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**DATE**

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**PROJECT NUMBER**

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**SUBJECT**

Off-Site PFAS Monitoring Summary & Proposed Scope of Work  
RACER Trust Industrial Land, Plant 6, Lansing, Michigan

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The following provides a summary of the monitoring well installation activities completed in December 2022 to further delineate per- and polyfluoroalkyl substances (PFAS) at RACER Trust, Plant 6 located in Lansing, Michigan (Site). The scope of work was provided to the Michigan Department of Energy Great Lakes and Environment (EGLE) as part of the *Off-Site PFAS VAP Investigation Summary & Proposed Scope of Work*, dated November 1, 2022. The objective of the new and existing off-site monitoring wells is to provide a sentinel monitoring network for off-site PFOA impacts and provide a basis for a City of Lansing ordinance restricting installation of groundwater wells within the impacted area.

Previous investigation results and prior work plans for evaluation of Plant 6 PFAS impacts are summarized in the following submittals provided to EGLE:

- *PFAS Investigation Phase 1 Summary* report, dated January 29, 2019 (Arcadis 2019a);
- *Plant 6 PFAS Investigation Summary – Phase 2* report, dated August 23, 2019 (Arcadis 2019b);
- *Plant 6 PFAS Monitoring Well Installation Summary and Off-Site Investigation Work Plan*, dated August 6, 2021 (Arcadis 2021);
- *2022 Plant 6 PFAS Off-site Investigation* report, dated January 4, 2022 (Arcadis 2022a); and
- *Off-site PFAS Monitoring Summary & Proposed Scope of Work*, dated August 10, 2022 (Arcadis 2022b).
- *Off-Site PFAS VAP Investigation Summary & Proposed Scope of Work*, dated November 1, 2022 (Arcadis 2022c)

Locations of all soil borings, and monitoring well results for the past two quarters, are summarized on **Figure 1**.

## Plant 6 Off-Site Investigation Summary

The investigation at Plant 6 identified concentrations of perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), and perfluorononanoic acid (PFNA) above the current EGLE Residential Drinking Water (DW) Criteria (EGLE 2020) along the northeastern, eastern, and southern Plant 6 property boundaries. Of these, only PFOA has been identified off-site at concentrations greater than the EGLE Residential DW Criteria of 8 nanograms per liter (ng/L).

PFOA at the property boundary and off-site are detected within shallow, more permeable sand and silty sand seams encountered at depths ranging from 5 to 35 feet below ground surface (ft bgs) (Arcadis 2019a, 2019b). Based on the previous investigation results, six monitoring wells were installed at the perimeter of Plant 6 (MW-21-133 through MW-21-135) and within the Michigan Avenue right-of-way (MW-21-136 through MW-21-138) to verify PFAS concentrations at the perimeter and locations for potential downgradient migration.

Additional vertical aquifer profile (VAP) borings and installation of ten monitoring wells to the east and northeast of the Site (MW-22-143 through MW-22-152) were completed in Fall of 2021 and Spring 2022, respectively. Follow-up sampling of the new off-site monitoring wells indicated all were below DW Criteria for PFOA (8 ng/L) with one exception. To the southeast of Plant 6, samples from monitoring well MW-22-145 installed at 10.5-15.5 feet at this location contained a concentration of PFOA ranging from 14 to 16 ng/L.

As a result of the exceedances observed at MW-22-145, vertical aquifer profile (VAP) borings were completed in September 2022 to delineate PFOA impacts. The additional VAP borings were completed in City of Lansing rights-of-way (ROWs) to the east of the southern portion of Plant 6 (Arcadis 2022c). Four out of the five borings did not have a saturated zone from which a sample could be obtained (dry), encountering primarily clay with some intermittent sandy seams. One VAP boring (SB-OS-SS444) located furthest to the east produced enough groundwater to sample. The groundwater sample was collected at SB-OS-SS444 at a depth of 8 to 13 feet bgs and contained PFOA at a concentration of 31 ng/L, exceeding the DW Criteria of 8 ng/L. Boring SB-OS-SS444 is located approximately 400 feet east of MW-22-145 and approximately 1,100 feet east of the Site. Well MW-22-145 is screened in the same shallow depth interval as SB-OS-SS444 and has shown PFOA concentrations ranging from 14 to 16 ng/L (April and June 2022).

In addition to PFOA, SB-OS-SS444 also contained significant concentrations of other PFAS including PFHxS (59 ng/L), PFHxA (24 ng/L), PFOS (16 ng/L) and PFPeS (5.2 ng/L), among others. A summary of the PFAS data and signature evaluation for SB-OS-SS444 was provided as part of the *Off-Site PFAS VAP Investigation Summary & Proposed Scope of Work* (Arcadis 2022c). The PFAS compounds detected appear to be like that of the upgradient wells (off-site MW-22-145; source area well P6-SB-07; and boundary wells MW-13-36R, MW-21-133, and MW-21-134), but the relative concentrations of PFHxS, PFPeS and PFOS are different. The detected concentrations of PFOS, PFPeS and PFHxS are notable because they are significantly higher than the concentrations observed in MW-22-145 or in monitoring wells located along the Plant 6 property boundary. The presence and concentrations of PFOS, PFPeS and PFHxS at SB-OS-SS444 suggests that PFAS in this sample is not associated with the on-site impacts. In particular, PFHxS and PFPeS are not found in Plant 6 groundwater except in trace amounts, typically <1-3 ng/L.

Total Oxidizable Precursor (TOP) Assay has been completed at Plant 6 at two locations (MW-14-67 and P6-SB-07), located within the primary suspected source areas, to evaluate if there are significant amounts of precursors present at the Site that, due to biotransformation, have the potential to add to perfluoroalkyl acid compounds at the source area and/or increase concentrations of perfluoroalkyl acid compounds, including PFOS, PFHxS and PFPeS, as the plume migrates eastward from source areas. The pre- and post-oxidation results are summarized as part of the *Off-Site PFAS VAP Investigation Summary & Proposed Scope of Work* (Arcadis 2022c). The results of the TOP assay do not indicate an increase in PFOS, PFHxS or PFPeS post-oxidation. The PFAS post-oxidation results were within 10% of the pre-oxidation results, within the margin of error for the analytical method. Further, both PFHxS and PFPeS were non-detect in both the pre- and post-oxidation results. This result strongly indicates the on-site PFAS chemistry is not susceptible to increases in PFOS, PFHxS or PFPeS over time due to the presence of precursors.

Further, as an additional line of evidence, since organic carbon partitioning coefficients ( $K_{oc}$ ) for PFOS and PFHxS indicate PFOS and PFHxS are significantly less mobile than PFOA, increasing concentration of these compounds at distance from the Site also suggests a non-site related source for the PFAS detected at SB-OS-SS444.

Based on the PFAS chemistry at the Site, the downgradient results, and the lines of evidence outlined above, it is likely the PFAs impact observed at SB-OS-SS444 are related to another local source. Upon discussion with EGLE, additional sampling at this location or further downgradient was determined to not be necessary.

Following evaluation of the VAP results, three monitoring wells (MW-22-158, MW-22-159, and MW-22-160) were installed east of Plant 6 in November and December 2022. The results of the installation and sampling are provided below.

## Monitoring Well Installation

Three monitoring wells (MW-22-158, MW-22-159, and MW-22-160) were installed upgradient of SB-OS-SS444 via hollow-stem auger at two of the previous VAP boring locations, as well as one new step-out soil boring location (MW-22-160). The monitoring well installations and well development work was completed on November 14 and 15, 2022 and on December 9 to 13, 2022, respectively. The new monitoring well locations are included on **Figure 1**. At each monitoring well location continuous soil cores were collected from the ground surface to a maximum depth of 30 ft bgs. An Arcadis geologist logged and described the soils in accordance with the Arcadis Soil Description Technical Guidance Instruction (TGI, previously submitted and available upon request). Soil boring logs were generated based on the field descriptions and are included in **Attachment 1**. The three monitoring wells were installed to a maximum depth of 31 feet bgs and constructed with a 2-inch diameter PVC riser and 5-foot stainless-steel wire-wrapped 0.010-slot screen (set in the first encountered saturated sand seam). The borings were backfilled with bentonite at the base of the borehole beneath the screen interval. An appropriate sand pack was placed around the screen interval to a depth of 2 feet above the well screen followed by bentonite grout to grade. The well was completed with a steel 8-inch diameter flush-mount cover and locking cap. The new monitoring wells were developed using surge-and-purge methods until reasonably free of fine-grained material.

Two of the three wells were sampled using low-flow sampling methods on December 13 to 15, 2022. To avoid cross contamination, all sampling was conducted in accordance with the Arcadis PFAS Sampling TGI (previously submitted and available upon request). During sampling, well MW-22-159 was dry and a groundwater sample could not be collected. A groundwater sample was also collected from MW-22-158 and MW-22-160.

Groundwater samples were submitted to Pace Analytical Laboratory located in Columbia, South Carolina for the 28 PFAS outlined in the October 2019 EGLE PFAS Minimum Laboratory Analyte List using modified USEPA Method 537 with isotope dilution (DoD QSM 5.3). Laboratory analytical reports are included in **Attachment 2** and groundwater sampling field records are included as **Attachment 3**. Please note that only laboratory analytical reports for data collected from the monitoring wells installed in December 2022 is included in **Attachment 2** and other laboratory analytical reports are contained in previous report submittals.

## Results

A summary of all groundwater analytical data collected from Plant 6 VAP borings and Plant 6 monitoring wells for the last two quarters is provided as **Table 1**. Groundwater sample locations, including monitoring well data for PFOA over the last two quarters is included on **Figure 1**. A summary of the results as follows:

- Geology observed in VAP soil borings completed during the investigation was generally consistent with observations from previous investigations (**Attachment 1**). The geology is dominated by clay with discontinuous layers of sand, silt, and some shallow fill material. Groundwater was encountered within certain of the more permeable sand lenses; however, the permeable zones appear discontinuous. The interbedded clays, silts, and sand lenses are underlain by a dense glacial till, generally encountered at depths of 20 to 35 feet bgs. Several VAP borings contained dry sands and silts below the first encountered water.
- MW-22-159 was dry and a groundwater sample could not be collected.
- Groundwater samples collected from MW-22-158 and MW-22-160 were both non-detect for PFOA with only low-level of detections of other PFAS, and no compounds that exceeded EGLE DW Criteria.

Results from the off-site wells MW-22-158, MW-22-159, and MW-22-160 and other off-site and on-site monitoring successfully delineate the PFAS impacts originating from Plant 6 to current Part 201 criteria. The three new monitoring wells will be integrated into the 2023 Revised Interim Groundwater Monitoring Plan for PFAS monitoring (currently in review). As discussed in the quarterly update meeting on April 4, 2023, the recently proposed USEPA MCLs create uncertainty regarding the levels to which delineation are necessary and the boundaries of a potential well restriction area. Therefore, monitoring will continue east of Plant 6. After four consecutive quarters of monitoring the situation will be evaluated and recommendations for additional monitoring and/or delineation will be developed.

Please direct any questions to Dave Favero at (217) 741-6235 or Patrick Curry at Arcadis at (810) 225-1926.

Christine Matlock  
EGLE  
April 12, 2023

## References:

Arcadis. 2019a. Memorandum, PFAS Investigation Phase 1 Summary. RACER Trust Plant 6, Lansing, Michigan. January 29.

Arcadis. 2019b. Memorandum, Plant 6 PFAS Investigation Summary – Phase 2. RACER Trust Plant 6, Lansing, Michigan. August 23.

Arcadis. 2021. Plant 6 PFAS Monitoring Well Installation Summary and Off-site Investigation Work Plan, RACER Trust Plant 6, Lansing, Michigan. August 6.

Arcadis. 2022a. Plant 6 PFAS Off-Site Investigation Summary. RACER Trust Plant 6, Lansing, Michigan. January 4.

Arcadis. 2022b. Off-Site PFAS Monitoring Summary & Proposed Scope of Work. RACER Trust Industrial Land, Plant 6, Lansing, Michigan. August 10.

## Enclosures:

### TABLE

Table 1 Plant 6 - 2022 VAP and Monitoring Well Groundwater Analytical Results

### FIGURE

Figure 1 Plant 6 PFOA Groundwater Analytical Summary

### ATTACHMENTS

Attachment 1 Soil Boring Logs and Well Construction Diagrams

Attachment 2 Laboratory Analytical Reports

Attachment 3 Groundwater Sampling Field Logs

# Table

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-03-05 06/07/2018 MW-03-05_060718 35-45	MW-03-05 12/01/2021 MW-03-05_120121 35-45	MW-03-05 06/06/2022 MW-03-05_060622 35-45	MW-03-06 06/07/2018 MW-03-06_060718 30-40	MW-03-06 12/01/2021 MW-03-06_120121 30-40	MW-03-06 06/06/2022 MW-03-06_060622 30-40	MW-04-05(6) 12/02/2021 MW-04-05(6)_120221 20-30	MW-04-05(6) 06/02/2022 MW-04-05(6)_060222 20-30	MW-12-10R 03/02/2022 MW-12-10R_030222 10-15	MW-12-10R 06/02/2022 MW-12-10R_060222 10-15	MW-12-11 12/01/2021 MW-12-11_120121 13-18
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
6:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
8:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<7.0	<6.7	<6.4	<6.9 [6.6]	<7.2
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<3.76	NA	NA	<3.78	NA	NA	<b>2.9 J</b>	<b>3.2 J</b>	<b>5</b>	<b>5.5 [7.9]</b>	<3.6
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<42.5	NA	NA	<42.8 X	NA	NA	<b>18</b>	<b>18</b>	<b>6.9</b>	<b>9.6 [9.4]</b>	<b>4.2</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<8.5	NA	NA	<8.55	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<20.2	NA	NA	<20.3	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>35.6</b>	NA	NA	<b>51.5</b>	NA	NA	<b>27</b>	<b>24</b>	<b>2.9 J</b>	<b>3.5 [3.9]</b>	<3.6
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>1.65 J</b>	NA	NA	<6.33	NA	NA	<3.5	<b>2.0 J</b>	<b>1.0 J</b>	<b>&lt;3.5 [1.4 J]</b>	<3.6
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>45.1</b>	NA	NA	<b>117</b>	NA	NA	<b>40</b>	<b>39</b>	<b>3.4</b>	<b>4.5 [4.7]</b>	<b>0.90 J</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluorononanoic acid (PFNA)	6	--	ng/L	NA	NA	NA	NA	NA	NA	<b>0.47 J</b>	<b>0.53 J</b>	<b>0.53 J</b>	<b>0.76 J [0.63 J]</b>	<3.6
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>1.51 J</b>	NA	NA	<6.24	NA	NA	<3.5	<3.4	<b>6.4</b>	<b>7.6 [7.7]</b>	<3.6
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>49.1</b>	NA	NA	<b>6.53</b>	NA	NA	<b>34</b>	<b>32</b>	<b>6.7</b>	<b>8.9 [8.8]</b>	<3.6
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>116</b>	NA	NA	<b>280</b>	NA	NA	<b>33</b>	<b>33</b>	<b>4.1</b>	<b>5.3 [5.3]</b>	<b>1.8 J</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	<3.5	<3.4	<3.2	<3.5 [3.3]	<3.6

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-12-11 06/02/2022 MW-12-11_060222 13-18	MW-12-12 03/04/2021 MW-12-12_030421 13-18	MW-12-12 06/02/2021 MW-12-12_060221 13-18	MW-12-12 09/01/2021 MW-12-12_090121 13-18	MW-12-12 12/01/2021 MW-12-12_120121 13-18	MW-12-12 03/01/2022 MW-12-12_030122 13-18	MW-12-12 06/02/2022 MW-12-12_060222 13-18	MW-12-12 11/09/2022 MW-12-12_110922 13-18	MW-12-13 03/04/2021 MW-12-13_030421 18.5-23.5	MW-12-13 06/02/2021 MW-12-13_060221 18.5-23.5	MW-12-13 08/31/2021 MW-12-13_083121 18.5-23.5
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	<7.2	<7.1	<7.4	<7.0	<7.1	<6.6	<8.0	<7.6 [<7.3]	<7.1	<7.4	<7.0
4:2 FTS	--	--	ng/L	<7.2	<7.1	<7.4	<7.0	<7.1	<6.6	<8.0	<7.6 [<7.3]	<7.1	<7.4	<7.0
6:2 FTS	--	--	ng/L	<7.2	<7.1	<7.4	<7.0	<7.1	<6.6	<b>5.4 J</b>	<7.6 [<7.3]	<7.1	<7.4	<7.0
8:2 FTS	--	--	ng/L	<7.2	<7.1	<7.4	<7.0	<7.1	<6.6	<8.0	<7.6 [<7.3]	<7.1	<7.4	<7.0
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	<7.2	<7.1	<7.4	<7.0	<7.1	<6.6	<8.0	<7.6 [<7.3]	<7.1	<7.4	<7.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<7.2	<7.1	<7.4	<7.0	<7.1	<6.6	<8.0	<7.6 [<7.3]	<7.1	<7.4	<7.0
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<7.2	<3.6	<3.7	<7.0	<7.1	<6.6	<8.0	<7.6 [<7.3]	<3.6	<3.7	<7.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<7.2	<3.6	<3.7	<7.0	<7.1	<6.6	<8.0	<7.6 [<7.3]	<3.6	<3.7	<7.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<7.2	<3.6	<3.7	<7.0	<7.1	<6.6	<8.0	<7.6 [<7.3]	<3.6	<3.7	<7.0
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<3.6	<1.8	<b>1.1 J</b>	<b>2.0 J</b>	<b>1.8 J</b>	<b>2.1 J</b>	<b>2.9 J</b>	<b>1.9 J [1.2 J]</b>	<1.8	<b>1.5 J</b>	<b>1.6 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>5.0</b>	<b>39.8</b>	<b>49</b>	<b>39</b>	<b>41</b>	<b>25</b>	<b>49</b>	<b>45 [48]</b>	<b>37.3</b>	<b>31.2</b>	<b>23</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.6	<1.8	<1.9	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<1.8	<1.9	<3.5
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<3.6	<b>14.2</b>	<b>16.4</b>	<b>15</b>	<b>17</b>	<b>9.5</b>	<b>11</b>	<b>13 [15]</b>	<1.8	<1.9	<3.5
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.6	<1.8	<1.9	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<1.8	<1.9	<3.5
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.6	<1.8	<1.9	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<1.8	<1.9	<3.5
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<3.6	<b>38.4</b>	<b>56.8</b>	<b>48</b>	<b>43</b>	<b>26</b>	<b>52</b>	<b>45 [42]</b>	<b>16.6</b>	<b>13.5</b>	<b>13</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<3.6	<b>3.4</b>	<b>1.7 J</b>	<b>2.1 J</b>	<b>1.5 J</b>	<b>1.3 J</b>	<b>2.0 J</b>	<b>1.9 J [1.6 J]</b>	<1.8	<1.9	<3.5
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>0.78 J</b>	<b>77.9</b>	<b>123</b>	<b>120</b>	<b>96</b>	<b>51</b>	<b>150</b>	<b>120 [120]</b>	<b>70.9</b>	<b>56.4</b>	<b>50</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.6	<1.8	<1.9	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<1.8	<1.9	<3.5
Perfluorononanoic acid (PFNA)	6	--	ng/L	<3.6	<b>9.3</b>	<b>8.5</b>	<b>8.0</b>	<b>8.4</b>	<b>6.0</b>	<b>5.1</b>	<b>7.8 [9.2]</b>	<1.8	<1.9	<3.5
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.6	<3.6	<19	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<3.6	<3.7	<3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<3.6	<b>46.9</b>	<b>48.2</b>	<b>43</b>	<b>50</b>	<b>35</b>	<b>33</b>	<b>43 [47]</b>	<1.8	<b>1.3 J</b>	<3.5
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<3.6	<b>78.7</b>	<b>91.4</b>	<b>82</b>	<b>83</b>	<b>52</b>	<b>90</b>	<b>99 [100]</b>	<b>2.8</b>	<b>1.6 J</b>	<b>2.3 J</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.6	<1.8	<1.9	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<1.8	<1.9	<3.5
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>1.6 J</b>	<b>69.1</b>	<b>94.2</b>	<b>81</b>	<b>59</b>	<b>44</b>	<b>96</b>	<b>71 [74]</b>	<b>46.9</b>	<b>43.2</b>	<b>34</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.6	<1.8	<1.9	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<1.8	<1.9	<3.5
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.6	<1.8	<1.9	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<1.8	<1.9	<3.5
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.6	<1.8	<1.9	<3.5	<3.5	<3.3	<4.0	<3.8 [<3.6]	<1.8	<1.9	<3.5

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-12-13 11/30/2021 MW-12-13_113021 18.5-23.5	MW-12-13 06/02/2022 MW-12-13_030122 18.5-23.5	MW-12-13 11/09/2022 MW-12-13_110922 18.5-23.5	MW-12-14 06/09/2015 MW-12-14_060915 25-30	MW-12-14 05/10/2016 MW-12-14_051016 25-30	MW-12-15 05/14/2018 MW-12-15_051418 18-23	MW-12-15 03/05/2021 MW-12-15_030521 18-23	MW-12-16 06/10/2019 MW-12-16_061019 28-33	MW-12-16 03/05/2021 MW-12-16_030521 28-33	MW-13-36R 03/04/2021 MW-13-36R_030421 5.5-10.5	MW-13-36R 06/02/2021 MW-13-36R_060221 5.5-10.5
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<36	NA	<7.1	<7.1 [<7.1]	<7.1 [<7.1]
4:2 FTS	--	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<7.1	NA	<7.1	<7.1 [<7.1]	<7.1 [<7.1]
6:2 FTS	--	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<7.1	NA	<7.1	<7.1 [<7.1]	<7.1 [<7.1]
8:2 FTS	--	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<7.1	NA	<7.1	<7.1 [<7.1]	<7.1 [<7.1]
9CI-PF3ONS (F-53B Major)	--	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<7.1	NA	<7.1	<7.1 [<7.1]	<7.1 [<7.1]
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<7.1	NA	<7.1	<7.1 [<7.1]	<7.1 [<7.1]
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<3.6	NA	<18	<3.6 [<3.6]	<3.6 [<3.6]
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<3.6	NA	<3.6	<b>4.6 [5]</b>	<b>6 [6.4]</b>
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<7.0	<6.7	<7.1	NA	NA	NA	<3.6	NA	<3.6	<b>2.9 J [2.8 J]</b>	<b>3.6 [3.8]</b>
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>3.9</b>	<b>2.4 J</b>	<b>4.6</b>	NA	NA	NA	<1.8	NA	<1.8	<b>3.6 [2.9]</b>	<b>1.9 [2.1]</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>25</b>	<b>24</b>	<b>26</b>	NA	NA	NA	<b>5.9</b>	NA	<b>5.5</b>	<b>30.9 [30.3]</b>	<b>38.7 [33.6]</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<1.8	<1.8 [<1.8]	<b>1.5 J [&lt;1.8]</b>
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<1.8	<b>20.9 [20.4]</b>	<b>24.5 [24.4]</b>
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<8.9	NA	<1.8	<1.8 [<1.8]	<1.8 [<1.8]
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<1.8	<1.8 [<1.8]	<1.8 [<1.8]
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>15</b>	<b>12</b>	<b>17</b>	NA	NA	NA	<b>1.2 J</b>	NA	<b>1.8</b>	<b>41.7 [43.2]</b>	<b>34 [33.8]</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<1.8	<b>2.2 [5.5]</b>	<b>1.1 J [1.4 J]</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>53</b>	<b>52</b>	<b>57</b>	NA	NA	NA	<b>2.5</b>	NA	<b>5.1</b>	<b>38.6 [37.5]</b>	<b>29.2 [29.9]</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<1.8	<1.8 [<1.8]	<1.8 [<1.8]
Perfluorononanoic acid (PFNA)	6	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<1.8	<b>16.5 [15.6]</b>	<b>15 [15.7]</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<18	NA	<3.6	<b>6.6 [6.1]</b>	<b>6.2 [6.1]</b>
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<b>0.92 J</b>	<b>47.9 [44.7]</b>	<b>48.6 [50.7]</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>2.2 J</b>	<b>2.2 J</b>	<b>4.1</b>	NA	NA	NA	<b>1.5 J</b>	NA	<b>3</b>	<b>81.1 [79.6]</b>	<b>70.1 [70.3]</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<1.8	<1.8 [<1.8]	<1.8 [<1.8]
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>39</b>	<b>38</b>	<b>36</b>	NA	NA	NA	<b>2.6</b>	NA	<b>5.1 J</b>	<b>34.4 [33.9]</b>	<b>38.8 [30.2]</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<8.9	NA	<8.9	<1.8 [<1.8]	<1.8 [<1.8]
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<8.9	NA	<1.8	<1.8 [<1.8]	<1.8 [<1.8]
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.5	<3.3	<3.5	NA	NA	NA	<1.8	NA	<1.8	<b>&lt;1.8 [1 J]</b>	<1.8 [<1.8]

