Memo

TO
Christine Matlock, EGLE
Joe Rogers, EGLE
John McCabe, EGLE

DATE
November 1, 2022

DEPARTMENT
Environment

COPIES TO
Dave Favero, RACER Trust

PROJECT NUMBER
30075941

NAME
Patrick Curry
810 225 1926
patrick.curry@arcadis.com

Alex Villhauer
517 324 5036
alex.villhauer@arcadis.com

SUBJECT

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

The following provides a summary of the September 2022 off-site investigation activities completed to delineate per- and polyfluoroalkyl substances (PFAS) at RACER Trust, Plant 6 located in the City of Lansing, Michigan (Site). The scope of work was provided to the Michigan Department of Energy Great Lakes and Environment (EGLE) on August 10, 2022, as part of the *Plant 6 PFAS Off-site PFAS Monitoring Summary & Proposed Scope of Work* and was subsequently approved by EGLE on September 2, 2022 (Work Plan).

Previous investigation results for Plant 6 PFAS impacts are summarized in the *PFAS Investigation Phase 1 Summary* report (Arcadis 2019a), the *Plant 6 PFAS Investigation Summary – Phase 2* report (Arcadis 2019b), 2022 *Plant 6 PFAS Off-site Investigation* report (Arcadis 2022a) and the 2022 *Plant 6 PFAS Off-site PFAS Monitoring Summary & Proposed Scope of Work (Arcadis 2022b)*. The investigations at Plant 6 identified concentrations of perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), and perfluorononanoic acid (PFNA) above the current EGLE Drinking Water Criteria (EGLE 2020) along the eastern and southern Plant 6 property boundaries. Of these, only PFOA has been identified off-site at concentrations greater than its Residential Drinking Water (DW) Criteria (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. Monitoring well construction details and analytical results for the perimeter monitoring wells were summarized in the Work Plan.

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. The objective of the new off-site monitoring wells was to provide a sentinel monitoring network to define off-site PFOA impacts and define a perimeter for a potential well restriction area. 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.

Based on the results at MW-22-145, an additional five VAP borings were completed off-site and are discussed below.

1. INVESTIGATION ACTIVITIES

The additional VAP borings were completed in City of Lansing rights-of-way (ROWs) to the east of the southern portion of Plant 6. The investigation was completed from September 9 to 19, 2022, and consisted of five VAP borings. Four out of the five borings were 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. Soil boring logs are provided as **Attachment 1** and **Figure 1** provides an overview of the PFOA results in the southeast of Plant 6 for the last two quarters and the location of the new VAP borings off-site to the east.

Groundwater samples were sent to PACE Analytical Laboratory located in Columbia, South Carolina and analyzed for the 28 PFAS outlined in the EGLE PFAS Minimum Laboratory Analyte List using modified USEPA Method 537 with isotope dilution (DoD QSM 5.1). The laboratory analytical reports are included as **Attachment 2.** To avoid cross contamination, all sampling was conducted in accordance with the Arcadis PFAS Sampling Technical Guidance Instruction, available upon request.

2. RESULTS AND DISCUSSION

The analytical results for groundwater samples were compared to the Part 201 Residential DW and Groundwater Surface Water Interface (GSI) Criteria and are summarized on **Table 1**. Groundwater sample locations (i.e., VAP borings and monitoring wells), criteria comparison for PFOA, and the last two quarters of analytical results for monitoring wells are shown on **Figure 1**.

- The geology is dominated by clay with discontinuous layers of sand, silt, and some shallow fill material. The geology is generally consistent with observations from previous investigations, but with thinner moist to dry sand lenses that did not produce water at four of the five borings when sampling was attempted. The interbedded clays, silts, and sand lenses are underlain by a dense glacial till, generally encountered at depths of 20 to 35 feet bgs.
- The groundwater sample collected from SB-OS-SS444 at a depth of 8 to 13 feet bgs contained PFOA at a concentration of 31 ng/L, exceeding the DW Criteria of 8 ng/L. 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. As shown on **Attachment 3**, except for PFHxS and perhaps PFPeS, the relative abundance of the PFAS compounds appears to be similar to that of the on-site 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). The detections of PFOS 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 of PFHxS and PFPeS at SB-OS-SS444 suggests that PFAS in this sample is not associated with the on-site impacts. PFHxS and PFPeS are not typically associated with 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 on **Attachment 4.** 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.

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 suggest a non-site related source of 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 either partially or wholly related to another local source. Therefore, additional sampling at this location or further downgradient is not proposed at this time.

3. PROPOSED ADDITIONAL ACTIVITIES

The location of the completed VAP borings and the proposed monitoring wells for sentinel monitoring of the PFOA impacts are shown on **Figure 1**. Three monitoring wells are proposed for VAP locations SB-OS-TM383 and SB-OS-TG414, and a new location MW-22-160. Although each of the VAP locations were dry during the VAP investigation, wells will be installed to collect groundwater samples, if possible, verify hydrogeologic conditions, and be part of a sentinel monitoring program. The proposed well at MW-22-160 location is intended to provide a sentinel monitoring point between wells MW-22-146 and the proposed well at SB-OS-TG414. The scope of work includes the following:

- Continuous soil cores will be obtained from the ground surface to the target well depth at each boring location. Arcadis will log and describe the soils in accordance with the Arcadis Soil Description Technical Guidance Instruction. Boring logs will be generated based on the field descriptions.
- Three (3) additional monitoring wells will be installed using rotary drilling methods. The monitoring wells will be screened within the first encountered saturated seam (shallow saturated sand interval) to serve as sentinel monitoring point for PFAS impacts identified within the shallow zone east of the perimeter of the southern portion of Plant 6.
- Monitoring wells will be screened at a depth based on observed soil conditions and be constructed with a 5-foot stainless-steel wire-wrapped 0.010-slot screens and 2-inch PVC riser. An appropriate sand pack will be placed around the screen interval to a depth of 1 foot above the well screen followed by 1 to 2 feet of choker sand and then bentonite grout to grade. The wells will be finished with a flush-mount well cover.

The proposed additional wells will be integrated into the revised Interim Groundwater Monitoring Plan. The new monitoring wells will be sampled quarterly for one year and then re-evaluated to determine an appropriate long-term sampling frequency.

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

Christine Matlock, Joe Rogers, John McCabe
Michigan Department of Environment, Great Lakes and Energy
November 1, 2022

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

Enclosures:

TABLES

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

FIGURES

Figure 1 PFOA Groundwater Analytical Results

ATTACHMENTS

Attachment 1 Soil Boring Logs

Attachment 2 Laboratory Analytical Reports

Attachment 3 Comparison of PFAS Chemical Signatures

Attachment 4 Plant 6 TOP Assay and SB-OS-SS444 Groundwater Comparison

Tables

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

Location ID:	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-21-133	MW-21-134	MW-21-135	MW-21-136	MW-21-137	MW-21-138	P6-SB-07	P6-SB-07	MW-22-143	MW-22-143
Sample Name:				MW-21-133_060222	MW-21-134_060222	MW-21-135_060222	MW-21-136_060222	MW-21-137_060222	MW-21-138_060222	P6-SB-07_030222	P6-SB-07_060322	MW-22-143_040522	MW-22-143_060122
Date Collected:				06/02/22	06/02/22	06/02/22	06/02/22	06/02/22	06/02/22	03/02/22	06/03/22	04/05/22	06/01/22
Sample Depth (ft. bgs)				10-15	11-16					15-20	15-20	26-31	26-31
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)													
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	< 6.7 U	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
4:2 FTS	- -	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	< 6.7 U	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
6:2 FTS	- -	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	**11**	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
8:2 FTS	- -	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	< 6.7 U	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	< 6.7 U	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
ADONA	- -	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	< 6.7 U	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	< 6.7 U	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	< 6.7 U	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 6.8 U	< 6.7 U	< 6.8 U	< 6.7 U	< 7.0 U	< 8.4 U	< 6.8 U [< 7.0 U]	< 6.9 U	< 6.9 [< 6.9]	< 6.9
Perfluorobutanesulfonic acid (PFBS)	420	**- -**	ng/L	**2.0 J**	**1.9 J**	**1.9 J**	**0.85 J**	< 3.5 U	< 4.2 U	**2.9 J [3.1 J]**	**3.4 J**	**0.81 J [0.91 J]**	**1.0 J**
Perfluorobutanoic acid (PFBA)	- -	**- -**	ng/L	**14**	**13**	**12**	**1.8 J**	< 3.5 U	< 4.2 U	**190 [180]**	**220**	**11 [11]**	**9.7**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	< 3.4 U [< 3.5 U]	< 3.5 U	< 3.5 [< 3.5]	< 3.5
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	**20 [19]**	**24**	< 3.5 [< 3.5]	< 3.5
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	< 3.4 U [< 3.5 U]	< 3.5 U	< 3.5 [< 3.5]	< 3.5
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	< 3.4 U **[0.43 J]**	**0.57 J**	< 3.5 [< 3.5]	< 3.5
Perfluoroheptanoic acid (PFHpA)	- -	**- -**	ng/L	**17**	**15**	**47**	< 3.4 U	< 3.5 U	< 4.2 U	**480 [450]**	**530**	**3.7 [3.7]**	**5.9**
Perfluorohexanesulfonic acid (PFHxS)	51	**- -**	ng/L	**1.7 J**	**2.0 J**	**1.6 J**	< 3.4 U	< 3.5 U	< 4.2 U	**2.6 J [2.4 J]**	**2.5 J**	< 3.5 [< 3.5]	< 3.5
Perfluorohexanoic acid (PFHxA)	400,000	**- -**	ng/L	**24**	**22**	**39**	< 3.4 U	< 3.5 U	< 4.2 U	**640 [630]**	**740**	**19 [19]**	**16**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	< 3.4 U [< 3.5 U]	< 3.5 U	< 3.5 [< 3.5]	< 3.5
Perfluorononanoic acid (PFNA)	6.0	- -	ng/L	**1.1 J**	< 3.4 U	1.1 J	< 3.4 U	< 3.5 U	< 4.2 U	**78 [74]**	**82**	< 3.5 [< 3.5]	< 3.5
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	< 3.4 U [< 3.5 U]	< 3.5 U	< 3.5 [< 3.5]	< 3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**4.6**	**4.2**	**2.1 J**	< 3.4 U	< 3.5 U	< 4.2 U	**38 [34]**	**42**	< 3.5 [< 3.5]	< 3.5
Perfluorooctanoic acid (PFOA)	8.0	12,000	ng/L	**43**	**23**	**38**	**0.70 J**	< 3.5 U	< 4.2 U	**640 [610]**	**720**	**1.5 J [1.5 J]**	**4.1**
Perfluoropentanesulfonic acid (PFPeS)	**- -**	**- -**	ng/L	**0.54 J**	**0.77 J**	**1.2 J**	< 3.4 U	< 3.5 U	< 4.2 U	**0.71 J [1.1 J]**	**1.0 J**	< 3.5 [< 3.5]	< 3.5
Perfluoropentanoic acid (PFPeA)	**- -**	**- -**	ng/L	**22**	**21**	**39**	**0.82 J**	**0.56 J**	**0.69 J**	**730 [710]**	**790**	**18 [20]**	**12**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	< 3.4 U [< 3.5 U]	< 3.5 U	< 3.5 [< 3.5]	< 3.5
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	< 3.4 U [< 3.5 U]	< 3.5 U	< 3.5 [< 3.5]	< 3.5
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.4 U	< 3.4 U	< 3.4 U	< 3.4 U	< 3.5 U	< 4.2 U	< 3.4 U [< 3.5 U]	< 3.5 U	< 3.5 [< 3.5]	< 3.5

See notes on last page.

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

Location ID: Sample Name: Date Collected: Sample Depth (ft. bgs)	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-144 MW-22-144_040422 04/04/22 19.5-24.5	MW-22-144 MW-22-144_060122 06/01/22 19.5-24.5	MW-22-145 MW-22-145_040422 04/04/22 10.5-15.5	MW-22-145 MW-22-145_060122 06/01/22 10.5-15.5	MW-22-146 MW-22-146_040522 04/05/22 5.5-10.5	MW-22-146 MW-22-146_060122 06/01/22 5.5-10.5	MW-22-147 MW-22-147_040422 04/04/22 7.5-12.5	MW-22-147 MW-22-147_060122 06/01/22 7.5-12.5	MW-22-148 MW-22-148_040422 04/04/22 24.5-29.5	MW-22-148 MW-22-148_060122 06/01/22 24.5-29.5
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)													
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
4:2 FTS	- -	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
6:2 FTS	- -	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
8:2 FTS	- -	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
ADONA	- -	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 7.1	< 7.3	< 7.2	< 6.8 [< 6.8]	< 7.0	< 7.0	< 6.9	< 6.8	< 7.0	< 7.2
Perfluorobutanesulfonic acid (PFBS)	420	**- -**	ng/L	**1.9 J**	**2.3 J**	**3.4 J**	**3.0 J [2.8 J]**	**4.0**	**6.0**	**2.5 JS**	**3.2 J**	**1.6 J**	**1.0 J**
Perfluorobutanoic acid (PFBA)	- -	**- -**	ng/L	**5.3**	**5.4**	**5.2**	**5.5 [5.6]**	**14**	**16**	**3.8 S**	**6.1**	**3.0 J**	**0.88 J**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.5	< 3.6	< 3.6	< 3.4 [< 3.4]	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.5	< 3.6	< 3.6	< 3.4 [< 3.4]	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.5	< 3.6	< 3.6	< 3.4 [< 3.4]	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.5	< 3.6	< 3.6	< 3.4 [< 3.4]	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluoroheptanoic acid (PFHpA)	- -	**- -**	ng/L	**3.6**	**4.5**	**5.7**	**5.8 [6.0]**	**0.59 J**	**1.0 J**	**0.69 J**	**1.4 J**	**0.39 J**	< 3.6
Perfluorohexanesulfonic acid (PFHxS)	51	**- -**	ng/L	**2.3 J**	**2.2 J**	**1.9 J**	**1.9 J [2.1 J]**	**1.1 J**	**1.2 J**	**1.3 J**	**1.4 J**	< 3.5	< 3.6
Perfluorohexanoic acid (PFHxA)	400,000	**- -**	ng/L	**7.7**	**10**	**9.9**	**9.7 [8.7]**	**6.7**	**5.8**	**1.1 J**	**2.7 J**	**1.1 J**	< 3.6
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.5	< 3.6	< 3.6	< 3.4 [< 3.4]	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluorononanoic acid (PFNA)	6.0	- -	ng/L	< 3.5	< 3.6	< 3.6	**0.75 J [0.79 J]**	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	< 3.5	< 3.6	**1.1 J**	< 3.4 [< 3.4]	< 3.5	< 3.5	**0.67 J**	< 3.4	**2.0 J**	< 3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	< 3.5	< 3.6	**3.6**	**6.8 [6.9]**	**1.7 J**	**1.9 J**	**2.0 JS**	**2.2 J**	< 3.5	< 3.6
Perfluorooctanoic acid (PFOA)	8.0	12,000	ng/L	**5.3**	**7.5**	**16**	**14 [14]**	**6.5**	**5.8**	**2.8 JS**	**3.7**	**1.1 J**	< 3.6
Perfluoropentanesulfonic acid (PFPeS)	**- -**	**- -**	ng/L	< 3.5	< 3.6	< 3.6	**0.54 J [0.51 J]**	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluoropentanoic acid (PFPeA)	**- -**	**- -**	ng/L	**8.8**	**9.9**	**9.3**	**9.5 [8.8]**	**5.4**	**4.9**	**1.2 J**	**2.9 J**	**0.92 J**	< 3.6
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.5	< 3.6	< 3.6	< 3.4 [< 3.4]	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.5	< 3.6	< 3.6	< 3.4 [< 3.4]	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.5	< 3.6	< 3.6	< 3.4 [< 3.4]	< 3.5	< 3.5	< 3.5	< 3.4	< 3.5	< 3.6

See notes on last page.

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

Location ID: Sample Name: Date Collected: Sample Depth (ft. bgs)	P201 Residential Drinking Water	P201 Groundwater Surface Water Interface	Units	MW-22-149 MW-22-149_040522 04/05/22 5.5-10.5	MW-22-149 MW-22-149_060122 06/01/22 5.5-10.5	MW-22-150 MW-22-150_040522 04/05/22 13-18	MW-22-150 MW-22-150_060122 06/01/22 13-18	MW-22-151 MW-22-151_040522 04/05/22 13-18	MW-22-151 MW-22-151_060122 06/01/22 13-18	MW-22-152 MW-22-152_040522 04/05/22 10-15	MW-22-152 MW-22-152_060122 06/01/22 10-15	SB-OS-KG312 SB-OS-KG312_11-15_20210908 09/08/21 11 - 15	SB-OS-KG312 SB-OS-KG312_23-27_20210908 09/08/21 23 - 27
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)													
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	< 6.8	< 6.8	< 6.8	<7.0	<6.9
4:2 FTS	- -	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	< 6.8	< 6.8	< 6.8	<7.0	<6.9
6:2 FTS	- -	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	**5.3 JQ**	< 6.8	< 6.8	<7.0	<6.9
8:2 FTS	- -	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	< 6.8	< 6.8	< 6.8	<7.0	<6.9
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	< 6.8	< 6.8	< 6.8	<7.0	<6.9
ADONA	- -	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	< 6.8	< 6.8	< 6.8	<7.0	<6.9
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	< 6.8	< 6.8	< 6.8	<7.0	<6.9
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	< 6.8	< 6.8	< 6.8	<7.0	<6.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	< 6.9	< 7.0	< 7.1	< 6.8	< 7.2	< 6.8	< 6.8	< 6.8	<7.0	<6.9
Perfluorobutanesulfonic acid (PFBS)	420	**- -**	ng/L	**1.8 J**	**1.4 J**	< 3.5	< 3.4	**7.9**	**8.4**	**1.8 J**	**2.1 J**	**4.2**	<3.5
Perfluorobutanoic acid (PFBA)	- -	**- -**	ng/L	**1.2 J**	**0.91 J**	**3.1 J**	**2.9 J**	**11**	**10**	**3.7**	**4.0**	**11**	**3.8**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.5
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.5
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.5
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.5
Perfluoroheptanoic acid (PFHpA)	- -	**- -**	ng/L	< 3.5	**0.41 J**	< 3.5	< 3.4	**3.5 J**	**2.7 J**	**1.0 J**	**0.99 J**	**8.5**	<3.5
Perfluorohexanesulfonic acid (PFHxS)	51	**- -**	ng/L	**0.88 J**	**0.91 J**	< 3.5	< 3.4	**1.8 J**	< 3.4	**1.1 J**	**1.8 J**	**3.3 J**	<3.5
Perfluorohexanoic acid (PFHxA)	400,000	**- -**	ng/L	< 3.5	< 3.5	**1.7 J**	**1.2 J**	**6.0**	**6.2**	**2.4 J**	**2.6 J**	**23**	**2.1 J**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.5
Perfluorononanoic acid (PFNA)	6.0	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	**0.59 J**	**0.39 J**	< 3.4	< 3.4	<3.5	<3.5
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	**0.53 J**	< 3.5	**0.57 J**	**1.6 J**	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.5
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	**2.1 J**	< 3.5	< 3.5	< 3.4	**2.0 J**	**3.4**	< 3.4	< 3.4	<3.5	<3.5
Perfluorooctanoic acid (PFOA)	8.0	12,000	ng/L	**0.72 J**	**1.1 J**	< 3.5	< 3.4	**9.4**	**7.7**	**2.4 J**	**2.5 J**	**11**	<3.5
Perfluoropentanesulfonic acid (PFPeS)	**- -**	**- -**	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	**0.94 J**	<3.5
Perfluoropentanoic acid (PFPeA)	**- -**	**- -**	ng/L	< 3.5	< 3.5	**2.1 J**	**1.7 J**	**13**	**14**	**2.7 J**	**3.0 J**	**29**	**4.5**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.4
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.5
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	< 3.5	< 3.5	< 3.5	< 3.4	< 3.6	< 3.4	< 3.4	< 3.4	<3.5	<3.5

See notes on last page.

