/2020 2001522	Result	
Lab Report									
Compound	Unit								
PFBA	ng/l								
PPPeA	ng/l								
PFHxA	ng/l								
PFHpA	ng/l								
PFOA	ng/l								
PFNA	ng/l								
PFDA	ng/l								
PFUnA	ng/l								
PFDaA	ng/l								
PFTrDA	ng/l								
PTeDA	ng/l								
11CI-PF3OUdS	ng/l								
9CI-PF3ONS	ng/l								
ADONA	ng/l								
HFPO-DA	ng/l								
PFDS	ng/l								
PFBS	ng/l								
PPPeS	ng/l								
PFHxS	ng/l								
PFHpS	ng/l								
PFOS	ng/l								
PFNS	ng/l								
PFOSA	ng/l								
4:2 FTS	ng/l								
6:2 FTS	ng/l								
8:2 FTS	ng/l								
EtFOSAA	ng/l								
MeFOSAA	ng/l								
PFOA+PFOS	ng/L								
Total PFAS	ng/l								

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. **Highlight** - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. **Highlight** - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Location Well Screen Interval (bgs)	RI-MW030				RI-MW032			
	24 - 25 ft				18 - 23 ft			
	Sample Date	Sample	GW1910101025RAP	GW2001230915RAP	GW2004141735GSC	GW1910091630RAP	GW2001221530MK	GW2004150915GSC
Compound	Unit	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.28	4.77	4.33	6.72	8.18	5.64	8.09
PPPeA	ng/l	< 2.28	< 2.05	< 2.08	9.72	15.1	11.2	13
PFHxA	ng/l	< 2.28	< 2.05	< 2.08	13.4	20.4	19.2	20.3
PFHpA	ng/l	< 2.28	< 2.05	< 2.08	3.87 J	5.84	6.59	8.73
PFOA	ng/l	< 2.28	< 2.05	< 2.08	11.3	15.9	17.9	19.8
PFNA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PFDA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PFUnA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PFDoA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PFTrDA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PTeDA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
11CI-PF3OUdS	ng/l	---	< 2.05	< 2.08	---	< 2.04	< 2.02	< 2.07
9CI-PF3ONS	ng/l	---	< 2.05	< 2.08	---	< 2.04	< 2.02	< 2.07
ADONA	ng/l	---	< 2.05	< 2.08	---	< 2.04	< 2.02	< 2.07
HFPO-DA	ng/l	---	< 3.07	< 3.13	---	< 3.06	< 3.02	< 3.10
PFDS	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PFBS	ng/l	< 2.28	< 2.05	< 2.08	23.8	27.6	23.8	25.6
PPPeS	ng/l	< 2.28	< 2.05	< 2.08	1.52 J	3.38 J	2.92 J	3.13 J
PFHxS	ng/l	< 2.28	< 2.05	< 2.08	44.3	75.2	71.6	88.3
PFHpS	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PFOS	ng/l	< 2.28	2.27 J	< 2.08	1.96 J, Q	3.21 J	< 2.02	2.15 J
PFNS	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PFOSA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
4:2 FTS	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
6:2 FTS	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
8:2 FTS	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
EtFOSAA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
MeFOSAA	ng/l	< 2.28	< 2.05	< 2.08	< 2.16	< 2.04	< 2.02	< 2.07
PFOA+PFOS	ng/L	ND	2.27	ND	13.26	19.11	17.9	21.95
Total PFAS	ng/l	ND	7.04	4.33	116.59	174.81	158.85	189.1

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. **Highlight** - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. **Highlight** - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Table 2
Annual Report October 2019-July 2020
GSU Monitoring Well Analytical Results
Iosco County, Michigan
60612721