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-13-36R 09/01/2021 MW-13-36R_090121 5.5-10.5	MW-13-36R 11/30/2021 MW-13-36R_113021 5.5-10.5	MW-13-36R 03/01/2022 MW-13-36R_030122 5.5-10.5	MW-13-36R 06/02/2022 MW-13-36R_060222 5.5-10.5	MW-13-36R 06/06/2022 MW-13-36R_060622 5.5-10.5	MW-13-36R 11/09/2022 MW-13-36R_110922 5.5-10.5	MW-14-66 06/03/2022 MW-14-66_060322 14-19	MW-14-67 03/04/2021 MW-14-67_030421 13-18	MW-14-67 06/02/2021 MW-14-67_060221 13-18	MW-14-67 08/31/2021 MW-14-67_083121 13-18	MW-14-67 12/01/2021 MW-14-67_120121 13-18
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	<6.8	<7.1	<6.7	<7.5	NA	<7.1	NA	<7.1	<7.1	<6.9	<7.0
4:2 FTS	--	--	ng/L	<6.8	<7.1	<6.7	<7.5	NA	<7.1	NA	<7.1	<7.1	<6.9	<7.0
6:2 FTS	--	--	ng/L	<6.8	<7.1	<6.7	<7.5	NA	<7.1	NA	<7.1	<7.1	<6.9	<7.0
8:2 FTS	--	--	ng/L	<6.8	<7.1	<6.7	<7.5	NA	<7.1	NA	<7.1	<7.1	<6.9	<7.0
9CI-PF3ONS (F-53B Major)	--	--	ng/L	<6.8	<7.1	<6.7	<7.5	NA	<7.1	NA	<7.1	<7.1	<6.9	<7.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<6.8	<7.1	<6.7	<7.5	NA	<7.1	NA	<7.1	<7.1	<6.9	<7.0
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<6.8	<7.1	<6.7	<7.5	NA	<7.1	NA	<18	<3.6	<6.9	<7.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<b>6.5 J</b>	<b>6.4 J</b>	<b>5.6 J</b>	<b>5.6 J</b>	NA	<b>5.6 J</b>	NA	<3.6	<3.6	<6.9	<7.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<b>4.4 J</b>	<b>4.1 J</b>	<b>3.8 J</b>	<b>3.5 J</b>	NA	<b>3.7 J</b>	NA	<3.6	<3.6	<6.9	<7.0
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>2.3 J</b>	<b>2.3 J</b>	<b>3.4</b>	<b>2.7 J</b>	NA	<b>1.7 J</b>	NA	<8.9	<b>1.8</b>	<b>3.4 J</b>	<b>7.8</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>180</b>	<b>52</b>	<b>20</b>	<b>20</b>	NA	<b>16</b>	NA	<b>60.5</b>	<b>58.9</b>	<b>37</b>	<b>44</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.4	<3.5	<3.3	<3.8	NA	<3.5	NA	<1.8	<1.8	<3.5	<3.5
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<b>24</b>	<b>22</b>	<b>23</b>	<b>24</b>	NA	<b>22</b>	NA	<b>3.8</b>	<b>2.4</b>	<b>1.6 J</b>	<b>1.6 J</b>
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.4	<b>0.65 J</b>	<b>0.49 J</b>	<3.8	NA	<b>0.45 J</b>	NA	<1.8	<1.8	<3.5	<3.5
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.4	<3.5	<b>0.55 J</b>	<b>0.54 J</b>	NA	<3.5	NA	<b>1.6 J</b>	<1.8	<3.5	<3.5
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>30</b>	<b>36</b>	<b>38</b>	<b>38</b>	NA	<b>28</b>	NA	<b>39.1</b>	<b>34.7</b>	<b>27</b>	<b>30</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>1.7 J</b>	<b>2.3 J</b>	<b>1.6 J</b>	<b>1.6 J</b>	NA	<b>1.4 J</b>	NA	<1.8	<1.8	<3.5	<3.5
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>28</b>	<b>34</b>	<b>33</b>	<b>35</b>	NA	<b>31</b>	NA	<b>106</b>	<b>91.7</b>	<b>77</b>	<b>84</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.4	<3.5	<3.3	<3.8	NA	<3.5	NA	<1.8	<1.8	<3.5	<3.5
Perfluorononanoic acid (PFNA)	6	--	ng/L	<b>13</b>	<b>14</b>	<b>15</b>	<b>15</b>	NA	<b>13</b>	NA	<b>1.7 J</b>	<b>0.96 J</b>	<3.5	<b>0.84 J</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<b>2.8 J</b>	<b>3.6</b>	<b>3.3</b>	<b>3.6 J</b>	NA	<b>3.4 J</b>	NA	<3.6	<3.6	<3.5	<3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>44</b>	<b>47</b>	<b>41</b>	<b>44</b>	NA	<b>42</b>	NA	<b>5.2</b>	<b>4.1</b>	<b>2.2 J</b>	<b>2.6 J</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>65</b>	<b>70</b>	<b>81</b>	<b>74</b>	NA	<b>65</b>	NA	<b>25.9</b>	<b>18.1</b>	<b>11</b>	<b>13</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.4	<3.5	<b>0.66 J</b>	<3.8	NA	<3.5	NA	<8.9	<1.8	<3.5	<3.5
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>28</b>	<b>29</b>	<b>31</b>	<b>31</b>	NA	<b>26</b>	NA	<b>78.5</b>	<b>77.6</b>	<b>61</b>	<b>64</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.4	<3.5	<3.3	<3.8	NA	<3.5	NA	<1.8	<1.8	<3.5	<3.5
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.4	<3.5	<3.3	<3.8	NA	<3.5	NA	<1.8	<1.8	<3.5	<3.5
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.4	<b>0.65 J</b>	<b>0.68 J</b>	<b>0.71 J</b>	NA	<3.5	NA	<1.8	<1.8	<3.5	<3.5

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-14-67 03/01/2022 MW-14-67_030122 13-18	MW-14-67 06/03/2022 MW-14-67_060322 13-18	MW-14-67 11/09/2022 MW-14-67_110922 13-18	MW-14-70 03/04/2021 MW-14-70_030421 16-21	MW-14-70 06/02/2021 MW-14-70_060221 16-21	MW-14-70 09/01/2021 MW-14-70_090121 16-21	MW-14-70 12/01/2021 MW-14-70_120121 16-21	MW-14-70 03/01/2022 MW-14-70_030122 16-21	MW-14-70 06/02/2022 MW-14-70_060222 16-21	MW-14-70 11/09/2022 MW-14-70_110922 16-21	MW-20-131 02/26/2021 MW-20-131_022621 5-10
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	<6.5	<7.0	<7.2	<7.1	<7.4	<7.0	<6.9	<6.4	<6.8	<7.1	<7.1 [<7.1]
4:2 FTS	--	--	ng/L	<6.5	<7.0	<7.2	<7.1	<7.4	<7.0	<6.9	<6.4	<6.8	<7.1	<7.1 [<7.1]
6:2 FTS	--	--	ng/L	<6.5	<7.0	<7.2	<7.1	<7.4	<7.0	<6.9	<6.4	<6.8	<7.1	<7.1 [<7.1]
8:2 FTS	--	--	ng/L	<6.5	<7.0	<7.2	<7.1	<7.4	<7.0	<6.9	<6.4	<6.8	<7.1	<7.1 [<7.1]
9CI-PF3ONS (F-53B Major)	--	--	ng/L	<6.5	<7.0	<7.2	<7.1	<7.4	<7.0	<6.9	<6.4	<6.8	<7.1	<7.1 [<7.1]
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<6.5	<7.0	<7.2	<7.1	<7.4	<7.0	<6.9	<6.4	<6.8	<7.1	<7.1 [<7.1]
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<6.5	<7.0	<7.2	<18	<3.7	<7.0	<6.9	<6.4	<6.8	<7.1	<3.6 [<3.6]
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<6.5	<7.0	<7.2	<3.6	<3.7	<7.0	<6.9	<6.4	<6.8	<7.1	<3.6 [<3.6]
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<6.5	<7.0	<7.2	<3.6	<3.7	<7.0	<6.9	<6.4	<6.8	<7.1	<3.6 [<3.6]
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>10</b>	<b>9.8</b>	<b>1.6 J</b>	<b>5.6 J</b>	<b>5.6</b>	<b>5.3</b>	<b>6.0</b>	<b>7.2</b>	<b>7.9</b>	<b>6.7</b>	<b>1.4 J [&lt;1.8]</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>36</b>	<b>45</b>	<b>43</b>	<b>57.3</b>	<b>50.1</b>	<b>61</b>	<b>53</b>	<b>42</b>	<b>44</b>	<b>100</b>	<b>24.1 [23.6]</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.2	<3.5	<3.6	<1.8	<1.9	<3.5	<3.5	<3.2	<3.4	<3.5	<1.8 [<1.8]
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<b>1.6 J</b>	<b>1.7 J</b>	<b>1.3 J</b>	<1.8	<1.9	<3.5	<3.5	<3.2	<3.4	<3.5	<1.8 [<1.8]
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.2	<3.5	<3.6	<1.8	<1.9	<3.5	<3.5	<3.2	<3.4	<3.5	<1.8 [<1.8]
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.2	<3.5	<3.6	<1.8	<1.9	<3.5	<3.5	<3.2	<3.4	<3.5	<1.8 [<1.8]
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>27</b>	<b>30</b>	<b>29</b>	<b>73.3</b>	<b>63.9</b>	<b>56</b>	<b>57</b>	<b>55</b>	<b>46</b>	<b>130</b>	<b>27.4 [27.2]</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<3.2	<3.5	<3.6	<b>10.8</b>	<b>2.5</b>	<b>1.8 J</b>	<b>2.6 J</b>	<b>2.7 J</b>	<b>3.0 J</b>	<3.5	<b>1.3 J [2.8]</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>74</b>	<b>87</b>	<b>78</b>	<b>124</b>	<b>99.6</b>	<b>140</b>	<b>110</b>	<b>84</b>	<b>80</b>	<b>280</b>	<b>33.6 [32.9]</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.2	<3.5	<3.6	<1.8	<1.9	<3.5	<3.5	<3.2	<3.4	<3.5	<1.8 [<1.8]
Perfluorononanoic acid (PFNA)	6	--	ng/L	<b>0.88 J</b>	<b>0.77 J</b>	<b>0.72 J</b>	<1.8	<1.9	<3.5	<b>0.42 J</b>	<b>0.45 J</b>	<b>0.44 J</b>	<3.5	<b>2.1 [2.4]</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.2	<3.5	<3.6	<3.6	<3.7	<3.5	<3.5	<3.2	<3.4	<3.5	<3.6 [<1.8]
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>3.1 J</b>	<b>2.6 J</b>	<b>2.2 J</b>	<1.8	<b>1.1 J</b>	<3.5	<3.5	<3.2	<3.4	<3.5	<b>4.9 [6]</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>13</b>	<b>16</b>	<b>15</b>	<b>51.9</b>	<b>38.5</b>	<b>23</b>	<b>32</b>	<b>36</b>	<b>34</b>	<b>18</b>	<b>37.3 [37.1]</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.2	<3.5	<b>0.54 J</b>	<b>6.4 J</b>	<1.9	<b>0.91 J</b>	<3.5	<b>1.2 J</b>	<3.4	<b>0.52 J</b>	<1.8 [<1.8]
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>58</b>	<b>68</b>	<b>57</b>	<b>154</b>	<b>139</b>	<b>190</b>	<b>150</b>	<b>120</b>	<b>100</b>	<b>350</b>	<b>38.4 [39.5]</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.2	<3.5	<3.6	<1.8	<1.9	<3.5	<3.5	<3.2	<3.4	<3.5	<8.9 [<1.8]
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.2	<3.5	<3.6	<1.8	<1.9	<3.5	<3.5	<3.2	<3.4	<3.5	<1.8 [<1.8]
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.2	<3.5	<3.6	<1.8	<1.9	<3.5	<3.5	<3.2	<3.4	<3.5	<1.8 [<1.8]

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-20-131 06/02/2021 MW-20-131_060221 5-10	MW-20-131 09/01/2021 MW-20-131_090121 5-10	MW-20-131 11/30/2021 MW-20-131_113021 5-10	MW-20-131 06/02/2022 MW-20-131_060222 5-10	MW-20-131 11/10/2022 MW-20-131_111022 5-10	MW-20-132 02/26/2021 MW-20-132_022621 6-11	MW-20-132 06/02/2021 MW-20-132_060221 6-11	MW-20-132 09/01/2021 MW-20-132_090121 6-11	MW-20-132 11/30/2021 MW-20-132_113021 6-11	MW-20-132 06/02/2022 MW-20-132_060222 6-11
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>													
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	<7.4	<6.7	<7.1	<6.9	<6.9 [<7]	<7.1	<7.4 [<7.4]	<6.7 [<6.9]	<7.1 [<7]	<6.8
4:2 FTS	--	--	ng/L	<7.4	<6.7	<7.1	<6.9	<6.9 [<7]	<7.1	<7.4 [<7.4]	<6.7 [<6.9]	<7.1 [<7]	<6.8
6:2 FTS	--	--	ng/L	<7.4	<6.7	<7.1	<6.9	<6.9 [<7]	<7.1	<7.4 [<7.4]	<6.7 [<6.9]	<7.1 [<7]	<6.8
8:2 FTS	--	--	ng/L	<7.4	<6.7	<7.1	<6.9	<6.9 [<7]	<7.1	<7.4 [<7.4]	<6.7 [<6.9]	<7.1 [<7]	<6.8
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	<7.4	<6.7	<7.1	<6.9	<6.9 [<7]	<7.1	<7.4 [<7.4]	<6.7 [<6.9]	<7.1 [<7]	<6.8
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<7.4	<6.7	<7.1	<6.9	<6.9 [<7]	<7.1	<7.4 [<7.4]	<6.7 [<6.9]	<7.1 [<7]	<6.8
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<3.7	<6.7	<7.1	<6.9	<6.9 [<7]	<3.6	<3.7 [<3.7]	<6.7 [<6.9]	<7.1 [<7]	<6.8
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<3.7	<6.7	<7.1	<6.9	<6.9 [<7]	<3.6	<3.7 [<3.7]	<6.7 [<6.9]	<7.1 [<7]	<6.8
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<3.7	<6.7	<7.1	<6.9	<6.9 [<7]	<3.6	<3.7 [<3.7]	<6.7 [<6.9]	<7.1 [<7]	<6.8
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	1 J	1.8 J	1.4 J	1.8 J	1.0 J [0.98 J]	1.4 J	1.2 J [1.2 J]	<3.4 [1.9 J]	1.9 J [1.6 J]	2.5 J
Perfluorobutanoic acid (PFBA)	--	--	ng/L	23.2	19	18	17	20 [19]	22.7	22.6 [22.4]	19 [18]	18 [18]	15
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<1.9	<3.4	<3.6	<3.5	<3.4 [<3.5]	<1.8	<1.9 [<1.9]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<1.9	<3.4	0.60 J	1.0 J	<3.4 [<3.5]	1.5 J	1.6 J [1.5 J]	2.7 J [2.5 J]	2.3 J [2.1 J]	1.6 J
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<1.9	<3.4	<3.6	<3.5	<3.4 [<3.5]	<1.8	<1.9 [<1.9]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<1.9	<3.4	<3.6	<3.5	<3.4 [<3.5]	1.2 J	<1.9 [<1.9]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	30.9	27	29	20	25 [26]	26.4	29.2 [28.5]	25 [26]	26 [27]	18
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	2.2	2.7 J	2.7 J	2.1 J	1.8 J [1.8 J]	2	1.3 J [1.8 J]	2.4 J [2.2 J]	1.8 J [1.9 J]	1.8 J
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	31.6	30	31	24	27 [26]	29.9	28.5 [28]	28 [27]	27 [28]	19
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<1.9	<3.4	<3.6	<3.5	<3.4 [<3.5]	<1.8	<1.9 [<1.9]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4
Perfluorononanoic acid (PFNA)	6	--	ng/L	3.4	4.0	4.0	1.4 J	2.1 J [2.2 J]	7.3	7.9 [7.8]	8.1 [8.4]	7.1 [6.9]	4.5
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.7	<3.4	<3.6	<3.5	<3.4 [<3.5]	<18	<3.7 [<3.7]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	8.5	8.2	8.7	6.2	4.8 [4.9]	20.2	20 [18.7]	19 [18]	16 [18]	12
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	38.8	41	38	27	38 [36]	43.2	45.2 [43.7]	41 [43]	39 [39]	29
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<1.9	<3.4	<3.6	<3.5	<3.4 [<3.5]	<1.8	0.97 J [<1.9]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	40.8	36	37	28	29 [28]	31.4	34.3 [33.7]	31 [31]	32 [33]	22
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<1.9	<3.4	<3.6	<3.5	<3.4 [<3.5]	<1.8	<1.9 [<1.9]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<1.9	<3.4	<3.6	<3.5	<3.4 [<3.5]	<1.8	<1.9 [<1.9]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<1.9	<3.4	<3.6	<3.5	<3.4 [<3.5]	<1.8	<1.9 [<1.9]	<3.4 [<3.5]	<3.5 [<3.5]	<3.4

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-20-132 11/09/2022 MW-20-132_110922 6-11	MW-21-133 03/22/2021 MW-21-133_032221 10-15	MW-21-133 06/02/2021 MW-21-133_060221 10-15	MW-21-133 09/01/2021 MW-21-133_090121 10-15	MW-21-133 11/30/2021 MW-21-133_113021 10-15	MW-21-133 06/02/2022 MW-21-133_060222 10-15	MW-21-133 11/09/2022 MW-21-133_110922 10-15	MW-21-134 03/19/2021 MW-21-134_031921 11-16	MW-21-134 06/02/2021 MW-21-134_060221 11-16	MW-21-134 08/31/2021 MW-21-134_083121 11-16	MW-21-134 11/30/2021 MW-21-134_113021 11-16
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	<7.8	<7.1	<7.1	<6.8	<7.1	<6.8	<6.9	<7.1	<7.1	<7.0	<6.8
4:2 FTS	--	--	ng/L	<7.8	<7.1	<7.1	<6.8	<7.1	<6.8	<6.9	<7.1	<7.1	<7.0	<6.8
6:2 FTS	--	--	ng/L	<7.8	<7.1	<7.1	<6.8	<7.1	<6.8	<6.9	<7.1	<7.1	<7.0	<6.8
8:2 FTS	--	--	ng/L	<7.8	<7.1	<7.1	<6.8	<7.1	<6.8	<6.9	<7.1	<7.1	<7.0	<6.8
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	<7.8	<7.1	<7.1	<6.8	<7.1	<6.8	<6.9	<7.1	<7.1	<7.0	<6.8
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<7.8	<7.1	<7.1	<6.8	<7.1	<6.8	<6.9	<7.1	<7.1	<7.0	<6.8
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<7.8	<3.6	<3.6	<6.8	<7.1	<6.8	<6.9	<3.6	<3.6	<7.0	<6.8
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<7.8	<3.6	<3.6	<6.8	<7.1	<6.8	<6.9	<3.6	<3.6	<7.0	<6.8
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<7.8	<3.6	<3.6	<6.8	<7.1	<6.8	<6.9	<3.6	<3.6	<7.0	<6.8
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	1.5 J	2.4	2.2	1.8 J	3.1 J	2.0 J	2.6 J	2.2	1.8	2.4 J	2.6 J
Perfluorobutanoic acid (PFBA)	--	--	ng/L	17	20.2	20.4	12	28	14	36	15.6	10.7	14	17
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.9	<1.8	<1.8	<3.4	<3.6	<3.4	<3.4	<1.8	<1.8	<3.5	<3.4
Perfluorodecanoic acid (PFDA)	--	--	ng/L	1.8 J	<1.8	<1.8	<3.4	<3.6	<3.4	<3.4	<1.8	<1.8	<3.5	<3.4
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.9	<1.8	<1.8	<3.4	<3.6	<3.4	<3.4	<1.8	<1.8	<3.5	<3.4
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.9	<1.8	<1.8	<3.4	<3.6	<3.4	<3.4	<1.8	<1.8	<3.5	<3.4
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	23	24.5	21.7	13	44	17	47	17.5	12.5	17	25
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	1.8 J	2.9	1.8	1.6 J	2.4 J	1.7 J	2.6 J	3.1	1.8	2.3 J	2.9 J
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	26	31.3	28.2	17	52	24	63	21.1	13.7	22	34
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.9	<1.8	<1.8	<3.4	<3.6	<3.4	<3.4	<1.8	<1.8	<3.5	<3.4
Perfluorononanoic acid (PFNA)	6	--	ng/L	5	1.2 J	<1.8	<3.4	1.3 J	1.1 J	3.7	<1.8	<1.8	<3.5	<3.4
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.9	<3.6	<3.6	<3.4	<3.6	<3.4	<3.4	<3.6	<3.6	<3.5	<3.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	13	8.7	7.4	4.9	8.4	4.6	10	6.7	5.2	4.5	5.2
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	33	62.9	44.9	31	87	43	110	37.6	22.6	31	41
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.9	1.4 J	<1.8	<3.4	0.90 J	0.54 J	0.93 J	1.1 J	<1.8	<3.5	0.65 J
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	25	23.7	25.6	14	47	22	43	19.8	12.1	17	31
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.9	<1.8	<1.8	<3.4	<3.6	<3.4	<3.4	<1.8	<1.8	<3.5	<3.4
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.9	<1.8	<1.8	<3.4	<3.6	<3.4	<3.4	<1.8	<1.8	<3.5	<3.4
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.9	<1.8	<1.8	<3.4	<3.6	<3.4	<3.4	<1.8	<1.8	<3.5	<3.4

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-134 06/02/2022 MW-21-134_060222 11-16	MW-21-134 11/09/2022 MW-21-134_110922 11-16	MW-21-135 03/19/2021 MW-21-135_031921 22-27	MW-21-135 06/02/2021 MW-21-135_060221 22-27	MW-21-135 08/31/2021 MW-21-135_083121 22-27	MW-21-135 11/30/2021 MW-21-135_113021 22-27	MW-21-135 06/02/2022 MW-21-135_060222 22-27	MW-21-135 11/09/2022 MW-21-135_110922 22-27	MW-21-136 03/19/2021 MW-21-136_031921 9-14	MW-21-136 06/02/2021 MW-21-136_060221 9-14	MW-21-136 08/31/2021 MW-21-136_083121 9-14
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	<6.7	<7.1	<7.1	<7.1	<6.9	<7.2	<6.8	<7.4	<7.1	<7.4	<7.0
4:2 FTS	--	--	ng/L	<6.7	<7.1	<7.1	<7.1	<6.9	<7.2	<6.8	<7.4	<7.1	<7.4	<7.0
6:2 FTS	--	--	ng/L	<6.7	<7.1	<7.1	<7.1	<6.9	<b>3.2 BJ</b>	<6.8	<7.4	<7.1	<7.4	<7.0
8:2 FTS	--	--	ng/L	<6.7	<7.1	<7.1	<7.1	<6.9	<7.2	<6.8	<7.4	<7.1	<7.4	<7.0
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	<6.7	<7.1	<7.1	<7.1	<6.9	<7.2	<6.8	<7.4	<7.1	<7.4	<7.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<6.7	<7.1	<7.1	<7.1	<6.9	<7.2	<6.8	<7.4	<7.1	<7.4	<7.0
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<6.7	<7.1	<3.6	<3.6	<6.9	<7.2	<6.8	<7.4	<3.6	<3.7	<7.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NETFOSAA)	--	--	ng/L	<6.7	<7.1	<3.6	<3.6	<6.9	<7.2	<6.8	<7.4	<3.6	<3.7	<7.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<6.7	<7.1	<3.6	<3.6	<6.9	<7.2	<6.8	<7.4	<3.6	<3.7	<7.0
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>1.9 J</b>	<b>2.4 J</b>	<b>2</b>	<b>2.4</b>	<b>1.8 J</b>	<b>1.7 J</b>	<b>1.9 J</b>	<b>1.8 J</b>	<1.8	<1.9	<b>1.4 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>13</b>	<b>23</b>	<b>21.1</b>	<b>18.5</b>	<b>14</b>	<b>14</b>	<b>12</b>	<b>9.5</b>	<b>3.1 J</b>	<3.7	<b>2.5 J</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.4	<3.5	<1.8	<1.8	<3.4	<3.6	<3.4	<3.7	<1.8	<1.9	<3.5
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<3.4	<3.5	<1.8	<1.8	<3.4	<3.6	<3.4	<3.7	<1.8	<1.9	<3.5
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.4	<3.5	<1.8	<1.8	<3.4	<3.6	<3.4	<3.7	<1.8	<1.9	<3.5
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.4	<b>0.49 J</b>	<1.8	<1.8	<3.4	<3.6	<3.4	<3.7	<1.8	<1.9	<3.5
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>15</b>	<b>35</b>	<b>31.7</b>	<b>35.6</b>	<b>34</b>	<b>39</b>	<b>47</b>	<b>54</b>	<1.8	<1.9	<3.5
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>2.0 J</b>	<b>2.7 J</b>	<b>2.4</b>	<b>1.4 J</b>	<b>1.7 J</b>	<b>1.8 J</b>	<b>1.6 J</b>	<b>1.8 J</b>	<1.8	<1.9	<3.5
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>22</b>	<b>52</b>	<b>40.4</b>	<b>37.2</b>	<b>36</b>	<b>45</b>	<b>39</b>	<b>34</b>	<b>1.4 J</b>	<1.9	<b>0.90 J</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.4	<3.5	<1.8	<1.8	<3.4	<3.6	<3.4	<3.7	<1.8	<1.9	<3.5
Perfluorononanoic acid (PFNA)	6	--	ng/L	<3.4	<b>0.60 J</b>	<b>2.7</b>	<b>2</b>	<b>1.9 J</b>	<b>2.1 J</b>	<b>1.1 J</b>	<b>1.0 J</b>	<1.8	<1.9	<3.5
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.4	<3.5	<3.6	<3.6	<3.4	<3.6	<3.4	<3.7	<3.6	<3.7	<3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>4.2</b>	<b>5</b>	<b>4.1</b>	<b>3.2</b>	<b>2.4 J</b>	<b>3.2 J</b>	<b>2.1 J</b>	<3.7	<b>1.8</b>	<1.9	<3.5
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>23</b>	<b>55</b>	<b>48.3</b>	<b>47.3</b>	<b>42</b>	<b>44</b>	<b>38</b>	<b>41</b>	<b>1.2 J</b>	<1.9	<b>1.2 J</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<b>0.77 J</b>	<b>0.82 J</b>	<1.8	<b>0.95 J</b>	<b>0.91 J</b>	<b>0.97 J</b>	<b>1.2 J</b>	<b>1.1 J</b>	<1.8	<1.9	<3.5
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>21</b>	<b>52</b>	<b>39.4</b>	<b>38.7</b>	<b>36</b>	<b>42</b>	<b>39</b>	<b>31</b>	<b>1.1 J</b>	<1.9	<b>1.1 J</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.4	<3.5	<8.9	<1.8	<3.4	<3.6	<3.4	<3.7	<1.8	<1.9	<3.5
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.4	<3.5	<1.8	<1.8	<3.4	<3.6	<3.4	<3.7	<1.8	<1.9	<3.5
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.4	<3.5	<1.8	<1.8	<3.4	<3.6	<3.4	<3.7	<1.8	<1.9	<3.5