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

Location ID:	P201	P201		SB-OS-LE285	SB-OS-LI335	SB-OS-OS376	SB-OS-QM379	SB-OS-QM379	SB-OS-RO398	SB-OS-SW386	SB-OS-SW386	SB-OS-TC335	SB-OS-SS444
Sample Name:	Residential	Groundwater		SB-OS-LE285_11-15_20210908	SB-OS-LI335_14-18_20210909	SB-OS-OS376_6-10_20210927	SB-OS-QM379_8-12_20210909	SB-OS-QM379_25-29_20210909	SB-OS-RO398_6-10_20210910	SB-OS-SW386_11-15_20210910	SB-OS-SW386_20-24_20210910	SB-OS-TC335_26-30_20210927	SB-OS-SS444_8-13
Date Collected:	Drinking	Surface Water		09/08/21	09/09/21	09/27/21	09/09/21	09/09/21	09/10/21	09/10/21	09/10/21	09/27/21	09/22/22
Sample Depth (ft. bgs)	Water	Interface	Units	11 - 15	14 - 18	6 - 10	8 - 12	25 - 29	6 - 10	11 - 15	20 - 24	26 - 30	8-13
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)													
11Cl-PF3OUdS (F-53B Minor)	- -	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	<6.9	<7.9	<6.9	< 7.2
4:2 FTS	- -	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	<6.9	<7.9	<6.9	< 7.2
6:2 FTS	- -	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	**20**	<7.9	<6.9	< 7.2
8:2 FTS	- -	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	<6.9	<7.9	<6.9	< 7.2
9Cl-PF3ONS (F-53B Major)	- -	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	<6.9	<7.9	<6.9	< 7.2
ADONA	- -	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	<6.9	<7.9	<6.9	< 7.2
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	<6.9	<7.9	<6.9	< 7.2
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	- -	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	<6.9	<7.9	<6.9	< 7.2
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	- -	- -	ng/L	<6.8	<7.0	<6.8	<6.9	<8.8	<7.3	<6.9	<7.9	<6.9	< 7.2
Perfluorobutanesulfonic acid (PFBS)	420	**- -**	ng/L	**2.4 J**	<3.5	**1.3 J**	**1.9 J**	**1.2 J**	**2.7 J**	**1.7 J**	**1.1 J**	<3.4	**8.0**
Perfluorobutanoic acid (PFBA)	- -	**- -**	ng/L	**3.6**	**4.2**	**0.95 J**	**5.0**	<4.4	**5.5**	**6.2**	**4.5**	**12**	**14**
Perfluorodecanesulfonic acid (PFDS)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6
Perfluorodecanoic acid (PFDA)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6
Perfluorododecanoic acid (PFDoA)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6
Perfluoroheptanesulfonic Acid (PFHpS)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	**0.85 J**
Perfluoroheptanoic acid (PFHpA)	- -	**- -**	ng/L	<3.4	<3.5	<3.4	**1.3 J**	<4.4	<3.6	**4.0**	**1.1 J**	**1.8 J**	**16**
Perfluorohexanesulfonic acid (PFHxS)	51	**- -**	ng/L	<3.4	<3.5	**1.4 J**	**2.7 J**	<4.4	<3.6	**1.4 J**	<3.9	<3.4	**59**
Perfluorohexanoic acid (PFHxA)	400,000	**- -**	ng/L	**2.1 J**	**1.3 J**	<3.4	**2.1 J**	<4.4	**1.4 J**	**6.9**	**2.8 J**	**18**	**24**
Perfluorononanesulfonic acid (PFNS)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6
Perfluorononanoic acid (PFNA)	6.0	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6
Perfluorooctane Sulfonamide (PFOSA)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	<3.4	<3.5	**2.8 J**	**1.6 J**	**1.3 J**	**2.1 J**	<3.5	<3.9	<3.4	**19**
Perfluorooctanoic acid (PFOA)	8.0	12,000	ng/L	**2.9 J**	<3.5	<3.4	**3.4**	<4.4	**2.1 J**	**4.8**	<3.9	<3.4	**31**
Perfluoropentanesulfonic acid (PFPeS)	**- -**	**- -**	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	**5.2**
Perfluoropentanoic acid (PFPeA)	**- -**	**- -**	ng/L	**2.2 J**	**2.6 J**	<3.4	**2.4 J**	<4.4	**0.97 J**	**7.1**	**3.1 J**	**23**	**16**
Perfluorotetradecanoic acid (PFTeA)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6
Perfluorotridecanoic Acid (PFTriA)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6
Perfluoroundecanoic acid (PFUnA)	- -	- -	ng/L	<3.4	<3.5	<3.4	<3.4	<4.4	<3.6	<3.5	<3.9	<3.4	< 3.6

See notes on last page.

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:

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

Figures

SB-P6-QM322

MW-21-133 (10-15')
11/30/2021: 87
6/2/2022: 43

SB-P6-QQ322

SB-P6-RQ322

MW-21-134 (11-16')
11/30/2021: 41
6/2/2022: 23

MW-21-135 (22-27')
11/30/2021: 44
6/2/2022: 38

SB-P6-SG322

MW-12-14 (25-30')

MW-22-143 (26-31')
4/5/2022: 1.5 J [1.5 J]
6/1/2022: 4.1

SB-OS-QR364

SB-OS-QM379 (8-12')
9/9/2021: 3.4
SB-OS-QM379 (25-29')
9/9/2021: ND (LESS THAN 4.4)

MW-22-148 (24.5-29.5')
4/4/2022: 1.1 J
6/1/2022: ND (LESS THAN 0.75)

MW-22-147 (7.5-12.5')
4/4/2022: 2.8 J
6/1/2022: 3.7

Forbes St

SB-OS-RO398 (6-10')
9/10/2021: 2.1 J

MW-22-146 (5.5-10.5')
4/5/2022: 6.5
6/1/2022: 5.8

Inverness Ave

SB-OS-RW339

W Ottawa St

SB-OS-SA361
Drilled to 30 ft bgs

Predominantly dry to moist clay with wet sand lenses from 13.5-22 ft bgs. Sampling attempted from 15-20 ft bgs, 19-24 ft bgs, and 25-30 ft bgs but not successful. No VAP samples collected.

Proposed MW-22-160.

N Verlinden Ave

Spencer St

MW-22-144 (19.5-24.5')
4/4/2022: 5.3
6/1/2022: 7.5

SB-OS-SS444
Drilled to 30 ft bgs

Predominantly dry to moist clay with wet sand lenses from 11-11.5 ft bgs and 12-12.5 ft bgs. VAP sample collected from 8-13 ft bgs. Sampling attempted from 15-20 ft bgs and 21-26 ft bgs but not successful.

N Jenison Ave

SB-OS-SS444
9/22/2022: 31

SB-OS-SW386 (11-15')
9/10/2021: 4.8 [4.7]
SB-OS-SW386 (20-24')
9/10/2021: ND (LESS THAN 3.9)

SB-OS-TC335 (20-24')
9/27/2021: Dry
SB-OS-TC335 (26-30')
9/27/2021: ND (LESS THAN 3.4)

MW-22-145 (10.5-15.5')
4/4/2022: 16
6/1/2022: 14 [14]

SB-OS-TG414
Drilled to 30 ft bgs

Predominantly dry to moist clay. Sampling attempted from 26-30 ft bgs but not successful. No VAP samples collected.

Proposed MW-22-159.

W Michigan Ave

SB-OS-TM383
Drilled to 30 ft bgs

Predominantly dry to moist clay with wet sand lens from 15-15.5 ft bgs and wet sand and clay from 16-19.3 ft bgs. Sampling attempted from 15.5-19.5 ft bgs but not successful. No VAP samples collected.

Proposed MW-22-158.

Mc Pherson Ave

SB-OS-T0444
Drilled to 30 ft bgs

Predominantly dry to moist clay with moist to wet sand lens from 25.5-25.8 ft bgs and moist sand from 21-21.2 ft bgs and 22-23.5 ft bgs. Sampling attempted from 24.5-28.5 ft bgs but not successful. No VAP samples collected.

S Jenison Ave

WAllegan St

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Legend

- LNAPL MONITORING WELL
- MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- WEATHERED BEDROCK MONITORING WELL
- BEDROCK MONITORING WELL
- VAP BORING
- SOIL BORING LOCATION
- PROPOSED MONITORING WELL LOCATION
- WELLS SAMPLED AND PFOA DOES NOT EXCEED DW CRITERIA
- WELLS SAMPLED AND PFOA EXCEEDS DW CRITERIA
- PLANT 6 - APPROXIMATE
- PARCEL OUTLINE
- STORMWATER MAIN
- SANITARY MAIN

NOTES:

RESULTS IN **RED** DENOTE AN EXCEEDANCE OF EGLE 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 QUANITATIVE REPORTING LIMIT

ng/L - NANOGRAMS PER LITER

PFOA - PERFLUOROOCTANOIC ACID

ALL ANALYSES COMPLETED USING MODIFIED USEPA METHOD 537.

NOTE: COORDINATE SYSTEM IS IN NAD 1983 STATE PLANE MICHIGAN SOUTH FIPS 2113 FEET INTL

N

0 125 250
SCALE IN FEET

RACER TRUST
PLANT 2
LANSING, MICHIGAN

PLANT 6 OFF-SITE PFAS SAMPLING

ARCADIS

FIGURE
1

CITY: Novi DIV: ENV DB: TRY PIC: PM: TM: TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
T:_ENV\RACER\Buffalo\MXDs\2022 Sampling\Figure 2 - Plant 6 Off-Site Proposed PFAS Delineation Locations.mxd PLOTTED: 10/28/2022 9:27:43 AM BY: VDavis

Attachment 1

Soil Boring Logs

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-SA361

Sheet: 1 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/09/2022
Date Completed: 09/13/2022

Logger: A.Westhuis
Editor: C. Cisco
Weather Conditions: 78° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1					0.0		(0.0-1.5') GRASS/TOPSOIL.	(0.0-2.0') Backfill with Cuttings	
2					0.0		(1.5-13.5') 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; dry; medium stiff; light brownish gray (10YR 6/2).		
3					0.0				
4			96		0.0				
5					0.0				
6					0.0				
7					0.0				
8					0.0				
9			24		0.0				
10					0.0				
11					0.0			(2.0-30.0') Bentonite Pellets	
12					0.0				
13			51		0.0				
14					0.0		(13.5-22.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, fine to medium, subrounded; dry to moist; medium stiff; gray (10YR 5/1).		
15					0.0				
16					0.0				
17					0.0				
18			52		0.0				
19					0.0				
20					0.0		Note: Sand lens, very fine to fine, wet present at 18.7' bgs, 19.0' bgs, and 19.5' bgs.		

Drilling Co.: Fibertec Environmental Services
Driller: Nick Wiseman
Drilling Method: Direct Push
Drilling Fluid: None
Remarks: ' / ft = feet. bgs = below ground surface. Hand augered to 8.0' bgs.

Sampling Method: 5.0' Macro Core
Sampling Interval: Continuous
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

SOIL BORING LOG_2013 \\ARCADIS-US.COM\OFFICE\DATA\NOV\-MI\COMMON\RACER LANSING\WORKING DATA ANALYSIS\BORING LOGS\RACER LANSING MASTER DATABASE_082522_NEW LOGS ONLY.GPJ ARCADIS_2013.GDT 10/10/22

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-SA361

Sheet: 2 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/09/2022
Date Completed: 09/13/2022

Logger: A.Westhuis
Editor: C. Cisco
Weather Conditions: 78° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0		(13.5-22.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, fine to medium, subrounded; dry to moist; medium stiff; gray (10YR 5/1).		
22					0.0				
23			50		0.0		(22.0-30.0') CLAY, nonplastic to low plasticity, no dilatancy; some silt; little sand, very fine to fine, subrounded; moist; stiff; gray (10YR 5/1).		
24					0.0				
25					0.0			(2.0-30.0') Bentonite Pellets	
26					0.0				
27					0.0				
28			54		0.0				
29					0.0				
30					0.0				
31							End of boring at 30.0' bgs.		
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-SS444

Sheet: 1 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/13/2022
Date Completed: 09/13/2022

Logger: A.Westhuis
Editor: C. Cisco
Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1			96		0.0		(0.0-1.5') GRASS/TOPSOIL.	(0.0-2.0') Backfill with Cuttings	
2					0.0		(1.5-9.0') CLAY, medium plasticity, no dilatancy; little silt; little sand, very fine to fine, subrounded; trace pebbles, small to medium, subrounded; trace granules, subrounded; dry; medium stiff; light brownish gray (10YR 6/2).		
3					0.0				
4					0.0				
5					0.0				
6					0.0				
7					0.0				
8					0.0				
9			24		0.0				
10					0.0		(9.0-11.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, fine to medium, subrounded; moist; soft; brown (10YR 5/3).		
11				SB-OS-SS444_8-13 _091322 @ 14:25	0.0		(11.0-11.5') SAND, very fine to fine, subrounded; little silt; well sorted; wet; loose; yellowish brown (10YR 5/4).	(2.0-30.0') Bentonite Pellets	
12					0.0		(11.5-12.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, fine to medium, subrounded; moist; soft; brown (10YR 5/3).		
13			60		0.0		(12.0-12.5') SAND, very fine to fine, subrounded; little silt; well sorted; wet; loose; yellowish brown (10YR 5/4).		
14					0.0		(12.5-21.0') 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; dry to moist; medium stiff; gray (10YR 5/1).		
15					0.0				
16					0.0				
17					0.0				
18			54		0.0				
19					0.0				
20					0.0				

Drilling Co.: Fibertec Environmental Services
Driller: Nick Wiseman
Drilling Method: Direct Push
Drilling Fluid: None
Remarks: ' / ft = feet. bgs = below ground surface. Hand augered to 8.0' bgs.

Sampling Method: 5.0' Macro Core
Sampling Interval: Continuous
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-SS444

Sheet: 2 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/13/2022
Date Completed: 09/13/2022

Logger: A.Westhuis
Editor: C. Cisco
Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21					0.0				
22					0.0		(21.0-25.5') SAND, very fine to fine, subrounded; little silt; well sorted; dry; medium dense; light gray (10YR 7/2).		
23			42		0.0				
24					0.0				
25					0.0			(2.0-30.0') Bentonite Pellets	
26					0.0		(25.5-25.7') 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).		
27					0.0		(25.7-26.0') SAND, very fine to fine, subrounded; little silt; well sorted; moist to wet; medium dense; light gray (10YR 7/2).		
28			60		0.0				
29					0.0		(26.0-30.0') 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).		
30					0.0				
31							End of boring at 30.0' bgs.		
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-TG414

Sheet: 1 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/19/2022
Date Completed: 09/19/2022

Logger: C. Cisco
Editor: C. Cisco
Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1–7			84				(0.0-1.5') GRASS/TOPSOIL. (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). (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).	(0.0-2.0') Backfill with Cuttings	
7–10			36				(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).		
10–15			54					(2.0-30.0') Bentonite Pellets	
14–15							(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).		
15–20			42						

Drilling Co.: Fibertec Environmental Services
Driller: Nick Wiseman
Drilling Method: Direct Push
Drilling Fluid: None
Remarks: ' / ft = feet. bgs = below ground surface. Hand augered to 7.0' bgs.

Sampling Method: 5.0' Macro Core
Sampling Interval: Continuous
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

SOIL BORING LOG_2013 \\ARCADIS-US.COM\OFFICE\DATA\NOV1-MI\COMMON\RACER LANSING\WORKING DATA ANALYSIS\BORING LOGS\RACER LANSING MASTER DATABASE_082522_NEW LOGS ONLY.GPJ ARCADIS_2013.GDT 10/10/22

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-TG414

Sheet: 2 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/19/2022
Date Completed: 09/19/2022

Logger: C. Cisco
Editor: C. Cisco
Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21			40				(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).		
22									
23									
24									
25							(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).	(2.0-30.0') Bentonite Pellets	
26			44	SB-OS-TG414_26-30 VAP attempted, DRY			(25.0-30.0') CLAY, medium to high plasticity, no dilatancy; little silt; little sand, very fine to fine, subrounded; moist; soft to very soft; grayish brown (10YR 5/2).		
27									
28									
29							Note: Sand lens, fine to coarse, subrounded; some gravel, subrounded present from 28.5-29.0' bgs		
30							End of boring at 30.0' bgs.		
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-TM383

Sheet: 1 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/19/2022
Date Completed: 09/19/2022

Logger: C. Cisco
Editor: C. Cisco
Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1–7			84				(0.0-1.5') GRASS/TOPSOIL. Note: Pebbles, medium to large present. (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).	(0.0-2.0') Backfill with Cuttings	
8–9			33						
10–15			57				(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). (14.0-18.0') 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. Note: Sand lens, fine to medium, subrounded to subangular present from 16.0-19.3' bgs.	(2.0-30.0') Bentonite Pellets	
16–18			60	SB-OS-TM383_15.5-19.5 VAP attempted, DRY			(18.0-19.3') SAND, very fine to fine, subrounded; little silt; well sorted; wet; loose; gray (10YR 5/1).		
19–20							(19.3-20.0') CLAY, low to medium plasticity, no dilatancy; little silt; trace sand, very fine to fine, subrounded; moist;		

Drilling Co.: Fibertec Environmental Services
Driller: Nick Wiseman
Drilling Method: Direct Push
Drilling Fluid: None
Remarks: ' / ft = feet. bgs = below ground surface. Hand augered to 7.0' bgs.

Sampling Method: 5.0' Macro Core
Sampling Interval: Continuous
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

SOIL BORING LOG_2013 \\ARCADIS-US.COM\OFFICEDATA\NOVI-MI\COMMON\RACER LANSING\WORKING DATA ANALYSIS\BORING LOGS\RACER LANSING MASTER DATABASE_082522_NEW LOGS ONLY.GPJ ARCADIS_2013.GDT 10/10/22

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-TM383

Sheet: 2 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/19/2022
Date Completed: 09/19/2022

Logger: C. Cisco
Editor: C. Cisco
Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21							medium stiff; gray (10YR 5/1).		
22							(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).		
23			60						
24									
25								(2.0-30.0') Bentonite Pellets	
26									
27									
28			60						
29									
30							End of boring at 30.0' bgs.		
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-TO444

Sheet: 1 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/19/2022
Date Completed: 09/19/2022

Logger: C. Cisco
Editor: C. Cisco
Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1–7			84				(0.0-1.5') GRASS/TOPSOIL. (1.5-6.0') CLAY, medium plasticity, no dilatancy; and SAND, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to medium, subrounded; dry; medium stiff; brown (10YR 5/3). (6.0-9.0') CLAY, medium plasticity, no dilatancy; little silt; little sand, very fine to fine, subrounded;trace granules, subrounded; trace pebbles, small to medium, subrounded to subangular; dry; medium stiff; brown (10YR 5/3).	(0.0-2.0') Backfill with Cuttings	
8–9			36						
10–15			60				(9.0-15.5') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, fine to medium, subrounded; dry; medium stiff; brown (10YR 5/3).	(2.0-30.0') Bentonite Pellets	
16–20			60				(15.5-21.0') CLAY, medium plasticity, no dilatancy; little silt; dry to moist; medium stiff; dark grayish brown (10YR 4/2). Note: Consistency changes to soft at 19.6' bgs.		

Drilling Co.: Fibertec Environmental Services
Driller: Nick Wiseman
Drilling Method: Direct Push
Drilling Fluid: None
Remarks: ' / ft = feet. bgs = below ground surface. Hand augered to 7.0' bgs.

Sampling Method: 5.0' Macro Core
Sampling Interval: Continuous
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

SOIL BORING LOG_2013 \\ARCADIS-US.COM\OFFICE\DATA\NOV1-MI\COMMON\RACER LANSING\WORKING DATA ANALYSIS\BORING LOGS\RACER LANSING MASTER DATABASE_082522_NEW LOGS ONLY.GPJ ARCADIS_2013.GDT 10/10/22

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: SB-OS-TO444

Sheet: 2 of 2

Project Name: RACER Lansing
Project Number: 30112892
Project Location: Lansing, MI

Date Started: 09/19/2022
Date Completed: 09/19/2022

Logger: C. Cisco
Editor: C. Cisco
Weather Conditions: 70° F, Cloudy

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
21							(15.5-21.0') CLAY, medium plasticity, no dilatancy; little silt; dry to moist; medium stiff; dark grayish brown (10YR 4/2).		
22							(21.0-21.2') SAND, very fine to fine, subrounded; little silt; well sorted; moist; light gray (10YR 7/2).		
23			45				(21.2-22.0') CLAY, medium plasticity, no dilatancy; little silt; little sand, very fine to fine, subrounded; trace pebbles, small to medium, subrounded; moist; medium stiff; dark gray (10YR 4/1).		
24							(22.0-23.5') SAND, very fine to fine, subrounded; little silt; well sorted; moist; light gray (10YR 7/2) to light brownish gray (10YR 6/2).		
25							(23.5-25.5') CLAY, medium plasticity, no dilatancy; little silt; little sand, very fine to fine, subrounded; trace pebbles, medium, subrounded; moist; soft; dark gray (10YR 4/1).	(2.0-30.0') Bentonite Pellets	
26				SB-OS-TO444_24.5-28.5 VAP attempted, DRY			(25.5-25.8') SAND, very fine to fine, subrounded; little silt; well sorted; moist to wet; light gray (10YR 7/2).		
27							(25.8-30.0') CLAY, medium plasticity, no dilatancy; little silt; little sand, very fine to fine, subrounded; trace pebbles, medium, subrounded; moist; medium stiff; gray (10YR 5/1).		
28			46						
29									
30							End of boring at 30.0' bgs.		
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									

Remarks:

Attachment 2

Laboratory Analytical Reports

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing

Project Number: 30112892.03100

Lot Number:**XD06118**

Date Completed:04/20/2022

04/21/2022 12:19 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

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

Case Narrative
Arcadis U.S., Inc.
Lot Number: XD06118

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 was in compliance 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). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. 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 = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

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

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} 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 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.

The MS/MSD associated with sample XD06118-004 had compounds recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Samples XD06118-008, XD06118-009, XD06118-010, XD06118-011, XD06118-012 had surrogates recovered above the acceptance limits. This reflects a high bias for compounds associated with this surrogate. There were no detections for these compounds in the sample; therefore, there is no impact on data quality and no corrective action is required.