Location Well Screen Interval (bgs)	RI-MW033 13 - 18 ft				RI-MW034 7.5 - 12.5 ft			
	Sample Date	GW1910100915RAP 10/10/2019 1903624	GW2001221440MK 1/22/2020 2000165	GW2004150830GSC 4/15/2020 2000899	GW2007151730GSC 7/15/2020 2001522	GW2007151800GSC 7/15/2020 2001522	Result	
	Lab Report							
Compound	Unit	Result	Result	Result	Result	Result		
PFBA	ng/l	2.43 J	5.68	6.51	3.45 J			
PPPeA	ng/l	1.51 J	< 2.02	1.85 J	3.42 J			
PFHxA	ng/l	1.53 J	1.9 J, Q	5.91	4.71			
PFHpA	ng/l	< 2.09	1.68 J	3.3 J	4.68			
PFOA	ng/l	8.14	10.6	14	17			
PFNA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFDA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFUnA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFDoA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFTrDA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PTeDA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
11CI-PF3OUdS	ng/l	---	< 2.02	< 1.98	< 2.05			
9CI-PF3ONS	ng/l	---	< 2.02	< 1.98	< 2.05			
ADONA	ng/l	---	< 2.02	< 1.98	< 2.05			
HFPO-DA	ng/l	---	< 3.02	< 2.96	< 3.07			
PFDS	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFBS	ng/l	3.35 J	2.61 J	6.11	2.97 J			
PPPeS	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFHxS	ng/l	35.9	26.5	22.8	22.3			
PFHpS	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFOS	ng/l	3.86 J	4.96	< 1.98	4.28			
PFNS	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFOSA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
4:2 FTS	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
6:2 FTS	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
8:2 FTS	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
EtFOSAA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
MeFOSAA	ng/l	< 2.09	< 2.02	< 1.98	< 2.05			
PFOA+PFOS	ng/L	12	15.56	14	21.28			
Total PFAS	ng/l	56.72	53.93	60.48	62.81			

Footnotes:

1. bgs - Below ground surface

2. ft = feet

4. ng/l - Nanograms per liter

5. < 2.05 - Result below detection limit

6. --- = Analyte not included in analysis

7. BOLD - Analyte above detection

8. **Highlight** - EPA Lifetime Health Advisory

70 ng/L PFOA+PFOS

9. **Highlight** - Exceeds Michigan Part 201 Criteria

PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),

PFHxS (51 ng/l), HFPO-DA (370 ng/L),

PFBS (420 ng/L), and PFHxA (400,000 ng/L)

Appendix C

Legend

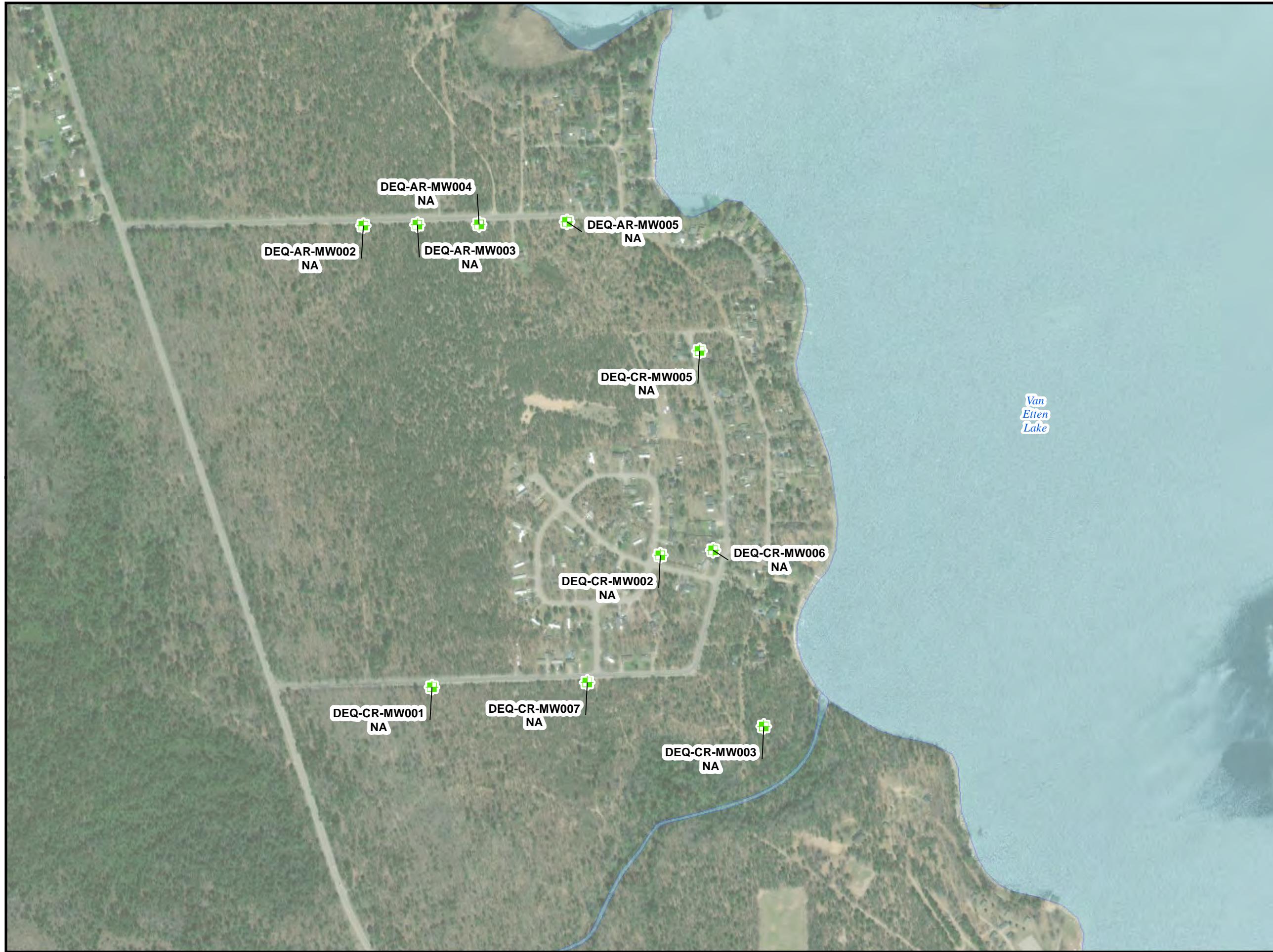
- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well
- NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 1
COLBATH AREA
GROUNDWATER ELEVATION
OCTOBER 2019
SHEET 1 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 550 1,100
Feet



Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well
- NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 2
COLBATH AREA
GROUNDWATER ELEVATION
JANUARY 2020
SHEET 2 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 550 1,100
Feet



Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well
- NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 3
COLBATH AREA
GROUNDWATER ELEVATION
APRIL 2020
SHEET 3 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 550 1,100
Feet



Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well
- NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 4
COLBATH AREA
GROUNDWATER ELEVATION
JULY 2020
SHEET 4 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 550 1,100
Feet



Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well
- NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 1
LOUD DRIVE AREA
GROUNDWATER ELEVATION
OCTOBER 2019
SHEET 1 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 650 1,300
Feet



Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well
- NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 2
LOUD DRIVE AREA
GROUNDWATER ELEVATION
JANUARY 2020
SHEET 2 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 650 1,300
Feet



Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well
- NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 3
LOUD DRIVE AREA
GROUNDWATER ELEVATION
APRIL 2020
SHEET 3 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 650 1,300
Feet



Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well
- NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 4
LOUD DRIVE AREA
GROUNDWATER ELEVATION
JULY 2020
SHEET 4 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 650 1,300
Feet



Au Sable River



11/24/2020

Legend

- GSU Monitoring Well
 - Wurtsmith PFAS
 - Groundwater Investigation Monitoring Well

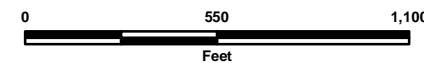
NA = No Measurement

NA = No Measurement

**DRAFT DELIBERATIVE
FOIA EXEMPT**

GSU YEAR 1 QUARTER 1
OSCODA HS AREA
GROUNDWATER ELEVATION
OCTOBER 2019
SHEET 1 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN





EGL

11/24/2020

Legend

- GSU Monitoring Well
 - Wurtsmith PFAS
 - Groundwater Investigation Monitoring Well
- NA = No Measurement

GSU YEAR 1 QUARTER 2
OSCODA HS AREA
GROUNDWATER ELEVATION
JANUARY 2020
SHEET 2 OF 4

OSCODA AREA
IOSCO COUNTY,
MICHIGAN

0 550 1,100
Feet







AECOM
3950 Sparks Drive Southeast
Grand Rapids, MI 49546
aecom.com