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-136 11/30/2021 MW-21-136_113021 9-14	MW-21-136 06/02/2022 MW-21-136_060222 9-14	MW-21-136 11/10/2022 MW-21-136_111022 9-14	MW-21-137 03/19/2021 MW-21-137_031921 7-12	MW-21-137 06/02/2021 MW-21-137_060221 7-12	MW-21-137 08/31/2021 MW-21-137_083121 7-12	MW-21-137 11/30/2021 MW-21-137_113021 7-12	MW-21-137 06/02/2022 MW-21-137_060222 7-12	MW-21-137 11/10/2022 MW-21-137_111022 7-12	MW-21-138 03/19/2021 MW-21-138_031921 24-29	MW-21-138 06/02/2021 MW-21-138_060221 24-29
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	<7.1	<6.7	<7.2	<7.1	<7.4	<6.8	<7.0	<7.0	<7.1	<7.1	<7.7
4:2 FTS	--	--	ng/L	<7.1	<6.7	<7.2	<7.1	<7.4	<6.8	<7.0	<7.0	<7.1	<7.1	<7.7
6:2 FTS	--	--	ng/L	<b>3.8 J</b>	<b>11</b>	<7.2	<7.1	<7.4	<6.8	<7.0	<7.0	<b>2.6 BJ</b>	<7.1	<7.7
8:2 FTS	--	--	ng/L	<7.1	<6.7	<7.2	<7.1	<7.4	<6.8	<7.0	<7.0	<7.1	<7.1	<7.7
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	<7.1	<6.7	<7.2	<7.1	<7.4	<6.8	<7.0	<7.0	<7.1	<7.1	<7.7
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<7.1	<6.7	<7.2	<7.1	<7.4	<6.8	<7.0	<7.0	<7.1	<7.1	<7.7
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<7.1	<6.7	<7.2	<3.6	<3.7	<6.8	<7.0	<7.0	<7.1	<3.6	<3.8
N-ethyl perfluorooctane sulfonamidoacetic acid (NETFOSAA)	--	--	ng/L	<7.1	<6.7	<7.2	<3.6	<3.7	<6.8	<7.0	<7.0	<7.1	<3.6	<3.8
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<7.1	<6.7	<7.2	<3.6	<3.7	<6.8	<7.0	<7.0	<7.1	<3.6	<3.8
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>1.0 J</b>	<b>0.85 J</b>	<b>0.62 J</b>	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>1.5 J</b>	<b>1.8 J</b>	<b>2.0 J</b>	<3.6	<3.7	<3.4	<3.5	<3.5	<3.6	<b>4.3</b>	<3.8
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>0.45 J</b>	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>0.83 J</b>	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<b>1.9</b>	<1.9
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorononanoic acid (PFNA)	6	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.5	<3.4	<3.6	<3.6	<3.7	<3.4	<3.5	<3.5	<3.6	<3.6	<3.8
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>1.4 J</b>	<b>0.70 J</b>	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<b>1.7 J</b>	<1.9
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<3.5	<b>0.82 J</b>	<b>0.80 J</b>	<1.8	<1.9	<3.4	<3.5	<b>0.56 J</b>	<3.6	<1.8	<1.9
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.5	<3.4	<3.6	<1.8	<1.9	<3.4	<3.5	<3.5	<3.6	<1.8	<1.9

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-138 08/31/2021 MW-21-138_083121 24-29	MW-21-138 11/30/2021 MW-21-138_113021 24-29	MW-21-138 06/02/2022 MW-21-138_060222 24-29	MW-21-138 11/10/2022 MW-21-138_111022 24-29	MW-22-143 04/05/2022 MW-22-143_040522 26-31	MW-22-143 06/01/2022 MW-22-143_060122 26-31	MW-22-143 11/10/2022 MW-22-143_111022 26-31	MW-22-144 04/04/2022 MW-22-144_040422 19.5-24.5	MW-22-144 06/01/2022 MW-22-144_060122 19.5-24.5	MW-22-144 11/10/2022 MW-22-144_111022 19.5-24.5	MW-22-145 04/04/2022 MW-22-145_040422 10.5-15.5
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	<6.7	<7.1	<8.4	<6.8	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
4:2 FTS	--	--	ng/L	<6.7	<7.1	<8.4	<6.8	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
6:2 FTS	--	--	ng/L	<6.7	<7.1	<8.4	<b>3.8 BJ</b>	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
8:2 FTS	--	--	ng/L	<6.7	<7.1	<8.4	<6.8	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	<6.7	<7.1	<8.4	<6.8	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<6.7	<7.1	<8.4	<6.8	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<6.7	<7.1	<8.4	<6.8	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<6.7	<7.1	<8.4	<6.8	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<6.7	<7.1	<8.4	<6.8	<6.9 [<6.9]	<6.9	<6.9	<7.1	<7.3	<6.8	<7.2
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<3.4	<3.5	<4.2	<3.4	<b>0.81 J [0.91 J]</b>	<b>1.0 J</b>	<b>1.3 J</b>	<b>1.9 J</b>	<b>2.3 J</b>	<b>2.0 J</b>	<b>3.4 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<b>11 [11]</b>	<b>9.7</b>	<b>10</b>	<b>5.3</b>	<b>5.4</b>	<b>3.8</b>	<b>5.2</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<b>3.7 [3.7]</b>	<b>5.9</b>	<b>6.7</b>	<b>3.6</b>	<b>4.5</b>	<b>3.6</b>	<b>5.7</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<b>2.3 J</b>	<b>2.2 J</b>	<b>5.6</b>	<b>1.9 J</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<3.4	<3.5	<4.2	<3.4	<b>19 [19]</b>	<b>16</b>	<b>15</b>	<b>7.7</b>	<b>10</b>	<b>6.2</b>	<b>9.9</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6
Perfluorononanoic acid (PFNA)	6	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<b>1.1 J</b>
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<b>3.6</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<3.4	<3.5	<4.2	<3.4	<b>1.5 J [1.5 J]</b>	<b>4.1</b>	<b>6.0</b>	<b>5.3</b>	<b>7.5</b>	<b>5.9</b>	<b>16</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<b>0.55 J</b>	<3.6
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<3.4	<3.5	<b>0.69 J</b>	<3.4	<b>18 [20]</b>	<b>12</b>	<b>12</b>	<b>8.8</b>	<b>9.9</b>	<b>5.1</b>	<b>9.3</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.4	<3.5	<4.2	<3.4	<3.5 [<3.5]	<3.5	<3.5	<3.5	<3.6	<3.4	<3.6

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-145 06/01/2022 MW-22-145_060122 10.5-15.5	MW-22-145 11/10/2022 MW-22-145_111022 10.5-15.5	MW-22-146 04/05/2022 MW-22-146_040522 5.5-10.5	MW-22-146 06/01/2022 MW-22-146_060122 5.5-10.5	MW-22-146 11/10/2022 MW-22-146_111022 5.5-10.5	MW-22-147 04/04/2022 MW-22-147_040422 7.5-12.5	MW-22-147 06/01/2022 MW-22-147_060122 7.5-12.5	MW-22-147 11/10/2022 MW-22-147_111022 7.5-12.5	MW-22-148 04/04/2022 MW-22-148_040422 24.5-29.5	MW-22-148 06/01/2022 MW-22-148_060122 24.5-29.5
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>													
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	<6.8 [ <6.8 ]	<6.7	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<6.9	<7.0	<7.2
4:2 FTS	--	--	ng/L	<6.8 [ <6.8 ]	<6.7	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<6.9	<7.0	<7.2
6:2 FTS	--	--	ng/L	<6.8 [ <6.8 ]	<b>9.6 B</b>	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<b>3.3 BJ</b>	<7.0	<7.2
8:2 FTS	--	--	ng/L	<6.8 [ <6.8 ]	<6.7	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<6.9	<7.0	<7.2
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	<6.8 [ <6.8 ]	<6.7	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<6.9	<7.0	<7.2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<6.8 [ <6.8 ]	<6.7	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<6.9	<7.0	<7.2
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<6.8 [ <6.8 ]	<6.7	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<6.9	<7.0	<7.2
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<6.8 [ <6.8 ]	<6.7	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<6.9	<7.0	<7.2
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<6.8 [ <6.8 ]	<6.7	<7.0	<7.0	<6.9 [ <6.9 ]	<6.9	<6.8	<6.9	<7.0	<7.2
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>3.0 J [2.8 J]</b>	<b>2.0 J</b>	<b>4.0</b>	<b>6.0</b>	<b>2.5 J [2.7 J]</b>	<b>2.5 JS</b>	<b>3.2 J</b>	<b>3.0 J</b>	<b>1.6 J</b>	<b>1.0 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>5.5 [5.6]</b>	<b>7.2</b>	<b>14</b>	<b>16</b>	<b>5.5 [5.7]</b>	<b>3.8 S</b>	<b>6.1</b>	<b>6.5</b>	<b>3.0 J</b>	<b>0.88 J</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>5.8 [6.0]</b>	<b>9.5</b>	<b>0.59 J</b>	<b>1.0 J</b>	<3.5 [ <3.5 ]	<b>0.69 J</b>	<b>1.4 J</b>	<b>1.1 J</b>	<b>0.39 J</b>	<3.6
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>1.9 J [2.1 J]</b>	<b>3.5</b>	<b>1.1 J</b>	<b>1.2 J</b>	<b>0.57 J [0.61 J]</b>	<b>1.3 J</b>	<b>1.4 J</b>	<b>1.8 J</b>	<3.5	<3.6
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>9.7 [8.7]</b>	<b>15</b>	<b>6.7</b>	<b>5.8</b>	<3.5 [ <3.5 ]	<b>1.1 J</b>	<b>2.7 J</b>	<b>2.0 J</b>	<b>1.1 J</b>	<3.6
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluorononanoic acid (PFNA)	6	--	ng/L	<b>0.75 J [0.79 J]</b>	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<b>0.67 J</b>	<3.4	<3.4	<b>2.0 J</b>	<3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>6.8 [6.9]</b>	<3.3	<b>1.7 J</b>	<b>1.9 J</b>	<b>1.7 J [1.8 J]</b>	<b>2.0 JS</b>	<b>2.2 J</b>	<b>2.6 J</b>	<3.5	<3.6
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>14 [14]</b>	<b>17</b>	<b>6.5</b>	<b>5.8</b>	<b>1.4 J [1.3 J]</b>	<b>2.8 JS</b>	<b>3.7</b>	<b>4.6</b>	<b>1.1 J</b>	<3.6
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<b>0.54 J [0.51 J]</b>	<b>0.73 J</b>	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>9.5 [8.8]</b>	<b>13</b>	<b>5.4</b>	<b>4.9</b>	<3.5 [ <3.5 ]	<b>1.2 J</b>	<b>2.9 J</b>	<b>2.3 J</b>	<b>0.92 J</b>	<3.6
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.4 [ <3.4 ]	<3.3	<3.5	<3.5	<3.5 [ <3.5 ]	<3.5	<3.4	<3.4	<3.5	<3.6

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-148 11/10/2022 MW-22-148_111022 24.5-29.5	MW-22-149 04/05/2022 MW-22-149_040522 5.5-10.5	MW-22-149 06/01/2022 MW-22-149_060122 5.5-10.5	MW-22-149 11/10/2022 MW-22-149_111022 5.5-10.5	MW-22-150 04/05/2022 MW-22-150_040522 13-18	MW-22-150 06/01/2022 MW-22-150_060122 13-18	MW-22-150 11/10/2022 MW-22-150_111022 13-18	MW-22-151 04/05/2022 MW-22-151_040522 13-18	MW-22-151 06/01/2022 MW-22-151_060122 13-18	MW-22-151 11/10/2022 MW-22-151_111022 13-18
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>													
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<6.8	<7.0
4:2 FTS	--	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<6.8	<7.0
6:2 FTS	--	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<b>5.3 JQ</b>	<7.0
8:2 FTS	--	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<6.8	<7.0
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<6.8	<7.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<6.8	<7.0
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<6.8	<7.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<6.8	<7.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<7.1	<6.9	<7.0	<6.9	<7.1	<6.8	<6.8	<7.2	<6.8	<7.0
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>2.0 J</b>	<b>1.8 J</b>	<b>1.4 J</b>	<b>1.3 J</b>	<3.5	<3.4	<3.4	<b>7.9</b>	<b>8.4</b>	<b>7.2</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>1.7 J</b>	<b>1.2 J</b>	<b>0.91 J</b>	<b>0.62 J</b>	<b>3.1 J</b>	<b>2.9 J</b>	<b>2.7 J</b>	<b>11</b>	<b>10</b>	<b>11</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.6	<3.5	<3.5	<b>2.3 J</b>	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<3.6	<3.5	<b>0.41 J</b>	<3.5	<3.5	<3.4	<3.4	<b>3.5 J</b>	<b>2.7 J</b>	<b>3.7</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<3.6	<b>0.88 J</b>	<b>0.91 J</b>	<b>0.79 J</b>	<3.5	<3.4	<3.4	<b>1.8 J</b>	<3.4	<b>0.98 J</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<3.6	<3.5	<3.5	<3.5	<b>1.7 J</b>	<b>1.2 J</b>	<3.4	<b>6.0</b>	<b>6.2</b>	<b>9.1</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5
Perfluorononanoic acid (PFNA)	6	--	ng/L	<3.6	<3.5	<3.5	<b>0.46 J</b>	<3.5	<3.4	<3.4	<b>0.59 J</b>	<b>0.39 J</b>	<b>0.42 J</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.6	<b>0.53 J</b>	<3.5	<3.5	<b>0.57 J</b>	<b>1.6 J</b>	<3.4	<3.6	<3.4	<3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<3.6	<b>2.1 J</b>	<3.5	<b>2.2 J</b>	<3.5	<3.4	<3.4	<b>2.0 J</b>	<b>3.4</b>	<b>4.3</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<3.6	<b>0.72 J</b>	<b>1.1 J</b>	<b>0.93 J</b>	<3.5	<3.4	<3.4	<b>9.4</b>	<b>7.7</b>	<b>7.8</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<b>2.1 J</b>	<b>1.7 J</b>	<b>2.8 J</b>	<b>13</b>	<b>14</b>	<b>19</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.6	<3.5	<3.5	<3.5	<3.5	<3.4	<3.4	<3.6	<3.4	<3.5

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-152 04/05/2022 MW-22-152_040522 10-15	MW-22-152 06/01/2022 MW-22-152_060122 10-15	MW-22-152 11/10/2022 MW-22-152_111022 10-15	MW-22-158 12/15/2022 MW-22-158_121522 16-21	MW-22-160 12/13/2022 MW-22-160_121322 14-19	P6-MW-01 05/10/2016 P6-MW-01_051016 23-28	P6-MW-01 05/02/2019 P6-MW-01-050219 23-28	P6-SB-07 03/02/2022 P6-SB-07_030222 15-20	P6-SB-07 06/03/2022 P6-SB-07_060322 15-20	P6-SB-07 11/09/2022 P6-SB-07_110922 15-20	P6-SB-21 05/10/2018 P6-SB-21_051018 3-8
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>														
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	<6.8	<6.8	<6.9	<0.58	<0.57 [<0.58]	NA	NA	<6.8 [<7.0]	<6.9	<7.3	NA
4:2 FTS	--	--	ng/L	<6.8	<6.8	<6.9	<0.77	<0.75 [<0.77]	NA	<8	<6.8 [<7.0]	<6.9	<7.3	<8
6:2 FTS	--	--	ng/L	<6.8	<6.8	<6.9	<1.8	<1.7 [<1.8]	NA	<8	<6.8 [<7.0]	<6.9	<7.3	<8
8:2 FTS	--	--	ng/L	<6.8	<6.8	<6.9	<1.4	<1.4 [<1.4]	NA	<8	<6.8 [<7.0]	<6.9	<7.3	<8
9CI-PF3ONS (F-53B Major)	--	--	ng/L	<6.8	<6.8	<6.9	<0.42	<0.41 [<0.42]	NA	NA	<6.8 [<7.0]	<6.9	<7.3	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	<6.8	<6.8	<6.9	<0.42	<0.41 [<0.43]	NA	NA	<6.8 [<7.0]	<6.9	<7.3	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	<6.8	<6.8	<6.9	<1.8	<1.8 [<1.8]	NA	NA	<6.8 [<7.0]	<6.9	<7.3	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NETFOSAA)	--	--	ng/L	<6.8	<6.8	<6.9	<0.66	<0.64 [<0.66]	NA	<20	<6.8 [<7.0]	<6.9	<7.3	<20
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<6.8	<6.8	<6.9	<0.82	<0.80 [<0.82]	NA	<20	<6.8 [<7.0]	<6.9	<7.3	<20
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>1.8 J</b>	<b>2.1 J</b>	<b>9.1</b>	<b>1.4 J</b>	<0.35 [<0.36]	NA	<b>1.32 J</b>	<b>2.9 J [3.1 J]</b>	<b>3.4 J</b>	<b>5</b>	<b>1.43 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>3.7</b>	<b>4.0</b>	<b>5.6</b>	<b>7.1 B</b>	<b>4.9 B [3.1 BJ]</b>	NA	<b>14.3</b>	<b>190 [180]</b>	<b>220</b>	<b>350</b>	<b>19.2</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<3.4	<3.4	<3.5	<0.68	<0.67 [<0.68]	NA	<4	<3.4 [<3.5]	<3.5	<3.6	<4
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<3.4	<3.4	<3.5	<0.46	<0.45 [<0.46]	NA	<4	<b>20 [19]</b>	<b>24</b>	<b>46</b>	<b>127</b>
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<3.4	<3.4	<3.5	<0.41	<0.40 [<0.42]	NA	<4	<3.4 [<3.5]	<3.5	<3.6	<4
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<3.4	<3.4	<3.5	<0.44	<0.43 [<0.44]	NA	<4	<b>&lt;3.4 [0.43 J]</b>	<b>0.57 J</b>	<b>0.98 J</b>	<4
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>1.0 J</b>	<b>0.99 J</b>	<b>1.5 J</b>	<b>1.6 J</b>	<0.38 [<0.39]	NA	<b>18.6</b>	<b>480 [450]</b>	<b>530</b>	<b>1000</b>	<b>32.2</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>1.1 J</b>	<b>1.8 J</b>	<b>3.5</b>	<0.48	<0.47 [<0.49]	NA	<4	<b>2.6 J [2.4 J]</b>	<b>2.5 J</b>	<b>5.3</b>	<b>1.84 J</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>2.4 J</b>	<b>2.6 J</b>	<b>3.6</b>	<b>3.9</b>	<0.59 [<0.61]	NA	<b>25.2</b>	<b>640 [630]</b>	<b>740</b>	<b>1300</b>	<b>37</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<3.4	<3.4	<3.5	<0.62	<0.61 [<0.63]	NA	<4	<3.4 [<3.5]	<3.5	<3.6	<4
Perfluorononanoic acid (PFNA)	6	--	ng/L	<3.4	<3.4	<3.5	<0.41	<0.40 [<0.41]	NA	<4	<b>78 [74]</b>	<b>82</b>	<b>170</b>	<b>29.4</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<3.4	<3.4	<3.5	<0.54	<0.52 [<0.54]	NA	<4	<3.4 [<3.5]	<3.5	<b>0.72 J</b>	<b>6.74</b>
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<3.4	<3.4	<b>2.1 J</b>	<1.8	<1.7 [<1.8]	NA	<4	<b>38 [34]</b>	<b>42</b>	<b>91</b>	<b>97.8</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>2.4 J</b>	<b>2.5 J</b>	<b>5.5</b>	<0.73	<0.71 [<0.73]	NA	<b>25.1</b>	<b>640 [610]</b>	<b>720</b>	<b>1500</b>	<b>87.6</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<3.4	<3.4	<3.5	<0.52	<0.51 [<0.52]	NA	<4	<b>0.71 J [1.1 J]</b>	<b>1.0 J</b>	<b>2.0 J</b>	<4
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>2.7 J</b>	<b>3.0 J</b>	<b>5.4</b>	<b>3.2 J</b>	<b>0.54 J [0.49 J]</b>	NA	<b>25</b>	<b>730 [710]</b>	<b>790</b>	<b>1400</b>	<b>49.8</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<3.4	<3.4	<3.5	<0.53	<0.51 [<0.53]	NA	<4	<3.4 [<3.5]	<3.5	<3.6	<4
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<3.4	<3.4	<3.5	<0.46	<0.45 [<0.47]	NA	<4	<3.4 [<3.5]	<3.5	<3.6	<4
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<3.4	<3.4	<3.5	<0.55	<0.54 [<0.55]	NA	<4	<3.4 [<3.5]	<3.5	<3.6	<b>7.15</b>

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	P6-SB-35 05/10/2018 P6-SB-35_051018 3-8	P6-SB-37 06/05/2018 P6-SB-37_060518 5-10	SB-OS-KG312 09/08/2021 SB-OS-KG312_11-15_20210908 11 - 15	SB-OS-KG312 09/08/2021 SB-OS-KG312_23-27_20210908 23 - 27	SB-OS-LE285 09/08/2021 15_20210908 11 - 15	SB-OS-LI335 09/09/2021 18_20210909 14 - 18	SB-OS-OS376 09/27/2021 10_20210927 6 - 10	SB-OS-QM379 09/09/2021 12_20210909 8 - 12	SB-OS-QM379 09/09/2021 29_20210909 25 - 29
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>												
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	NA	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
4:2 FTS	--	--	ng/L	<8	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
6:2 FTS	--	--	ng/L	<8	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
8:2 FTS	--	--	ng/L	<8	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	NA	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	NA	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	NA	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
N-ethyl perfluorooctane sulfonamidoacetic acid (NETFOSAA)	--	--	ng/L	<20	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<20	NA	<7.0	<6.9	<6.8	<7.0	<6.8	<6.9	<8.8
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<4	<3.62	<b>4.2</b>	<3.5	<b>2.4 J</b>	<3.5	<b>1.3 J</b>	<b>1.9 J</b>	<b>1.2 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>27.3</b>	<40.8	<b>11</b>	<b>3.8</b>	<b>3.6</b>	<b>4.2</b>	<b>0.95 J</b>	<b>5.0</b>	<4.4
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<4	NA	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<b>18.1</b>	<b>13.7</b>	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<4	NA	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<b>1.14 J</b>	<19.4	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>18.6</b>	<b>19.1</b>	<b>8.5</b>	<3.5	<3.4	<3.5	<3.4	<b>1.3 J</b>	<4.4
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>2.09 J</b>	<b>1.67 J</b>	<b>3.3 J</b>	<3.5	<3.4	<3.5	<b>1.4 J</b>	<b>2.7 J</b>	<4.4
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>18.5</b>	<b>21.6</b>	<b>23</b>	<b>2.1 J</b>	<b>1.3 J</b>	<3.4	<3.4	<b>2.1 J</b>	<4.4
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<4	NA	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluorononanoic acid (PFNA)	6	--	ng/L	<b>11.6</b>	NA	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<b>4.25</b>	NA	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>101</b>	<b>75</b>	<3.5	<3.5	<3.4	<3.5	<b>2.8 J</b>	<b>1.6 J</b>	<b>1.3 J</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>45</b>	<b>35.6</b>	<b>11</b>	<3.5	<b>2.9 J</b>	<3.5	<3.4	<b>3.4</b>	<4.4
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<4	NA	<b>0.94 J</b>	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>23.5</b>	<b>62.5</b>	<b>29</b>	<b>4.5</b>	<b>2.2 J</b>	<b>2.6 J</b>	<3.4	<b>2.4 J</b>	<4.4
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<4	NA	<3.5	<3.4	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<4	NA	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<4	NA	<3.5	<3.5	<3.4	<3.5	<3.4	<3.4	<4.4