Sample Summary
Arcadis U.S., Inc.
Lot Number: XD06118

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-22-145_040422	Aqueous	04/04/2022 1325	04/06/2022
002	MW-22-144_040422	Aqueous	04/04/2022 1425	04/06/2022
003	MW-22-148_040422	Aqueous	04/04/2022 1545	04/06/2022
004	MW-22-147_040422	Aqueous	04/04/2022 1630	04/06/2022
005	MW-22-143_040522	Aqueous	04/05/2022 1045	04/06/2022
006	MW-22-146_040522	Aqueous	04/05/2022 1205	04/06/2022
007	MW-22-149_040522	Aqueous	04/05/2022 1250	04/06/2022
008	MW-22-150_040522	Aqueous	04/05/2022 1345	04/06/2022
009	MW-22-151_040522	Aqueous	04/05/2022 1440	04/06/2022
010	MW-22-152_040522	Aqueous	04/05/2022 1550	04/06/2022
011	Dup-01_040522	Aqueous	04/05/2022	04/06/2022
012	EB-01_040522	Aqueous	04/05/2022 1615	04/06/2022

(12 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: XD06118

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-22-145_040422	Aqueous	PFBS	PFAS by ID	3.4	J	ng/L	6
001	MW-22-145_040422	Aqueous	PFOSA	PFAS by ID	1.1	J	ng/L	6
001	MW-22-145_040422	Aqueous	PFHxS	PFAS by ID	1.9	J	ng/L	6
001	MW-22-145_040422	Aqueous	PFBA	PFAS by ID	5.2		ng/L	6
001	MW-22-145_040422	Aqueous	PFHpA	PFAS by ID	5.7		ng/L	6
001	MW-22-145_040422	Aqueous	PFHxA	PFAS by ID	9.9		ng/L	6
001	MW-22-145_040422	Aqueous	PFOA	PFAS by ID	16		ng/L	6
001	MW-22-145_040422	Aqueous	PFPeA	PFAS by ID	9.3		ng/L	6
001	MW-22-145_040422	Aqueous	PFOS	PFAS by ID	3.6		ng/L	6
002	MW-22-144_040422	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	8
002	MW-22-144_040422	Aqueous	PFHxS	PFAS by ID	2.3	J	ng/L	8
002	MW-22-144_040422	Aqueous	PFBA	PFAS by ID	5.3		ng/L	8
002	MW-22-144_040422	Aqueous	PFHpA	PFAS by ID	3.6		ng/L	8
002	MW-22-144_040422	Aqueous	PFHxA	PFAS by ID	7.7		ng/L	8
002	MW-22-144_040422	Aqueous	PFOA	PFAS by ID	5.3		ng/L	8
002	MW-22-144_040422	Aqueous	PFPeA	PFAS by ID	8.8		ng/L	8
003	MW-22-148_040422	Aqueous	PFBS	PFAS by ID	1.6	J	ng/L	10
003	MW-22-148_040422	Aqueous	PFOSA	PFAS by ID	2.0	J	ng/L	10
003	MW-22-148_040422	Aqueous	PFBA	PFAS by ID	3.0	J	ng/L	10
003	MW-22-148_040422	Aqueous	PFHpA	PFAS by ID	0.39	J	ng/L	10
003	MW-22-148_040422	Aqueous	PFHxA	PFAS by ID	1.1	J	ng/L	10
003	MW-22-148_040422	Aqueous	PFOA	PFAS by ID	1.1	J	ng/L	10
003	MW-22-148_040422	Aqueous	PFPeA	PFAS by ID	0.92	J	ng/L	10
004	MW-22-147_040422	Aqueous	PFBS	PFAS by ID	2.5	JS	ng/L	12
004	MW-22-147_040422	Aqueous	PFOSA	PFAS by ID	0.67	J	ng/L	12
004	MW-22-147_040422	Aqueous	PFHxS	PFAS by ID	1.3	J	ng/L	12
004	MW-22-147_040422	Aqueous	PFBA	PFAS by ID	3.8	S	ng/L	12
004	MW-22-147_040422	Aqueous	PFHpA	PFAS by ID	0.69	J	ng/L	12
004	MW-22-147_040422	Aqueous	PFHxA	PFAS by ID	1.1	J	ng/L	12
004	MW-22-147_040422	Aqueous	PFOA	PFAS by ID	2.8	JS	ng/L	12
004	MW-22-147_040422	Aqueous	PFPeA	PFAS by ID	1.2	J	ng/L	12
004	MW-22-147_040422	Aqueous	PFOS	PFAS by ID	2.0	JS	ng/L	12
005	MW-22-143_040522	Aqueous	PFBS	PFAS by ID	0.81	J	ng/L	14
005	MW-22-143_040522	Aqueous	PFBA	PFAS by ID	11		ng/L	14
005	MW-22-143_040522	Aqueous	PFHpA	PFAS by ID	3.7		ng/L	14
005	MW-22-143_040522	Aqueous	PFHxA	PFAS by ID	19		ng/L	14
005	MW-22-143_040522	Aqueous	PFOA	PFAS by ID	1.5	J	ng/L	14
005	MW-22-143_040522	Aqueous	PFPeA	PFAS by ID	18		ng/L	14
006	MW-22-146_040522	Aqueous	PFBS	PFAS by ID	4.0		ng/L	16
006	MW-22-146_040522	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	16
006	MW-22-146_040522	Aqueous	PFBA	PFAS by ID	14		ng/L	16
006	MW-22-146_040522	Aqueous	PFHpA	PFAS by ID	0.59	J	ng/L	16
006	MW-22-146_040522	Aqueous	PFHxA	PFAS by ID	6.7		ng/L	16
006	MW-22-146_040522	Aqueous	PFOA	PFAS by ID	6.5		ng/L	16
006	MW-22-146_040522	Aqueous	PFPeA	PFAS by ID	5.4		ng/L	16

Detection Summary (Continued)

Lot Number: XD06118

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
006	MW-22-146_040522	Aqueous	PFOS	PFAS by ID	1.7	J	ng/L	16
007	MW-22-149_040522	Aqueous	PFBS	PFAS by ID	1.8	J	ng/L	18
007	MW-22-149_040522	Aqueous	PFOSA	PFAS by ID	0.53	J	ng/L	18
007	MW-22-149_040522	Aqueous	PFHxS	PFAS by ID	0.88	J	ng/L	18
007	MW-22-149_040522	Aqueous	PFBA	PFAS by ID	1.2	J	ng/L	18
007	MW-22-149_040522	Aqueous	PFOA	PFAS by ID	0.72	J	ng/L	18
007	MW-22-149_040522	Aqueous	PFOS	PFAS by ID	2.1	J	ng/L	18
008	MW-22-150_040522	Aqueous	PFOSA	PFAS by ID	0.57	J	ng/L	20
008	MW-22-150_040522	Aqueous	PFBA	PFAS by ID	3.1	J	ng/L	20
008	MW-22-150_040522	Aqueous	PFHxA	PFAS by ID	1.7	J	ng/L	20
008	MW-22-150_040522	Aqueous	PFPeA	PFAS by ID	2.1	J	ng/L	20
009	MW-22-151_040522	Aqueous	PFBS	PFAS by ID	7.9		ng/L	22
009	MW-22-151_040522	Aqueous	PFHxS	PFAS by ID	1.8	J	ng/L	22
009	MW-22-151_040522	Aqueous	PFBA	PFAS by ID	11		ng/L	22
009	MW-22-151_040522	Aqueous	PFHpA	PFAS by ID	3.5	J	ng/L	22
009	MW-22-151_040522	Aqueous	PFHxA	PFAS by ID	6.0		ng/L	22
009	MW-22-151_040522	Aqueous	PFNA	PFAS by ID	0.59	J	ng/L	22
009	MW-22-151_040522	Aqueous	PFOA	PFAS by ID	9.4		ng/L	22
009	MW-22-151_040522	Aqueous	PFPeA	PFAS by ID	13		ng/L	22
009	MW-22-151_040522	Aqueous	PFOS	PFAS by ID	2.0	J	ng/L	22
010	MW-22-152_040522	Aqueous	PFBS	PFAS by ID	1.8	J	ng/L	24
010	MW-22-152_040522	Aqueous	PFHxS	PFAS by ID	1.1	J	ng/L	24
010	MW-22-152_040522	Aqueous	PFBA	PFAS by ID	3.7		ng/L	24
010	MW-22-152_040522	Aqueous	PFHpA	PFAS by ID	1.0	J	ng/L	24
010	MW-22-152_040522	Aqueous	PFHxA	PFAS by ID	2.4	J	ng/L	24
010	MW-22-152_040522	Aqueous	PFOA	PFAS by ID	2.4	J	ng/L	24
010	MW-22-152_040522	Aqueous	PFPeA	PFAS by ID	2.7	J	ng/L	24
011	Dup-01_040522	Aqueous	PFBS	PFAS by ID	0.91	J	ng/L	26
011	Dup-01_040522	Aqueous	PFBA	PFAS by ID	11		ng/L	26
011	Dup-01_040522	Aqueous	PFHpA	PFAS by ID	3.7		ng/L	26
011	Dup-01_040522	Aqueous	PFHxA	PFAS by ID	19		ng/L	26
011	Dup-01_040522	Aqueous	PFOA	PFAS by ID	1.5	J	ng/L	26
011	Dup-01_040522	Aqueous	PFPeA	PFAS by ID	20		ng/L	26

(78 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-001**

Description: **MW-22-145_040422** Matrix: **Aqueous**

Date Sampled: **04/04/2022 1325**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 0131	MMM	04/11/2022 1037	37696

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		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.4**	**J**	**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**1.1**	**J**	**3.6**	**0.55**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.2**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.7**		**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.9**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**16**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.3**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.6**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		95	25-150
13C2_6:2FTS		123	25-150
13C2_8:2FTS		92	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		84	25-150
13C3_PFBS		81	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		82	25-150
13C4_PFHpA		85	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		88	25-150
13C7_PFUdA		83	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-001**
Description: **MW-22-145_040422**
Matrix: **Aqueous**
Date Sampled: **04/04/2022 1325**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		95	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		84	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		85	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-002**

Description: **MW-22-144_040422** Matrix: **Aqueous**

Date Sampled: **04/04/2022 1425**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 0142	MMM	04/11/2022 1037	37696

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		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.5**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	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	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.3**	**J**	**3.5**	**0.49**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.3**		**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.47	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**	**3.6**		**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**7.7**		**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**	**5.3**		**3.5**	**0.74**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.8**		**3.5**	**0.48**	**ng/L**	**1**
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	0.56	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
13C2_4:2FTS		102	25-150
13C2_6:2FTS		120	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		86	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		86	25-150
13C3_PFHxS		88	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		79	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		88	25-150
13C6_PFDA		87	25-150
13C7_PFUdA		84	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-002**
Description: **MW-22-144_040422**
Matrix: **Aqueous**
Date Sampled: **04/04/2022 1425**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		85	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		86	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-003**

Description: **MW-22-148_040422** Matrix: **Aqueous**

Date Sampled: **04/04/2022 1545**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 0153	MMM	04/11/2022 1037	37696

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	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	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	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.6**	**J**	**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	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**2.0**	**J**	**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
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.0**	**J**	**3.5**	**0.52**	**ng/L**	**1**
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
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.39**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.1**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**0.92**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		117	25-150
13C2_6:2FTS		122	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		87	25-150
13C4_PFBA		81	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		87	25-150
13C7_PFUdA		88	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-003**
Description: **MW-22-148_040422**
Matrix: **Aqueous**
Date Sampled: **04/04/2022 1545**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		99	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		88	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-004**

Description: **MW-22-147_040422** Matrix: **Aqueous**

Date Sampled: **04/04/2022 1630**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 0204	MMM	04/11/2022 1037	37696

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	S	6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND	S	6.9	0.58	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	S	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	S	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	S	6.9	0.76	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	S	6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND	S	6.9	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND	S	6.9	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.5**	**JS**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND	S	3.5	0.68	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND	S	3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND	S	3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**0.67**	**J**	**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND	S	3.5	0.52	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.3**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.8**	**S**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND	S	3.5	0.46	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND	S	3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.69**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.1**	**J**	**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND	S	3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.8**	**JS**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.2**	**J**	**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	S	3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND	S	3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND	S	3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.0**	**JS**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		142	25-150
13C2_6:2FTS		121	25-150
13C2_8:2FTS		89	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		87	25-150
13C3-HFPO-DA		81	25-150
13C4_PFBA		61	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		80	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		87	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-004**
Description: **MW-22-147_040422**
Matrix: **Aqueous**
Date Sampled: **04/04/2022 1630**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	25-150
13C8_PFOS		86	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		84	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-005**

Description: **MW-22-143_040522** Matrix: **Aqueous**

Date Sampled: **04/05/2022 1045**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 0237	MMM	04/11/2022 1037	37696

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		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.58	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	0.76	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	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.81**	**J**	**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	0.43	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	0.53	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
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.5**	**0.52**	**ng/L**	**1**
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
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.7**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**19**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**18**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		122	25-150
13C2_6:2FTS		125	25-150
13C2_8:2FTS		87	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		81	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		77	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		80	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-005**
Description: **MW-22-143_040522**
Matrix: **Aqueous**
Date Sampled: **04/05/2022 1045**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		78	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		79	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-006**

Description: **MW-22-146_040522** Matrix: **Aqueous**

Date Sampled: **04/05/2022 1205**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 0248	MMM	04/11/2022 1037	37696

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	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	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	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**4.0**		**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	0.62	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**	**1.1**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**14**		**3.5**	**0.52**	**ng/L**	**1**
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
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.59**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.7**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.5**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.4**		**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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**	**1.7**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		143	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		72	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		44	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		83	25-150
13C5_PFPeA		70	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		83	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-006**
Description: **MW-22-146_040522**
Matrix: **Aqueous**
Date Sampled: **04/05/2022 1205**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		81	10-150
13C9_PFNA		81	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		85	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-007**

Description: **MW-22-149_040522** Matrix: **Aqueous**

Date Sampled: **04/05/2022 1250**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 0259	MMM	04/11/2022 1037	37696

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		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-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	0.76	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	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	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**	**0.53**	**J**	**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**0.88**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**1.2**	**J**	**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	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	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**0.72**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.1**	**J**	**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		94	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		79	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		80	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		84	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-007**
Description: **MW-22-149_040522**
Matrix: **Aqueous**
Date Sampled: **04/05/2022 1250**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		90	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		88	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-008**

Description: **MW-22-150_040522** Matrix: **Aqueous**

Date Sampled: **04/05/2022 1345**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 0310	MMM	04/11/2022 1037	37696

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		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	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**	**0.57**	**J**	**3.5**	**0.54**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.1**	**J**	**3.5**	**0.53**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.47	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	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.7**	**J**	**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	0.74	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.1**	**J**	**3.5**	**0.48**	**ng/L**	**1**
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	0.56	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
13C2_4:2FTS	N	177	25-150
13C2_6:2FTS		136	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		78	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		68	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		67	25-150
13C4_PFBA		34	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		55	25-150
13C6_PFDA		82	25-150
13C7_PFUdA		82	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-008**
Description: **MW-22-150_040522**
Matrix: **Aqueous**
Date Sampled: **04/05/2022 1345**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		85	25-150
13C8_PFOSA		79	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		86	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-009**

Description: **MW-22-151_040522** Matrix: **Aqueous**

Date Sampled: **04/05/2022 1440**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 2332	MMM		37899

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		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**7.9**		**3.6**	**0.37**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.5**	**J**	**3.6**	**0.40**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.0**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.59**	**J**	**3.6**	**0.42**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**9.4**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**13**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.0**	**J**	**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	205	25-150
13C2_6:2FTS	N	216	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		65	25-150
13C4_PFBA		43	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		83	25-150
13C5_PFPeA		64	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		82	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-009**
Description: **MW-22-151_040522**
Matrix: **Aqueous**
Date Sampled: **04/05/2022 1440**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		92	25-150
13C8_PFOS		91	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		86	25-150
d3-MeFOSAA		81	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-010**

Description: **MW-22-152_040522** Matrix: **Aqueous**

Date Sampled: **04/05/2022 1550**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/19/2022 2342	MMM		37899

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	Q	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-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.8**	**J**	**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**	**1.1**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.7**		**3.4**	**0.51**	**ng/L**	**1**
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**	**1.0**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.4**	**J**	**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**	**2.4**	**J**	**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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
13C2_4:2FTS		123	25-150
13C2_6:2FTS	N	273	25-150
13C2_8:2FTS		76	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		83	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		92	25-150
13C6_PFDA		80	25-150
13C7_PFUdA		77	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-010**
Description: **MW-22-152_040522**
Matrix: **Aqueous**
Date Sampled: **04/05/2022 1550**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		102	25-150
13C8_PFOS		88	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		78	25-150
d3-MeFOSAA		82	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-011**

Description: **Dup-01_040522** Matrix: **Aqueous**

Date Sampled: **04/05/2022**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/20/2022 0004	MMM		37899

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		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.58	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	Q	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	0.76	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	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**0.91**	**J**	**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	0.43	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	0.53	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
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**11**		**3.5**	**0.52**	**ng/L**	**1**
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
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.7**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**19**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.5**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**20**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		149	25-150
13C2_6:2FTS	N	260	25-150
13C2_8:2FTS		80	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		76	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		87	25-150
13C6_PFDA		98	25-150
13C7_PFUdA		83	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-011**
Description: **Dup-01_040522**
Matrix: **Aqueous**
Date Sampled: **04/05/2022**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	25-150
13C8_PFOS		95	25-150
13C8_PFOSA		89	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		85	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XD06118-012**

Description: **EB-01_040522** Matrix: **Aqueous**

Date Sampled: **04/05/2022 1615**

Date Received: **04/06/2022**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	04/20/2022 0014	MMM		37899

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		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.61	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.69	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.7	0.38	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.7	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.7	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.7	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.7	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.7	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.7	0.51	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.7	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.7	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.7	0.63	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.7	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.7	0.76	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.7	0.50	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.7	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.7	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.7	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.7	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		104	25-150
13C2_6:2FTS	N	259	25-150
13C2_8:2FTS		73	25-150
13C2_PFDoA		69	25-150
13C2_PFTeDA		68	25-150
13C3_PFBS		94	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		90	25-150
13C4_PFHpA		89	25-150
13C5_PFHxA		94	25-150
13C5_PFPeA		90	25-150
13C6_PFDA		88	25-150
13C7_PFUdA		81	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XD06118-012**
Description: **EB-01_040522**
Matrix: **Aqueous**
Date Sampled: **04/05/2022 1615**
Date Received: **04/06/2022**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		110	25-150
13C8_PFOS		82	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		78	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

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

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: XQ37696-001
Batch: 37696
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/11/2022 1037

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	04/19/2022 0109
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	04/19/2022 0109
8:2 FTS	ND		1	8.0	1.6	ng/L	04/19/2022 0109
6:2 FTS	ND		1	8.0	2.0	ng/L	04/19/2022 0109
4:2 FTS	ND		1	8.0	0.87	ng/L	04/19/2022 0109
GenX	ND		1	8.0	2.1	ng/L	04/19/2022 0109
ADONA	ND		1	8.0	0.48	ng/L	04/19/2022 0109
EtFOSAA	ND		1	8.0	0.75	ng/L	04/19/2022 0109
MeFOSAA	ND		1	8.0	0.93	ng/L	04/19/2022 0109
PFBS	ND		1	4.0	0.41	ng/L	04/19/2022 0109
PFDS	ND		1	4.0	0.78	ng/L	04/19/2022 0109
PFHpS	ND		1	4.0	0.50	ng/L	04/19/2022 0109
PFNS	ND		1	4.0	0.71	ng/L	04/19/2022 0109
PFOSA	ND		1	4.0	0.61	ng/L	04/19/2022 0109
PFPeS	ND		1	4.0	0.59	ng/L	04/19/2022 0109
PFHxS	ND		1	4.0	0.55	ng/L	04/19/2022 0109
PFBA	ND		1	4.0	0.60	ng/L	04/19/2022 0109
PFDA	ND		1	4.0	0.52	ng/L	04/19/2022 0109
PFDoA	ND		1	4.0	0.47	ng/L	04/19/2022 0109
PFHpA	ND		1	4.0	0.45	ng/L	04/19/2022 0109
PFHxA	ND		1	4.0	0.69	ng/L	04/19/2022 0109
PFNA	ND		1	4.0	0.46	ng/L	04/19/2022 0109
PFOA	ND		1	4.0	0.83	ng/L	04/19/2022 0109
PFPeA	ND		1	4.0	0.54	ng/L	04/19/2022 0109
PFTeDA	ND		1	4.0	0.60	ng/L	04/19/2022 0109
PFTrDA	ND		1	4.0	0.53	ng/L	04/19/2022 0109
PFUdA	ND		1	4.0	0.63	ng/L	04/19/2022 0109
PFOS	ND		1	4.0	2.0	ng/L	04/19/2022 0109

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		89	25-150
13C2_6:2FTS		110	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		81	25-150
13C3_PFBS		85	25-150
13C3_PFHxS		86	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		90	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ37696-001
Batch: 37696
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/11/2022 1037

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		91	25-150
13C7_PFUdA		90	25-150
13C8_PFOA		96	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ37696-002
Batch: 37696
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/11/2022 1037

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	50-150	04/19/2022 0120
11Cl-PF3OUdS	15	15		1	98	50-150	04/19/2022 0120
8:2 FTS	15	16		1	105	50-150	04/19/2022 0120
6:2 FTS	15	17		1	110	50-150	04/19/2022 0120
4:2 FTS	15	16		1	108	50-150	04/19/2022 0120
GenX	32	37		1	114	50-150	04/19/2022 0120
ADONA	15	18		1	118	50-150	04/19/2022 0120
EtFOSAA	16	17		1	108	50-150	04/19/2022 0120
MeFOSAA	16	19		1	117	50-150	04/19/2022 0120
PFBS	14	15		1	105	50-150	04/19/2022 0120
PFDS	15	16		1	104	50-150	04/19/2022 0120
PFHpS	15	18		1	118	50-150	04/19/2022 0120
PFNS	15	16		1	106	50-150	04/19/2022 0120
PFOSA	16	17		1	107	50-150	04/19/2022 0120
PFPeS	15	16		1	110	50-150	04/19/2022 0120
PFHxS	15	16		1	113	50-150	04/19/2022 0120
PFBA	16	17		1	108	50-150	04/19/2022 0120
PFDA	16	18		1	112	50-150	04/19/2022 0120
PFDoA	16	18		1	114	50-150	04/19/2022 0120
PFHpA	16	18		1	110	50-150	04/19/2022 0120
PFHxA	16	18		1	113	50-150	04/19/2022 0120
PFNA	16	18		1	111	50-150	04/19/2022 0120
PFOA	16	16		1	101	50-150	04/19/2022 0120
PFPeA	16	17		1	109	50-150	04/19/2022 0120
PFTeDA	16	18		1	110	50-150	04/19/2022 0120
PFTrDA	16	17		1	108	50-150	04/19/2022 0120
PFUdA	16	18		1	111	50-150	04/19/2022 0120
PFOS	15	15		1	102	50-150	04/19/2022 0120

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		99	25-150
13C2_6:2FTS		136	25-150
13C2_8:2FTS		99	25-150
13C2_PFDoA		86	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		89	25-150
13C3-HFPO-DA		95	25-150
13C4_PFBA		94	25-150
13C4_PFHpA		91	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ37696-002
Batch: 37696
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/11/2022 1037

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		96	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		105	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: XD06118-004MS
Batch: 37696
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/11/2022 1037