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	SB-OS-QR364 05/02/2019 17.5_20190502 12.5-17.5	SB-OS-QR364 05/02/2019 27.5_20190502 22.5-27.5	SB-OS-RO398 09/10/2021 10_20210910 6 - 10	SB-OS-RW339 05/02/2019 23.5_20190502 18.5-23.5	SB-OS-SS444 09/22/2022 13_092222 8-13	SB-OS-SW386 09/10/2021 15_20210910 11 - 15	SB-OS-SW386 09/10/2021 24_20210910 20 - 24	SB-OS-TC335 09/27/2021 30_20210927 26 - 30	SB-P6-MF293 11/27/2018 25_20181128 3-8	SB-P6-MF293 11/27/2018 8_20181128 3-8
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>													
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	NA	NA	<7.3	NA	<7.2	<6.9	<7.9	<6.9	NA	NA
4:2 FTS	--	--	ng/L	<8	<8	<7.3	<8	<7.2	<6.9	<7.9	<6.9	<8	<8
6:2 FTS	--	--	ng/L	<8	<8	<7.3	<8	<7.2	<b>20</b>	<7.9	<6.9	<8	<8
8:2 FTS	--	--	ng/L	<8	<8	<7.3	<8	<7.2	<6.9	<7.9	<6.9	<8	<8
9CI-PF3ONS (F-53B Major)	--	--	ng/L	NA	NA	<7.3	NA	<7.2	<6.9	<7.9	<6.9	NA	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	NA	NA	<7.3	NA	<7.2	<6.9	<7.9	<6.9	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	NA	NA	<7.3	NA	<7.2	<6.9	<7.9	<6.9	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<20	<20	<7.3	<20	<7.2	<6.9	<7.9	<6.9	<20	<20
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<20	<20	<7.3	<20	<7.2	<6.9	<7.9	<6.9	<20	<20
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<4	<b>3.80 J</b>	<b>2.7 J</b>	<b>3.24 J</b>	<b>8.0</b>	<b>1.7 J</b>	<b>1.1 J</b>	<3.4	<b>2.03 J</b>	<b>2.23 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>3.67 J</b>	<b>9.39</b>	<b>5.5</b>	<b>11.2</b>	<b>14</b>	<b>6.2</b>	<b>4.5</b>	<b>12</b>	<b>20</b>	<b>19.9</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<4	<4
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<4	<4
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<4	<4
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<4	<4	<3.6	<4	<b>0.85 J</b>	<3.5	<3.9	<3.4	<4	<4
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>4.42</b>	<b>5.03</b>	<3.6	<b>14.1</b>	<b>16</b>	<b>4.0</b>	<b>1.1 J</b>	<b>1.8 J</b>	<b>16.5</b>	<b>15.7</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>1.11 J</b>	<b>66.8</b>	<3.6	<b>1.46 J</b>	<b>59</b>	<b>1.4 J</b>	<3.9	<3.4	<4	<4
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>6.41</b>	<b>9.95</b>	<b>1.4 J</b>	<b>19.6</b>	<b>24</b>	<b>6.9</b>	<b>2.8 J</b>	<b>18</b>	<b>41</b>	<b>38.1</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<4	<4
Perfluorononanoic acid (PFNA)	6	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<b>1.40 J</b>	<b>2.64 J</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<4	<4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>3.51 J</b>	<b>2.01 J</b>	<b>2.1 J</b>	<4	<b>19</b>	<3.5	<3.9	<3.4	<4	<b>4.62</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>9.43</b>	<b>8.31</b>	<b>2.1 J</b>	<b>37</b>	<b>31</b>	<b>4.8</b>	<3.9	<3.4	<b>41.5</b>	<b>50.4</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<4	<4	<3.6	<4	<b>5.2</b>	<3.5	<3.9	<3.4	<4	<4
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>7</b>	<b>9.15</b>	<b>0.97 J</b>	<b>17.1</b>	<b>16</b>	<b>7.1</b>	<b>3.1 J</b>	<b>23</b>	<b>34.1</b>	<b>31.5</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<4	<4
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<4	<4
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<4	<4	<3.6	<4	<3.6	<3.5	<3.9	<3.4	<4	<4

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	SB-P6-MF293 11/27/2018_ 25_20181128 20-25	SB-P6-MF301 11/27/2018_ 8_20181128 3-8	SB-P6-MF301 11/27/2018_ 25_20181128 20-25	SB-P6-MF311 11/27/2018_ 13_20181128 8-13	SB-P6-MF311 11/27/2018_ 25_20181128 20-25	SB-P6-MF321 11/27/2018_ 20_20181128 15-20	SB-P6-MK335 11/29/2018_ 14_20181129 9-14	SB-P6-MK335 11/29/2018_ 33_20181129 28-33	SB-P6-MP275 04/30/2019_ 15_20190501 10-15	SB-P6-MP275 04/30/2019_ 25_20190501 23-28
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>													
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	<8	<8	<8	<8.3	<8 [<8]	<8	<8	<8	<8.3	<8
6:2 FTS	--	--	ng/L	<8	<8	<8	<8.3	<8 [<8]	<8	<8	<8	<8.3	<8
8:2 FTS	--	--	ng/L	<8	<8	<8	<8.3	<8 [<8]	<8	<8	<8	<8.3	<8
9CI-PF3ONS (F-53B Major)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<20	<20	<20	<21	<20 [<20]	<20	<20	<20	<21	<20
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<20	<20	<20	<21	<20 [<20]	<20	<20	<20	<21	<20
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>2.03 J</b>	<b>1.78 J</b>	<4	<b>1.23 J</b>	<4 [<4]	<b>1.38 J</b>	<4	<4	<b>1.71 J</b>	<b>1.91 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>20</b>	<b>18.3</b>	<b>11.7</b>	<b>23.3</b>	<b>25.1 [24.7]</b>	<b>6.17 J</b>	<8	<8	<b>6.44 J</b>	<b>16.5</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>16.5</b>	<b>14.1</b>	<b>1.83 J</b>	<b>20</b>	<b>13.3 [13]</b>	<b>4.27</b>	<4	<4	<b>2.86 J</b>	<b>9.12</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<4	<b>1.03 J</b>	<4	<b>1.21 J</b>	<4 [<4]	<b>1.54 J</b>	<4	<4	<b>1.20 J</b>	<b>1.77 J</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>41</b>	<b>21.7</b>	<b>7.15</b>	<b>47.6</b>	<b>37.2 [36.5]</b>	<b>5.57</b>	<4	<4	<b>3.63 J</b>	<b>14.9</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluorononanoic acid (PFNA)	6	--	ng/L	<b>1.4 J</b>	<b>1.33 J</b>	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<b>1.33 J</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<4	<b>4.08</b>	<4	<b>3.01 J</b>	<4 [<4]	<b>2.97 J</b>	<4	<4	<b>3.33 J</b>	<b>3.28 J</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>41.5</b>	<b>23.8</b>	<b>1.61 J</b>	<b>11.4</b>	<b>7.25 [6.24]</b>	<b>14.2</b>	<b>1.13 J</b>	<b>1.09 J</b>	<b>14.7</b>	<b>34.1</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>34.1</b>	<b>20.3</b>	<b>11.7</b>	<b>53.3</b>	<b>49.1 [48]</b>	<b>5.36</b>	<b>1.55 J</b>	<4	<b>2.82 J</b>	<b>9.89</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<4	<4	<4	<4.2	<4 [<4]	<4	<4	<4	<4.2	<4

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	SB-P6-MQ289 11/19/2018 20_20181120 15-20	SB-P6-MQ289 11/19/2018 32_20181130 27-32	SB-P6-MQ312 11/19/2018 10_20181121 5-10	SB-P6-NF322 11/19/2018 24.5_20181121 19.5-24.5	SB-P6-NS335 11/29/2018 16_20181129 11-16	SB-P6-NT322 11/20/2018 24_20181121 19-24	SB-P6-NU322 04/30/2019 16_20190501 23-28	SB-P6-OH322 11/20/2018 15_20181128 10-15	SB-P6-OH322 11/20/2018 20_20181128 15-20	SB-P6-OS335 11/28/2018 23.5_20181128 18.5-23.5
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>													
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	<8 [<8]	<17	<8	<8	<8 [<8]	<8	<8	<8	<8	<8
6:2 FTS	--	--	ng/L	<8 [<8]	<17	<8	<8	<8 [<8]	<8	<8	<8	<8	<8
8:2 FTS	--	--	ng/L	<8 [<8]	<17	<8	<8	<8 [<8]	<8	<8	<8	<8	<8
9CI-PF3ONS (F-53B Major)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<20 [<20]	<42	<20	<20	<20 [<20]	<20	<20	<20	<20	<20
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<20 [<20]	<42	<20	<20	<20 [<20]	<20	<20	<20	<20	<20
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>4.46 [4.48]</b>	<8.3	<b>4.04</b>	<4	<b>2.11 J [2.39 J]</b>	<b>1.9 J</b>	<4	<b>4.88</b>	<b>4.09</b>	<b>1.54 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>42.1 [58.7]</b>	<b>15.4 J</b>	<b>42.7</b>	<b>36.1</b>	<8 [<8]	<b>18.5</b>	<b>21.1</b>	<b>27.6</b>	<b>21.1</b>	<b>7.05 J</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<4 [<4]	<8.3	<b>6.76</b>	<4	<4 [<4]	<4	<4	<4	<4	<4
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<4 [<4]	<8.3	<b>35.3</b>	<4	<4 [<4]	<4	<4	<b>3.32 J</b>	<b>5.36</b>	<4
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<4 [<4]	<8.3	<4	<4	<4 [<4]	<4	<4	<4	<4	<4
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<4 [<4]	<8.3	<b>1.25 J</b>	<4	<4 [<4]	<4	<4	<4	<4	<4
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>48.3 [68.2]</b>	<b>12.6</b>	<b>110</b>	<4	<4 [<4]	<b>2.94 J</b>	<4	<b>46</b>	<b>29.3</b>	<b>2.83 J</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>2.11 J [2.88 J]</b>	<8.3	<b>2.58 J</b>	<4	<b>1.18 J [1.47 J]</b>	<4	<4	<b>5.54</b>	<b>4.1</b>	<b>1.12 J</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>122 [178]</b>	<b>30.2</b>	<b>76.1</b>	<b>17.6</b>	<4 [<4]	<b>11</b>	<b>5.85</b>	<b>46.7</b>	<b>34.2</b>	<b>5.79</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<4 [<4]	<8.3	<4	<4	<4 [<4]	<4	<4	<4	<4	<4
Perfluorononanoic acid (PFNA)	6	--	ng/L	<b>3.19 J [1.82 J]</b>	<8.3	<b>28.2</b>	<4	<4 [<4]	<4	<4	<b>7.2</b>	<b>5.49</b>	<4
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<4 [<4]	<8.3	<b>4.56</b>	<4	<4 [<4]	<4	<4	<4	<4	<4
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>7.32 [10.7]</b>	<b>8.02 J</b>	<b>71.9</b>	<4	<4 [<4]	<4	<4	<b>19.5</b>	<b>16.1</b>	<b>8.41</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>94.6 [118]</b>	<b>28.8</b>	<b>226</b>	<4	<4 [<4]	<b>5.8</b>	<4	<b>68.8</b>	<b>39.6</b>	<b>7.31</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<4 [<4]	<8.3	<4	<4	<4 [<4]	<4	<4	<4	<4	<4
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>33 [78.4]</b>	<b>19.5</b>	<b>86.7</b>	<b>47.3</b>	<4 [<4]	<b>19</b>	<b>14.2</b>	<b>50</b>	<b>34.6</b>	<b>6.51</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<4 [<4]	<8.3	<4	<4	<4 [<4]	<4	<4	<4	<4	<4
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<4 [<4]	<8.3	<4	<4	<4 [<4]	<4	<4	<4	<4	<4
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<4 [<4]	<8.3	<4	<4	<4 [<4]	<4	<4	<4	<4	<4

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	SB-P6-OX322 11/21/2018 23_20181126 18-23	SB-P6-QA336 11/28/2018 18_20181129 13-18	SB-P6-QA336 11/28/2018 35_20181129 30-35	SB-P6-QH240 11/26/2018 20_20181130 15-20	SB-P6-QM322 11/20/2018 20_20181126 15-20	SB-P6-QQ322 04/29/2019 15_20190501 10-15	SB-P6-QQ322 05/01/2019 15_050119 25-30	SB-P6-QT226 11/21/2018 18_20181130 13-18	SB-P6-QT239 11/21/2018 20_20181130 15-20	SB-P6-RH241 11/21/2018 18_20181130 13-18
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>													
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	<40	<8	<20	<15	<40	<8 [<8]	<0.83	<17	<17	<17
6:2 FTS	--	--	ng/L	<40	<8	<20	<15	<40	<8 [<8]	<0.83	<17	<17	<17
8:2 FTS	--	--	ng/L	<40	<8	<20	<15	<40	<8 [<8]	<0.83	<17	<17	<17
9CI-PF3ONS (F-53B Major)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,8-dioxa-3H-perfluoronanoic acid (ADONA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<100	<20	<50	<38	<100	<20 [<20]	<2.1	<42	<42	<42
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<100	<20	<50	<38	<100	<20 [<20]	<2.1	<42	<42	<42
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<20	<b>2.81 J</b>	<10	<7.7	<20	<b>2.80 J [3.56 J]</b>	<b>0.28</b>	<8.3	<b>2.6 J</b>	<8.3
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>27 J</b>	<b>5.46 J</b>	<b>8.35 J</b>	<b>19.3</b>	<b>99.7</b>	<b>44.6 [39.9]</b>	<b>4.46</b>	<b>20.2</b>	<b>100</b>	<b>48.6</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<20	<4	<10	<7.7	<20	<4.2 [<4.2]	<0.42	<8.3	<8.3	<8.3
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<20	<4	<b>2.92 J</b>	<b>7.85</b>	<b>12.9 J</b>	<b>1.50 J [&lt;4.2]</b>	<b>0.15</b>	<8.3	<b>44.1</b>	<b>2.7 J</b>
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<20	<4	<10	<7.7	<20	<4.2 [<4.2]	<0.42	<8.3	<8.3	<8.3
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<20	<4	<10	<7.7	<20	<4.2 [<4.2]	<0.42	<8.3	<8.3	<8.3
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>34.6</b>	<b>3.43 J</b>	<b>4.76 J</b>	<b>24.7</b>	<b>131</b>	<b>31.9 [25.6]</b>	<b>3.19</b>	<b>9.12</b>	<b>332</b>	<b>79.3</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<20	<b>4.77</b>	<b>2.86 J</b>	<7.7	<20	<b>2.63 J [2.33 J]</b>	<b>0.263</b>	<8.3	<8.3	<b>4.49 J</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>44.7</b>	<b>5.91</b>	<b>6.78 J</b>	<b>21.1</b>	<b>157</b>	<b>57.4 [48.2]</b>	<b>5.74</b>	<b>21.8</b>	<b>350</b>	<b>107</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<20	<4	<10	<7.7	<20	<4.2 [<4.2]	<0.42	<8.3	<8.3	<8.3
Perfluoronanoic acid (PFNA)	6	--	ng/L	<20	<4	<10	<b>9.94</b>	<b>23.9</b>	<b>4.88 [3.25 J]</b>	<b>0.488</b>	<8.3	<b>99.6</b>	<b>18.1</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<20	<4	<10	<b>8.24</b>	<20	<4.2 [<4.2]	<0.42	<8.3	<8.3	<8.3
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<20	<b>2.65 J</b>	<b>3.93 J</b>	<b>105</b>	<b>23.9</b>	<b>19.8 [13.7]</b>	<b>1.98</b>	<8.3	<b>39.1</b>	<b>16.9</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>65.6</b>	<b>9.81</b>	<b>11.1</b>	<b>77.6</b>	<b>189</b>	<b>74.1 [52.6]</b>	<b>7.41</b>	<b>12.2</b>	<b>449</b>	<b>253</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<20	<4	<10	<7.7	<20	<4.2 [<4.2]	<0.42	<8.3	<8.3	<8.3
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>40.5</b>	<b>6.71</b>	<b>10.1</b>	<b>20.9</b>	<b>162</b>	<b>65.0 [51.7]</b>	<b>6.5</b>	<b>30.6</b>	<b>368</b>	<b>108</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<20	<4	<10	<7.7	<20	<4.2 [<4.2]	<0.42	<8.3	<8.3	<8.3
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<20	<4	<10	<7.7	<20	<4.2 [<4.2]	<0.42	<8.3	<8.3	<8.3
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<20	<4	<10	<7.7	<20	<4.2 [<4.2]	<0.42	<8.3	<b>2.94 J</b>	<8.3

See notes on last page.

Table 1  
 Plant 6 - 2022 VAP and Monnitoring Well Groundwater Analytical Results  
 RACER Trust Plant 6  
 Lansing, Michigan



Location ID: Date Collected: Sample Name: Sample Depth (ft. bgs):	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	SB-P6-RQ322 11/19/2018 18_20181126 13-18	SB-P6-RQ322 11/19/2018 32_20181127 27-32	SB-P6-SG322 04/29/2019 15_20190430 10-15	SB-P6-SG322 04/29/2019 30_20190430 25-30	SB-P6-TA228 05/01/2019 10_20190502 5-10	SB-P6-TA242 05/01/2019 13_20190502 8-13	SB-P6-TA258 05/01/2019 10_20190502 5-10	SB-P6-TA258 05/01/2019 30_20190502 25-30	SB-P6-TA272 04/30/2019 34_20190502 29-34
<b>Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)</b>												
11CI-PF3OUdS (F-53B Minor)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	<8	<8	<8	<8	<10	<8	<8	<8	<10
6:2 FTS	--	--	ng/L	<8	<8	<8	<8	<10	<8	<8	<8	<10
8:2 FTS	--	--	ng/L	<8	<8	<8	<8	<10	<8	<8	<8	<10
9CI-PF3ONS (F-53B Major)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	<20	<20	<20	<20	<25	<20	<20	<20	<25
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	<20	<20	<20	<20	<25	<20	<20	<20	<25
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	<b>1.89 J</b>	<b>4.64</b>	<b>1.74 J</b>	<b>2.02 J</b>	<5	<b>1.89 J</b>	<b>2.11 J</b>	<4	<b>1.54 J</b>
Perfluorobutanoic acid (PFBA)	--	--	ng/L	<b>42.2</b>	<b>19.5</b>	<b>12.5</b>	<b>30.1</b>	<b>14.8</b>	<b>56.2</b>	<b>12.2</b>	<b>38.6</b>	<b>19.5</b>
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	<4	<4	<4	<4	<5	<4	<4	<4	<5
Perfluorodecanoic acid (PFDA)	--	--	ng/L	<4	<4	<b>1.51 J</b>	<4	<5	<b>1.58 J</b>	<b>6.79</b>	<b>1.80 J</b>	<b>2.77 J</b>
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	<4	<4	<4	<4	<5	<4	<4	<4	<5
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	<4	<4	<4	<4	<5	<4	<4	<4	<5
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	<b>92.4</b>	<b>59.5</b>	<b>18.3</b>	<b>57.4</b>	<b>26.9</b>	<b>100</b>	<b>18.1</b>	<b>32.1</b>	<b>29.7</b>
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	<b>1.96 J</b>	<b>2.81 J</b>	<b>1.32 J</b>	<b>2.21 J</b>	<5	<b>2.03 J</b>	<4	<4	<b>1.77 J</b>
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	<b>96.9</b>	<b>48.1</b>	<b>22</b>	<b>66.3</b>	<b>30</b>	<b>185</b>	<b>42</b>	<b>137</b>	<b>39.4</b>
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	<4	<4	<4	<4	<5	<4	<4	<4	<5
Perfluorononanoic acid (PFNA)	6	--	ng/L	<b>8.87</b>	<b>2.12 J</b>	<b>3.21 J</b>	<b>4.26</b>	<b>4.14 J</b>	<b>6.89</b>	<b>10</b>	<4	<b>4.10 J</b>
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	<4	<4	<4	<4	<5	<4	<4	<4	<5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<b>8.96</b>	<b>2.66 J</b>	<b>13.5</b>	<b>6.07</b>	<b>5.66</b>	<b>13.8</b>	<b>15.3</b>	<b>2.16 J</b>	<b>11.1</b>
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	<b>157</b>	<b>60.9</b>	<b>39.8</b>	<b>91.1</b>	<b>45.1</b>	<b>119</b>	<b>74.1</b>	<b>18.7</b>	<b>75.6</b>
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	<4	<b>1.38 J</b>	<4	<4	<5	<4	<4	<4	<5
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	<b>89.4</b>	<b>38.3</b>	<b>20.6</b>	<b>57</b>	<b>26.7</b>	<b>216</b>	<b>16.1</b>	<b>103</b>	<b>25.6</b>
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	<4	<4	<4	<4	<5	<4	<4	<4	<5
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	<4	<4	<4	<4	<5	<4	<4	<4	<5
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	<4	<4	<4	<4	<5	<4	<b>3.54 J</b>	<4	<5

See notes on last page.

**Table 1**  
**Summary of Groundwater Analytical Results**  
**2021 Plant 6 PFAS Off-Site Investigation Summary**  
**RACER Trust Plant 6**  
**Lansing, Michigan**

**Data Flagging:**

**Bold font** represents data where detections were noted above the laboratory method detection limit.

**Gray shading** represents result exceeding either or both the EGLE Part 201 Generic Cleanup Criteria and Screening Levels or the EGLE GSI Criteria (Updated December 21, 2020)

**Notes:**

1. EGLE Part 201 Residential Drinking Water Criteria and Groundwater Surface Water Interface Criteria from the Generic Cleanup Criteria and Screening Levels revised criteria values (dated December 21, 2020) are used for comparison with all PFAS data.

**Abbreviations:**

< = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

[ ] = duplicate analytical data, listed in brackets next to parent sample

Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)

\* = Analyzed for low-level 1,4-Dioxane via EPA Method 522

Deg. C. = degrees Celsius

EGLE = Michigan Department of Environment, Great Lakes, and Energy

mg/L = milligrams per liter

NA = Not Analyzed

NR = Not Recorded

NTU = Nephelometric Turbidity Unit

s.u. = standard unit

ug/L = micrograms per liter

μS/cm = microSiemens per centimeter

**Lab and Validation Data Qualifiers:**

B = Detected in the method blank

F1 = Matrix spike and/or matrix spike duplicate recovery is outside acceptance limits.

Perfluorooctane Sulfonamide (PFOSA)

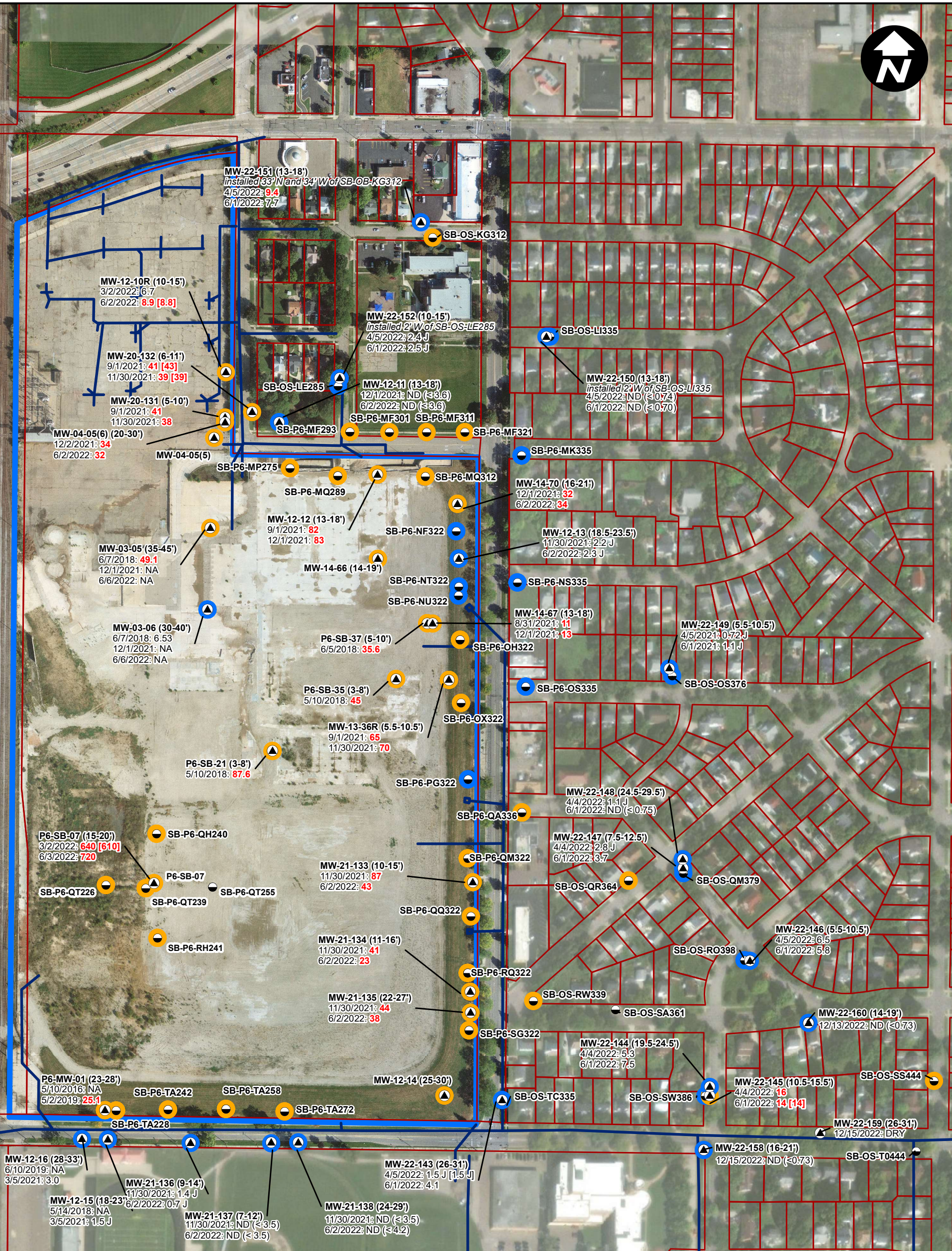
Q = Surrogate failure

S = MS/MSD failure

U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Y = Elevated reporting limit due to high target concentration.

# Figure



**LEGEND**

- MONITORING WELL
- VAP BORING
- WELL SAMPLED AND PFOA DOES NOT EXCEED DW CRITERIA
- WELL SAMPLED AND PFOA EXCEED DW CRITERIA
- STORM SEWER LOCATION
- ASSUMED/ESTIMATED STORM SEWER LOCATION
- PARCEL OUTLINE
- APPROXIMATE PLANT BOUNDARIES
- PLANT 2
- PLANT 3
- PLANT 6

**NOTES:**  
 MOST RECENT DATA FROM EACH MONITORING WELL IS SHOWN. SOIL BORING AND VAP DATA IS INCLUDED IN TABLE 1.

RESULTS IN **RED** DENOTE AN EXCEEDANCE OF EGLE RESIDENTIAL DRINKING WATER CRITERIA (8 ng/L FOR PFOA)

NO PFAS OTHER THAN PFOA EXCEEDED CRITERIA

ND = NON-DETECT    NA = NOT ANALYZED

THE SAMPLES ARE PRESENTED IN UNITS OF ng/L. THE MOST RECENT SAMPLING DATA IS SHOWN.

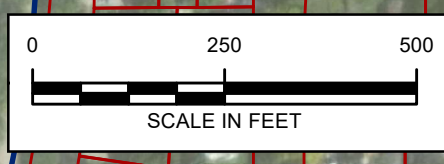
ANALYTICAL RESULTS IN BRACKETS REPRESENT DUPLICATE SAMPLE RESULTS.

J - COMPOUND DETECTED ABOVE LABORATORY METHOD DETECTION LIMIT AND BELOW THE QUANTITATIVE REPORTING LIMIT

DRY - INSUFFICIENT GROUNDWATER FOR SAMPLE COLLECTION

ng/L - NANOGRAMS PER LITER  
 ft bgs - FEET BELOW GROUND SURFACE  
 PFOA - PERFLUOROOCCTANOIC ACID

ALL ANALYSES COMPLETED USING MODIFIED USEPA METHOD 537.



RACER TRUST  
 PLANT 6  
 LANSING, MICHIGAN

**PLANT 6 PFOA ANALYTICAL SUMMARY**

**ARCADIS** | FIGURE 1

# Attachment 1

**Soil Boring Logs and Well Construction Diagrams**

# Soil Boring Log

Project Name: RACER Lansing Date Started: 09/19/2022 Logger: C. Cisco  
 Project Number: 30112892 Date Completed: 09/19/2022 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1						(0.0-1.5') GRASS/TOPSOIL. Note: Pebbles, medium to large present.	(0.0-0.5') Concrete Well Pad with Flushmount Casing (0.5-2.0') Filter Pack Sand and Cement Mixture (2.0-14.0') Bentonite Chips (0.5-16.0') 2.0" dia. SCH-40 PVC casing		
2					(1.5-9.0') CLAY, medium plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; dry; medium stiff; brown (10YR 5/3) to light brownish gray (10YR 6/2).				
3			84						
4									
5									
6									
7									
8			33			(9.0-14.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; dry to moist; medium stiff to soft; grayish brown (10YR 5/2).	(14.0-21.0') Filter Pack Sand		
9									
10									
11			57						
12									
13						(14.0-18.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; moist; soft; grayish brown (10YR 5/2). Note: Sand lens, fine to medium, subrounded to subangular present from 15.0-15.5' bgs.			
14						Note: Sand lens, fine to medium, subrounded to subangular present from 16.0-19.3' bgs.			
15						(18.0-19.3') SAND, very fine to fine, subrounded; little silt; well sorted; wet; loose; gray (10YR 5/1).	(16.0-21.0') 2.0" dia. Stainless-Steel 0.010-Slot Screen		
16									
17									
18			60	SB-OS-TM383_15.5-19.5 VAP attempted, DRY		(19.3-20.0') CLAY, low to medium plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; moist;			
19									
20									

Drilling Co.: Fibertec Environmental Services Sampling Method: 5.0' Macro Core  
 Driller: Nick Wiseman Sampling Interval: Continuous  
 Drilling Method: Direct Push Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Hand augered to 7.0' bgs. Converted to Well:  Yes  No  
 Surface Elev.: NA  
 North Coord.: \_\_\_\_\_  
 East Coord.: \_\_\_\_\_

SOIL BORING LOG - 2013 VARCADIS-US-COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_012323.GPJ ARCADIS\_2013.GDT 11/23/23

# Soil Boring Log

Project Name: RACER Lansing Date Started: 09/19/2022 Logger: C. Cisco  
 Project Number: 30112892 Date Completed: 09/19/2022 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		60				medium stiff; gray (10YR 5/1). (20.0-30.0') CLAY, medium to high plasticity, no dilatancy to slow dilatancy; little silt; little sand, very fine to fine, subrounded; moist; soft to very soft; gray (10YR 5/1).		
22									
23									
24									
25									
26	X		60						
27									
28									
29									
30									
31							End of boring at 30.0' bgs.		
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

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# Soil Boring Log

Project Name: RACER Lansing Date Started: 09/19/2022 Logger: C. Cisco  
 Project Number: 30112892 Date Completed: 09/19/2022 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1						(0.0-1.5') GRASS/TOPSOIL.		(0.0-0.5') Concrete Well Pad with Flushmount Casing (0.5-2.0') Filter Pack Sand and Cement Mixture	
2			84		(1.5-6.0') CLAY, medium plasticity, no dilatancy; some sand, very fine to fine, subrounded; little silt; trace pebbles, small to medium, subrounded; trace granules, subrounded; dry; medium stiff; brown (10YR 4/3).				
3					(6.0-7.0') CLAY, medium plasticity, no dilatancy; and PEBBLES, small to medium, subrounded; some sand, very fine to fine, subrounded; little silt; trace granules, subrounded; dry; medium stiff; brown (10YR 4/3).				
4						(7.0-14.0') CLAY, medium to high plasticity, no dilatancy; little silt; little pebbles, small to medium, subrounded; trace sand, very fine to fine, subrounded; dry to moist; medium stiff to soft; brown (10YR 4/3).		(2.0-24.0') Bentonite Chips	
5									
6									
7			36						
8									
9								(0.5-26.0') 2.0" dia. SCH-40 PVC casing	
10									
11									
12			54						
13									
14									
15									
16									
17									
18			42						
19									
20									

Drilling Co.: Fibertec Environmental Services Sampling Method: 5.0' Macro Core  
 Driller: Nick Wiseman Sampling Interval: Continuous  
 Drilling Method: Direct Push Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. bto.): NA  
 Remarks: ' / ft = feet. bgs = below ground surface. Hand augered to 7.0' bgs. Converted to Well:  Yes  No  
 Surface Elev.: NA  
 North Coord.: \_\_\_\_\_  
 East Coord.: \_\_\_\_\_

SOIL BORING LOG - 2013 VARCADIS-US-COM-OFFICE-DATA-ANALYSIS-BORING-LOGS-RACER-LANSING-MASTER-DATBASE\_012323.GPJ ARCADIS - 2013.GDT 1/23/23

# Soil Boring Log

Project Name: RACER Lansing Date Started: 09/19/2022 Logger: C. Cisco  
 Project Number: 30112892 Date Completed: 09/19/2022 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21	X		40			[Diagonal Hatching]	(14.0-24.5') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; moist; soft; grayish brown (10YR 5/2).		[Well Diagram]
22									
23									
24									
25	X		44	SB-OS-TG414_26-30 VAP attempted, DRY	[Solid Black]	[Diagonal Hatching]	(24.5-25.0') CLAY, low to medium plasticity, no dilatancy; some sand, very fine to fine, subrounded; little silt; moist; soft to very soft; dark grayish brown (10YR 4/2).	(24.0-31.0') Filter Pack Sand	[Well Diagram]
26									
27									
28									
29									
30									
31	End of boring at 30.0' bgs.							[Well Diagram]	
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\MI\COMMON\MONI\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_012323.GPJ ARCADIS 2013 GDT 11/23/23

# Soil Boring Log

Project Name: RACER Lansing Date Started: 12/09/2022 Logger: C. Cisco  
 Project Number: 30112892 Date Completed: 12/09/2022 Editor: A. Westhuis  
 Project Location: Lansing, MI Weather Conditions: 30° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1						(0.0-1.5') GRASS/TOPSOIL. Note: Organic matter/roots present.		(0.0-0.5') Concrete Well Pad with Flushmount Casing (0.5-1.0')	
2			96			(1.5-10.5') CLAY, low to medium plasticity, no dilatancy; little silt; little sand, very fine fine, subrounded; trace granules, subrounded; trace pebbles, small to medium, subrounded; dry; medium stiff; light brownish gray (10YR 6/2) to yellowish brown (10YR 5/6).  Note: Pebble content increases to some at approximately 4.0' bgs. Small to large pebbles present.	(1.0-14.0') Filter Pack Sand and Cement Mixture (0.5-14.0') 2.0" dia. SCH-40 PVC casing (1.0-12.0') Bentonite Chips		
3									
4									
5									
6									
7									
8									
9			24				Note: Sand lens, very fine to medium, subrounded, present from 9.5-9.7' bgs.		
10									
11									
12			43			(10.5-14.8') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, fine to medium, subrounded; dry to moist; soft to medium stiff; brown (10YR 5/3).			
13									
14									
15								(12.0-19.0') Filter Pack Sand	
16							(14.8-15.0') SAND, fine to medium, subrounded; little silt; well sorted; moist; loose; light gray (10YR 7/2). (15.0-15.2') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, fine to medium, subrounded; dry to moist; soft to medium stiff; brown (10YR 5/3).	(14.0-19.0') 2.0" dia. Stainless-Steel 0.010-Slot Screen	
17			26				(15.2-19.0') SAND, fine to medium, subrounded; little silt; well sorted; moist to wet; loose; light gray (10YR 7/2).		
18									
19									
20							(19.0-20.0') CLAY, low to medium plasticity, no dilatancy; little silt; little sand, very fine to fine, subrounded; trace pebbles, small to medium, subrounded; trace granules, subrounded; moist; medium stiff; gray (10YR 5/1). End of boring at 20.0' bgs.	(19.0-20.0') Natural Collapse, Backfill with Cuttings	
21									
22									

Drilling Co.: Fibertec Sampling Method: 5.0' Macro Core  
 Driller: Nick Wiseman Sampling Interval: Continuous  
 Drilling Method: Direct Push Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: ft = feet. Converted to Well:  Yes  No  
bgs = below ground surface. Surface Elev.: NA  
Flushmount well. North Coord.: \_\_\_\_\_  
 East Coord.: \_\_\_\_\_

SOIL BORING LOG: 2013 VARCADIS-US-COM-OFFICE-DATA\NOV-11-MICROMINI-RACER-LANSING-121422-FROM-AJUSTIN-GPJ-ARCADIS-2013.GDT 1/23/23

# Attachment 2

Laboratory Analytical Reports

# PACE ANALYTICAL SERVICES, LLC

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## Report of Analysis

**Arcadis U.S., Inc.**  
630 Plaza Drive  
Suite 600  
Highlands Ranch, CO 80129  
Attention: Kaitlyn Hunt

Project Name: **RACER Lansing**

Lot Number: **XL16048**  
Date Completed: **Preliminary**

Project Manager: **Kathy E. Smith**



This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

# PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

## Case Narrative

**Arcadis U.S., Inc.**

**Lot Number: XL16048**

**Project Name: RACER Lansing**

**Project Number:**

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report. Where sampling is conducted by the client, results relate to the accuracy of the information provided, and as the samples are received.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

# PACE ANALYTICAL SERVICES, LLC

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## Sample Summary

Arcadis U.S., Inc.

Lot Number: XL16048

Project Name: RACER Lansing

Project Number:

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<u>Sample Number</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Sampled</u>	<u>Date Received</u>
001	MW-22-160_121322	Aqueous	12/13/2022 1145	12/16/2022
002	Dup-01_121322	Aqueous	12/13/2022	12/16/2022
003	MW-22-158_121522	Aqueous	12/15/2022 1145	12/16/2022
004	EB-01_121522	Aqueous	12/15/2022 1200	12/16/2022

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(4 samples)

PRELIMINARY

# PACE ANALYTICAL SERVICES, LLC

## Detection Summary

Arcadis U.S., Inc.

Lot Number: XL16048

Project Name: RACER Lansing

Project Number:

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-22-160_121322	Aqueous	PFPeA	PFAS by ID	0.54	J	ng/L	5
002	Dup-01_121322	Aqueous	PFPeA	PFAS by ID	0.49	J	ng/L	9
003	MW-22-158_121522	Aqueous	PFBS	PFAS by ID	1.4	J	ng/L	13
003	MW-22-158_121522	Aqueous	PFHpA	PFAS by ID	1.6	J	ng/L	13
003	MW-22-158_121522	Aqueous	PFHxA	PFAS by ID	3.9		ng/L	13
003	MW-22-158_121522	Aqueous	PFPeA	PFAS by ID	3.2	J	ng/L	13
004	EB-01_121522	Aqueous	PFHxA	PFAS by ID	0.70	J	ng/L	17

(7 detections)

PRELIMINARY

# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-001**

Description: **MW-22-160\_121322**

Matrix: **Aqueous**

Date Sampled: **12/13/2022 1145**

Project Name: **RACER Lansing**

Date Received: **12/16/2022**

Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1713	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1			01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>4.9</b>	<b>B</b>	<b>3.4</b>	<b>0.51</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>0.54</b>	<b>J</b>	<b>3.4</b>	<b>0.47</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		112	25-150	H	Pending	150
13C2_6:2FTS		109	25-150	H	Pending	150
13C2_8:2FTS		79	25-150	H	Pending	150
13C2_PFDa		71	25-150	H	Pending	150
13C2_PFTeDA		76	25-150	H	Pending	150
13C3_PFBS		88	25-150	H	Pending	150
13C3_PFHxS		89	25-150	H	Pending	150
13C3-HFPO-DA		81	25-150	H	Pending	150
13C4_PFBA		73	25-150	H	Pending	150
13C4_PFHpA		100	25-150	H	Pending	150
13C5_PFHxA		84	25-150	H	Pending	150
13C5_PFPeA		90	25-150	H	Pending	150
13C6_PFDA		81	25-150	H	Pending	150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-001</b>
Description: <b>MW-22-160_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022 1145</b>	Project Name: <b>RACER Lansing</b>
Date Received: <b>12/16/2022</b>	Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		68	25-150	H	Pending	150
13C8_PFOA		89	25-150	H	Pending	150
13C8_PFOS		90	25-150	H	Pending	150
13C8_PFOSA		78	10-150	H	Pending	150
13C9_PFNA		86	25-150	H	Pending	150
d5-EtFOSAA		73	25-150	H	Pending	150
d3-MeFOSAA		78	25-150	H	Pending	150

PRELIMINARY

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-001**

Description: **MW-22-160\_121322**

Matrix: **Aqueous**

Date Sampled: **12/13/2022 1145**

Project Name: **RACER Lansing**

Date Received: **12/16/2022**

Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1713	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1			01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	Pending	H	8	0.482	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	Pending	H	8	0.663	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	Pending	H	8	1.603	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	Pending	H	8	2	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	Pending	H	8	0.8739	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	Pending	H	8	2.0751	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	Pending	H	8	0.4836	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	Pending	H	8	0.7503	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	Pending	H	8	0.9322	ng/L	2
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	Pending	H	4	0.4146	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	Pending	H	4	0.7779	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	Pending	H	4	0.4987	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	Pending	H	4	0.7117	ng/L	2
Perfluoro-1-octanesulfonamide (PFOA)	754-91-6	PFAS by ID SOP	Pending	H	4	0.6129	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	Pending	H	4	0.594	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	Pending	H	4	0.5515	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	Pending	H	4	0.6	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	Pending	H	4	0.5249	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	Pending	H	4	0.4718	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	Pending	H	4	0.4472	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	Pending	H	4	0.6879	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	Pending	H	4	0.462	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	Pending	H	4	0.8291	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	Pending	H	4	0.5441	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	Pending	H	4	0.5995	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	Pending	H	4	0.5289	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	Pending	H	4	0.6264	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	Pending	H	4	2.0018	ng/L	2

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		112	25-150	H	Pending	150
13C2_6:2FTS		109	25-150	H	Pending	150
13C2_8:2FTS		79	25-150	H	Pending	150
13C2_PFDa		71	25-150	H	Pending	150
13C2_PFTeDA		76	25-150	H	Pending	150
13C3_PFBS		88	25-150	H	Pending	150
13C3_PFHxS		89	25-150	H	Pending	150
13C3-HFPO-DA		81	25-150	H	Pending	150
13C4_PFBA		73	25-150	H	Pending	150
13C4_PFHpA		100	25-150	H	Pending	150
13C5_PFHxA		84	25-150	H	Pending	150
13C5_PFPeA		90	25-150	H	Pending	150
13C6_PFDA		81	25-150	H	Pending	150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-001</b>
Description: <b>MW-22-160_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022 1145</b>	Project Name: <b>RACER Lansing</b>
Date Received: <b>12/16/2022</b>	Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		68	25-150	H	Pending	150
13C8_PFOA		89	25-150	H	Pending	150
13C8_PFOS		90	25-150	H	Pending	150
13C8_PFOSA		78	10-150	H	Pending	150
13C9_PFNA		86	25-150	H	Pending	150
d5-EtFOSAA		73	25-150	H	Pending	150
d3-MeFOSAA		78	25-150	H	Pending	150

PRELIMINARY

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-002**

Description: **Dup-01\_121322**

Matrix: **Aqueous**

Date Sampled: **12/13/2022**

Project Name: **RACER Lansing**

Date Received: **12/16/2022**

Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1724	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1			01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>3.1</b>	<b>BJ</b>	<b>3.5</b>	<b>0.53</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>0.49</b>	<b>J</b>	<b>3.5</b>	<b>0.48</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		120	25-150	H	Pending	150
13C2_6:2FTS		105	25-150	H	Pending	150
13C2_8:2FTS		83	25-150	H	Pending	150
13C2_PFDaA		72	25-150	H	Pending	150
13C2_PFTeDA		70	25-150	H	Pending	150
13C3_PFBS		85	25-150	H	Pending	150
13C3_PFHxS		89	25-150	H	Pending	150
13C3-HFPO-DA		84	25-150	H	Pending	150
13C4_PFBA		75	25-150	H	Pending	150
13C4_PFHpA		106	25-150	H	Pending	150
13C5_PFHxA		85	25-150	H	Pending	150
13C5_PFPeA		91	25-150	H	Pending	150
13C6_PFDA		84	25-150	H	Pending	150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-002</b>
Description: <b>Dup-01_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022</b>	Project Name: <b>RACER Lansing</b>
Date Received: <b>12/16/2022</b>	Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	25-150	H	Pending	150
13C8_PFOA		84	25-150	H	Pending	150
13C8_PFOS		94	25-150	H	Pending	150
13C8_PFOSA		84	10-150	H	Pending	150
13C9_PFNA		86	25-150	H	Pending	150
d5-EtFOSAA		72	25-150	H	Pending	150
d3-MeFOSAA		78	25-150	H	Pending	150

PRELIMINARY

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-002**

Description: **Dup-01\_121322**

Matrix: **Aqueous**

Date Sampled: **12/13/2022**

Project Name: **RACER Lansing**

Date Received: **12/16/2022**

Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1724	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1			01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	Pending	H	8	0.482	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	Pending	H	8	0.663	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	Pending	H	8	1.603	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	Pending	H	8	2	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	Pending	H	8	0.8739	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	Pending	H	8	2.0751	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	Pending	H	8	0.4836	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	Pending	H	8	0.7503	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	Pending	H	8	0.9322	ng/L	2
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	Pending	H	4	0.4146	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	Pending	H	4	0.7779	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	Pending	H	4	0.4987	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	Pending	H	4	0.7117	ng/L	2
Perfluoro-1-octanesulfonamide (PFOA)	754-91-6	PFAS by ID SOP	Pending	H	4	0.6129	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	Pending	H	4	0.594	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	Pending	H	4	0.5515	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	Pending	H	4	0.6	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	Pending	H	4	0.5249	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	Pending	H	4	0.4718	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	Pending	H	4	0.4472	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	Pending	H	4	0.6879	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	Pending	H	4	0.462	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	Pending	H	4	0.8291	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	Pending	H	4	0.5441	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	Pending	H	4	0.5995	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	Pending	H	4	0.5289	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	Pending	H	4	0.6264	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	Pending	H	4	2.0018	ng/L	2

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		120	25-150	H	Pending	150
13C2_6:2FTS		105	25-150	H	Pending	150
13C2_8:2FTS		83	25-150	H	Pending	150
13C2_PFDa		72	25-150	H	Pending	150
13C2_PFTeDA		70	25-150	H	Pending	150
13C3_PFBS		85	25-150	H	Pending	150
13C3_PFHxS		89	25-150	H	Pending	150
13C3-HFPO-DA		84	25-150	H	Pending	150
13C4_PFBA		75	25-150	H	Pending	150
13C4_PFHpA		106	25-150	H	Pending	150
13C5_PFHxA		85	25-150	H	Pending	150
13C5_PFPeA		91	25-150	H	Pending	150
13C6_PFDA		84	25-150	H	Pending	150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-002</b>
Description: <b>Dup-01_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022</b>	Project Name: <b>RACER Lansing</b>
Date Received: <b>12/16/2022</b>	Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	25-150	H	Pending	150
13C8_PFOA		84	25-150	H	Pending	150
13C8_PFOS		94	25-150	H	Pending	150
13C8_PFOSA		84	10-150	H	Pending	150
13C9_PFNA		86	25-150	H	Pending	150
d5-EtFOSAA		72	25-150	H	Pending	150
d3-MeFOSAA		78	25-150	H	Pending	150

PRELIMINARY

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-003**

Description: **MW-22-158\_121522**

Matrix: **Aqueous**

Date Sampled: **12/15/2022 1145**

Project Name: **RACER Lansing**

Date Received: **12/16/2022**

Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1756	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1			01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
<b>Perfluoro-1-butanesulfonic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>1.4</b>	<b>J</b>	<b>3.5</b>	<b>0.36</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>7.1</b>	<b>B</b>	<b>3.5</b>	<b>0.53</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.6</b>	<b>J</b>	<b>3.5</b>	<b>0.39</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>3.9</b>		<b>3.5</b>	<b>0.60</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>3.2</b>	<b>J</b>	<b>3.5</b>	<b>0.48</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_4:2FTS		103	25-150	H	Pending	150
13C2_6:2FTS		99	25-150	H	Pending	150
13C2_8:2FTS		74	25-150	H	Pending	150
13C2_PFDa		80	25-150	H	Pending	150
13C2_PFTeDA		86	25-150	H	Pending	150
13C3_PFBS		86	25-150	H	Pending	150
13C3_PFHxS		82	25-150	H	Pending	150
13C3-HFPO-DA		84	25-150	H	Pending	150
13C4_PFBA		76	25-150	H	Pending	150
13C4_PFHpA		90	25-150	H	Pending	150
13C5_PFHxA		86	25-150	H	Pending	150
13C5_PFPeA		85	25-150	H	Pending	150
13C6_PFDA		84	25-150	H	Pending	150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-003</b>
Description: <b>MW-22-158_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1145</b>	Project Name: <b>RACER Lansing</b>
Date Received: <b>12/16/2022</b>	Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		85	25-150	H	Pending	150
13C8_PFOA		79	25-150	H	Pending	150
13C8_PFOS		86	25-150	H	Pending	150
13C8_PFOSA		86	10-150	H	Pending	150
13C9_PFNA		86	25-150	H	Pending	150
d5-EtFOSAA		78	25-150	H	Pending	150
d3-MeFOSAA		81	25-150	H	Pending	150

PRELIMINARY

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-003**

Description: **MW-22-158\_121522**

Matrix: **Aqueous**

Date Sampled: **12/15/2022 1145**

Project Name: **RACER Lansing**

Date Received: **12/16/2022**

Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1756	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1			01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	Pending	H	8	0.482	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	Pending	H	8	0.663	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	Pending	H	8	1.603	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	Pending	H	8	2	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	Pending	H	8	0.8739	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	Pending	H	8	2.0751	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	Pending	H	8	0.4836	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	Pending	H	8	0.7503	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	Pending	H	8	0.9322	ng/L	2
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	Pending	H	4	0.4146	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	Pending	H	4	0.7779	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	Pending	H	4	0.4987	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	Pending	H	4	0.7117	ng/L	2
Perfluoro-1-octanesulfonamide (PFOA)	754-91-6	PFAS by ID SOP	Pending	H	4	0.6129	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	Pending	H	4	0.594	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	Pending	H	4	0.5515	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	Pending	H	4	0.6	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	Pending	H	4	0.5249	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	Pending	H	4	0.4718	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	Pending	H	4	0.4472	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	Pending	H	4	0.6879	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	Pending	H	4	0.462	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	Pending	H	4	0.8291	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	Pending	H	4	0.5441	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	Pending	H	4	0.5995	ng/L	2
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	Pending	H	4	0.5289	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	Pending	H	4	0.6264	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	Pending	H	4	2.0018	ng/L	2