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	108	50-150	04/19/2022 0215
11Cl-PF3OUdS	ND	14	14		1	106	50-150	04/19/2022 0215
8:2 FTS	ND	14	14		1	105	50-150	04/19/2022 0215
6:2 FTS	ND	14	14		1	106	50-150	04/19/2022 0215
4:2 FTS	ND	13	16		1	117	50-150	04/19/2022 0215
GenX	ND	29	30		1	103	50-150	04/19/2022 0215
ADONA	ND	14	15		1	113	50-150	04/19/2022 0215
EtFOSAA	ND	14	16		1	112	50-150	04/19/2022 0215
MeFOSAA	ND	14	17		1	116	50-150	04/19/2022 0215
PFBS	2.5	13	15		1	103	50-150	04/19/2022 0215
PFDS	ND	14	14		1	105	50-150	04/19/2022 0215
PFHpS	ND	14	14		1	103	50-150	04/19/2022 0215
PFNS	ND	14	15		1	110	50-150	04/19/2022 0215
PFOSA	0.67	14	17		1	113	50-150	04/19/2022 0215
PFPeS	ND	13	15		1	112	50-150	04/19/2022 0215
PFHxS	1.3	13	16		1	109	50-150	04/19/2022 0215
PFBA	3.8	14	19		1	104	50-150	04/19/2022 0215
PFDA	ND	14	15		1	108	50-150	04/19/2022 0215
PFDoA	ND	14	16		1	113	50-150	04/19/2022 0215
PFHpA	0.69	14	16		1	109	50-150	04/19/2022 0215
PFHxA	1.1	14	17		1	111	50-150	04/19/2022 0215
PFNA	ND	14	16		1	109	50-150	04/19/2022 0215
PFOA	2.8	14	18		1	104	50-150	04/19/2022 0215
PFPeA	1.2	14	17		1	109	50-150	04/19/2022 0215
PFTeDA	ND	14	16		1	109	50-150	04/19/2022 0215
PFTrDA	ND	14	16		1	112	50-150	04/19/2022 0215
PFUdA	ND	14	16		1	110	50-150	04/19/2022 0215
PFOS	2.0	13	16		1	123	50-150	04/19/2022 0215

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		140	25-150
13C2_6:2FTS		122	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		78	25-150
13C3_PFHxS		84	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		64	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		77	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: XD06118-004MS
Batch: 37696
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/11/2022 1037

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		86	25-150
13C7_PFUdA		84	25-150
13C8_PFOA		89	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: XD06118-004MD
Batch: 37696
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/11/2022 1037

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	8.0	2.7	N,+	1	34	140	50-150	30	04/19/2022 0226
11Cl-PF3OUdS	ND	8.1	2.8	N,+	1	34	140	50-150	30	04/19/2022 0226
8:2 FTS	ND	1.7	2.9	N,+	1	178	130	50-150	30	04/19/2022 0226
6:2 FTS	ND	1.6	2.9	N,+	1	180	130	50-150	30	04/19/2022 0226
4:2 FTS	ND	1.6	2.9	N,+	1	182	140	50-150	30	04/19/2022 0226
GenX	ND	8.6	6.1	+	1	71	130	50-150	30	04/19/2022 0226
ADONA	ND	8.1	2.9	N,+	1	36	140	50-150	30	04/19/2022 0226
EtFOSAA	ND	1.7	3.0	N,+	1	176	140	50-150	30	04/19/2022 0226
MeFOSAA	ND	1.7	3.1	N,+	1	180	140	50-150	30	04/19/2022 0226
PFBS	2.5	1.5	3.1	N,+	1	42	130	50-150	30	04/19/2022 0226
PFDS	ND	1.7	2.7	N,+	1	164	140	50-150	30	04/19/2022 0226
PFHpS	ND	1.6	2.6	N,+	1	161	140	50-150	30	04/19/2022 0226
PFNS	ND	1.7	2.7	N,+	1	165	140	50-150	30	04/19/2022 0226
PFOSA	0.67	1.7	3.1	+	1	143	140	50-150	30	04/19/2022 0226
PFPeS	ND	1.6	2.9	N,+	1	181	140	50-150	30	04/19/2022 0226
PFHxS	1.3	1.6	3.0	+	1	107	140	50-150	30	04/19/2022 0226
PFBA	3.8	1.7	3.6	N,+	1	-9.9	140	50-150	30	04/19/2022 0226
PFDA	ND	1.7	3.2	N,+	1	183	130	50-150	30	04/19/2022 0226
PFDoA	ND	1.7	3.0	N,+	1	173	140	50-150	30	04/19/2022 0226
PFHpA	0.69	1.7	3.1	+	1	140	140	50-150	30	04/19/2022 0226
PFHxA	1.1	1.7	3.3	+	1	130	130	50-150	30	04/19/2022 0226
PFNA	ND	1.7	3.1	N,+	1	179	130	50-150	30	04/19/2022 0226
PFOA	2.8	1.7	3.6	N,+	1	48	130	50-150	30	04/19/2022 0226
PFPeA	1.2	1.7	3.2	+	1	117	140	50-150	30	04/19/2022 0226
PFTeDA	ND	1.7	3.0	N,+	1	177	140	50-150	30	04/19/2022 0226
PFTrDA	ND	1.7	3.2	N,+	1	186	130	50-150	30	04/19/2022 0226
PFUdA	ND	1.7	3.1	N,+	1	182	130	50-150	30	04/19/2022 0226
PFOS	2.0	1.6	2.9	N,+	1	180	140	50-150	30	04/19/2022 0226

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		139	25-150
13C2_6:2FTS		120	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		79	25-150
13C2_PFTeDA		70	25-150
13C3_PFBS		80	25-150
13C3_PFHxS		85	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		62	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		79	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: XD06118-004MD
Batch: 37696
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/11/2022 1037

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		81	25-150
13C7_PFUdA		83	25-150
13C8_PFOA		90	25-150
13C8_PFOS		83	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		80	25-150
d3-MeFOSAA		84	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ37899-001
Batch: 37899
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/30/1899 0000

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	04/19/2022 2310
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	04/19/2022 2310
8:2 FTS	ND		1	8.0	1.6	ng/L	04/19/2022 2310
6:2 FTS	ND		1	8.0	2.0	ng/L	04/19/2022 2310
4:2 FTS	ND		1	8.0	0.87	ng/L	04/19/2022 2310
GenX	ND		1	8.0	2.1	ng/L	04/19/2022 2310
ADONA	ND		1	8.0	0.48	ng/L	04/19/2022 2310
EtFOSAA	ND		1	8.0	0.75	ng/L	04/19/2022 2310
MeFOSAA	ND		1	8.0	0.93	ng/L	04/19/2022 2310
PFBS	ND		1	4.0	0.41	ng/L	04/19/2022 2310
PFDS	ND		1	4.0	0.78	ng/L	04/19/2022 2310
PFHpS	ND		1	4.0	0.50	ng/L	04/19/2022 2310
PFNS	ND		1	4.0	0.71	ng/L	04/19/2022 2310
PFOSA	ND		1	4.0	0.61	ng/L	04/19/2022 2310
PFPeS	ND		1	4.0	0.59	ng/L	04/19/2022 2310
PFHxS	ND		1	4.0	0.55	ng/L	04/19/2022 2310
PFBA	ND		1	4.0	0.60	ng/L	04/19/2022 2310
PFDA	ND		1	4.0	0.52	ng/L	04/19/2022 2310
PFDoA	ND		1	4.0	0.47	ng/L	04/19/2022 2310
PFHpA	ND		1	4.0	0.45	ng/L	04/19/2022 2310
PFHxA	ND		1	4.0	0.69	ng/L	04/19/2022 2310
PFNA	ND		1	4.0	0.46	ng/L	04/19/2022 2310
PFOA	ND		1	4.0	0.83	ng/L	04/19/2022 2310
PFPeA	ND		1	4.0	0.54	ng/L	04/19/2022 2310
PFTeDA	ND		1	4.0	0.60	ng/L	04/19/2022 2310
PFTrDA	ND		1	4.0	0.53	ng/L	04/19/2022 2310
PFUdA	ND		1	4.0	0.63	ng/L	04/19/2022 2310
PFOS	ND		1	4.0	2.0	ng/L	04/19/2022 2310

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		125	25-150
13C2_6:2FTS	N	273	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		113	25-150
13C2_PFTeDA		102	25-150
13C3_PFBS		124	25-150
13C3_PFHxS		117	25-150
13C3-HFPO-DA		118	25-150
13C4_PFBA		117	25-150
13C4_PFHpA		113	25-150
13C5_PFHxA		121	25-150
13C5_PFPeA		110	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ37899-001
Batch: 37899
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/30/1899 0000

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		114	25-150
13C7_PFUdA		107	25-150
13C8_PFOA		132	25-150
13C8_PFOS		105	25-150
13C8_PFOSA		109	10-150
13C9_PFNA		112	25-150
d5-EtFOSAA		106	25-150
d3-MeFOSAA		113	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ37899-002
Batch: 37899
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/30/1899 0000

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	103	50-150	04/19/2022 2321
11Cl-PF3OUdS	15	14		1	94	50-150	04/19/2022 2321
8:2 FTS	15	18		1	118	50-150	04/19/2022 2321
6:2 FTS	15	19		1	126	50-150	04/19/2022 2321
4:2 FTS	15	16		1	110	50-150	04/19/2022 2321
GenX	32	32		1	101	50-150	04/19/2022 2321
ADONA	15	17		1	112	50-150	04/19/2022 2321
EtFOSAA	16	18		1	113	50-150	04/19/2022 2321
MeFOSAA	16	17		1	106	50-150	04/19/2022 2321
PFBS	14	15		1	104	50-150	04/19/2022 2321
PFDS	15	15		1	95	50-150	04/19/2022 2321
PFHpS	15	17		1	109	50-150	04/19/2022 2321
PFNS	15	18		1	120	50-150	04/19/2022 2321
PFOSA	16	17		1	104	50-150	04/19/2022 2321
PFPeS	15	15		1	100	50-150	04/19/2022 2321
PFHxS	15	16		1	113	50-150	04/19/2022 2321
PFBA	16	17		1	105	50-150	04/19/2022 2321
PFDA	16	16		1	102	50-150	04/19/2022 2321
PFDoA	16	18		1	109	50-150	04/19/2022 2321
PFHpA	16	17		1	108	50-150	04/19/2022 2321
PFHxA	16	18		1	110	50-150	04/19/2022 2321
PFNA	16	18		1	114	50-150	04/19/2022 2321
PFOA	16	18		1	115	50-150	04/19/2022 2321
PFPeA	16	16		1	102	50-150	04/19/2022 2321
PFTeDA	16	19		1	116	50-150	04/19/2022 2321
PFTrDA	16	16		1	102	50-150	04/19/2022 2321
PFUdA	16	17		1	104	50-150	04/19/2022 2321
PFOS	15	16		1	107	50-150	04/19/2022 2321

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		101	25-150
13C2_6:2FTS	N	207	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		84	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		108	25-150
13C3_PFHxS		94	25-150
13C3-HFPO-DA		105	25-150
13C4_PFBA		96	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		98	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ37899-002
Batch: 37899
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/30/1899 0000

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		94	25-150
13C7_PFUdA		87	25-150
13C8_PFOA		106	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		89	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

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

PFAS by LC/MS/MS - Duplicate

Sample ID: XD06118-010DU
Batch: 37899
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/30/1899 0000

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	04/19/2022 2353
11Cl-PF3OUdS	ND	ND		1	0.00	20	04/19/2022 2353
8:2 FTS	ND	ND		1	0.00	20	04/19/2022 2353
6:2 FTS	ND	ND		1	0.00	20	04/19/2022 2353
4:2 FTS	ND	ND		1	0.00	20	04/19/2022 2353
GenX	ND	ND		1	0.00	20	04/19/2022 2353
ADONA	ND	ND		1	0.00	20	04/19/2022 2353
EtFOSAA	ND	ND		1	0.00	20	04/19/2022 2353
MeFOSAA	ND	ND		1	0.00	20	04/19/2022 2353
PFBS	1.8	1.8	J	1	2.0	20	04/19/2022 2353
PFDS	ND	ND		1	0.00	20	04/19/2022 2353
PFHpS	ND	ND		1	0.00	20	04/19/2022 2353
PFNS	ND	ND		1	0.00	20	04/19/2022 2353
PFOSA	ND	ND		1	0.00	20	04/19/2022 2353
PFPeS	ND	ND		1	0.00	20	04/19/2022 2353
PFHxS	1.1	1.3	J	1	8.7	20	04/19/2022 2353
PFBA	3.7	3.6	J	1	2.8	20	04/19/2022 2353
PFDA	ND	ND		1	0.00	20	04/19/2022 2353
PFDoA	ND	ND		1	0.00	20	04/19/2022 2353
PFHpA	1.0	1.0	J	1	2.0	20	04/19/2022 2353
PFHxA	2.4	2.4	J	1	3.8	20	04/19/2022 2353
PFNA	ND	ND		1	0.00	20	04/19/2022 2353
PFOA	2.4	2.3	J	1	1.1	20	04/19/2022 2353
PFPeA	2.7	2.6	J	1	1.3	20	04/19/2022 2353
PFTeDA	ND	ND		1	0.00	20	04/19/2022 2353
PFTrDA	ND	ND		1	0.00	20	04/19/2022 2353
PFUdA	ND	ND		1	0.00	20	04/19/2022 2353
PFOS	ND	ND		1	0.00	20	04/19/2022 2353

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		121	25-150
13C2_6:2FTS	N	242	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - Duplicate

Sample ID: XD06118-010DU
Batch: 37899
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 12/30/1899 0000

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		94	25-150
13C7_PFUdA		85	25-150
13C8_PFOA		114	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		90	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		85	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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

PACE ANALYTICAL SERVICES, LLC

Pace Analytical®

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 132698

Client: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip Code: 48377
Project Name: RACER Lansing
Project No.: 30112892.03100
P.O. No.:

Report to Contact: Tiffany Linder, Caitlin Cisco
Sampler's Signature: x [signature]
Printed Name: Austin Westhuis

Telephone No. / E-mail: 248-225-1927 / Tiffany.Linder@arcadis.com; 248-722-2441 / Caitlin.Cisco@arcadis.com
Quote No.:
Analysis (Attach list if more space is needed): PFAS via Method 537 mod. in solids / Water per 537.1
Page 1 of 2

XD06118
KE52

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Wet/Frozen	PFAS via Method 537 mod. in solids / Water per 537.1	Remarks / Cooler I.D.
MW-22-145_040422	4/4/22	1325	G	X			2							X	
MW-22-144_040422	4/4/22	1425	G	X			2							X	
MW-22-148_040422	4/4/22	1545	G	X			2							X	
MW-22-147_040422	4/4/22	1630	G	X			6							X	
MW-22-143_040522	4/5/22	1045	G	X			2							X	MS/MSD
MW-22-146_040522	4/5/22	1205	G	X			2							X	
MW-22-149_040522	4/5/22	1250	G	X			2							X	
MW-22-150_040522	4/5/22	1345	G	X			2							X	
MW-22-151_040522	4/5/22	1440	G	X			2							X	
MW-22-152_040522	4/5/22	1556	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)
Sample Disposal: ☐ Return to Client ☒ Disposal by Lab
Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished by: [signature] / Austin Westhuis / Arcadis	4/5/22	1715	1. Received by: FedEx	4/5/22	1715
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FedEx	4-6-22	16:20	4. Laboratory received by: [signature]	4-6-22	16:20

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle): (Yes) No Ice Pack Receipt Temp. 3.5 °C Temp Blank ☒Y ☐N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy ★ Report EGLE 28 Compounds ★

Document Number: ME003N2-01

Pace Analytical®

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 132699

Client	Arcadis
Address	28550 Cabot Drive, Suite 500
City	Novi
State	MI
Zip Code	48377
Project Name	RACER Lansing
Project No.	30112892.03100
P.O. No.	
Report to Contact	Tiffany Linder, Caitlin Cisco
Telephone No. / E-mail	313-425-1928 / Tiffany.Linder@arcadis.com; 248-722-2411 / Caitlin.Cisco@arcadis.com
Quote No.	
Sampler's Signature	x [signature]
Printed Name	Austin Westhuis
Page	2 of 2

XD06118

KES2

Analysis (Attach list if more space is needed): PFAS via method 537 mod w/ isotope dilution per QSM 5.1

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	Zinc Ac	Field Filtered	PFAS via method 537 mod w/ isotope dilution per QSM 5.1	Remarks / Cooler I.D.
Dup-01_040522	4/5/22	—	G	X			2							X	
EB-01_040522	4/5/22	1615	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☒ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

Relinquished by	Date	Time	Received by	Date	Time
1. [signature] / Austin Westhuis / Arcadis	4/5/22	1715	1. FedEx	4/5/22	1715
2.			2.		
3.			3.		
4. FedEx	4-6-22	1620	4. Laboratory received by [signature]	4-6-22	16:20

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY: Received on Ice (Circle) (Yes) No Ice Pack; Receipt Temp. 5.5 °C; Temp Blank ☐ Y ☐ N

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

★ Report EGLE 28 Compounds ★

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: TEC / 04/06/2022 Lot #: XD06118

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.5 / 3.5 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☐ Yes	☐ No	☑ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L. (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: KDRW Date: 04/06/2022

Comments:

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing

Project Number: 30112892.0370A

Lot Number:**XF07078**

Date Completed:06/24/2022

06/24/2022 4:10 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

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

Case Narrative
Arcadis U.S., Inc.
Lot Number: XF07078

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 was in compliance 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). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. 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 = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

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

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} 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 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.

Sample XF07078-005, XF07078-009, XF07078-010, XF07078-011, XF07078-012, XF07078-014, XF07078-015, XF07078-016, XF07078-018, XF07078-019, XF07078-020 had surrogates recovered outside of the acceptance limits due to confirmed matrix interference.

Sample Summary
Arcadis U.S., Inc.
Lot Number: XF07078
Project Name: RACER Lansing
Project Number: 30112892.0370A

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-22-143_060122	Aqueous	06/01/2022 1045	06/07/2022
002	MW-22-144_060122	Aqueous	06/01/2022 1200	06/07/2022
003	MW-22-145_060122	Aqueous	06/01/2022 1235	06/07/2022
004	Dup-17_060122	Aqueous	06/01/2022	06/07/2022
005	MW-22-146_060122	Aqueous	06/01/2022 1315	06/07/2022
006	MW-22-147_060122	Aqueous	06/01/2022 1400	06/07/2022
007	MW-22-148_060122	Aqueous	06/01/2022 1430	06/07/2022
008	EB-02_060122	Aqueous	06/01/2022 1445	06/07/2022
009	MW-22-149_060122	Aqueous	06/01/2022 1340	06/07/2022
010	MW-22-150_060122	Aqueous	06/01/2022 1105	06/07/2022
011	MW-22-151_060122	Aqueous	06/01/2022 1225	06/07/2022
012	MW-22-152_060122	Aqueous	06/01/2022 1440	06/07/2022
013	EB-03_060122	Aqueous	06/01/2022 1000	06/07/2022
014	MW-14-70_060222	Aqueous	06/02/2022 0955	06/07/2022
015	MW-12-13_060222	Aqueous	06/02/2022 1055	06/07/2022
016	MW-21-133_060222	Aqueous	06/02/2022 1150	06/07/2022
017	MW-21-134_060222	Aqueous	06/02/2022 1250	06/07/2022
018	MW-21-135_060222	Aqueous	06/02/2022 1430	06/07/2022
019	MW-12-10R_060222	Aqueous	06/02/2022 1520	06/07/2022
020	Dup-15_060222	Aqueous	06/02/2022	06/07/2022

(20 samples)

Detection Summary

Arcadis U.S., Inc.

Lot Number: XF07078

Project Name: RACER Lansing

Project Number: 30112892.0370A

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-22-143_060122	Aqueous	PFBS	PFAS by ID	1.0	J	ng/L	7
001	MW-22-143_060122	Aqueous	PFBA	PFAS by ID	9.7		ng/L	7
001	MW-22-143_060122	Aqueous	PFHpA	PFAS by ID	5.9		ng/L	7
001	MW-22-143_060122	Aqueous	PFHxA	PFAS by ID	16		ng/L	7
001	MW-22-143_060122	Aqueous	PFOA	PFAS by ID	4.1		ng/L	7
001	MW-22-143_060122	Aqueous	PFPeA	PFAS by ID	12		ng/L	7
002	MW-22-144_060122	Aqueous	PFBS	PFAS by ID	2.3	J	ng/L	9
002	MW-22-144_060122	Aqueous	PFHxS	PFAS by ID	2.2	J	ng/L	9
002	MW-22-144_060122	Aqueous	PFBA	PFAS by ID	5.4		ng/L	9
002	MW-22-144_060122	Aqueous	PFHpA	PFAS by ID	4.5		ng/L	9
002	MW-22-144_060122	Aqueous	PFHxA	PFAS by ID	10		ng/L	9
002	MW-22-144_060122	Aqueous	PFOA	PFAS by ID	7.5		ng/L	9
002	MW-22-144_060122	Aqueous	PFPeA	PFAS by ID	9.9		ng/L	9
003	MW-22-145_060122	Aqueous	PFBS	PFAS by ID	3.0	J	ng/L	11
003	MW-22-145_060122	Aqueous	PFPeS	PFAS by ID	0.54	J	ng/L	11
003	MW-22-145_060122	Aqueous	PFHxS	PFAS by ID	1.9	J	ng/L	11
003	MW-22-145_060122	Aqueous	PFBA	PFAS by ID	5.5		ng/L	11
003	MW-22-145_060122	Aqueous	PFHpA	PFAS by ID	5.8		ng/L	11
003	MW-22-145_060122	Aqueous	PFHxA	PFAS by ID	9.7		ng/L	11
003	MW-22-145_060122	Aqueous	PFNA	PFAS by ID	0.75	J	ng/L	11
003	MW-22-145_060122	Aqueous	PFOA	PFAS by ID	14		ng/L	11
003	MW-22-145_060122	Aqueous	PFPeA	PFAS by ID	9.5		ng/L	11
003	MW-22-145_060122	Aqueous	PFOS	PFAS by ID	6.8		ng/L	11
004	Dup-17_060122	Aqueous	PFBS	PFAS by ID	2.8	J	ng/L	13
004	Dup-17_060122	Aqueous	PFPeS	PFAS by ID	0.51	J	ng/L	13
004	Dup-17_060122	Aqueous	PFHxS	PFAS by ID	2.1	J	ng/L	13
004	Dup-17_060122	Aqueous	PFBA	PFAS by ID	5.6		ng/L	13
004	Dup-17_060122	Aqueous	PFHpA	PFAS by ID	6.0		ng/L	13
004	Dup-17_060122	Aqueous	PFHxA	PFAS by ID	8.7		ng/L	13
004	Dup-17_060122	Aqueous	PFNA	PFAS by ID	0.79	J	ng/L	13
004	Dup-17_060122	Aqueous	PFOA	PFAS by ID	14		ng/L	13
004	Dup-17_060122	Aqueous	PFPeA	PFAS by ID	8.8		ng/L	13
004	Dup-17_060122	Aqueous	PFOS	PFAS by ID	6.9		ng/L	13
005	MW-22-146_060122	Aqueous	PFBS	PFAS by ID	6.0		ng/L	15
005	MW-22-146_060122	Aqueous	PFHxS	PFAS by ID	1.2	J	ng/L	15
005	MW-22-146_060122	Aqueous	PFBA	PFAS by ID	16		ng/L	15
005	MW-22-146_060122	Aqueous	PFHpA	PFAS by ID	1.0	J	ng/L	15
005	MW-22-146_060122	Aqueous	PFHxA	PFAS by ID	5.8		ng/L	15
005	MW-22-146_060122	Aqueous	PFOA	PFAS by ID	5.8		ng/L	15
005	MW-22-146_060122	Aqueous	PFPeA	PFAS by ID	4.9		ng/L	15
005	MW-22-146_060122	Aqueous	PFOS	PFAS by ID	1.9	J	ng/L	15
006	MW-22-147_060122	Aqueous	PFBS	PFAS by ID	3.2	J	ng/L	17
006	MW-22-147_060122	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	17

Detection Summary (Continued)

Lot Number: XF07078

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
006	MW-22-147_060122	Aqueous	PFBA	PFAS by ID	6.1		ng/L	17
006	MW-22-147_060122	Aqueous	PFHpA	PFAS by ID	1.4	J	ng/L	17
006	MW-22-147_060122	Aqueous	PFHxA	PFAS by ID	2.7	J	ng/L	17
006	MW-22-147_060122	Aqueous	PFOA	PFAS by ID	3.7		ng/L	17
006	MW-22-147_060122	Aqueous	PFPeA	PFAS by ID	2.9	J	ng/L	17
006	MW-22-147_060122	Aqueous	PFOS	PFAS by ID	2.2	J	ng/L	17
007	MW-22-148_060122	Aqueous	PFBS	PFAS by ID	1.0	J	ng/L	19
007	MW-22-148_060122	Aqueous	PFBA	PFAS by ID	0.88	J	ng/L	19
009	MW-22-149_060122	Aqueous	PFBS	PFAS by ID	1.4	J	ng/L	23
009	MW-22-149_060122	Aqueous	PFHxS	PFAS by ID	0.91	J	ng/L	23
009	MW-22-149_060122	Aqueous	PFBA	PFAS by ID	0.91	J	ng/L	23
009	MW-22-149_060122	Aqueous	PFHpA	PFAS by ID	0.41	J	ng/L	23
009	MW-22-149_060122	Aqueous	PFOA	PFAS by ID	1.1	J	ng/L	23
010	MW-22-150_060122	Aqueous	PFOSA	PFAS by ID	1.6	J	ng/L	25
010	MW-22-150_060122	Aqueous	PFBA	PFAS by ID	2.9	J	ng/L	25
010	MW-22-150_060122	Aqueous	PFHxA	PFAS by ID	1.2	J	ng/L	25
010	MW-22-150_060122	Aqueous	PFPeA	PFAS by ID	1.7	J	ng/L	25
011	MW-22-151_060122	Aqueous	6:2 FTS	PFAS by ID	5.3	JQ	ng/L	27
011	MW-22-151_060122	Aqueous	PFBS	PFAS by ID	8.4		ng/L	27
011	MW-22-151_060122	Aqueous	PFBA	PFAS by ID	10		ng/L	27
011	MW-22-151_060122	Aqueous	PFHpA	PFAS by ID	2.7	J	ng/L	27
011	MW-22-151_060122	Aqueous	PFHxA	PFAS by ID	6.2		ng/L	27
011	MW-22-151_060122	Aqueous	PFNA	PFAS by ID	0.39	J	ng/L	27
011	MW-22-151_060122	Aqueous	PFOA	PFAS by ID	7.7		ng/L	27
011	MW-22-151_060122	Aqueous	PFPeA	PFAS by ID	14		ng/L	27
011	MW-22-151_060122	Aqueous	PFOS	PFAS by ID	3.4		ng/L	27
012	MW-22-152_060122	Aqueous	PFBS	PFAS by ID	2.1	J	ng/L	29
012	MW-22-152_060122	Aqueous	PFHxS	PFAS by ID	1.8	J	ng/L	29
012	MW-22-152_060122	Aqueous	PFBA	PFAS by ID	4.0		ng/L	29
012	MW-22-152_060122	Aqueous	PFHpA	PFAS by ID	0.99	J	ng/L	29
012	MW-22-152_060122	Aqueous	PFHxA	PFAS by ID	2.6	J	ng/L	29
012	MW-22-152_060122	Aqueous	PFOA	PFAS by ID	2.5	J	ng/L	29
012	MW-22-152_060122	Aqueous	PFPeA	PFAS by ID	3.0	J	ng/L	29
014	MW-14-70_060222	Aqueous	PFBS	PFAS by ID	7.9		ng/L	33
014	MW-14-70_060222	Aqueous	PFHxS	PFAS by ID	3.0	J	ng/L	33
014	MW-14-70_060222	Aqueous	PFBA	PFAS by ID	44		ng/L	33
014	MW-14-70_060222	Aqueous	PFHpA	PFAS by ID	46		ng/L	33
014	MW-14-70_060222	Aqueous	PFHxA	PFAS by ID	80		ng/L	33
014	MW-14-70_060222	Aqueous	PFNA	PFAS by ID	0.44	J	ng/L	33
014	MW-14-70_060222	Aqueous	PFOA	PFAS by ID	34		ng/L	33
014	MW-14-70_060222	Aqueous	PFPeA	PFAS by ID	100		ng/L	33
015	MW-12-13_060222	Aqueous	PFBS	PFAS by ID	2.7	J	ng/L	35
015	MW-12-13_060222	Aqueous	PFBA	PFAS by ID	26		ng/L	35
015	MW-12-13_060222	Aqueous	PFHpA	PFAS by ID	15		ng/L	35
015	MW-12-13_060222	Aqueous	PFHxA	PFAS by ID	54		ng/L	35
015	MW-12-13_060222	Aqueous	PFOA	PFAS by ID	2.3	J	ng/L	35
015	MW-12-13_060222	Aqueous	PFPeA	PFAS by ID	38		ng/L	35
016	MW-21-133_060222	Aqueous	PFBS	PFAS by ID	2.0	J	ng/L	37

Detection Summary (Continued)

Lot Number: XF07078

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
016	MW-21-133_060222	Aqueous	PFPeS	PFAS by ID	0.54	J	ng/L	37
016	MW-21-133_060222	Aqueous	PFHxS	PFAS by ID	1.7	J	ng/L	37
016	MW-21-133_060222	Aqueous	PFBA	PFAS by ID	14		ng/L	37
016	MW-21-133_060222	Aqueous	PFHpA	PFAS by ID	17		ng/L	37
016	MW-21-133_060222	Aqueous	PFHxA	PFAS by ID	24		ng/L	37
016	MW-21-133_060222	Aqueous	PFNA	PFAS by ID	1.1	J	ng/L	37
016	MW-21-133_060222	Aqueous	PFOA	PFAS by ID	43		ng/L	37
016	MW-21-133_060222	Aqueous	PFPeA	PFAS by ID	22		ng/L	37
016	MW-21-133_060222	Aqueous	PFOS	PFAS by ID	4.6		ng/L	37
017	MW-21-134_060222	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	39
017	MW-21-134_060222	Aqueous	PFPeS	PFAS by ID	0.77	J	ng/L	39
017	MW-21-134_060222	Aqueous	PFHxS	PFAS by ID	2.0	J	ng/L	39
017	MW-21-134_060222	Aqueous	PFBA	PFAS by ID	13		ng/L	39
017	MW-21-134_060222	Aqueous	PFHpA	PFAS by ID	15		ng/L	39
017	MW-21-134_060222	Aqueous	PFHxA	PFAS by ID	22		ng/L	39
017	MW-21-134_060222	Aqueous	PFOA	PFAS by ID	23		ng/L	39
017	MW-21-134_060222	Aqueous	PFPeA	PFAS by ID	21		ng/L	39
017	MW-21-134_060222	Aqueous	PFOS	PFAS by ID	4.2		ng/L	39
018	MW-21-135_060222	Aqueous	PFBS	PFAS by ID	1.9	J	ng/L	41
018	MW-21-135_060222	Aqueous	PFPeS	PFAS by ID	1.2	J	ng/L	41
018	MW-21-135_060222	Aqueous	PFHxS	PFAS by ID	1.6	J	ng/L	41
018	MW-21-135_060222	Aqueous	PFBA	PFAS by ID	12		ng/L	41
018	MW-21-135_060222	Aqueous	PFHpA	PFAS by ID	47		ng/L	41
018	MW-21-135_060222	Aqueous	PFHxA	PFAS by ID	39		ng/L	41
018	MW-21-135_060222	Aqueous	PFNA	PFAS by ID	1.1	J	ng/L	41
018	MW-21-135_060222	Aqueous	PFOA	PFAS by ID	38		ng/L	41
018	MW-21-135_060222	Aqueous	PFPeA	PFAS by ID	39		ng/L	41
018	MW-21-135_060222	Aqueous	PFOS	PFAS by ID	2.1	J	ng/L	41
019	MW-12-10R_060222	Aqueous	PFBS	PFAS by ID	5.5		ng/L	43
019	MW-12-10R_060222	Aqueous	PFBA	PFAS by ID	9.6		ng/L	43
019	MW-12-10R_060222	Aqueous	PFHpA	PFAS by ID	3.5		ng/L	43
019	MW-12-10R_060222	Aqueous	PFHxA	PFAS by ID	4.5		ng/L	43
019	MW-12-10R_060222	Aqueous	PFNA	PFAS by ID	0.76	J	ng/L	43
019	MW-12-10R_060222	Aqueous	PFOA	PFAS by ID	8.9		ng/L	43
019	MW-12-10R_060222	Aqueous	PFPeA	PFAS by ID	5.3		ng/L	43
019	MW-12-10R_060222	Aqueous	PFOS	PFAS by ID	7.6		ng/L	43
020	Dup-15_060222	Aqueous	PFBS	PFAS by ID	7.9		ng/L	45
020	Dup-15_060222	Aqueous	PFHxS	PFAS by ID	1.4	J	ng/L	45
020	Dup-15_060222	Aqueous	PFBA	PFAS by ID	9.4		ng/L	45
020	Dup-15_060222	Aqueous	PFHpA	PFAS by ID	3.9		ng/L	45
020	Dup-15_060222	Aqueous	PFHxA	PFAS by ID	4.7		ng/L	45
020	Dup-15_060222	Aqueous	PFNA	PFAS by ID	0.63	J	ng/L	45
020	Dup-15_060222	Aqueous	PFOA	PFAS by ID	8.8		ng/L	45
020	Dup-15_060222	Aqueous	PFPeA	PFAS by ID	5.3		ng/L	45
020	Dup-15_060222	Aqueous	PFOS	PFAS by ID	7.7		ng/L	45

(136 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-001**

Description: **MW-22-143_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1045** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/23/2022 2230	LAB	06/20/2022 1638	45585

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		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-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	0.76	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	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**J**	**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	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	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.7**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**5.9**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**16**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.1**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**12**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		124	25-150
13C2_6:2FTS		108	25-150
13C2_8:2FTS		83	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		92	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		77	25-150
13C4_PFHpA		88	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		89	25-150
13C6_PFDA		88	25-150
13C7_PFUdA		88	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-001**
Description: **MW-22-143_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1045**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		84	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		93	25-150
d5-EtFOSAA		84	25-150
d3-MeFOSAA		88	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-002**

Description: **MW-22-144_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1200** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/23/2022 2240	LAB	06/20/2022 1638	45585

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		7.3	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.3	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.3	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.3	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.3	0.80	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.3	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.3	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.3	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.3	0.85	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.3**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.71	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.46	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.65	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.2**	**J**	**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.4**		**3.6**	**0.55**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.5**		**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**10**		**3.6**	**0.63**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**7.5**		**3.6**	**0.76**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.9**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		111	25-150
13C2_6:2FTS		124	25-150
13C2_8:2FTS		111	25-150
13C2_PFDoA		109	25-150
13C2_PFTeDA		103	25-150
13C3_PFBS		110	25-150
13C3_PFHxS		110	25-150
13C3-HFPO-DA		98	25-150
13C4_PFBA		107	25-150
13C4_PFHpA		112	25-150
13C5_PFHxA		113	25-150
13C5_PFPeA		116	25-150
13C6_PFDA		95	25-150
13C7_PFUdA		109	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **XF07078-002**
Description: **MW-22-144_060122**		Matrix: **Aqueous**
Date Sampled: **06/01/2022 1200**	Project Name: **RACER Lansing**	
Date Received: **06/07/2022**	Project Number: **30112892.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	25-150
13C8_PFOS		112	25-150
13C8_PFOSA		117	10-150
13C9_PFNA		110	25-150
d5-EtFOSAA		106	25-150
d3-MeFOSAA		102	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-003**

Description: **MW-22-145_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1235** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/23/2022 2251	LAB	06/20/2022 1638	45585

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-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-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.0**	**J**	**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**	**0.54**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.5**		**3.4**	**0.51**	**ng/L**	**1**
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**	**5.8**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.7**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.75**	**J**	**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.5**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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**	**6.8**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		94	25-150
13C2_6:2FTS		75	25-150
13C2_8:2FTS		101	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		120	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		99	25-150
13C4_PFBA		106	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		100	25-150
13C5_PFPeA		105	25-150
13C6_PFDA		106	25-150
13C7_PFUdA		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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-003**
Description: **MW-22-145_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1235**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		106	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		102	25-150
d3-MeFOSAA		104	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-004**

Description: **Dup-17_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/23/2022 2302	LAB	06/20/2022 1638	45585

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		6.7	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.8**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	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**	**0.51**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.6**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	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**	**6.0**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**8.7**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.79**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**14**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**8.8**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**6.9**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	25-150
13C2_6:2FTS		122	25-150
13C2_8:2FTS		110	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		112	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		112	25-150
13C6_PFDA		109	25-150
13C7_PFUdA		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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-004**
Description: **Dup-17_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		106	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		96	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-005**

Description: **MW-22-146_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1315** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/23/2022 2312	LAB	06/20/2022 1638	45585

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	Q	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
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**6.0**		**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	0.62	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**	**1.2**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**16**		**3.5**	**0.53**	**ng/L**	**1**
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
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.0**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**5.8**		**3.5**	**0.60**	**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**	**5.8**		**3.5**	**0.73**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.9**		**3.5**	**0.48**	**ng/L**	**1**
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	0.46	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**	**1.9**	**J**	**3.5**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	154	25-150
13C2_6:2FTS		133	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		111	25-150
13C2_PFTeDA		97	25-150
13C3_PFBS		103	25-150
13C3_PFHxS		111	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		64	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		108	25-150
13C7_PFUdA		95	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-005**
Description: **MW-22-146_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1315**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		101	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		95	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-006**

Description: **MW-22-147_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1400** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/23/2022 2323	LAB	06/20/2022 1638	45585

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	0.56	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	0.74	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	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**3.2**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	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**	**1.4**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**6.1**		**3.4**	**0.51**	**ng/L**	**1**
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**	**1.4**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.7**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.9**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.2**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		150	25-150
13C2_6:2FTS		145	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		115	25-150
13C3_PFHxS		107	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		84	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		111	25-150
13C5_PFPeA		106	25-150
13C6_PFDA		106	25-150
13C7_PFUdA		100	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-006**
Description: **MW-22-147_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1400**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		104	25-150
13C8_PFOS		116	25-150
13C8_PFOSA		112	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		96	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-007**

Description: **MW-22-148_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1430** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/23/2022 2333	LAB	06/20/2022 1638	45585

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		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.2	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.0**	**J**	**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.6	0.50	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.88**	**J**	**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.6	0.41	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.6	0.62	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.6	0.75	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.6	0.49	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.6	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		101	25-150
13C2_6:2FTS		116	25-150
13C2_8:2FTS		106	25-150
13C2_PFDoA		106	25-150
13C2_PFTeDA		104	25-150
13C3_PFBS		126	25-150
13C3_PFHxS		121	25-150
13C3-HFPO-DA		106	25-150
13C4_PFBA		112	25-150
13C4_PFHpA		107	25-150
13C5_PFHxA		112	25-150
13C5_PFPeA		117	25-150
13C6_PFDA		116	25-150
13C7_PFUdA		110	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-007**
Description: **MW-22-148_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1430**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		106	25-150
13C8_PFOS		109	25-150
13C8_PFOSA		116	10-150
13C9_PFNA		110	25-150
d5-EtFOSAA		109	25-150
d3-MeFOSAA		102	25-150

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-008**

Description: **EB-02_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1445** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/23/2022 2344	LAB	06/20/2022 1638	45585

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	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	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	0.65	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.0	0.81	ng/L	1
Perfluoro-1-butanesulfonic 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	0.43	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	0.53	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
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
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
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	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		94	25-150
13C2_6:2FTS		113	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		113	25-150
13C3_PFHxS		107	25-150
13C3-HFPO-DA		105	25-150
13C4_PFBA		112	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		105	25-150
13C6_PFDA		104	25-150
13C7_PFUdA		94	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **XF07078-008**
Description: **EB-02_060122**		Matrix: **Aqueous**
Date Sampled: **06/01/2022 1445**	Project Name: **RACER Lansing**	
Date Received: **06/07/2022**	Project Number: **30112892.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		92	25-150
d5-EtFOSAA		102	25-150
d3-MeFOSAA		102	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-009**

Description: **MW-22-149_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1340** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0016	LAB	06/20/2022 1638	45585

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	Q	7.0	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.0	0.76	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	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.4**	**J**	**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	0.62	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**	**0.91**	**J**	**3.5**	**0.48**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**0.91**	**J**	**3.5**	**0.52**	**ng/L**	**1**
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
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**0.41**	**J**	**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**1.1**	**J**	**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	25-150
13C2_6:2FTS	N	182	25-150
13C2_8:2FTS		93	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		86	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		96	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		98	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		97	25-150
13C7_PFUdA		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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-009**
Description: **MW-22-149_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1340**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		95	25-150
d5-EtFOSAA		96	25-150
d3-MeFOSAA		87	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-010**

Description: **MW-22-150_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1105** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0027	LAB	06/20/2022 1638	45585

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	0.56	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	Q	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	Q	6.8	0.74	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	0.79	ng/L	1
Perfluoro-1-butanesulfonic 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	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	**754-91-6**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.52**	**ng/L**	**1**
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.4	0.47	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.9**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	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**	**1.2**	**J**	**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.4	0.70	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	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
13C2_4:2FTS	N	198	25-150
13C2_6:2FTS	N	268	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		106	25-150
13C3-HFPO-DA		77	25-150
13C4_PFBA		58	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		107	25-150
13C7_PFUdA		119	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-010**
Description: **MW-22-150_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1105**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	25-150
13C8_PFOS		106	25-150
13C8_PFOSA		108	10-150
13C9_PFNA		102	25-150
d5-EtFOSAA		114	25-150
d3-MeFOSAA		91	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-011**

Description: **MW-22-151_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1225** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0058	LAB	06/20/2022 1638	45585

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	Q	6.8	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**5.3**	**JQ**	**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	Q	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-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**8.4**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	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
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**10**		**3.4**	**0.51**	**ng/L**	**1**
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**	**2.7**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**6.2**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.39**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**7.7**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**14**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.4**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	207	25-150
13C2_6:2FTS	N	212	25-150
13C2_8:2FTS	N	169	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		100	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		70	25-150
13C4_PFBA		55	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		76	25-150
13C6_PFDA		117	25-150
13C7_PFUdA		101	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-011**
Description: **MW-22-151_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1225**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		89	25-150
13C8_PFOS		107	25-150
13C8_PFOSA		104	10-150
13C9_PFNA		116	25-150
d5-EtFOSAA		101	25-150
d3-MeFOSAA		100	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-012**

Description: **MW-22-152_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1440** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0109	LAB	06/20/2022 1638	45585

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	0.56	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	0.74	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	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	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	0.50	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.8**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**4.0**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	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**	**0.99**	**J**	**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.6**	**J**	**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.5**	**J**	**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.0**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND	Q	3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	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
13C2_4:2FTS		130	25-150
13C2_6:2FTS		147	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		74	25-150
13C2_PFTeDA	N	21	25-150
13C3_PFBS		119	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		102	25-150
13C4_PFBA		101	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		107	25-150
13C5_PFPeA		113	25-150
13C6_PFDA		102	25-150
13C7_PFUdA		90	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-012**
Description: **MW-22-152_060122**
Matrix: **Aqueous**
Date Sampled: **06/01/2022 1440**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		103	25-150
13C8_PFOSA		104	10-150
13C9_PFNA		105	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		99	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-013**

Description: **EB-03_060122** Matrix: **Aqueous**

Date Sampled: **06/01/2022 1000** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0120	LAB	06/20/2022 1638	45585