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		103	25-150	H	Pending	150
13C2_6:2FTS		99	25-150	H	Pending	150
13C2_8:2FTS		74	25-150	H	Pending	150
13C2_PFDa		80	25-150	H	Pending	150
13C2_PFTeDA		86	25-150	H	Pending	150
13C3_PFBS		86	25-150	H	Pending	150
13C3_PFHxS		82	25-150	H	Pending	150
13C3-HFPO-DA		84	25-150	H	Pending	150
13C4_PFBA		76	25-150	H	Pending	150
13C4_PFHpA		90	25-150	H	Pending	150
13C5_PFHxA		86	25-150	H	Pending	150
13C5_PFPeA		85	25-150	H	Pending	150
13C6_PFDA		84	25-150	H	Pending	150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-003</b>
Description: <b>MW-22-158_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1145</b>	Project Name: <b>RACER Lansing</b>
Date Received: <b>12/16/2022</b>	Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		85	25-150	H	Pending	150
13C8_PFOA		79	25-150	H	Pending	150
13C8_PFOS		86	25-150	H	Pending	150
13C8_PFOSA		86	10-150	H	Pending	150
13C9_PFNA		86	25-150	H	Pending	150
d5-EtFOSAA		78	25-150	H	Pending	150
d3-MeFOSAA		81	25-150	H	Pending	150

PRELIMINARY

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-004**

Description: **EB-01\_121522**

Matrix: **Aqueous**

Date Sampled: **12/15/2022 1200**

Project Name: **RACER Lansing**

Date Received: **12/16/2022**

Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1806	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1			01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.48	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>1.5</b>	<b>BJ</b>	<b>3.4</b>	<b>0.52</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>0.70</b>	<b>J</b>	<b>3.4</b>	<b>0.59</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		101	25-150	H	Pending	150
13C2_6:2FTS		106	25-150	H	Pending	150
13C2_8:2FTS		75	25-150	H	Pending	150
13C2_PFDaA		85	25-150	H	Pending	150
13C2_PFTeDA		83	25-150	H	Pending	150
13C3_PFBs		89	25-150	H	Pending	150
13C3_PFHxS		85	25-150	H	Pending	150
13C3-HFPO-DA		96	25-150	H	Pending	150
13C4_PFBa		87	25-150	H	Pending	150
13C4_PFHpA		91	25-150	H	Pending	150
13C5_PFHxA		93	25-150	H	Pending	150
13C5_PFPeA		91	25-150	H	Pending	150
13C6_PFDa		83	25-150	H	Pending	150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-004</b>
Description: <b>EB-01_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1200</b>	Project Name: <b>RACER Lansing</b>
Date Received: <b>12/16/2022</b>	Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		82	25-150	H	Pending	150
13C8_PFOA		97	25-150	H	Pending	150
13C8_PFOS		98	25-150	H	Pending	150
13C8_PFOSA		89	10-150	H	Pending	150
13C9_PFNA		100	25-150	H	Pending	150
d5-EtFOSAA		82	25-150	H	Pending	150
d3-MeFOSAA		81	25-150	H	Pending	150

PRELIMINARY

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

# PFAS by LC/MS/MS

 Client: **Arcadis U.S., Inc.**

 Laboratory ID: **XL16048-004**

 Description: **EB-01\_121522**

 Matrix: **Aqueous**

 Date Sampled: **12/15/2022 1200**

 Project Name: **RACER Lansing**

 Date Received: **12/16/2022**

Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1806	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1			01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	Pending	H	8	0.482	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	Pending	H	8	0.663	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	Pending	H	8	1.603	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	Pending	H	8	2	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	Pending	H	8	0.8739	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	Pending	H	8	2.0751	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	Pending	H	8	0.4836	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	Pending	H	8	0.7503	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	Pending	H	8	0.9322	ng/L	2
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	Pending	H	4	0.4146	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	Pending	H	4	0.7779	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	Pending	H	4	0.4987	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	Pending	H	4	0.7117	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	Pending	H	4	0.6129	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	Pending	H	4	0.594	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	Pending	H	4	0.5515	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	Pending	H	4	0.6	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	Pending	H	4	0.5249	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	Pending	H	4	0.4718	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	Pending	H	4	0.4472	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	Pending	H	4	0.6879	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	Pending	H	4	0.462	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	Pending	H	4	0.8291	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	Pending	H	4	0.5441	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	Pending	H	4	0.5995	ng/L	2
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	Pending	H	4	0.5289	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	Pending	H	4	0.6264	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	Pending	H	4	2.0018	ng/L	2

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C2_4:2FTS		101	25-150	H	Pending	150
13C2_6:2FTS		106	25-150	H	Pending	150
13C2_8:2FTS		75	25-150	H	Pending	150
13C2_PFDa		85	25-150	H	Pending	150
13C2_PFTeDA		83	25-150	H	Pending	150
13C3_PFBS		89	25-150	H	Pending	150
13C3_PFHxS		85	25-150	H	Pending	150
13C3-HFPO-DA		96	25-150	H	Pending	150
13C4_PFBA		87	25-150	H	Pending	150
13C4_PFHpA		91	25-150	H	Pending	150
13C5_PFHxA		93	25-150	H	Pending	150
13C5_PFPeA		91	25-150	H	Pending	150
13C6_PFDA		83	25-150	H	Pending	150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-004</b>
Description: <b>EB-01_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1200</b>	Project Name: <b>RACER Lansing</b>
Date Received: <b>12/16/2022</b>	Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		82	25-150	H	Pending	150
13C8_PFOA		97	25-150	H	Pending	150
13C8_PFOS		98	25-150	H	Pending	150
13C8_PFOSA		89	10-150	H	Pending	150
13C9_PFNA		100	25-150	H	Pending	150
d5-EtFOSAA		82	25-150	H	Pending	150
d3-MeFOSAA		81	25-150	H	Pending	150

PRELIMINARY

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

## QC Summary

PRELIMINARY

# PFAS by LC/MS/MS - MB

Sample ID: YQ64087-001

Matrix: Aqueous

Batch: 64087

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/04/2023 1235

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9CI-PF3ONS	ND		1	8.0	0.48	ng/L	01/11/2023 1652
11CI-PF3OUdS	ND		1	8.0	0.66	ng/L	01/11/2023 1652
8:2 FTS	ND		1	8.0	1.6	ng/L	01/11/2023 1652
6:2 FTS	ND		1	8.0	2.0	ng/L	01/11/2023 1652
4:2 FTS	ND		1	8.0	0.87	ng/L	01/11/2023 1652
GenX	ND		1	8.0	2.1	ng/L	01/11/2023 1652
ADONA	ND		1	8.0	0.48	ng/L	01/11/2023 1652
EtFOSAA	ND		1	8.0	0.75	ng/L	01/11/2023 1652
MeFOSAA	ND		1	8.0	0.93	ng/L	01/11/2023 1652
PFBS	ND		1	4.0	0.41	ng/L	01/11/2023 1652
PFDS	ND		1	4.0	0.78	ng/L	01/11/2023 1652
PFHpS	ND		1	4.0	0.50	ng/L	01/11/2023 1652
PFNS	ND		1	4.0	0.71	ng/L	01/11/2023 1652
PFOSA	ND		1	4.0	0.61	ng/L	01/11/2023 1652
PFPeS	ND		1	4.0	0.59	ng/L	01/11/2023 1652
PFHxS	ND		1	4.0	0.55	ng/L	01/11/2023 1652
<b>PFBA</b>	<b>2.0</b>	<b>J</b>	<b>1</b>	<b>4.0</b>	<b>0.60</b>	<b>ng/L</b>	<b>01/11/2023 1652</b>
PFDA	ND		1	4.0	0.52	ng/L	01/11/2023 1652
PFDoA	ND		1	4.0	0.47	ng/L	01/11/2023 1652
PFHpA	ND		1	4.0	0.45	ng/L	01/11/2023 1652
PFHxA	ND		1	4.0	0.69	ng/L	01/11/2023 1652
PFNA	ND		1	4.0	0.46	ng/L	01/11/2023 1652
PFOA	ND		1	4.0	0.83	ng/L	01/11/2023 1652
PFPeA	ND		1	4.0	0.54	ng/L	01/11/2023 1652
PFTeDA	ND		1	4.0	0.60	ng/L	01/11/2023 1652
PFTTrDA	ND		1	4.0	0.53	ng/L	01/11/2023 1652
PFUdA	ND		1	4.0	0.63	ng/L	01/11/2023 1652
PFOS	ND		1	4.0	2.0	ng/L	01/11/2023 1652

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		82	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		82	25-150
13C3_PFBs		82	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		88	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - MB

Sample ID: YQ64087-001

Matrix: Aqueous

Batch: 64087

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/04/2023 1235

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	25-150
13C7_PFUdA		97	25-150
13C8_PFOA		87	25-150
13C8_PFOS		89	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		87	25-150

PRELIMINARY

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: YQ64087-002

Matrix: Aqueous

Batch: 64087

Prep Method: SOP SPE

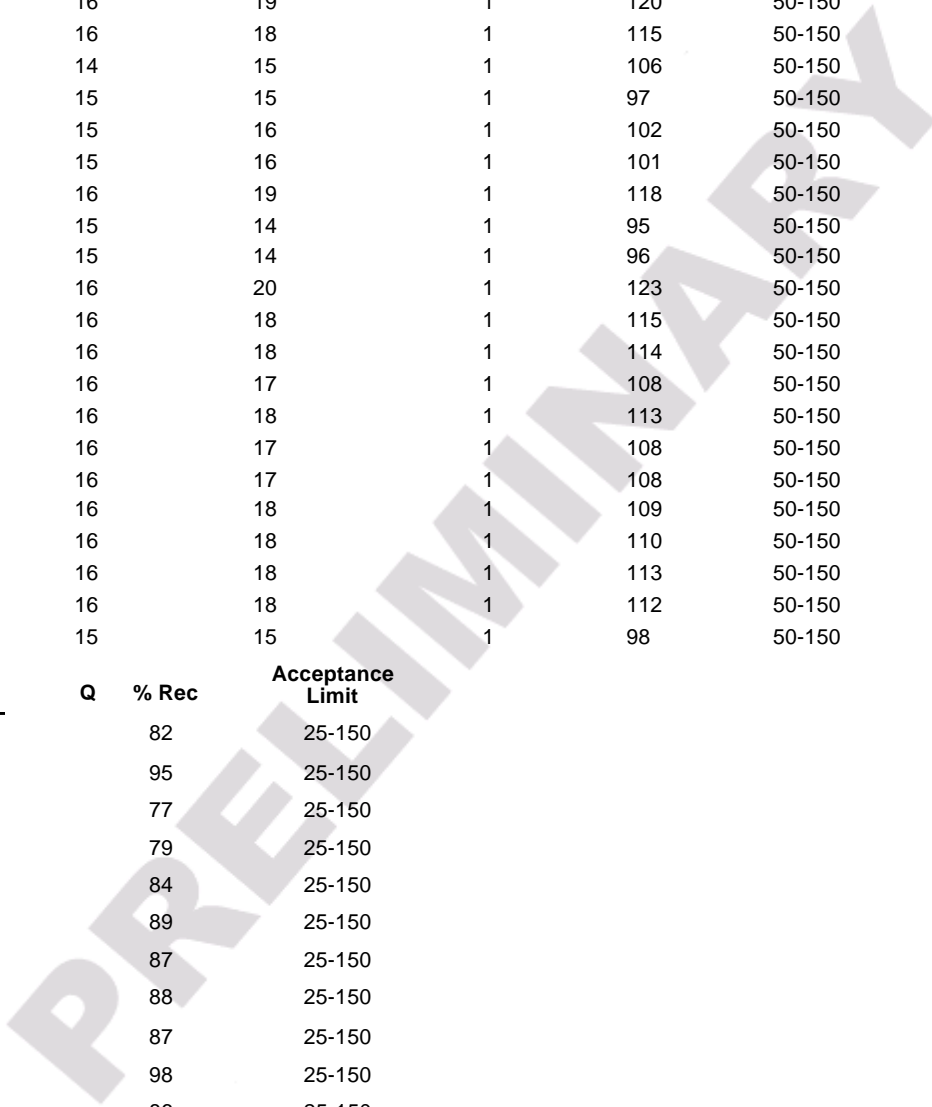
Analytical Method: PFAS by ID SOP

Prep Date: 01/04/2023 1235

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	105	50-150	01/11/2023 1702
11CI-PF3OUdS	15	16		1	107	50-150	01/11/2023 1702
8:2 FTS	15	16		1	107	50-150	01/11/2023 1702
6:2 FTS	15	17		1	112	50-150	01/11/2023 1702
4:2 FTS	15	18		1	120	50-150	01/11/2023 1702
GenX	32	32		1	99	50-150	01/11/2023 1702
ADONA	15	17		1	114	50-150	01/11/2023 1702
EtFOSAA	16	19		1	120	50-150	01/11/2023 1702
MeFOSAA	16	18		1	115	50-150	01/11/2023 1702
PFBS	14	15		1	106	50-150	01/11/2023 1702
PFDS	15	15		1	97	50-150	01/11/2023 1702
PFHpS	15	16		1	102	50-150	01/11/2023 1702
PFNS	15	16		1	101	50-150	01/11/2023 1702
PFOSA	16	19		1	118	50-150	01/11/2023 1702
PFPeS	15	14		1	95	50-150	01/11/2023 1702
PFHxS	15	14		1	96	50-150	01/11/2023 1702
PFBA	16	20		1	123	50-150	01/11/2023 1702
PFDA	16	18		1	115	50-150	01/11/2023 1702
PFDaA	16	18		1	114	50-150	01/11/2023 1702
PFHpA	16	17		1	108	50-150	01/11/2023 1702
PFHxA	16	18		1	113	50-150	01/11/2023 1702
PFNA	16	17		1	108	50-150	01/11/2023 1702
PFOA	16	17		1	108	50-150	01/11/2023 1702
PFPeA	16	18		1	109	50-150	01/11/2023 1702
PFTeDA	16	18		1	110	50-150	01/11/2023 1702
PFTTrDA	16	18		1	113	50-150	01/11/2023 1702
PFUdA	16	18		1	112	50-150	01/11/2023 1702
PFOS	15	15		1	98	50-150	01/11/2023 1702

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		82	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		77	25-150
13C2_PFDaA		79	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		88	25-150



LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

# PFAS by LC/MS/MS - LCS

Sample ID: YQ64087-002

Matrix: Aqueous

Batch: 64087

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/04/2023 1235

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	25-150
13C7_PFUdA		81	25-150
13C8_PFOA		83	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		86	25-150

PRELIMINARY

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

**Chain of Custody  
and  
Miscellaneous Documents**

PRELIMINARY

# PACE ANALYTICAL SERVICES, LLC



**PACE ANALYTICAL SERVICES, LLC**  
 106 Vantage Point Drive • West Columbia, SC 29172  
 Telephone No. 803-791-9700 Fax No. 803-791-9111  
 www.pacelabs.com

Number 141212

<b>Client:</b> Arcadis 28550 Cabot Drive, Suite 500 City: Novi, State: MI, Zip Code: 48377		<b>Report to Contact:</b> Keatlyn Hunt Keatlyn.Hunt@arcadis.com Telephone No. / E-mail: 947-777-5215 Analysis (Attach list if more space is needed)		Quote No. Page 1 of 1			
<b>Project Name:</b> RICEK Lansing		<b>Printed Name:</b> Austin Westhuis		Barcode: XL16048 KES2 Remarks / Cooler I.D.			
Project No.	Sample ID / Description	Collection Date(s)	Division Time (M:SS)	Matrix	No. of Containers by Preservative Type	Possible Hazard Identification	CC Requirements (Specify)
30112892.03704	(Containers for each sample may be combined on one row.)						
	MW-22-160-121322	12/13/22	1145	G X	2	1. Received by Fed Ex	Date: 12/15/22 Time: 1300
	Dup-01-121322	12/13/22	---	G X	2	2. Received by	Date: Time
	MW-22-158-121522	12/15/22	1145	G X	2	3. Received by	Date: Time
	EB-01-121522	12/15/22	1200	G X	2	4. Laboratory received by Keatlyn Hunt	Date: 12/16/22 Time: 1605
Turn Around Time Required (Prior lab approval required for expedited TAT): <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush (Specify)							Received on ice (Circle): <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> For Pack <input type="radio"/> For Pack Receipt Temp: 3.0 °C
1. Requisitioned by: Keatlyn Hunt / Austin Westhuis / Arcadis Date: 12/15/22 Time: 1300							1. Received by: Fed Ex Date: Time
2. Requisitioned by: Date: Time							2. Received by: Date: Time
3. Requisitioned by: Date: Time							3. Received by: Date: Time
4. Requisitioned by: Fedex Date: 12/16/22 Time: 1605							4. Laboratory received by: Keatlyn Hunt Date: 12/16/22 Time: 1605
Note: All samples are retained for four weeks from receipt unless other arrangements are made.							

DISTRIBUTION: WHITE & YELLOW Return to laboratory with Sample(s), Pink-Field/Client Copy

Document Number: ME00392-01

PRELIMINARY

# PACE ANALYTICAL SERVICES, LLC

DC#\_Title: ENV-FRM-WCOL-0286 v02\_Samples Receipt Checklist (SRC)  
 Effective Date: 8/2/2022

## Sample Receipt Checklist (SRC)

Client: Acadis

Cooler Inspected by/date: KDRW / 12/16/2022

Lot #: XL16048

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other: _____	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1. Were custody seals present on the cooler?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: <u>NA</u> Chlorine Strip ID: <u>NA</u> Tested by: <u>NA</u>	
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Soap-Cup ID: <u>NA</u> 3.0 / 3.0 °C <u>NA</u> / <u>NA</u> °C <u>NA</u> / <u>NA</u> °C <u>NA</u> / <u>NA</u> °C	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gm ID: <u>8</u> IR Gm Correction Factor: <u>0</u> °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC and all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Was collection date & time listed on the COC and all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Was adequate sample volume available?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Were all samples containers accounted for? (No missing/excess)
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pca-size" (¼" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all applicable NH <sub>4</sub> /TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	18. Was the quote number listed on the container label? If yes, Quote # <u>25329</u>
<b>Sample Preservation</b> (Must be completed for any sample(s) incorrectly preserved or with headspace.)	
Sample(s) <u>NA</u> were received incorrectly preserved and were adjusted accordingly in sample receiving with <u>NA</u> mL of circle one: H <sub>2</sub> SO <sub>4</sub> , HNO <sub>3</sub> , HCl, NaOH using SR # <u>NA</u> . Time of preservation <u>NA</u> . If more than one preservative is needed, please note in the comments below.	
Sample(s) <u>NA</u> were received with bubbles >6 mm in diameter.	
Samples(s) <u>NA</u> were received with TRC > 0.5 mg/l. (If #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Unique ID: <u>NA</u> .	
Comments: _____ _____ _____ _____	



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## Report of Analysis

**Arcadis U.S., Inc.**  
630 Plaza Drive  
Suite 600  
Highlands Ranch, CO 80129  
Attention: Kaitlyn Hunt

Project Name: RACER Lansing

Lot Number: **XL16048**

Date Completed: 01/19/2023

*Kathy Smith*

01/19/2023 2:03 PM

Approved and released by:  
Project Manager II: **Kathy E. Smith**



The electronic signature above is the equivalent of a handwritten signature.  
This report shall not be reproduced, except in its entirety, without the written approval of Pace Analytical Services, LLC.

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Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)  
106 Vantage Point Drive West Columbia, SC 29172  
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

# PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

## Case Narrative Arcadis U.S., Inc. Lot Number: XL16048

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

$$CF = DF * FV / Vo$$

FV is volume of extract (mL)

Vo is initial sample volume (mL)

DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:

Concentration (ng/L) = Cs\*CF,

$$C_s = \frac{\left( \frac{A_s \times C_{is}}{A_{is}} \right) - B}{M1}$$

Where

C<sub>s</sub> is on column concentration of target analyte in the sample (ng/L)

C<sub>is</sub> is concentration of internal standard in the sample (ng/L)

A<sub>s</sub> is peak response of target analyte in the sample

A<sub>is</sub> is peak response of internal standard in the sample

M1 is the average RF from ICAL or the slope from linear regression ICAL

B is the y-intercept from the ICAL

# PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001

NELAC No: E87653

NC DENR No: 329

NC Field Parameters No: 5639

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Samples XL16048-001, XL16048-002 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet.

Re-extraction of the following samples was performed outside of the analytical holding time: XL16048-001, XL16048-002, XL16048-003, XL16048-004. During the first analytical run for these samples were associated with a method blank that had a PFBA contamination. The re-extracted method blank again had PFBA contamination. There is insufficient sample for another re-extract. All data has been reported.

# PACE ANALYTICAL SERVICES, LLC

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## Sample Summary

Arcadis U.S., Inc.

Lot Number: XL16048

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Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-22-160_121322	Aqueous	12/13/2022 1145	12/16/2022
002	Dup-01_121322	Aqueous	12/13/2022	12/16/2022
003	MW-22-158_121522	Aqueous	12/15/2022 1145	12/16/2022
004	EB-01_121522	Aqueous	12/15/2022 1200	12/16/2022

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(4 samples)

# PACE ANALYTICAL SERVICES, LLC

## Detection Summary

Arcadis U.S., Inc.

Lot Number: XL16048

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-22-160_121322	Aqueous	PFPeA	PFAS by ID	0.54	J	ng/L	5
001	MW-22-160_121322	Aqueous	PFBA	PFAS by ID	4.2	BH	ng/L	7
002	Dup-01_121322	Aqueous	PFPeA	PFAS by ID	0.49	J	ng/L	9
002	Dup-01_121322	Aqueous	PFBA	PFAS by ID	4.1	BH	ng/L	11
003	MW-22-158_121522	Aqueous	PFBS	PFAS by ID	1.4	J	ng/L	13
003	MW-22-158_121522	Aqueous	PFHpA	PFAS by ID	1.6	J	ng/L	13
003	MW-22-158_121522	Aqueous	PFHxA	PFAS by ID	3.9		ng/L	13
003	MW-22-158_121522	Aqueous	PFPeA	PFAS by ID	3.2	J	ng/L	13
003	MW-22-158_121522	Aqueous	PFBA	PFAS by ID	6.6	BH	ng/L	15
004	EB-01_121522	Aqueous	PFHxA	PFAS by ID	0.70	J	ng/L	17
004	EB-01_121522	Aqueous	PFBA	PFAS by ID	2.4	BHJ	ng/L	19

(11 detections)

# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-001**

Description: **MW-22-160\_121322**

Matrix: **Aqueous**

Date Sampled: **12/13/2022 1145**

Date Received: **12/16/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1713	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1	01/17/2023 2306	BWS	01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.8	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.8	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.8	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.8	1.8	ng/L	1
4,8-dioxo-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.8	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.8	0.64	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.8	0.80	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.35	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>4.9</b>	<b>B</b>	<b>3.4</b>	<b>0.51</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.38	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.4	0.59	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>0.54</b>	<b>J</b>	<b>3.4</b>	<b>0.47</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_4:2FTS		112	25-150	HN	153	25-150
13C2_6:2FTS		109	25-150	H	114	25-150
13C2_8:2FTS		79	25-150	H	99	25-150
13C2_PFDa		71	25-150	H	83	25-150
13C2_PFTeDA		76	25-150	H	77	25-150
13C3_PFBs		88	25-150	H	99	25-150
13C3_PFHxS		89	25-150	H	105	25-150
13C3-HFPO-DA		81	25-150	H	93	25-150
13C4_PFBa		73	25-150	H	87	25-150
13C4_PFHpA		100	25-150	H	99	25-150
13C5_PFHxA		84	25-150	H	103	25-150
13C5_PFPeA		90	25-150	H	101	25-150
13C6_PFDa		81	25-150	H	93	25-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-001</b>
Description: <b>MW-22-160_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022 1145</b>	
Date Received: <b>12/16/2022</b>	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		68	25-150	H	84	25-150
13C8_PFOA		89	25-150	H	108	25-150
13C8_PFOS		90	25-150	H	96	25-150
13C8_PFOSA		78	10-150	H	94	10-150
13C9_PFNA		86	25-150	H	96	25-150
d5-EtFOSAA		73	25-150	H	84	25-150
d3-MeFOSAA		78	25-150	H	85	25-150

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
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# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-001**

Description: **MW-22-160\_121322**

Matrix: **Aqueous**

Date Sampled: **12/13/2022 1145**

Date Received: **12/16/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1713	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1	01/17/2023 2306	BWS	01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	6.9	0.42	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	6.9	0.57	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	6.9	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	6.9	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	HQ	6.9	0.76	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	6.9	1.8	ng/L	2
4,8-dioxo-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	6.9	0.42	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	6.9	0.65	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	6.9	0.81	ng/L	2
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	H	3.5	0.36	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	3.5	0.67	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	H	3.5	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	3.5	0.62	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H	3.5	0.53	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	H	3.5	0.51	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	H	3.5	0.48	ng/L	2
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>4.2</b>	<b>BH</b>	<b>3.5</b>	<b>0.52</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	3.5	0.45	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	3.5	0.41	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	H	3.5	0.39	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	H	3.5	0.60	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	H	3.5	0.40	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	H	3.5	0.72	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	H	3.5	0.47	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	3.5	0.52	ng/L	2
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND	H	3.5	0.46	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	3.5	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	H	3.5	1.7	ng/L	2