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-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-butanesulfonic 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
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
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
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
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
13C2_4:2FTS		97	25-150
13C2_6:2FTS		72	25-150
13C2_8:2FTS		99	25-150
13C2_PFDoA		103	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		118	25-150
13C3_PFHxS		127	25-150
13C3-HFPO-DA		104	25-150
13C4_PFBA		114	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		106	25-150
13C5_PFPeA		107	25-150
13C6_PFDA		101	25-150
13C7_PFUdA		101	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **XF07078-013**
Description: **EB-03_060122**		Matrix: **Aqueous**
Date Sampled: **06/01/2022 1000**	Project Name: **RACER Lansing**	
Date Received: **06/07/2022**	Project Number: **30112892.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		102	25-150
13C8_PFOS		109	25-150
13C8_PFOSA		108	10-150
13C9_PFNA		109	25-150
d5-EtFOSAA		100	25-150
d3-MeFOSAA		100	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-014**

Description: **MW-14-70_060222** Matrix: **Aqueous**

Date Sampled: **06/02/2022 0955** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0130	LAB	06/20/2022 1638	45585

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	Q	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-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**7.9**		**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	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**	**3.0**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**44**		**3.4**	**0.51**	**ng/L**	**1**
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**	**46**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**80**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.44**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**34**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**100**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	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
13C2_4:2FTS	N	184	25-150
13C2_6:2FTS		143	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		90	25-150
13C3_PFHxS		99	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		50	25-150
13C4_PFHpA		99	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		56	25-150
13C7_PFUdA		94	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-014**
Description: **MW-14-70_060222**
Matrix: **Aqueous**
Date Sampled: **06/02/2022 0955**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		91	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		96	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		89	25-150

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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-015**

Description: **MW-12-13_060222** Matrix: **Aqueous**

Date Sampled: **06/02/2022 1055** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0141	LAB	06/20/2022 1638	45585

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	0.56	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	Q	6.8	0.74	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	0.79	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.7**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	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
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**26**		**3.4**	**0.51**	**ng/L**	**1**
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**	**15**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**54**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.3**	**J**	**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**38**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	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
13C2_4:2FTS	N	157	25-150
13C2_6:2FTS		65	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		105	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		102	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		78	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		92	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **XF07078-015**
Description: **MW-12-13_060222**		Matrix: **Aqueous**
Date Sampled: **06/02/2022 1055**	Project Name: **RACER Lansing**	
Date Received: **06/07/2022**	Project Number: **30112892.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		97	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		102	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		95	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-016**

Description: **MW-21-133_060222** Matrix: **Aqueous**

Date Sampled: **06/02/2022 1150** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0152	LAB	06/20/2022 1638	45585

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	Q	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-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**2.0**	**J**	**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**	**0.54**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.7**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**14**		**3.4**	**0.51**	**ng/L**	**1**
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**	**17**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**24**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**43**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**22**		**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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**	**4.6**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		148	25-150
13C2_6:2FTS	N	163	25-150
13C2_8:2FTS		117	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		110	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		88	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		98	25-150
13C6_PFDA		115	25-150
13C7_PFUdA		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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-016**
Description: **MW-21-133_060222**
Matrix: **Aqueous**
Date Sampled: **06/02/2022 1150**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	25-150
13C8_PFOS		111	25-150
13C8_PFOSA		116	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		93	25-150
d3-MeFOSAA		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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-017**

Description: **MW-21-134_060222** Matrix: **Aqueous**

Date Sampled: **06/02/2022 1250** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0202	LAB	06/20/2022 1638	45585

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		6.7	0.41	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.7	0.56	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.7	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.7	0.74	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.7	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.7	0.41	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.7	0.63	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.7	0.78	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.65	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.4	0.42	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.4	0.60	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**	**0.77**	**J**	**3.4**	**0.50**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**2.0**	**J**	**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**13**		**3.4**	**0.51**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.4	0.44	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**	**15**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**22**		**3.4**	**0.58**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.4	0.39	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**23**		**3.4**	**0.70**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**21**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**4.2**		**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		144	25-150
13C2_6:2FTS		125	25-150
13C2_8:2FTS		124	25-150
13C2_PFDoA		122	25-150
13C2_PFTeDA		91	25-150
13C3_PFBS		128	25-150
13C3_PFHxS		119	25-150
13C3-HFPO-DA		115	25-150
13C4_PFBA		100	25-150
13C4_PFHpA		117	25-150
13C5_PFHxA		116	25-150
13C5_PFPeA		118	25-150
13C6_PFDA		143	25-150
13C7_PFUdA		123	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-017**
Description: **MW-21-134_060222**
Matrix: **Aqueous**
Date Sampled: **06/02/2022 1250**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		103	25-150
13C8_PFOS		118	25-150
13C8_PFOSA		137	10-150
13C9_PFNA		116	25-150
d5-EtFOSAA		116	25-150
d3-MeFOSAA		110	25-150

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-018**

Description: **MW-21-135_060222** Matrix: **Aqueous**

Date Sampled: **06/02/2022 1430** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/24/2022 0213	LAB	06/20/2022 1638	45585

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	Q	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-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.9**	**J**	**3.4**	**0.35**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.4	0.66	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**	**1.2**	**J**	**3.4**	**0.51**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.6**	**J**	**3.4**	**0.47**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**12**		**3.4**	**0.51**	**ng/L**	**1**
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**	**47**		**3.4**	**0.38**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**39**		**3.4**	**0.59**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.1**	**J**	**3.4**	**0.39**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**38**		**3.4**	**0.71**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**39**		**3.4**	**0.46**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.4	0.51	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.53	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.1**	**J**	**3.4**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	169	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		117	25-150
13C2_PFDoA		99	25-150
13C2_PFTeDA		97	25-150
13C3_PFBS		114	25-150
13C3_PFHxS		119	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		89	25-150
13C4_PFHpA		113	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		106	25-150
13C6_PFDA		110	25-150
13C7_PFUdA		101	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-018**
Description: **MW-21-135_060222**
Matrix: **Aqueous**
Date Sampled: **06/02/2022 1430**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		108	25-150
13C8_PFOS		110	25-150
13C8_PFOSA		116	10-150
13C9_PFNA		113	25-150
d5-EtFOSAA		101	25-150
d3-MeFOSAA		101	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-019**

Description: **MW-12-10R_060222** Matrix: **Aqueous**

Date Sampled: **06/02/2022 1520** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/22/2022 2007	ASD	06/21/2022 1155	45642

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		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-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	Q	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	Q	6.9	0.76	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	0.81	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**5.5**		**3.5**	**0.36**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	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	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.6**		**3.5**	**0.52**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.5**		**3.5**	**0.39**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.5**		**3.5**	**0.60**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.76**	**J**	**3.5**	**0.40**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.9**		**3.5**	**0.72**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.3**		**3.5**	**0.47**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	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	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.6**		**3.5**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	255	25-150
13C2_6:2FTS	N	198	25-150
13C2_8:2FTS		120	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		95	25-150
13C3-HFPO-DA		78	25-150
13C4_PFBA		50	25-150
13C4_PFHpA		98	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		74	25-150
13C6_PFDA		105	25-150
13C7_PFUdA		106	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**		Laboratory ID: **XF07078-019**
Description: **MW-12-10R_060222**		Matrix: **Aqueous**
Date Sampled: **06/02/2022 1520**	Project Name: **RACER Lansing**	
Date Received: **06/07/2022**	Project Number: **30112892.0370A**	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		107	25-150
13C8_PFOS		109	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		110	25-150
d5-EtFOSAA		105	25-150
d3-MeFOSAA		106	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XF07078-020**

Description: **Dup-15_060222** Matrix: **Aqueous**

Date Sampled: **06/02/2022** Project Name: **RACER Lansing**

Date Received: **06/07/2022** Project Number: **30112892.0370A**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	06/22/2022 2018	ASD	06/21/2022 1155	45642

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		6.6	0.40	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.6	0.55	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.6	1.3	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.6	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND	Q	6.6	0.72	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.6	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.6	0.40	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.6	0.62	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.6	0.77	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**7.9**		**3.3**	**0.34**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.3	0.64	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.3	0.41	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.3	0.59	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.3	0.51	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.3	0.49	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**1.4**	**J**	**3.3**	**0.46**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**9.4**		**3.3**	**0.50**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.3	0.43	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.3	0.39	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.9**		**3.3**	**0.37**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.7**		**3.3**	**0.57**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**0.63**	**J**	**3.3**	**0.38**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**8.8**		**3.3**	**0.69**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**5.3**		**3.3**	**0.45**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.3	0.50	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.3	0.44	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.3	0.52	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**7.7**		**3.3**	**1.7**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	257	25-150
13C2_6:2FTS	N	205	25-150
13C2_8:2FTS		118	25-150
13C2_PFDoA		98	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		79	25-150
13C4_PFBA		47	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		70	25-150
13C6_PFDA		105	25-150
13C7_PFUdA		103	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.**
Laboratory ID: **XF07078-020**
Description: **Dup-15_060222**
Matrix: **Aqueous**
Date Sampled: **06/02/2022**
Project Name: **RACER Lansing**
Date Received: **06/07/2022**
Project Number: **30112892.0370A**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		102	25-150
13C8_PFOS		104	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		109	25-150
d5-EtFOSAA		103	25-150
d3-MeFOSAA		101	25-150

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

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

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: XQ45585-001
Batch: 45585
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/20/2022 1638

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/23/2022 2158
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/23/2022 2158
8:2 FTS	ND		1	8.0	1.6	ng/L	06/23/2022 2158
6:2 FTS	ND		1	8.0	2.0	ng/L	06/23/2022 2158
4:2 FTS	ND		1	8.0	0.87	ng/L	06/23/2022 2158
GenX	ND		1	8.0	2.1	ng/L	06/23/2022 2158
ADONA	ND		1	8.0	0.48	ng/L	06/23/2022 2158
EtFOSAA	ND		1	8.0	0.75	ng/L	06/23/2022 2158
MeFOSAA	ND		1	8.0	0.93	ng/L	06/23/2022 2158
PFBS	ND		1	4.0	0.41	ng/L	06/23/2022 2158
PFDS	ND		1	4.0	0.78	ng/L	06/23/2022 2158
PFHpS	ND		1	4.0	0.50	ng/L	06/23/2022 2158
PFNS	ND		1	4.0	0.71	ng/L	06/23/2022 2158
PFOSA	ND		1	4.0	0.61	ng/L	06/23/2022 2158
PFPeS	ND		1	4.0	0.59	ng/L	06/23/2022 2158
PFHxS	ND		1	4.0	0.55	ng/L	06/23/2022 2158
PFBA	ND		1	4.0	0.60	ng/L	06/23/2022 2158
PFDA	ND		1	4.0	0.52	ng/L	06/23/2022 2158
PFDoA	ND		1	4.0	0.47	ng/L	06/23/2022 2158
PFHpA	ND		1	4.0	0.45	ng/L	06/23/2022 2158
PFHxA	ND		1	4.0	0.69	ng/L	06/23/2022 2158
PFNA	ND		1	4.0	0.46	ng/L	06/23/2022 2158
PFOA	ND		1	4.0	0.83	ng/L	06/23/2022 2158
PFPeA	ND		1	4.0	0.54	ng/L	06/23/2022 2158
PFTeDA	ND		1	4.0	0.60	ng/L	06/23/2022 2158
PFTrDA	ND		1	4.0	0.53	ng/L	06/23/2022 2158
PFUdA	ND		1	4.0	0.63	ng/L	06/23/2022 2158
PFOS	ND		1	4.0	2.0	ng/L	06/23/2022 2158

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		97	25-150
13C2_6:2FTS	N	186	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		106	25-150
13C2_PFTeDA		93	25-150
13C3_PFBS		118	25-150
13C3_PFHxS		107	25-150
13C3-HFPO-DA		105	25-150
13C4_PFBA		109	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		108	25-150
13C5_PFPeA		111	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ45585-001
Batch: 45585
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/20/2022 1638

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		112	25-150
13C7_PFUdA		102	25-150
13C8_PFOA		112	25-150
13C8_PFOS		110	25-150
13C8_PFOSA		107	10-150
13C9_PFNA		108	25-150
d5-EtFOSAA		97	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ45585-002
Batch: 45585
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/20/2022 1638

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	50-150	06/23/2022 2209
11Cl-PF3OUdS	15	13		1	84	50-150	06/23/2022 2209
8:2 FTS	15	15		1	100	50-150	06/23/2022 2209
6:2 FTS	15	18		1	117	50-150	06/23/2022 2209
4:2 FTS	15	16		1	106	50-150	06/23/2022 2209
GenX	32	33		1	104	50-150	06/23/2022 2209
ADONA	15	16		1	106	50-150	06/23/2022 2209
EtFOSAA	16	16		1	99	50-150	06/23/2022 2209
MeFOSAA	16	19		1	116	50-150	06/23/2022 2209
PFBS	14	14		1	102	50-150	06/23/2022 2209
PFDS	15	13		1	86	50-150	06/23/2022 2209
PFHpS	15	18		1	117	50-150	06/23/2022 2209
PFNS	15	14		1	90	50-150	06/23/2022 2209
PFOSA	16	15		1	96	50-150	06/23/2022 2209
PFPeS	15	15		1	100	50-150	06/23/2022 2209
PFHxS	15	15		1	103	50-150	06/23/2022 2209
PFBA	16	17		1	108	50-150	06/23/2022 2209
PFDA	16	19		1	119	50-150	06/23/2022 2209
PFDoA	16	17		1	109	50-150	06/23/2022 2209
PFHpA	16	17		1	107	50-150	06/23/2022 2209
PFHxA	16	17		1	103	50-150	06/23/2022 2209
PFNA	16	18		1	113	50-150	06/23/2022 2209
PFOA	16	18		1	112	50-150	06/23/2022 2209
PFPeA	16	18		1	113	50-150	06/23/2022 2209
PFTeDA	16	17		1	103	50-150	06/23/2022 2209
PFTrDA	16	16		1	99	50-150	06/23/2022 2209
PFUdA	16	18		1	112	50-150	06/23/2022 2209
PFOS	15	14		1	96	50-150	06/23/2022 2209

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		112	25-150
13C2_6:2FTS	N	209	25-150
13C2_8:2FTS		107	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		82	25-150
13C3_PFBS		125	25-150
13C3_PFHxS		109	25-150
13C3-HFPO-DA		107	25-150
13C4_PFBA		118	25-150
13C4_PFHpA		112	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		113	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ45585-002
Batch: 45585
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/20/2022 1638

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		114	25-150
13C7_PFUdA		100	25-150
13C8_PFOA		112	25-150
13C8_PFOS		122	25-150
13C8_PFOSA		124	10-150
13C9_PFNA		114	25-150
d5-EtFOSAA		102	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: XF07078-010MS
Batch: 45585
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/20/2022 1638

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	14		1	109	50-150	06/24/2022 0037
11Cl-PF3OUdS	ND	13	13		1	100	50-150	06/24/2022 0037
8:2 FTS	ND	14	15		1	112	50-150	06/24/2022 0037
6:2 FTS	ND	13	14		1	107	50-150	06/24/2022 0037
4:2 FTS	ND	13	14		1	109	50-150	06/24/2022 0037
GenX	ND	28	35		1	122	50-150	06/24/2022 0037
ADONA	ND	13	14		1	105	50-150	06/24/2022 0037
EtFOSAA	ND	14	18		1	130	50-150	06/24/2022 0037
MeFOSAA	ND	14	19		1	131	50-150	06/24/2022 0037
PFBS	ND	13	15		1	117	50-150	06/24/2022 0037
PFDS	ND	14	15		1	111	50-150	06/24/2022 0037
PFHpS	ND	14	15		1	108	50-150	06/24/2022 0037
PFNS	ND	14	13		1	97	50-150	06/24/2022 0037
PFOSA	1.6	14	16		1	105	50-150	06/24/2022 0037
PFPeS	ND	13	16		1	120	50-150	06/24/2022 0037
PFHxS	ND	13	15		1	114	50-150	06/24/2022 0037
PFBA	2.9	14	19		1	114	50-150	06/24/2022 0037
PFDA	ND	14	15		1	109	50-150	06/24/2022 0037
PFDoA	ND	14	17		1	116	50-150	06/24/2022 0037
PFHpA	ND	14	15		1	106	50-150	06/24/2022 0037
PFHxA	1.2	14	17		1	111	50-150	06/24/2022 0037
PFNA	ND	14	15		1	109	50-150	06/24/2022 0037
PFOA	ND	14	16		1	115	50-150	06/24/2022 0037
PFPeA	1.7	14	18		1	113	50-150	06/24/2022 0037
PFTeDA	ND	14	15		1	108	50-150	06/24/2022 0037
PFTrDA	ND	14	15		1	104	50-150	06/24/2022 0037
PFUdA	ND	14	15		1	103	50-150	06/24/2022 0037
PFOS	ND	13	15		1	113	50-150	06/24/2022 0037

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	226	25-150
13C2_6:2FTS	N	251	25-150
13C2_8:2FTS		110	25-150
13C2_PFDoA		105	25-150
13C2_PFTeDA		102	25-150
13C3_PFBS		109	25-150
13C3_PFHxS		114	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		59	25-150
13C4_PFHpA		116	25-150
13C5_PFHxA		105	25-150
13C5_PFPeA		88	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MS

Sample ID: XF07078-010MS
Batch: 45585
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/20/2022 1638

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		114	25-150
13C7_PFUdA		119	25-150
13C8_PFOA		110	25-150
13C8_PFOS		114	25-150
13C8_PFOSA		119	10-150
13C9_PFNA		110	25-150
d5-EtFOSAA		109	25-150
d3-MeFOSAA		102	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: XF07078-010MD
Batch: 45585
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/20/2022 1638

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	ND	12	13		1	107	9.5	50-150	30	06/24/2022 0048
11Cl-PF3OUdS	ND	12	12		1	93	14	50-150	30	06/24/2022 0048
8:2 FTS	ND	13	14		1	112	7.6	50-150	30	06/24/2022 0048
6:2 FTS	ND	13	14		1	110	3.7	50-150	30	06/24/2022 0048
4:2 FTS	ND	12	13		1	108	7.7	50-150	30	06/24/2022 0048
GenX	ND	26	34		1	127	2.6	50-150	30	06/24/2022 0048
ADONA	ND	12	13		1	102	10	50-150	30	06/24/2022 0048
EtFOSAA	ND	13	15		1	117	18	50-150	30	06/24/2022 0048
MeFOSAA	ND	13	15		1	110	25	50-150	30	06/24/2022 0048
PFBS	ND	12	12		1	104	19	50-150	30	06/24/2022 0048
PFDS	ND	13	12		1	93	24	50-150	30	06/24/2022 0048
PFHpS	ND	13	13		1	103	12	50-150	30	06/24/2022 0048
PFNS	ND	13	13		1	100	4.7	50-150	30	06/24/2022 0048
PFOSA	1.6	13	16		1	107	4.6	50-150	30	06/24/2022 0048
PFPeS	ND	12	14		1	116	10	50-150	30	06/24/2022 0048
PFHxS	ND	12	14		1	116	5.4	50-150	30	06/24/2022 0048
PFBA	2.9	13	17		1	109	10	50-150	30	06/24/2022 0048
PFDA	ND	13	13		1	101	14	50-150	30	06/24/2022 0048
PFDoA	ND	13	15		1	110	12	50-150	30	06/24/2022 0048
PFHpA	ND	13	13		1	101	12	50-150	30	06/24/2022 0048
PFHxA	1.2	13	15		1	106	11	50-150	30	06/24/2022 0048
PFNA	ND	13	16		1	120	3.1	50-150	30	06/24/2022 0048
PFOA	ND	13	14		1	108	13	50-150	30	06/24/2022 0048
PFPeA	1.7	13	17		1	117	3.8	50-150	30	06/24/2022 0048
PFTeDA	ND	13	15		1	114	1.9	50-150	30	06/24/2022 0048
PFTrDA	ND	13	14		1	104	7.1	50-150	30	06/24/2022 0048
PFUdA	ND	13	15		1	111	0.011	50-150	30	06/24/2022 0048
PFOS	ND	12	13		1	104	16	50-150	30	06/24/2022 0048

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS	N	218	25-150
13C2_6:2FTS	N	229	25-150
13C2_8:2FTS		99	25-150
13C2_PFDoA		94	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		73	25-150
13C4_PFBA		54	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		100	25-150
13C5_PFPeA		76	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

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

PFAS by LC/MS/MS - MSD

Sample ID: XF07078-010MD
Batch: 45585
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/20/2022 1638

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		109	25-150
13C7_PFUdA		96	25-150
13C8_PFOA		95	25-150
13C8_PFOS		110	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		102	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ45642-001
Batch: 45642
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/21/2022 1155

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	06/22/2022 1912
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	06/22/2022 1912
8:2 FTS	ND		1	8.0	1.6	ng/L	06/22/2022 1912
6:2 FTS	ND		1	8.0	2.0	ng/L	06/22/2022 1912
4:2 FTS	ND		1	8.0	0.87	ng/L	06/22/2022 1912
GenX	ND		1	8.0	2.1	ng/L	06/22/2022 1912
ADONA	ND		1	8.0	0.48	ng/L	06/22/2022 1912
EtFOSAA	ND		1	8.0	0.75	ng/L	06/22/2022 1912
MeFOSAA	ND		1	8.0	0.93	ng/L	06/22/2022 1912
PFBS	ND		1	4.0	0.41	ng/L	06/22/2022 1912
PFDS	ND		1	4.0	0.78	ng/L	06/22/2022 1912
PFHpS	ND		1	4.0	0.50	ng/L	06/22/2022 1912
PFNS	ND		1	4.0	0.71	ng/L	06/22/2022 1912
PFOSA	ND		1	4.0	0.61	ng/L	06/22/2022 1912
PFPeS	ND		1	4.0	0.59	ng/L	06/22/2022 1912
PFHxS	ND		1	4.0	0.55	ng/L	06/22/2022 1912
PFBA	ND		1	4.0	0.60	ng/L	06/22/2022 1912
PFDA	ND		1	4.0	0.52	ng/L	06/22/2022 1912
PFDoA	ND		1	4.0	0.47	ng/L	06/22/2022 1912
PFHpA	ND		1	4.0	0.45	ng/L	06/22/2022 1912
PFHxA	ND		1	4.0	0.69	ng/L	06/22/2022 1912
PFNA	ND		1	4.0	0.46	ng/L	06/22/2022 1912
PFOA	ND		1	4.0	0.83	ng/L	06/22/2022 1912
PFPeA	ND		1	4.0	0.54	ng/L	06/22/2022 1912
PFTeDA	ND		1	4.0	0.60	ng/L	06/22/2022 1912
PFTrDA	ND		1	4.0	0.53	ng/L	06/22/2022 1912
PFUdA	ND		1	4.0	0.63	ng/L	06/22/2022 1912
PFOS	ND		1	4.0	2.0	ng/L	06/22/2022 1912