Surrogate	Run 1		Acceptance Limits	Run 2		Acceptance Limits
	Q	% Recovery		Q	% Recovery	
13C2_4:2FTS		112	25-150	HN	153	25-150
13C2_6:2FTS		109	25-150	H	114	25-150
13C2_8:2FTS		79	25-150	H	99	25-150
13C2_PFDa		71	25-150	H	83	25-150
13C2_PFTeDA		76	25-150	H	77	25-150
13C3_PFBs		88	25-150	H	99	25-150
13C3_PFHxS		89	25-150	H	105	25-150
13C3-HFPO-DA		81	25-150	H	93	25-150
13C4_PFBa		73	25-150	H	87	25-150
13C4_PFHpA		100	25-150	H	99	25-150
13C5_PFHxA		84	25-150	H	103	25-150
13C5_PFPeA		90	25-150	H	101	25-150
13C6_PFDa		81	25-150	H	93	25-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-001</b>
Description: <b>MW-22-160_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022 1145</b>	
Date Received: <b>12/16/2022</b>	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		68	25-150	H	84	25-150
13C8_PFOA		89	25-150	H	108	25-150
13C8_PFOS		90	25-150	H	96	25-150
13C8_PFOSA		78	10-150	H	94	10-150
13C9_PFNA		86	25-150	H	96	25-150
d5-EtFOSAA		73	25-150	H	84	25-150
d3-MeFOSAA		78	25-150	H	85	25-150

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-002</b>
Description: <b>Dup-01_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022</b>	
Date Received: <b>12/16/2022</b>	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1724	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1	01/17/2023 2317	BWS	01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxo-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>3.1</b>	<b>BJ</b>	<b>3.5</b>	<b>0.53</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>0.49</b>	<b>J</b>	<b>3.5</b>	<b>0.48</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_4:2FTS		120	25-150	HN	154	25-150
13C2_6:2FTS		105	25-150	H	126	25-150
13C2_8:2FTS		83	25-150	H	106	25-150
13C2_PFDa		72	25-150	H	88	25-150
13C2_PFTeDA		70	25-150	H	80	25-150
13C3_PFBs		85	25-150	H	111	25-150
13C3_PFHxS		89	25-150	H	105	25-150
13C3-HFPO-DA		84	25-150	H	97	25-150
13C4_PFBa		75	25-150	H	91	25-150
13C4_PFHpA		106	25-150	H	103	25-150
13C5_PFHxA		85	25-150	H	116	25-150
13C5_PFPeA		91	25-150	H	107	25-150
13C6_PFDa		84	25-150	H	99	25-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-002</b>
Description: <b>Dup-01_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022</b>	
Date Received: <b>12/16/2022</b>	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	25-150	H	88	25-150
13C8_PFOA		84	25-150	H	111	25-150
13C8_PFOS		94	25-150	H	103	25-150
13C8_PFOSA		84	10-150	H	95	10-150
13C9_PFNA		86	25-150	H	106	25-150
d5-EtFOSAA		72	25-150	H	90	25-150
d3-MeFOSAA		78	25-150	H	91	25-150

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-002</b>
Description: <b>Dup-01_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022</b>	
Date Received: <b>12/16/2022</b>	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1724	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1	01/17/2023 2317	BWS	01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	6.9	0.42	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	6.9	0.57	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	6.9	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	6.9	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	HQ	6.9	0.76	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	6.9	1.8	ng/L	2
4,8-dioxo-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	6.9	0.42	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	6.9	0.65	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	6.9	0.81	ng/L	2
Perfluoro-1-butanefluoro-1-octanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	H	3.5	0.36	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	3.5	0.67	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	H	3.5	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	3.5	0.62	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H	3.5	0.53	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	H	3.5	0.52	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	H	3.5	0.48	ng/L	2
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>4.1</b>	<b>BH</b>	<b>3.5</b>	<b>0.52</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	3.5	0.46	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	3.5	0.41	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	H	3.5	0.39	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND	H	3.5	0.60	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	H	3.5	0.40	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	H	3.5	0.72	ng/L	2
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>0.61</b>	<b>HJ</b>	<b>3.5</b>	<b>0.47</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	3.5	0.52	ng/L	2
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND	H	3.5	0.46	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	3.5	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	H	3.5	1.7	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_4:2FTS		120	25-150	HN	154	25-150
13C2_6:2FTS		105	25-150	H	126	25-150
13C2_8:2FTS		83	25-150	H	106	25-150
13C2_PFDa		72	25-150	H	88	25-150
13C2_PFTeDA		70	25-150	H	80	25-150
13C3_PFBs		85	25-150	H	111	25-150
13C3_PFHxS		89	25-150	H	105	25-150
13C3-HFPO-DA		84	25-150	H	97	25-150
13C4_PFBa		75	25-150	H	91	25-150
13C4_PFHpA		106	25-150	H	103	25-150
13C5_PFHxA		85	25-150	H	116	25-150
13C5_PFPeA		91	25-150	H	107	25-150
13C6_PFDa		84	25-150	H	99	25-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-002</b>
Description: <b>Dup-01_121322</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/13/2022</b>	
Date Received: <b>12/16/2022</b>	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		71	25-150	H	88	25-150
13C8_PFOA		84	25-150	H	111	25-150
13C8_PFOS		94	25-150	H	103	25-150
13C8_PFOSA		84	10-150	H	95	10-150
13C9_PFNA		86	25-150	H	106	25-150
d5-EtFOSAA		72	25-150	H	90	25-150
d3-MeFOSAA		78	25-150	H	91	25-150

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**

Laboratory ID: **XL16048-003**

Description: **MW-22-158\_121522**

Matrix: **Aqueous**

Date Sampled: **12/15/2022 1145**

Date Received: **12/16/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1756	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1	01/17/2023 2350	BWS	01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.0	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.0	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.0	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.0	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.0	0.66	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.82	ng/L	1
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>1.4</b>	<b>J</b>	<b>3.5</b>	<b>0.36</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>7.1</b>	<b>B</b>	<b>3.5</b>	<b>0.53</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.6</b>	<b>J</b>	<b>3.5</b>	<b>0.39</b>	<b>ng/L</b>	<b>1</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>3.9</b>		<b>3.5</b>	<b>0.60</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.73	ng/L	1
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>3.2</b>	<b>J</b>	<b>3.5</b>	<b>0.48</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.55	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_4:2FTS		103	25-150	H	138	25-150
13C2_6:2FTS		99	25-150	H	106	25-150
13C2_8:2FTS		74	25-150	H	99	25-150
13C2_PFDa		80	25-150	H	94	25-150
13C2_PFTeDA		86	25-150	H	95	25-150
13C3_PFBFS		86	25-150	H	102	25-150
13C3_PFHxS		82	25-150	H	105	25-150
13C3-HFPO-DA		84	25-150	H	95	25-150
13C4_PFBFA		76	25-150	H	89	25-150
13C4_PFHpA		90	25-150	H	101	25-150
13C5_PFHxA		86	25-150	H	106	25-150
13C5_PFPeA		85	25-150	H	103	25-150
13C6_PFDa		84	25-150	H	96	25-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-003</b>
Description: <b>MW-22-158_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1145</b>	
Date Received: <b>12/16/2022</b>	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		85	25-150	H	92	25-150
13C8_PFOA		79	25-150	H	106	25-150
13C8_PFOS		86	25-150	H	102	25-150
13C8_PFOSA		86	10-150	H	98	10-150
13C9_PFNA		86	25-150	H	101	25-150
d5-EtFOSAA		78	25-150	H	94	25-150
d3-MeFOSAA		81	25-150	H	93	25-150

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-003</b>
Description: <b>MW-22-158_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1145</b>	
Date Received: <b>12/16/2022</b>	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1756	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1	01/17/2023 2350	BWS	01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	6.9	0.41	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	6.9	0.57	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	6.9	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	6.9	1.7	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	H	6.9	0.75	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	6.9	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	6.9	0.42	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	6.9	0.65	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	6.9	0.80	ng/L	2
<b>Perfluoro-1-butanefluoronic acid (PFBS)</b>	<b>375-73-5</b>	<b>PFAS by ID SOP</b>	<b>1.3</b>	<b>HJ</b>	<b>3.4</b>	<b>0.36</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	3.4	0.67	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	H	3.4	0.43	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	3.4	0.61	ng/L	2
Perfluoro-1-octanesulfonamide (PFOA)	754-91-6	PFAS by ID SOP	ND	H	3.4	0.53	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	H	3.4	0.51	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	H	3.4	0.47	ng/L	2
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>6.6</b>	<b>BH</b>	<b>3.4</b>	<b>0.52</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	3.4	0.45	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	3.4	0.41	ng/L	2
<b>Perfluoro-n-heptanoic acid (PFHpA)</b>	<b>375-85-9</b>	<b>PFAS by ID SOP</b>	<b>1.6</b>	<b>HJ</b>	<b>3.4</b>	<b>0.38</b>	<b>ng/L</b>	<b>2</b>
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>3.5</b>	<b>H</b>	<b>3.4</b>	<b>0.59</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	H	3.4	0.40	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	H	3.4	0.71	ng/L	2
<b>Perfluoro-n-pentanoic acid (PFPeA)</b>	<b>2706-90-3</b>	<b>PFAS by ID SOP</b>	<b>3.5</b>	<b>H</b>	<b>3.4</b>	<b>0.47</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	3.4	0.52	ng/L	2
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND	H	3.4	0.45	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	3.4	0.54	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	H	3.4	1.7	ng/L	2

Surrogate	Q	Run 1		Q	Run 2	
		% Recovery	Acceptance Limits		% Recovery	Acceptance Limits
13C2_4:2FTS		103	25-150	H	138	25-150
13C2_6:2FTS		99	25-150	H	106	25-150
13C2_8:2FTS		74	25-150	H	99	25-150
13C2_PFDa		80	25-150	H	94	25-150
13C2_PFTeDA		86	25-150	H	95	25-150
13C3_PFBS		86	25-150	H	102	25-150
13C3_PFHxS		82	25-150	H	105	25-150
13C3-HFPO-DA		84	25-150	H	95	25-150
13C4_PFBA		76	25-150	H	89	25-150
13C4_PFHpA		90	25-150	H	101	25-150
13C5_PFHxA		86	25-150	H	106	25-150
13C5_PFPeA		85	25-150	H	103	25-150
13C6_PFDA		84	25-150	H	96	25-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-003</b>
Description: <b>MW-22-158_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1145</b>	
Date Received: <b>12/16/2022</b>	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		85	25-150	H	92	25-150
13C8_PFOA		79	25-150	H	106	25-150
13C8_PFOS		86	25-150	H	102	25-150
13C8_PFOSA		86	10-150	H	98	10-150
13C9_PFNA		86	25-150	H	101	25-150
d5-EtFOSAA		78	25-150	H	94	25-150
d3-MeFOSAA		81	25-150	H	93	25-150

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-004</b>
Description: <b>EB-01_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1200</b>	
Date Received: <b>12/16/2022</b>	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1806	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1	01/18/2023 0001	BWS	01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.75	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxo-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.80	ng/L	1
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.4	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.61	ng/L	1
Perfluoro-1-octanesulfonamide (PFOA)	754-91-6	PFAS by ID SOP	ND		3.4	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.48	ng/L	1
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>1.5</b>	<b>BJ</b>	<b>3.4</b>	<b>0.52</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.4	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>0.70</b>	<b>J</b>	<b>3.4</b>	<b>0.59</b>	<b>ng/L</b>	<b>1</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.71	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND		3.4	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.4	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.4	1.7	ng/L	1

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_4:2FTS		101	25-150	H	120	25-150
13C2_6:2FTS		106	25-150	H	113	25-150
13C2_8:2FTS		75	25-150	H	100	25-150
13C2_PFDa		85	25-150	H	93	25-150
13C2_PFTeDA		83	25-150	H	93	25-150
13C3_PFBFS		89	25-150	H	99	25-150
13C3_PFHxS		85	25-150	H	99	25-150
13C3-HFPO-DA		96	25-150	H	97	25-150
13C4_PFBA		87	25-150	H	100	25-150
13C4_PFHpA		91	25-150	H	98	25-150
13C5_PFHxA		93	25-150	H	105	25-150
13C5_PFPeA		91	25-150	H	99	25-150
13C6_PFDA		83	25-150	H	97	25-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-004</b>
Description: <b>EB-01_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1200</b>	
Date Received: <b>12/16/2022</b>	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		82	25-150	H	93	25-150
13C8_PFOA		97	25-150	H	109	25-150
13C8_PFOS		98	25-150	H	108	25-150
13C8_PFOSA		89	10-150	H	93	10-150
13C9_PFNA		100	25-150	H	110	25-150
d5-EtFOSAA		82	25-150	H	92	25-150
d3-MeFOSAA		81	25-150	H	88	25-150

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LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
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# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-004</b>
Description: <b>EB-01_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1200</b>	
Date Received: <b>12/16/2022</b>	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	01/11/2023 1806	ALM	01/04/2023 1235	64087
2	SOP SPE	PFAS by ID SOP	1	01/18/2023 0001	BWS	01/16/2023 1340	64959

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)	756426-58-1	PFAS by ID SOP	ND	H	7.0	0.42	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3...)	763051-92-9	PFAS by ID SOP	ND	H	7.0	0.58	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	H	7.0	1.4	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	H	7.0	1.8	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	H	7.0	0.77	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND	H	7.0	1.8	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND	H	7.0	0.43	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	H	7.0	0.66	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	H	7.0	0.82	ng/L	2
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	PFAS by ID SOP	ND	H	3.5	0.36	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	H	3.5	0.68	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	H	3.5	0.44	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	H	3.5	0.63	ng/L	2
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND	H	3.5	0.54	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	H	3.5	0.52	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND	H	3.5	0.48	ng/L	2
<b>Perfluoro-n-butanoic acid (PFBA)</b>	<b>375-22-4</b>	<b>PFAS by ID SOP</b>	<b>2.4</b>	<b>BHJ</b>	<b>3.5</b>	<b>0.53</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	H	3.5	0.46	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	H	3.5	0.41	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND	H	3.5	0.39	ng/L	2
<b>Perfluoro-n-hexanoic acid (PFHxA)</b>	<b>307-24-4</b>	<b>PFAS by ID SOP</b>	<b>0.76</b>	<b>HJ</b>	<b>3.5</b>	<b>0.60</b>	<b>ng/L</b>	<b>2</b>
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	H	3.5	0.41	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND	H	3.5	0.73	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND	H	3.5	0.48	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	H	3.5	0.53	ng/L	2
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	PFAS by ID SOP	ND	H	3.5	0.47	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	H	3.5	0.55	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND	H	3.5	1.8	ng/L	2

Surrogate	Run 1			Run 2		
	Q	% Recovery	Acceptance Limits	Q	% Recovery	Acceptance Limits
13C2_4:2FTS		101	25-150	H	120	25-150
13C2_6:2FTS		106	25-150	H	113	25-150
13C2_8:2FTS		75	25-150	H	100	25-150
13C2_PFDa		85	25-150	H	93	25-150
13C2_PFTeDA		83	25-150	H	93	25-150
13C3_PFBs		89	25-150	H	99	25-150
13C3_PFHxS		85	25-150	H	99	25-150
13C3-HFPO-DA		96	25-150	H	97	25-150
13C4_PFBa		87	25-150	H	100	25-150
13C4_PFHpA		91	25-150	H	98	25-150
13C5_PFHxA		93	25-150	H	105	25-150
13C5_PFPeA		91	25-150	H	99	25-150
13C6_PFDa		83	25-150	H	97	25-150

LOQ = Limit of Quantitation      B = Detected in the method blank      E = Quantitation of compound exceeded the calibration range      DL = Detection Limit      Q = Surrogate failure  
 ND = Not detected at or above the DL      N = Recovery is out of criteria      P = The RPD between two GC columns exceeds 40%      J = Estimated result < LOQ and ≥ DL      L = LCS/LCSD failure  
 H = Out of holding time      W = Reported on wet weight basis      S = MS/MSD failure

# PFAS by LC/MS/MS

Client: <b>Arcadis U.S., Inc.</b>	Laboratory ID: <b>XL16048-004</b>
Description: <b>EB-01_121522</b>	Matrix: <b>Aqueous</b>
Date Sampled: <b>12/15/2022 1200</b>	
Date Received: <b>12/16/2022</b>	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		82	25-150	H	93	25-150
13C8_PFOA		97	25-150	H	109	25-150
13C8_PFOS		98	25-150	H	108	25-150
13C8_PFOSA		89	10-150	H	93	10-150
13C9_PFNA		100	25-150	H	110	25-150
d5-EtFOSAA		82	25-150	H	92	25-150
d3-MeFOSAA		81	25-150	H	88	25-150

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LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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## QC Summary

# PFAS by LC/MS/MS - MB

Sample ID: YQ64087-001

Matrix: Aqueous

Batch: 64087

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/04/2023 1235

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9CI-PF3ONS	ND		1	8.0	0.48	ng/L	01/11/2023 1652
11CI-PF3OUdS	ND		1	8.0	0.66	ng/L	01/11/2023 1652
8:2 FTS	ND		1	8.0	1.6	ng/L	01/11/2023 1652
6:2 FTS	ND		1	8.0	2.0	ng/L	01/11/2023 1652
4:2 FTS	ND		1	8.0	0.87	ng/L	01/11/2023 1652
GenX	ND		1	8.0	2.1	ng/L	01/11/2023 1652
ADONA	ND		1	8.0	0.48	ng/L	01/11/2023 1652
EtFOSAA	ND		1	8.0	0.75	ng/L	01/11/2023 1652
MeFOSAA	ND		1	8.0	0.93	ng/L	01/11/2023 1652
PFBS	ND		1	4.0	0.41	ng/L	01/11/2023 1652
PFDS	ND		1	4.0	0.78	ng/L	01/11/2023 1652
PFHpS	ND		1	4.0	0.50	ng/L	01/11/2023 1652
PFNS	ND		1	4.0	0.71	ng/L	01/11/2023 1652
PFOSA	ND		1	4.0	0.61	ng/L	01/11/2023 1652
PFPeS	ND		1	4.0	0.59	ng/L	01/11/2023 1652
PFHxS	ND		1	4.0	0.55	ng/L	01/11/2023 1652
<b>PFBA</b>	<b>2.0</b>	<b>J</b>	<b>1</b>	<b>4.0</b>	<b>0.60</b>	<b>ng/L</b>	<b>01/11/2023 1652</b>
PFDA	ND		1	4.0	0.52	ng/L	01/11/2023 1652
PFDoA	ND		1	4.0	0.47	ng/L	01/11/2023 1652
PFHpA	ND		1	4.0	0.45	ng/L	01/11/2023 1652
PFHxA	ND		1	4.0	0.69	ng/L	01/11/2023 1652
PFNA	ND		1	4.0	0.46	ng/L	01/11/2023 1652
PFOA	ND		1	4.0	0.83	ng/L	01/11/2023 1652
PFPeA	ND		1	4.0	0.54	ng/L	01/11/2023 1652
PFTeDA	ND		1	4.0	0.60	ng/L	01/11/2023 1652
PFTTrDA	ND		1	4.0	0.53	ng/L	01/11/2023 1652
PFUdA	ND		1	4.0	0.63	ng/L	01/11/2023 1652
PFOS	ND		1	4.0	2.0	ng/L	01/11/2023 1652

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		82	25-150
13C2_6:2FTS		94	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		82	25-150
13C3_PFBs		82	25-150
13C3_PFHxS		90	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		80	25-150
13C5_PFPeA		88	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# PFAS by LC/MS/MS - MB

Sample ID: YQ64087-001

Matrix: Aqueous

Batch: 64087

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/04/2023 1235

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		82	25-150
13C7_PFUdA		97	25-150
13C8_PFOA		87	25-150
13C8_PFOS		89	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		87	25-150

LOQ = Limit of Quantitation

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DL = Detection Limit

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# PFAS by LC/MS/MS - LCS

Sample ID: YQ64087-002

Matrix: Aqueous

Batch: 64087

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/04/2023 1235

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	105	50-150	01/11/2023 1702
11CI-PF3OUdS	15	16		1	107	50-150	01/11/2023 1702
8:2 FTS	15	16		1	107	50-150	01/11/2023 1702
6:2 FTS	15	17		1	112	50-150	01/11/2023 1702
4:2 FTS	15	18		1	120	50-150	01/11/2023 1702
GenX	32	32		1	99	50-150	01/11/2023 1702
ADONA	15	17		1	114	50-150	01/11/2023 1702
EtFOSAA	16	19		1	120	50-150	01/11/2023 1702
MeFOSAA	16	18		1	115	50-150	01/11/2023 1702
PFBS	14	15		1	106	50-150	01/11/2023 1702
PFDS	15	15		1	97	50-150	01/11/2023 1702
PFHpS	15	16		1	102	50-150	01/11/2023 1702
PFNS	15	16		1	101	50-150	01/11/2023 1702
PFOSA	16	19		1	118	50-150	01/11/2023 1702
PFPeS	15	14		1	95	50-150	01/11/2023 1702
PFHxS	15	14		1	96	50-150	01/11/2023 1702
PFBA	16	20		1	123	50-150	01/11/2023 1702
PFDA	16	18		1	115	50-150	01/11/2023 1702
PFDoA	16	18		1	114	50-150	01/11/2023 1702
PFHpA	16	17		1	108	50-150	01/11/2023 1702
PFHxA	16	18		1	113	50-150	01/11/2023 1702
PFNA	16	17		1	108	50-150	01/11/2023 1702
PFOA	16	17		1	108	50-150	01/11/2023 1702
PFPeA	16	18		1	109	50-150	01/11/2023 1702
PFTeDA	16	18		1	110	50-150	01/11/2023 1702
PFTTrDA	16	18		1	113	50-150	01/11/2023 1702
PFUdA	16	18		1	112	50-150	01/11/2023 1702
PFOS	15	15		1	98	50-150	01/11/2023 1702

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		82	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		77	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		88	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# PFAS by LC/MS/MS - LCS

Sample ID: YQ64087-002

Matrix: Aqueous

Batch: 64087

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/04/2023 1235

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		84	25-150
13C7_PFUdA		81	25-150
13C8_PFOA		83	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# PFAS by LC/MS/MS - MB

Sample ID: YQ64959-001

Matrix: Aqueous

Batch: 64959

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/16/2023 1340

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9CI-PF3ONS	ND		1	8.0	0.48	ng/L	01/17/2023 2117
11CI-PF3OUdS	ND		1	8.0	0.66	ng/L	01/17/2023 2117
8:2 FTS	ND		1	8.0	1.6	ng/L	01/17/2023 2117
6:2 FTS	ND		1	8.0	2.0	ng/L	01/17/2023 2117
4:2 FTS	ND		1	8.0	0.87	ng/L	01/17/2023 2117
GenX	ND		1	8.0	2.1	ng/L	01/17/2023 2117
ADONA	ND		1	8.0	0.48	ng/L	01/17/2023 2117
EtFOSAA	ND		1	8.0	0.75	ng/L	01/17/2023 2117
MeFOSAA	ND		1	8.0	0.93	ng/L	01/17/2023 2117
PFBS	ND		1	4.0	0.41	ng/L	01/17/2023 2117
PFDS	ND		1	4.0	0.78	ng/L	01/17/2023 2117
PFHpS	ND		1	4.0	0.50	ng/L	01/17/2023 2117
PFNS	ND		1	4.0	0.71	ng/L	01/17/2023 2117
PFOSA	ND		1	4.0	0.61	ng/L	01/17/2023 2117
PFPeS	ND		1	4.0	0.59	ng/L	01/17/2023 2117
PFHxS	ND		1	4.0	0.55	ng/L	01/17/2023 2117
<b>PFBA</b>	<b>2.6</b>	<b>J</b>	<b>1</b>	<b>4.0</b>	<b>0.60</b>	<b>ng/L</b>	<b>01/17/2023 2117</b>
PFDA	ND		1	4.0	0.52	ng/L	01/17/2023 2117
PFDoA	ND		1	4.0	0.47	ng/L	01/17/2023 2117
PFHpA	ND		1	4.0	0.45	ng/L	01/17/2023 2117
PFHxA	ND		1	4.0	0.69	ng/L	01/17/2023 2117
PFNA	ND		1	4.0	0.46	ng/L	01/17/2023 2117
PFOA	ND		1	4.0	0.83	ng/L	01/17/2023 2117
PFPeA	ND		1	4.0	0.54	ng/L	01/17/2023 2117
PFTeDA	ND		1	4.0	0.60	ng/L	01/17/2023 2117
PFTTrDA	ND		1	4.0	0.53	ng/L	01/17/2023 2117
PFUdA	ND		1	4.0	0.63	ng/L	01/17/2023 2117
PFOS	ND		1	4.0	2.0	ng/L	01/17/2023 2117

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		102	25-150
13C2_6:2FTS		95	25-150
13C2_8:2FTS		104	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		96	25-150
13C5_PFPeA		100	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and ≥ DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

+ = RPD is out of criteria

**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# PFAS by LC/MS/MS - MB

Sample ID: YQ64959-001

Matrix: Aqueous

Batch: 64959

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/16/2023 1340

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		99	25-150
13C7_PFUdA		91	25-150
13C8_PFOA		101	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		92	25-150
d3-MeFOSAA		92	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

DL = Detection Limit

J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

\* = RSD is out of criteria

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# PFAS by LC/MS/MS - LCS

Sample ID: YQ64959-002

Matrix: Aqueous

Batch: 64959

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/16/2023 1340

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9CI-PF3ONS	15	16		1	106	50-150	01/17/2023 2128
11CI-PF3OUdS	15	15		1	99	50-150	01/17/2023 2128
8:2 FTS	15	17		1	113	50-150	01/17/2023 2128
6:2 FTS	15	15		1	98	50-150	01/17/2023 2128
4:2 FTS	15	17		1	112	50-150	01/17/2023 2128
GenX	32	37		1	114	50-150	01/17/2023 2128
ADONA	15	16		1	109	50-150	01/17/2023 2128
EtFOSAA	16	18		1	110	50-150	01/17/2023 2128
MeFOSAA	16	18		1	112	50-150	01/17/2023 2128
PFBS	14	14		1	101	50-150	01/17/2023 2128
PFDS	15	16		1	101	50-150	01/17/2023 2128
PFHpS	15	17		1	113	50-150	01/17/2023 2128
PFNS	15	17		1	109	50-150	01/17/2023 2128
PFOSA	16	18		1	112	50-150	01/17/2023 2128
PFPeS	15	15		1	101	50-150	01/17/2023 2128
PFHxS	15	15		1	103	50-150	01/17/2023 2128
PFBA	16	20		1	124	50-150	01/17/2023 2128
PFDA	16	17		1	108	50-150	01/17/2023 2128
PFDaA	16	17		1	109	50-150	01/17/2023 2128
PFHpA	16	18		1	113	50-150	01/17/2023 2128
PFHxA	16	18		1	111	50-150	01/17/2023 2128
PFNA	16	18		1	113	50-150	01/17/2023 2128
PFOA	16	17		1	109	50-150	01/17/2023 2128
PFPeA	16	18		1	115	50-150	01/17/2023 2128
PFTeDA	16	17		1	109	50-150	01/17/2023 2128
PFTTrDA	16	15		1	95	50-150	01/17/2023 2128
PFUdA	16	18		1	113	50-150	01/17/2023 2128
PFOS	15	16		1	106	50-150	01/17/2023 2128

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		99	25-150
13C2_6:2FTS		103	25-150
13C2_8:2FTS		99	25-150
13C2_PFDaA		101	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		104	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		93	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation

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**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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# PFAS by LC/MS/MS - LCS

Sample ID: YQ64959-002

Matrix: Aqueous

Batch: 64959

Prep Method: SOP SPE

Analytical Method: PFAS by ID SOP

Prep Date: 01/16/2023 1340

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		99	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		101	25-150
13C8_PFOS		104	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		99	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		94	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the DL

N = Recovery is out of criteria

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J = Estimated result < LOQ and  $\geq$  DL

P = The RPD between two GC columns exceeds 40%

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**Note: Calculations are performed before rounding to avoid round-off errors in calculated results**

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**Chain of Custody  
and  
Miscellaneous Documents**

# PACE ANALYTICAL SERVICES, LLC



**PACE ANALYTICAL SERVICES, LLC**  
 106 Vantage Point Drive • West Columbia, SC 29172  
 Telephone No. 803-791-9700 Fax No. 803-791-9111  
 www.pacelabs.com

Number 141212

<b>Client:</b> Arcadis 28550 Cabot Drive, Suite 500 City: Novi, State: MI, Zip Code: 48377		<b>Report to Contact:</b> Keatlyn Hunt Keatlyn.Hunt@arcadis.com Telephone No. / E-mail: 947-777-5215 Analysis (Attach list if more space is needed):		Quote No. Page 1 of 1			
<b>Project Name:</b> RICEK Lansing		<b>Printed Name:</b> Austin Westhuis		Barcode: XL16048 KES2 Remarks / Cooler I.D.			
Project No.	Sample ID / Description	Collection Date(s)	Division Time (M:SS)	Matrix	No. of Containers by Preservative Type	Possible Hazard Identification	CC Requirements (Specify)
30112892.03704	(Containers for each sample may be combined on one row.)						
	MW-22-160-121522	12/13/22	1145	GX	2	<input checked="" type="checkbox"/> Non-hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison <input type="checkbox"/> Unknown	Date: 12/15/22 Time: 1300
	Dup-01-121522	12/13/22	---	GX	2		Date: 12/15/22 Time: 1300
	MW-22-158-121522	12/15/22	1145	GX	2		Date: 12/15/22 Time: 1300
	EB-01-121522	12/15/22	1200	GX	2		Date: 12/15/22 Time: 1300
Turn Around Time Required (Prior lab approval required for expedited TAT): <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Rush (Specify)							Date: 12/15/22 Time: 1300
1. Requisitioned by: <u>Arcadis / Austin Westhuis</u>							Date: 12/15/22 Time: 1300
2. Requisitioned by:							Date: Time:
3. Requisitioned by:							Date: Time:
4. Requisitioned by: <u>FedEx</u>							Date: 12/16/22 Time: 1005
Note: All samples are retained for four weeks from receipt unless other arrangements are made.							Received on ice (Circle): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Receipt Temp: 3.0 °C

**DISTRIBUTION:** WHITE & YELLOW Return to laboratory with Samples; PURK-Field/Client Copy

Document Number: ME00392-01

# PACE ANALYTICAL SERVICES, LLC

DC#\_Title: ENV-FRM-WCOL-0286 v02\_Samples Receipt Checklist (SRC)  
 Effective Date: 8/2/2022

## Sample Receipt Checklist (SRC)

Client: Acadis

Cooler Inspected by/date: KDRW / 12/16/2022

Lot #: XL16048

Means of receipt: <input type="checkbox"/> Pace <input type="checkbox"/> Client <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> Other: _____	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1. Were custody seals present on the cooler?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	2. If custody seals were present, were they intact and unbroken?
pH Strip ID: <u>NA</u> Chlorine Strip ID: <u>NA</u> Tested by: <u>NA</u>	
Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Soap-Cup ID: <u>NA</u> 3.0 / 3.0 °C <u>NA</u> / <u>NA</u> °C <u>NA</u> / <u>NA</u> °C <u>NA</u> / <u>NA</u> °C	
Method: <input checked="" type="checkbox"/> Temperature Blank <input type="checkbox"/> Against Bottles IR Gun ID: <u>8</u> IR Gun Correction Factor: <u>0</u> °C	
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Ice Packs <input type="checkbox"/> Dry Ice <input type="checkbox"/> None	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	4. Is the commercial courier's packing slip attached to this form?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Were proper custody procedures (relinquished/received) followed?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6. Were sample IDs listed on the COC and all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7. Was collection date & time listed on the COC and all sample containers?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8. Did all container label information (ID, date, time) agree with the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9. Were tests to be performed listed on the COC?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. Was adequate sample volume available?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. Were all samples containers accounted for? (No missing/excess)
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pca-size" (¼" or 6mm in diameter) in any of the VOA vials?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA	17. Were all applicable NH <sub>4</sub> /TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	18. Was the quote number listed on the container label? If yes, Quote # <u>25329</u>
<b>Sample Preservation</b> (Must be completed for any sample(s) incorrectly preserved or with headspace.)	
Sample(s) <u>NA</u> were received incorrectly preserved and were adjusted accordingly in sample receiving with <u>NA</u> mL of circle one: H <sub>2</sub> SO <sub>4</sub> , HNO <sub>3</sub> , HCl, NaOH using SR # <u>NA</u> . Time of preservation <u>NA</u> . If more than one preservative is needed, please note in the comments below.	
Sample(s) <u>NA</u> were received with bubbles >6 mm in diameter.	
Samples(s) <u>NA</u> were received with TRC > 0.5 mg/l. (If #19 is no) and were adjusted accordingly in sample receiving with sodium thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ) with Unique ID: <u>NA</u> .	
Comments: _____ _____ _____ _____	

# Attachment 3

## Groundwater Sampling Field Logs

## 30112892, MW-22-158, 2022-12-15, RACER Trust, RACER Lansing Plant 6 PFAS GWS

Created	2022-12-15 16:17:15 UTC by Austin Westhuis
Updated	2022-12-20 15:10:36 UTC by Kaitlyn Hunt
Location	42.7336145193, -84.5750435908
Status	<span style="color: green;">■</span> QC Complete

This app is being archived as of Q1 2023 and will be replaced with an improved version. Please contact your task manager to ensure your team is onboarded.

Note: This app is for sampling that is completed using a pump or bailer and not hydrasleeve or PDB

Note: Please make sure to sync frequently throughout your work day when possible.

Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case? Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

Select Project Number	30112892, RACER Trust, RACER Lansing 2022
Project Number	30112892
Client	RACER Trust
Project Name / Location	RACER Lansing Plant 6 PFAS GWS
Well ID	MW-22-158
Date	2022-12-15
Time In	11:00
Sampler Name	Austin Westhuis
Are you connected to the internet via data plan or WiFi?	Yes
Click here to get weather data from National Weather Service (NWS) for your current location. It may take a few seconds to retrieve and populate the data from NWS.	N/A
Weather from NWS	42.1 degrees F and Cloudy.
Note: You have selected to bring in weather data from NWS. Please review and/or confirm the weather data prior to submitting (ensure wind speed, temperature, etc. is of reasonable value and in the units required by project).	
Weather Calculation	NA
Is well able to be sampled?	Yes

### Evacuation Details

Is Well Head PID Reading required?	No
Measuring Point (mp) Description	Top of Inner Casing
Casing Diameter (inches)	2
Well Casing Material	PVC
Static Water Level (ft-bmp)	14.9
Total Depth (ft-bmp)	20.15
Water Column	5.249999999999998
Gallons in Well	0.85

Reference Note: Well Volume Calculation [ $\pi r^2 h$ , where h= 1foot] Well radius (inch):Volume (Gal./foot):Volume (mL/foot) 1 cubic inch = 0.004329 gallons 0.5" diameter = 0.01 gal/ft = 37.85 mL/ft 1" diameter = 0.04 gal/ft = 151.4 mL/ft 2" diameter = 0.16 gal/ft = 605.66 mL/ft 3" diameter = 0.37 gal/ft = 1400.6 mL/ft 4" diameter = 0.65 gal/ft = 2460 mL/ft

Purge Method	Low-Flow
Purge Equipment	Peristaltic

Sample Method	Low-Flow
Sample Depth (ft-bmp) (e.g. pump intake)	17.65
Water Quality Meter Make/Model	YSI Professional Plus
Serial Number of Water Quality Meter	19J103977
Are you using the Groundwater Sampling TGI to stabilize parameters?	Yes
Purge Start (Pump On)	11:15

**@11:20, DTW:15.22, pH:7.14, temp:13.5, cond:3.37, turb:10.9, DO:2.81, redox:232.3**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:20
Minutes Elapsed between readings	0
Total Elapsed Minutes (during parameter readings)	0
Total Elapsed Minutes from Purge Start Time	5
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.22
Milliliters Purged (total)	1000
Theoretical Total Volume Purged	1000 milliliters purged
pH	7.14
Conductivity (mS/cm)	3.37
Turbidity (NTU)	10.9
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	2.81
Temperature (Degrees Celsius)	13.5
Redox (ORP mV)	232.3
parameters	@11:20, DTW:15.22, pH:7.14, temp:13.5, cond:3.37, turb:10.9, DO:2.81, redox:232.3
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: not stable cond: not stable turb: not stable DO: not stable temp: not stable ORP: not stable time elapsed: 1440

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

**@11:25, DTW:15.25, pH:7.15, temp:13.6, cond:3.31, turb:4.14, DO:2.72, redox:225.5**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:25
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	5
Total Elapsed Minutes from Purge Start Time	10
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.25
Milliliters Purged (total)	2000

Theoretical Total Volume Purged	2000 milliliters purged
pH	7.15
Conductivity (mS/cm)	3.31
Turbidity (NTU)	4.14
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	2.72
Temperature (Degrees Celsius)	13.6
Redox (ORP mV)	225.5
parameters	@11:25, DTW:15.25, pH:7.15, temp:13.6, cond:3.31, turb:4.14, DO:2.72, redox:225.5
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: not stable cond: not stable turb: not stable DO: not stable temp: not stable ORP: not stable time elapsed: 5

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

### **@11:30, DTW:15.25, pH:7.15, temp:13.5, cond:3.31, turb:2.63, DO:2.77, redox:224.2**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:30
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	10
Total Elapsed Minutes from Purge Start Time	15
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.25
Milliliters Purged (total)	3000
Theoretical Total Volume Purged	3000 milliliters purged
pH	7.15
Conductivity (mS/cm)	3.31
Turbidity (NTU)	2.63
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	2.77
Temperature (Degrees Celsius)	13.5
Redox (ORP mV)	224.2
parameters	@11:30, DTW:15.25, pH:7.15, temp:13.5, cond:3.31, turb:2.63, DO:2.77, redox:224.2
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: stable cond: stable turb: not stable DO: stable temp: stable ORP: stable time elapsed: 10

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

### **@11:35, DTW:15.25, pH:7.15, temp:13.5, cond:3.29, turb:2.25, DO:2.67, redox:214.1**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
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Reading Time	11:35
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	15
Total Elapsed Minutes from Purge Start Time	20
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.25
Milliliters Purged (total)	4000
Theoretical Total Volume Purged	4000 milliliters purged
pH	7.15
Conductivity (mS/cm)	3.29
Turbidity (NTU)	2.25
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	2.67
Temperature (Degrees Celsius)	13.5
Redox (ORP mV)	214.1
parameters	@11:35, DTW:15.25, pH:7.15, temp:13.5, cond:3.29, turb:2.25, DO:2.67, redox:214.1
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: stable cond: stable turb: not stable DO: stable temp: stable ORP: not stable time elapsed: 15

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

**@11:40, DTW:15.25, pH:7.15, temp:13.4, cond:3.29, turb:1.95, DO:2.61, redox:210.1**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:40
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	20
Total Elapsed Minutes from Purge Start Time	25
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.25
Milliliters Purged (total)	5000
Theoretical Total Volume Purged	5000 milliliters purged
pH	7.15
Conductivity (mS/cm)	3.29
Turbidity (NTU)	1.95
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	2.61
Temperature (Degrees Celsius)	13.4
Redox (ORP mV)	210.1
parameters	@11:40, DTW:15.25, pH:7.15, temp:13.4, cond:3.29, turb:1.95, DO:2.61, redox:210.1

Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: stable cond: stable turb: stable DO: stable temp: stable ORP: not stable time elapsed: 20

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

**@11:45, DTW:15.25, pH:7.15, temp:13.5, cond:3.29, turb:1.76, DO:2.58, redox:206.9**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:45
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	25
Total Elapsed Minutes from Purge Start Time	30
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.25
Milliliters Purged (total)	6000
Theoretical Total Volume Purged	6000 milliliters purged
pH	7.15
Conductivity (mS/cm)	3.29
Turbidity (NTU)	1.76
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	2.58
Temperature (Degrees Celsius)	13.5
Redox (ORP mV)	206.9
parameters	@11:45, DTW:15.25, pH:7.15, temp:13.5, cond:3.29, turb:1.76, DO:2.58, redox:206.9
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	You may sample the well.

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

Sample Start Time	11:45
Purge End (Pump Off)	11:50
Total Volume Measured (units)	Milliliters
Total Milliliters Purged	7000
Well Volumes Purged	2.18

**Sample Information**

Did the well go dry during purging?	No
Sample ID	MW-22-158_121522
Sample Time	11:45
Sample Date	2022-12-15
Sample Equipment	Peristaltic
Sample Type	Grab

Color	Clear
Notable Odors	None
Replicate Type	Not Applicable

### PFAS, 250mL HDPE Plastic, 2

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Constituent Sampled	PFAS
Container Type	250mL HDPE Plastic
Number of Containers	2
Preservative	None
Field Filtered?	No
Total Count of Bottles Collected	2
Time Out	11:50

### Well Information

Is the well damaged?	No
Well Completion	Flush mount
Well Location	See figure.
Condition of Well	Good condition
Well Locked at Arrival	Yes
Lock Functioning	Yes
Well Locked at Departure	Yes
Key Number to Well	2035
Access to well maintained	Yes
Well housing and pad in good shape	Yes
Well properly labeled	Yes
Have you performed work in accordance with the applicable QP/TGI?	Yes
Unique Sample ID	30112892-MW-22-158_121522-20221215

## 30112892, MW-22-160, 2022-12-13, RACER Trust, RACER Lansing Plant 6 PFAS GWS

Created	2022-12-13 16:15:40 UTC by Austin Westhuis
Updated	2023-01-19 21:12:59 UTC by Kaitlyn Hunt
Location	42.7346695494, -84.5739744791
Status	<span style="color: green;">■</span> QC Complete

This app is being archived as of Q1 2023 and will be replaced with an improved version. Please contact your task manager to ensure your team is onboarded.

Note: This app is for sampling that is completed using a pump or bailer and not hydrasleeve or PDB

Note: Please make sure to sync frequently throughout your work day when possible.

Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case? Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

Select Project Number	30112892, RACER Trust, RACER Lansing 2022
Project Number	30112892
Client	RACER Trust
Project Name / Location	RACER Lansing Plant 6 PFAS GWS
Well ID	MW-22-160
Date	2022-12-13
Time In	11:00
Sampler Name	Austin Westhuis
Are you connected to the internet via data plan or WiFi?	Yes
Click here to get weather data from National Weather Service (NWS) for your current location. It may take a few seconds to retrieve and populate the data from NWS.	N/A
Weather from NWS	30.9 degrees F and Cloudy. The wind is blowing E at 12.8 mph.
Note: You have selected to bring in weather data from NWS. Please review and/or confirm the weather data prior to submitting (ensure wind speed, temperature, etc. is of reasonable value and in the units required by project).	
Weather Calculation	NA
Is well able to be sampled?	Yes

### Evacuation Details

Is Well Head PID Reading required?	No
Measuring Point (mp) Description	Top of Inner Casing
Casing Diameter (inches)	2
Well Casing Material	PVC
Static Water Level (ft-bmp)	15
Total Depth (ft-bmp)	18.15
Water Column	3.149999999999986
Gallons in Well	0.51
Reference Note: Well Volume Calculation [ $\pi r^2 h$ , where h= 1foot] Well radius (inch):Volume (Gal./foot):Volume (mL/foot) 1 cubic inch = 0.004329 gallons 0.5" diameter = 0.01 gal/ft = 37.85 mL/ft 1" diameter = 0.04 gal/ft = 151.4 mL/ft 2" diameter = 0.16 gal/ft = 605.66 mL/ft 3" diameter = 0.37 gal/ft = 1400.6 mL/ft 4" diameter = 0.65 gal/ft = 2460 mL/ft	
Purge Method	Low-Flow
Purge Equipment	Peristaltic

Sample Method	Low-Flow
Sample Depth (ft-bmp) (e.g. pump intake)	17.15
Water Quality Meter Make/Model	YSI Professional Plus
Serial Number of Water Quality Meter	19J103977
Are you using the Groundwater Sampling TGI to stabilize parameters?	Yes
Purge Start (Pump On)	11:10

**@11:15, DTW:15.03, pH:6.92, temp:12.9, cond:1.13, turb:142, DO:0.49, redox:143.1**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:15
Minutes Elapsed between readings	0
Total Elapsed Minutes (during parameter readings)	0
Total Elapsed Minutes from Purge Start Time	5
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.03
Milliliters Purged (total)	1000
Theoretical Total Volume Purged	1000 milliliters purged
pH	6.92
Conductivity (mS/cm)	1.13
Turbidity (NTU)	142
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	0.49
Temperature (Degrees Celsius)	12.9
Redox (ORP mV)	143.1
parameters	@11:15, DTW:15.03, pH:6.92, temp:12.9, cond:1.13, turb:142, DO:0.49, redox:143.1
Are you collecting an additional groundwater parameter not listed above?	No

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

**@11:20, DTW:15.03, pH:6.93, temp:12.9, cond:1.13, turb:112, DO:0.47, redox:125**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:20
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	5
Total Elapsed Minutes from Purge Start Time	10
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.03
Milliliters Purged (total)	2000
Theoretical Total Volume Purged	2000 milliliters purged
pH	6.93

Conductivity (mS/cm)	1.13
Turbidity (NTU)	112
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	0.47
Temperature (Degrees Celsius)	12.9
Redox (ORP mV)	125
parameters	@11:20, DTW:15.03, pH:6.93, temp:12.9, cond:1.13, turb:112, DO:0.47, redox:125
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: not stable cond: not stable turb: not stable DO: not stable temp: not stable ORP: not stable time elapsed: 5

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

### **@11:25, DTW:15.03, pH:6.94, temp:12.9, cond:1.13, turb:27.4, DO:0.38, redox:88.4**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:25
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	10
Total Elapsed Minutes from Purge Start Time	15
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.03
Milliliters Purged (total)	3000
Theoretical Total Volume Purged	3000 milliliters purged
pH	6.94
Conductivity (mS/cm)	1.13
Turbidity (NTU)	27.4
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	0.38
Temperature (Degrees Celsius)	12.9
Redox (ORP mV)	88.4
parameters	@11:25, DTW:15.03, pH:6.94, temp:12.9, cond:1.13, turb:27.4, DO:0.38, redox:88.4
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: stable cond: stable turb: not stable DO: not stable temp: stable ORP: not stable time elapsed: 10

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

### **@11:30, DTW:15.03, pH:6.94, temp:13, cond:1.13, turb:6.61, DO:0.34, redox:69**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:30
Minutes Elapsed between readings	5

Total Elapsed Minutes (during parameter readings)	15
Total Elapsed Minutes from Purge Start Time	20
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.03
Milliliters Purged (total)	4000
Theoretical Total Volume Purged	4000 milliliters purged
pH	6.94
Conductivity (mS/cm)	1.13
Turbidity (NTU)	6.61
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	0.34
Temperature (Degrees Celsius)	13
Redox (ORP mV)	69
parameters	@11:30, DTW:15.03, pH:6.94, temp:13, cond:1.13, turb:6.61, DO:0.34, redox:69
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: stable cond: stable turb: not stable DO: not stable temp: stable ORP: not stable time elapsed: 15

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

### **@11:35, DTW:15.03, pH:6.95, temp:12.9, cond:1.13, turb:2.21, DO:0.32, redox:58.7**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:35
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	20
Total Elapsed Minutes from Purge Start Time	25
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.03
Milliliters Purged (total)	5000
Theoretical Total Volume Purged	5000 milliliters purged
pH	6.95
Conductivity (mS/cm)	1.13
Turbidity (NTU)	2.21
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	0.32
Temperature (Degrees Celsius)	12.9
Redox (ORP mV)	58.7
parameters	@11:35, DTW:15.03, pH:6.95, temp:12.9, cond:1.13, turb:2.21, DO:0.32, redox:58.7
Are you collecting an additional groundwater parameter not listed above?	No

Stabilization Criteria

Continue purging, the parameters are not stable. pH: stable cond: stable turb: not stable DO: not stable temp: stable ORP: not stable time elapsed: 20

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

**@11:40, DTW:15.03, pH:6.96, temp:12.9, cond:1.13, turb:1.87, DO:0.31, redox:56.3**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:40
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	25
Total Elapsed Minutes from Purge Start Time	30
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.03
Milliliters Purged (total)	6000
Theoretical Total Volume Purged	6000 milliliters purged
pH	6.96
Conductivity (mS/cm)	1.13
Turbidity (NTU)	1.87
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	0.31
Temperature (Degrees Celsius)	12.9
Redox (ORP mV)	56.3
parameters	@11:40, DTW:15.03, pH:6.96, temp:12.9, cond:1.13, turb:1.87, DO:0.31, redox:56.3
Are you collecting an additional groundwater parameter not listed above?	No

Stabilization Criteria

Continue purging, the parameters are not stable. pH: stable cond: stable turb: not stable DO: stable temp: stable ORP: not stable time elapsed: 25

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

**@11:45, DTW:15.03, pH:6.95, temp:12.9, cond:1.13, turb:1.69, DO:0.31, redox:54.8**

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Reading Time	11:45
Minutes Elapsed between readings	5
Total Elapsed Minutes (during parameter readings)	30
Total Elapsed Minutes from Purge Start Time	35
Purge Rate measured in:	mL/min
Rate (mL/min)	200
Depth to Water (ft)	15.03
Milliliters Purged (total)	7000
Theoretical Total Volume Purged	7000 milliliters purged
pH	6.95
Conductivity (mS/cm)	1.13

Turbidity (NTU)	1.69
Is the turbidity reading outside the range of the meter?	No
Dissolved Oxygen (mg/L)	0.31
Temperature (Degrees Celsius)	12.9
Redox (ORP mV)	54.8
parameters	@11:45, DTW:15.03, pH:6.95, temp:12.9, cond:1.13, turb:1.69, DO:0.31, redox:54.8
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	You may sample the well.
Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% - ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit	
Sample Start Time	11:45
Purge End (Pump Off)	11:55
Total Volume Measured (units)	Milliliters
Total Milliliters Purged	9000
Well Volumes Purged	4.66

### Sample Information

Did the well go dry during purging?	No
Sample ID	MW-22-160_121322
Sample Time	11:45
Sample Date	2022-12-13
Sample Equipment	Peristaltic
Sample Type	Grab
Color	Clear
Notable Odors	None
Replicate Type	Dup
Replicate ID (e.g. Dup)	DUP-01_121322

### PFAS, 250mL HDPE Plastic, 4

Well-ClientName	MW-22-160RACER Lansing Plant 6 PFAS GWS
Constituent Sampled	PFAS
Container Type	250mL HDPE Plastic
Number of Containers	4
Preservative	None
Field Filtered?	No
Total Count of Bottles Collected	4
Time Out	11:55

### Well Information

Is the well damaged?	No
Well Completion	Flush mount
Well Location	See figure.
Condition of Well	Good condition

Well Locked at Arrival	No
Lock Functioning	Yes
Well Locked at Departure	Yes
Key Number to Well	2035
Access to well maintained	Yes
Well housing and pad in good shape	Yes
Well properly labeled	Yes

Photo of Well



Have you performed work in accordance with the applicable QP/TGI?	Yes
Unique Sample ID	30112892-MW-22-160_121322-20221213