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		100	25-150
13C2_6:2FTS		123	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		103	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		100	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		104	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		105	25-150
13C5_PFPeA		103	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ45642-001
Batch: 45642
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/21/2022 1155

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		107	25-150
13C7_PFUdA		103	25-150
13C8_PFOA		117	25-150
13C8_PFOS		108	25-150
13C8_PFOSA		100	10-150
13C9_PFNA		111	25-150
d5-EtFOSAA		102	25-150
d3-MeFOSAA		105	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ45642-002
Batch: 45642
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/21/2022 1155

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	13		1	89	50-150	06/22/2022 1923
11Cl-PF3OUdS	15	13		1	89	50-150	06/22/2022 1923
8:2 FTS	15	13		1	84	50-150	06/22/2022 1923
6:2 FTS	15	15		1	96	50-150	06/22/2022 1923
4:2 FTS	15	14		1	92	50-150	06/22/2022 1923
GenX	32	32		1	99	50-150	06/22/2022 1923
ADONA	15	14		1	90	50-150	06/22/2022 1923
EtFOSAA	16	15		1	92	50-150	06/22/2022 1923
MeFOSAA	16	16		1	99	50-150	06/22/2022 1923
PFBS	14	14		1	98	50-150	06/22/2022 1923
PFDS	15	14		1	90	50-150	06/22/2022 1923
PFHpS	15	15		1	97	50-150	06/22/2022 1923
PFNS	15	13		1	87	50-150	06/22/2022 1923
PFOSA	16	15		1	95	50-150	06/22/2022 1923
PFPeS	15	14		1	94	50-150	06/22/2022 1923
PFHxS	15	14		1	93	50-150	06/22/2022 1923
PFBA	16	15		1	96	50-150	06/22/2022 1923
PFDA	16	14		1	91	50-150	06/22/2022 1923
PFDoA	16	15		1	91	50-150	06/22/2022 1923
PFHpA	16	15		1	92	50-150	06/22/2022 1923
PFHxA	16	14		1	88	50-150	06/22/2022 1923
PFNA	16	14		1	87	50-150	06/22/2022 1923
PFOA	16	14		1	90	50-150	06/22/2022 1923
PFPeA	16	15		1	93	50-150	06/22/2022 1923
PFTeDA	16	15		1	96	50-150	06/22/2022 1923
PFTrDA	16	14		1	87	50-150	06/22/2022 1923
PFUdA	16	14		1	88	50-150	06/22/2022 1923
PFOS	15	14		1	92	50-150	06/22/2022 1923

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		108	25-150
13C2_6:2FTS		122	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		106	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		105	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		104	25-150
13C4_PFHpA		105	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		105	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ45642-002
Batch: 45642
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/21/2022 1155

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		105	25-150
13C7_PFUdA		110	25-150
13C8_PFOA		113	25-150
13C8_PFOS		108	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		110	25-150
d5-EtFOSAA		108	25-150
d3-MeFOSAA		103	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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

Pace Analytical®

Plant 6

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 135284

Client: Arcadis	Report to Contact: Tiffany Linder, Kaitlyn Hunt	Telephone No. / E-mail: 810-225-1923 / Tiffany.Linder@arcadis.com; 947-777-5815 / Kaitlyn.Hunt@arcadis.com
Address: 28550 Cabot Drive, Suite 500	Sampler's Signature: x [signature]	Quote No.
City: Novi; State: MI; Zip Code: 48377	Printed Name: Austin Westhuis	Analysis (Attach list if more space is needed)
Project Name: RACER Lansing		Page 1 of 2
Project No.: 30112892.0370A	P.O. No.	XF07078 KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS via method 537 mod. w/ isotope dilution [illegible]	Remarks / Cooler I.D.
MW-22-143_060122	6/1/22	1045	G	X			2							X	
MW-22-144_060122	6/1/22	1200	G	X			2							X	
MW-22-145_060122	6/1/22	1235	G	X			2							X	
Dup-17_060122	6/1/22	—	G	X			2							X	
MW-22-146_060122	6/1/22	1315	G	X			2							X	
MW-22-147_060122	6/1/22	1400	G	X			2							X	
MW-22-148_060122	6/1/22	1430	G	X			2							X	
EB-02_060122	6/1/22	1445	G	X			2							X	
MW-22-149_060122	6/1/22	1340	G	X			2							X	
MW-22-150_060122	6/1/22	1105	G	X			6							X	MS/MSD

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☒ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

Relinquished by	Date	Time	Received by	Date	Time
1.			1.		
2.			2.		
3.			3.		
4. FedEx	6-1-22	1530	4. Laboratory received by [signature]	6-2-22	1630

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack Receipt Temp. 3.2 °C Temp Blank ☒ Y ☐ N

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

* Report EGLE 28 Compounds

Document Number: ME003N2-01

Pace Analytical®

Plant 6

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 135284

Client: Arcadis
Address: 28550 Cabot Drive, Suite 500
City: Novi State: MI Zip Code: 48377
Project Name: RICCR Lansing
Project No.: 30112892.0370A
P.O. No.:
Report to Contact: Tiffany Linder, Kaitlyn Hunt
Telephone No. / E-mail: 810-223-1429 / tiffany.linder@arcadis.com; 947-777-5315 / kaitlyn.hunt@arcadis.com
Quote No.:
Sampler's Signature: x [signature]
Printed Name: Austin Westhuis
Analysis (Attach list if more space is needed): PFAS
Page 2 of 2
XF07078
KE52

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers: Unpres	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS	Remarks / Cooler I.D.
MW-22-151_060122	6/1/22	1225	G	X			2							X	
MW-22-152_060122	6/1/22	1440	G	X			2							X	
EB-03_060122	6/1/22	1000	G	X			2							X	
MW-14-70_060222	6/2/22	0955	G	X			2							X	
MW-12-13_060222	6/2/22	1055	G	X			2							X	
MW-21-133_060222	6/2/22	1150	G	X			2							X	
MW-21-134_060222	6/2/22	1250	G	X			2							X	
MW-21-135_060222	6/2/22	1430	G	X			2							X	
MW-12-10R_060222	6/2/22	1520	G	X			2							X	
Dup-15_060222	6/2/22	——	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)
Sample Disposal: ☐ Return to Client ☒ Disposal by Lab
Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify):

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by			1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: FEDEX	6-7-22	1630	4. Laboratory received by: [signature]	6-7-22	1630

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes (circled) No Ice Pack
Receipt Temp. 3.2 °C
Temp Blank ☒ Y ☐ N

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

* Report EGLE 28 Compounds

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: TEC / 06/07/2022 Lot #: XF07078

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.2 / 3.2 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 6 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: KDRW Date: 06/07/2022

Comments:

Report of Analysis

Arcadis U.S., Inc.
630 Plaza Drive
Suite 600
Highlands Ranch, CO 80129
Attention: Tiffany Linder

Project Name: RACER Lansing

Lot Number:**XI15055**

Date Completed:10/06/2022

10/06/2022 8:50 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

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

Case Narrative
Arcadis U.S., Inc.
Lot Number: XI15055

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,

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

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} 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 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.

Sample XI15055-001 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.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for prep batch 55630 exceeded acceptance criteria for the following analyte: 6:2 FTS EIS. The data has been reported.

Surrogate recovery for the following sample was outside the upper control limit: XI15055-001. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

Arcadis U.S., Inc.

Lot Number: XI15055

Project Name: RACER Lansing

Project Number:

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	SB-OS-SS444_8-13	Aqueous	09/13/2022 1425	09/15/2022

(1 sample)

Detection Summary

Arcadis U.S., Inc.

Lot Number: XI15055

Project Name: RACER Lansing

Project Number:

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	SB-OS-SS444_8-13	Aqueous	PFBS	PFAS by ID	8.0		ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFHpS	PFAS by ID	0.85	J	ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFPeS	PFAS by ID	5.2		ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFHxS	PFAS by ID	59		ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFBA	PFAS by ID	14		ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFHpA	PFAS by ID	16		ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFHxA	PFAS by ID	24		ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFOA	PFAS by ID	31		ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFPeA	PFAS by ID	16		ng/L	5
001	SB-OS-SS444_8-13	Aqueous	PFOS	PFAS by ID	19		ng/L	5

(10 detections)

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XI15055-001**

Description: **SB-OS-SS444_8-13** Matrix: **Aqueous**

Date Sampled: **09/13/2022 1425** Project Name: **RACER Lansing**

Date Received: **09/15/2022** Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	10/04/2022 1950	ALM	09/29/2022 1301	55630

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		7.2	0.44	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.2	0.60	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND	Q	7.2	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.2	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.2	0.79	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.2	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.2	0.44	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.2	0.68	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.2	0.84	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**8.0**		**3.6**	**0.38**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.70	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	**375-92-8**	**PFAS by ID SOP**	**0.85**	**J**	**3.6**	**0.45**	**ng/L**	**1**
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	**2706-91-4**	**PFAS by ID SOP**	**5.2**		**3.6**	**0.54**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**59**		**3.6**	**0.50**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**14**		**3.6**	**0.54**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.43	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**16**		**3.6**	**0.41**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**24**		**3.6**	**0.62**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**31**		**3.6**	**0.75**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**16**		**3.6**	**0.49**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.48	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.57	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**19**		**3.6**	**1.8**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		118	25-150
13C2_6:2FTS	N	196	25-150
13C2_8:2FTS	N	173	25-150
13C2_PFDoA		80	25-150
13C2_PFTeDA		75	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		76	25-150
13C4_PFHpA		104	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		95	25-150
13C6_PFDA		99	25-150
13C7_PFUdA		83	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

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

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XI15055-001**

Description: **SB-OS-SS444_8-13** Matrix: **Aqueous**

Date Sampled: **09/13/2022 1425** Project Name: **RACER Lansing**

Date Received: **09/15/2022** Project Number:

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		102	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		87	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		98	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

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

QC Summary

PFAS by LC/MS/MS - MB

Sample ID: XQ55630-001
Batch: 55630
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/29/2022 1301

Parameter	Result	Q	Dil	LOQ	DL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	10/04/2022 1908
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	10/04/2022 1908
8:2 FTS	ND		1	8.0	1.6	ng/L	10/04/2022 1908
6:2 FTS	ND		1	8.0	2.0	ng/L	10/04/2022 1908
4:2 FTS	ND		1	8.0	0.87	ng/L	10/04/2022 1908
GenX	ND		1	8.0	2.1	ng/L	10/04/2022 1908
ADONA	ND		1	8.0	0.48	ng/L	10/04/2022 1908
EtFOSAA	ND		1	8.0	0.75	ng/L	10/04/2022 1908
MeFOSAA	ND		1	8.0	0.93	ng/L	10/04/2022 1908
PFBS	ND		1	4.0	0.41	ng/L	10/04/2022 1908
PFDS	ND		1	4.0	0.78	ng/L	10/04/2022 1908
PFHpS	ND		1	4.0	0.50	ng/L	10/04/2022 1908
PFNS	ND		1	4.0	0.71	ng/L	10/04/2022 1908
PFOSA	ND		1	4.0	0.61	ng/L	10/04/2022 1908
PFPeS	ND		1	4.0	0.59	ng/L	10/04/2022 1908
PFHxS	ND		1	4.0	0.55	ng/L	10/04/2022 1908
PFBA	ND		1	4.0	0.60	ng/L	10/04/2022 1908
PFDA	ND		1	4.0	0.52	ng/L	10/04/2022 1908
PFDoA	ND		1	4.0	0.47	ng/L	10/04/2022 1908
PFHpA	ND		1	4.0	0.45	ng/L	10/04/2022 1908
PFHxA	ND		1	4.0	0.69	ng/L	10/04/2022 1908
PFNA	ND		1	4.0	0.46	ng/L	10/04/2022 1908
PFOA	ND		1	4.0	0.83	ng/L	10/04/2022 1908
PFPeA	ND		1	4.0	0.54	ng/L	10/04/2022 1908
PFTeDA	ND		1	4.0	0.60	ng/L	10/04/2022 1908
PFTrDA	ND		1	4.0	0.53	ng/L	10/04/2022 1908
PFUdA	ND		1	4.0	0.63	ng/L	10/04/2022 1908
PFOS	ND		1	4.0	2.0	ng/L	10/04/2022 1908

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		83	25-150
13C2_6:2FTS		140	25-150
13C2_8:2FTS		110	25-150
13C2_PFDoA		91	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		108	25-150
13C4_PFBA		88	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		97	25-150
13C5_PFPeA		90	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ55630-001
Batch: 55630
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/29/2022 1301

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	25-150
13C7_PFUdA		103	25-150
13C8_PFOA		100	25-150
13C8_PFOS		102	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		104	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ55630-002
Batch: 55630
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/29/2022 1301

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	109	50-150	10/04/2022 1919
11Cl-PF3OUdS	15	18		1	117	50-150	10/04/2022 1919
8:2 FTS	15	17		1	111	50-150	10/04/2022 1919
6:2 FTS	15	15		1	101	50-150	10/04/2022 1919
4:2 FTS	15	13		1	90	50-150	10/04/2022 1919
GenX	32	41		1	129	50-150	10/04/2022 1919
ADONA	15	17		1	112	50-150	10/04/2022 1919
EtFOSAA	16	17		1	108	50-150	10/04/2022 1919
MeFOSAA	16	17		1	107	50-150	10/04/2022 1919
PFBS	14	16		1	110	50-150	10/04/2022 1919
PFDS	15	17		1	111	50-150	10/04/2022 1919
PFHpS	15	17		1	111	50-150	10/04/2022 1919
PFNS	15	17		1	113	50-150	10/04/2022 1919
PFOSA	16	18		1	114	50-150	10/04/2022 1919
PFPeS	15	14		1	97	50-150	10/04/2022 1919
PFHxS	15	15		1	106	50-150	10/04/2022 1919
PFBA	16	17		1	108	50-150	10/04/2022 1919
PFDA	16	18		1	112	50-150	10/04/2022 1919
PFDoA	16	18		1	114	50-150	10/04/2022 1919
PFHpA	16	21		1	129	50-150	10/04/2022 1919
PFHxA	16	19		1	116	50-150	10/04/2022 1919
PFNA	16	17		1	107	50-150	10/04/2022 1919
PFOA	16	18		1	112	50-150	10/04/2022 1919
PFPeA	16	17		1	107	50-150	10/04/2022 1919
PFTeDA	16	18		1	111	50-150	10/04/2022 1919
PFTrDA	16	17		1	109	50-150	10/04/2022 1919
PFUdA	16	16		1	100	50-150	10/04/2022 1919
PFOS	15	16		1	108	50-150	10/04/2022 1919

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		109	25-150
13C2_6:2FTS	N	167	25-150
13C2_8:2FTS		116	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		90	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		96	25-150
13C4_PFBA		89	25-150
13C4_PFHpA		92	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		86	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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: XQ55630-002
Batch: 55630
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/29/2022 1301

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		94	25-150
13C7_PFUdA		94	25-150
13C8_PFOA		97	25-150
13C8_PFOS		99	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		99	25-150
d3-MeFOSAA		97	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = 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

PaceAnalytical®

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 135796

Client	Arcadis
Address	28550 Cabot Drive, Suite 500
City	Novi
State	MI
Zip Code	48377
Project Name	PACER Lansing
Project No.	30112892.00102
P.O. No.	
Report to Contact	Tiffany Linder, Caitlin Cisco
Sampler's Signature	x [signature]
Printed Name	Austin Westhuis
Telephone No. / E-mail	Tiffany.Linder@arcadis.com, Caitlin.Cisco@arcadis.com
Quote No.	
Page	1 of 1

XI15055

KES2

Analysis (Attach list if more space is needed): PFAS via method 537 mod. w/ isotope dilution Rev. 05/21 [illegible]

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS via method 537 mod.	Remarks / Cooler I.D.
SB-05-SS444_8-13	9/13/22	1425	G	X			2							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify):

Relinquished by	Date	Time	Received by	Date	Time
1. [signature] / Austin Westhuis / Arcadis	9/14/22	1200	1. FedEx	9/14/22	1200
2.			2.		
3.			3.		
4. FedEx	9.15.22	1445	4. Laboratory received by [signature]	9.15.22	1445

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY: Received on ice (Circle) (Yes) No Ice Pack — Receipt Temp. 3.2 °C — Temp Blank ☐ Y ☒ N

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

Document Number: ME003N2-01

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: RSS / 09/15/2022 Lot #: XH15055

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:			
☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.2 / 3.2 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ 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).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25328

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

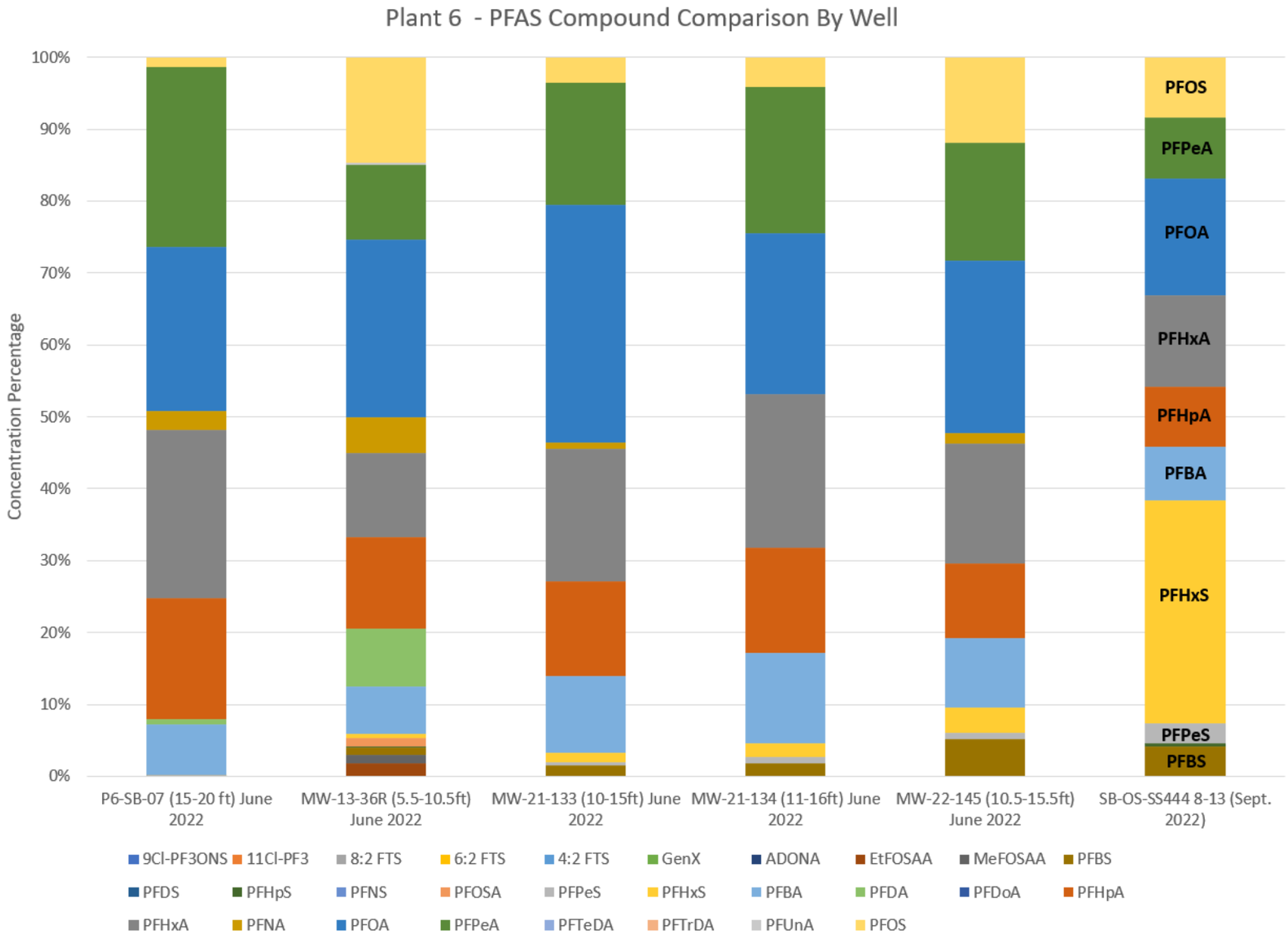
Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Attachment 3

Comparison of PFAS Chemical Signatures



ARCADIS

Attachment 3
Plant 6 Relative Abundance of PFAS Compounds in Monitoring Wells and Off-site SB-OS-SS444

RACER Trust Plant 6
Lansing, Michigan

Project Number

Legend

- PERCHED ZONE MONITORING WELL
- ANALYTICAL RESULTS USED IN TOP ASSAY REVIEW
- PLANT 6

NOTES:

COORDINATE SYSTEM IS IN NAD 1983 STATE PLANE MICHIGAN SOUTH FIPS 2113 FEET INTL

0 500 1,000

SCALE IN FEET

ARCADIS

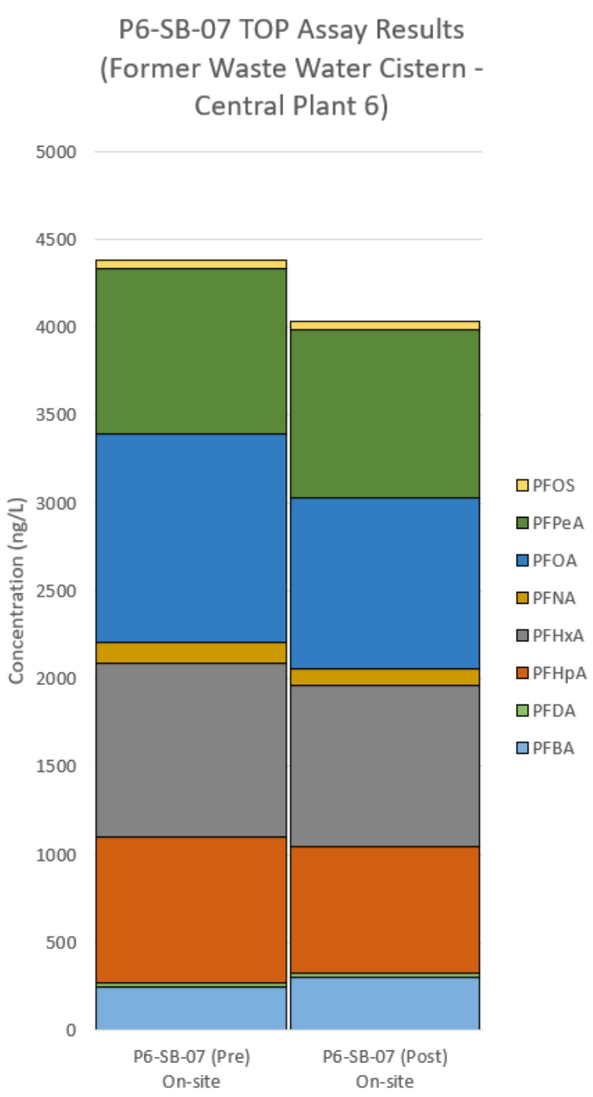
Attachment 3
Plant 6 Relative Abundance of PFAS Compounds in Monitoring Wells and Off-site SB-OS-SS444 - Location Map

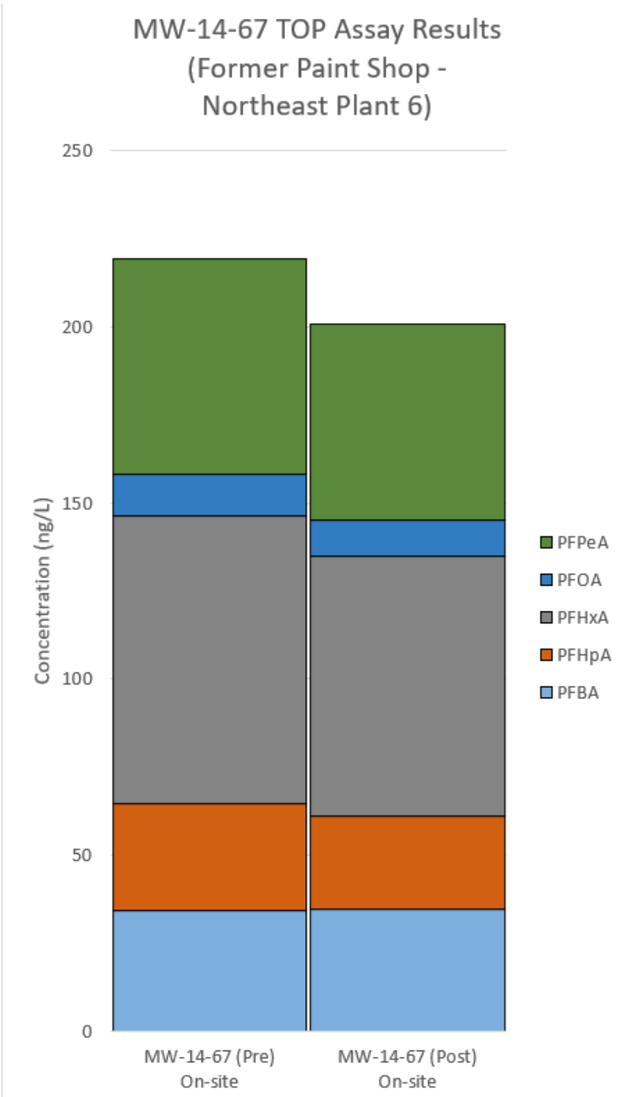
RACER Trust Plant 6
Lansing, Michigan

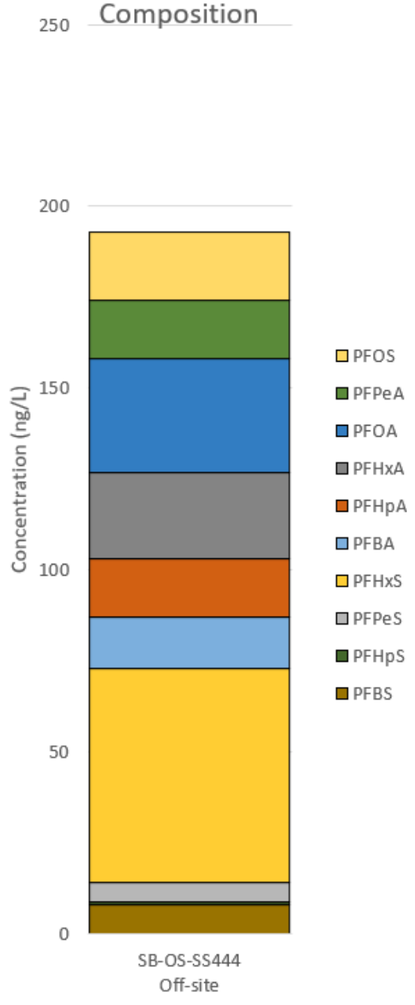
Project Number

Attachment 4

Plant 6 TOP Assay and SB-OS-SS444 Groundwater Comparison







ARCADIS

Attachment 4
Plant 6 TOP Assay and SB-OS-SS444 Groundwater Comparison

RACER Trust Plant 6
Lansing, Michigan

Project Number

LELAP Certificate Number: 01955
A2LA Accredited (DoD ELAP-QSM 5.4) Certificate Number: 6429.01

ANALYTICAL RESULTS

PERFORMED BY

Pace Analytical Gulf Coast
7979 Innovation Park Dr.
Baton Rouge, LA 70820
(225) 769-4900

Report Date 10/21/2022

Report # 222083056

Project RACER Lansing Plant 6 30112892

Samples Collected 8/29/22

Deliver To	***Additional Recipients***
Kaitlyn Hunt Arcadis of Michigan, LLC 28550 Cabot Drive Suite 500 Novi, MI 48377 248-809-4013	Tiffany Linder, Arcadis of Michigan, LLC

A2LA ACCREDITED
CERT # 6429.01

Laboratory Endorsement

Sample analysis was performed in accordance with approved methodologies provided by the Environmental Protection Agency or other recognized agencies. The samples and their corresponding extracts will be maintained for a period of 30 days unless otherwise arranged. Following this retention period the samples will be disposed in accordance with Pace Gulf Coast's Standard Operating Procedures.

Common Abbreviations that may be Utilized in this Report

ND	Indicates the result was Not Detected at the specified reporting limit
NO	Indicates the sample did not ignite when preliminary test performed for EPA Method 1030
DO	Indicates the result was Diluted Out
MI	Indicates the result was subject to Matrix Interference
TNTC	Indicates the result was Too Numerous To Count
SUBC	Indicates the analysis was Sub-Contracted
FLD	Indicates the analysis was performed in the Field
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
RE	Re-analysis
CF	HPLC or GC Confirmation
00:01	Reported as a time equivalent to 12:00 AM

Reporting Flags that may be Utilized in this Report

J or I	Indicates the result is between the MDL and LOQ
J	DOD flag on analyte in the parent sample for MS/MSD outside acceptance criteria
U	Indicates the compound was analyzed for but not detected
B or V	Indicates the analyte was detected in the associated Method Blank
Q	Indicates a non-compliant QC Result (See Q Flag Application Report)
*****	Indicates a non-compliant or not applicable QC recovery or RPD – see narrative
E	Organics **-** The result is estimated because it exceeded the instrument calibration range
E	Metals - % diference for the serial dilution is > 10%
L	Reporting Limits adjusted to meet risk-based limit.
P	RPD between primary and confirmation result is greater than 40
DL	Diluted analysis – when appended to Client Sample ID

Sample receipt at Pace Gulf Coast is documented through the attached chain of custody. In accordance with NELAC, this report shall be reproduced only in full and with the written permission of Pace Gulf Coast. The results contained within this report relate only to the samples reported. The documented results are presented within this report.

This report pertains only to the samples listed in the Report Sample Summary and should be retained as a permanent record thereof. The results contained within this report are intended for the use of the client. Any unauthorized use of the information contained in this report is prohibited.

I certify that this data package is in compliance with The NELAC Institute (TNI) Standard 2009 and terms and conditions of the contract and Statement of Work both technically and for completeness, for other than the conditions in the case narrative. Release of the data contained in this hardcopy data package and in the computer readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature.

Estimated uncertainty of measurement is available upon request. This report is in compliance with the DOD QSM as specified in the contract if applicable.

Authorized Signature
Pace Gulf Coast Report 222083056

Certifications

Certification	Certification Number
A2LA Accredited (DoD ELAP-QSM 5.4)	6429.01
Alabama	01955
Arkansas	88-0655
Colorado	01955
Delaware	01955
Florida	E87854
Georgia	01955
Hawaii	01955
Idaho	01955
Illinois	200048
Indiana	01955
Kansas	E-10354
Kentucky	95
Louisiana	01955
Maryland	01955
Massachusetts	01955
Michigan	01955
Mississippi	01955
Missouri	01955
Montana	N/A
Nebraska	01955
New Mexico	01955
North Carolina	618
North Dakota	R-195
Oklahoma	9403
South Carolina	73006001
South Dakota	01955
Tennessee	01955
Texas	T104704178
Vermont	01955
Virginia	460215
Washington	C929
USDA Soil Permit	P330-16-00234

Case Narrative

Client: Arcadis of Michigan LLC **Report:** 222083056

Pace Analytical Gulf Coast received and analyzed the sample(s) listed
on the Report Sample Summary page of this report. Receipt of the sample(s) is documented
by the attached chain of custody. This applies only to the sample(s) listed in this report.
No sample integrity or quality control exceptions were identified unless noted below.

SEMI-VOLATILES MASS SPECTROMETRY

Samples 22208305601 (MW-14-67_082922) and 22208305602 (P6-SB-07_082922) were re-extracted outside holding time due to the original extract being unnecessarily diluted 1:1000

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard d-NEtFOSA andd-NMeFOSA is outside the control limits for sample 2393264 (MB for HBN 749316 [LCMS/6523]) .

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard d-NMeFOSA andM2PFHxDA is outside the control limits for sample 2393266 (LCSD for HBN 749316 [LCMS/6523) .

In the PFAS Top Assay QSM B15 (Pre) analysis, the recovery for the extracted internal standard d-NEtFOSA andd-NMeFOSA is outside the control limits for sample 2400713 (MB for HBN 750661 [LCMS/6658]) .

In the PFAS Top Assay QSM B15 (Pre) analysis, the recovery for the extracted internal standard d-NEtFOSA is outside the control limits for sample 22208305601 (MW-14-67_082922) .

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 4:2 FTS is above the upper control limits for sample 2393267 (VESBK for HBN 749316 [LCMS/652) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 6:2 FTS is above the upper control limits for sample 2393267 (VESBK for HBN 749316 [LCMS/652) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 8:2 FTS is above the upper control limits for sample 2393267 (VESBK for HBN 749316 [LCMS/652) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2PFHxDA is above the upper control limits for sample 2393267 (VESBK for HBN 749316 [LCMS/652) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 4:2 FTS is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 6:2 FTS is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 8:2 FTS is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2PFHxDA is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M3PFBS is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M3PFHxS is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M6PFDA is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M7PFUnA is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M8PFOS is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard MPFDoA is above the upper control limits for sample 22208305601 (MW-14-67_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard MPFOA is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 4:2 FTS is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 6:2 FTS is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2 8:2 FTS is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M2PFHxDA is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M3HFPODA is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M3PFBS is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M3PFHxS is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M4PFHpA is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M5PFHxA is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M6PFDA is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M8PFOA is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M8PFOS is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard M9PFNA is above the upper control limits for sample 22208305602 (P6-SB-07_082922) . There are no target hits for the associated compounds.

In the PFAS Top Assay QSM B15 (Post) analysis, the recovery for the extracted internal standard d-NEtFOSA is outside the control limits for sample 2393266 (LCSD for HBN 749316 [LCMS/6523) . The recovery of the associated compounds is within control limits.

In the PFAS Top Assay QSM B15 (Post) analysis for prep batch 749316, the LCS and/or LCSD recoveries are outside control limits for PFODA.

In the PFAS Top Assay QSM B15 (Post) analysis for prep batch 749316, the LCS and/or LCSD recoveries are above the upper control limits for NMeFOSA. This analyte was not detected in the associated samples.

In the PFAS Top Assay QSM B15 (Pre) analysis for prep batch 749157, the LCS/LCSD RPD is above the control limit for NEtFOSE.

In the PFAS Top Assay QSM B15 (Post) analysis for prep batch 749316, the LCS/LCSD RPD is above the control limit for PFODA.

MISCELLANEOUS

See subcontract laboratory report case narrative.

Sample Summary

Lab ID	Client ID	Matrix	Collect Date	Receive Date
22208305601	MW-14-67_082922	Water	8/29/22 14:20	8/30/22 12:00
22208305602	P6-SB-07_082922	Water	8/29/22 15:20	8/30/22 12:00

Detect Summary

Results and Detection Limits are adjusted for dilution and moisture when applicable

PFAS Top Assay QSM B15 (Post)

Lab ID	Client ID	Parameter	Units	Result	Dil.	%Moist
22208305601	MW-14-67_082922	Perfluorobutanoic acid (PFBA)	ng/L	34.7	1	NA
22208305601	MW-14-67_082922	Perfluoroheptanoic acid (PFHpA)	ng/L	26.4	1	NA
22208305601	MW-14-67_082922	Perfluorohexanoic acid (PFHxA)	ng/L	73.7	1	NA
22208305601	MW-14-67_082922	Perfluorooctanoic acid (PFOA)	ng/L	10.3	1	NA
22208305601	MW-14-67_082922	Perfluoropentanoic acid (PFPeA)	ng/L	55.6	1	NA
22208305602	P6-SB-07_082922	Perfluorobutanoic acid (PFBA)	ng/L	301	1	NA
22208305602	P6-SB-07_082922	Perfluorodecanoic acid (PFDA)	ng/L	22.1	1	NA
22208305602	P6-SB-07_082922	Perfluoroheptanoic acid (PFHpA)	ng/L	725	1	NA
22208305602	P6-SB-07_082922	Perfluorohexanoic acid (PFHxA)	ng/L	910	1	NA
22208305602	P6-SB-07_082922	Perfluorononanoic acid (PFNA)	ng/L	98.0	1	NA
22208305602	P6-SB-07_082922	Perfluorooctanesulfonic acid (PFOS)	ng/L	41.4	1	NA
22208305602	P6-SB-07_082922	Perfluorooctanoic acid (PFOA)	ng/L	972	1	NA
22208305602	P6-SB-07_082922	Perfluoropentanoic acid (PFPeA)	ng/L	960	1	NA

PFAS Top Assay QSM B15 (Pre)

Lab ID	Client ID	Parameter	Units	Result	Dil.	%Moist
22208305601	MW-14-67_082922	Perfluorobutanoic acid (PFBA)	ng/L	34.0	1	NA
22208305601	MW-14-67_082922	Perfluoroheptanoic acid (PFHpA)	ng/L	30.6	1	NA
22208305601	MW-14-67_082922	Perfluorohexanoic acid (PFHxA)	ng/L	81.8	1	NA
22208305601	MW-14-67_082922	Perfluorooctanoic acid (PFOA)	ng/L	11.6	1	NA
22208305601	MW-14-67_082922	Perfluoropentanoic acid (PFPeA)	ng/L	61.2	1	NA
22208305602	P6-SB-07_082922	Perfluorobutanoic acid (PFBA)	ng/L	248	1	NA
22208305602	P6-SB-07_082922	Perfluorodecanoic acid (PFDA)	ng/L	25.4	1	NA
22208305602	P6-SB-07_082922	Perfluoroheptanoic acid (PFHpA)	ng/L	829	1	NA
22208305602	P6-SB-07_082922	Perfluorohexanoic acid (PFHxA)	ng/L	983	1	NA
22208305602	P6-SB-07_082922	Perfluorononanoic acid (PFNA)	ng/L	119	1	NA
22208305602	P6-SB-07_082922	Perfluorooctanesulfonic acid (PFOS)	ng/L	48.8	1	NA
22208305602	P6-SB-07_082922	Perfluorooctanoic acid (PFOA)	ng/L	1190	1	NA
22208305602	P6-SB-07_082922	Perfluoropentanoic acid (PFPeA)	ng/L	940	1	NA

Sample Results

MW-14-67_082922

Collect Date	08/29/2022 14:20	**Lab ID**	22208305601
Receive Date	08/30/2022 12:00	**Matrix**	Water

PFAS Top Assay QSM B15 (Pre)

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
10/08/22 09:00	750661	PFAS Top Assay QSM B15 (Pre)	1	10/11/22 00:32	751527	SLR2	NA

CAS#	Parameter	Result	LOQ	Units
120226-60-0	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND	10.0	ng/L
763051-92-9	11Cl-PF3OUdS	ND	10.0	ng/L
757124-72-4	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND	10.0	ng/L
27619-97-2	6:2 Fluorotelomer sulfonic acid (6:2FTS)	ND	10.0	ng/L
39108-34-4	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	10.0	ng/L
756426-58-1	9Cl-PF3ONS	ND	10.0	ng/L
919005-14-4	ADONA	ND	10.0	ng/L
4151-50-2	NEtFOSA	ND	20.0	ng/L
2991-50-6	NEtFOSAA	ND	20.0	ng/L
1691-99-2	NEtFOSE	ND	20.0	ng/L
31506-32-8	NMeFOSA	ND	20.0	ng/L
2355-31-9	NMeFOSAA	ND	20.0	ng/L
24448-09-7	NMeFOSE	ND	20.0	ng/L
151772-58-6	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10.0	ng/L
113507-82-7	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	10.0	ng/L
13252-13-6	Perfluoro-2-proxypropanoic acid (HFPO-DA)	ND	20.0	ng/L
377-73-1	Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	10.0	ng/L
863090-89-5	Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	10.0	ng/L
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND	10.0	ng/L
375-22-4	**Perfluorobutanoic acid (PFBA)**	**34.0**	**10.0**	ng/L
335-77-3	Perfluorodecane sulfonic acid (PFDS)	ND	10.0	ng/L
335-76-2	Perfluorodecanoic acid (PFDA)	ND	10.0	ng/L
307-55-1	Perfluorododecanoic acid (PFDoA)	ND	10.0	ng/L
375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	ND	10.0	ng/L
375-85-9	**Perfluoroheptanoic acid (PFHpA)**	**30.6**	**10.0**	ng/L
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND	10.0	ng/L
307-24-4	**Perfluorohexanoic acid (PFHxA)**	**81.8**	**10.0**	ng/L
68259-12-1	Perfluorononanesulfonic acid (PFNS)	ND	10.0	ng/L
375-95-1	Perfluorononanoic acid (PFNA)	ND	10.0	ng/L
754-91-6	Perfluorooctane Sulfonamide (FOSA)	ND	10.0	ng/L
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND	10.0	ng/L
335-67-1	**Perfluorooctanoic acid (PFOA)**	**11.6**	**10.0**	ng/L
2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	ND	10.0	ng/L
2706-90-3	**Perfluoropentanoic acid (PFPeA)**	**61.2**	**10.0**	ng/L
376-06-7	Perfluorotetradecanoic acid (PFTA)	ND	10.0	ng/L
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	ND	10.0	ng/L
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND	10.0	ng/L
79780-39-5	PFDoS	ND	10.0	ng/L
67905-19-5	PFHxDA	ND	10.0	ng/L

Sample Results

MW-14-67_082922	**Collect Date**	08/29/2022 14:20	**Lab ID**	22208305601
	Receive Date	08/30/2022 12:00	**Matrix**	Water

PFAS Top Assay QSM B15 (Pre) (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
10/08/22 09:00	750661	PFAS Top Assay QSM B15 (Pre)	1	10/11/22 00:32	751527	SLR2	NA

CAS#	Parameter	Result	LOQ	Units
16517-11-6	PFODA	ND	10.0	ng/L

CAS#	Extracted Internal Standard(EIS)	Cal Area	Samp Area	Units	%Recovery	%Rec Limits
335-67-1-SUR	MPFOA	500	529	ng/L	106	50 - 150
4151-50-2-EIS	d-NEtFOSA	250	121	ng/L	49*	50 - 150
31506-32-8-EIS	d-NMeFOSA	250	147	ng/L	59	50 - 150
2355-31-9-EIS	d3-NMeFOSAA	250	248	ng/L	99	50 - 150
2991-50-6-EIS	d5-NEtFOSAA	250	270	ng/L	108	50 - 150
24448-09-7-EIS	d7-NMeFOSE	250	162	ng/L	65	50 - 150
1691-99-2-EIS	d9-NEtFOSE	250	136	ng/L	54	50 - 150
757124-72-4-EIS	M2 4:2 FTS	250	350	ng/L	140	50 - 150
27619-97-2-EIS	M2 6:2 FTS	250	249	ng/L	100	50 - 150
39108-34-4-EIS	M2 8:2 FTS	250	276	ng/L	110	50 - 150
67905-19-5-EIS	M2PFHxDA	250	283	ng/L	113	50 - 150
376-06-7-EIS	M2PFTA	250	233	ng/L	93	50 - 150
13252-13-6-EIS	M3HFPODA	250	244	ng/L	98	50 - 150
375-73-5-EIS	M3PFBS	250	241	ng/L	96	50 - 150
355-46-4-EIS	M3PFHxS	250	253	ng/L	101	50 - 150
375-85-9-EIS	M4PFHpA	250	260	ng/L	104	50 - 150
307-24-4-EIS	M5PFHxA	250	265	ng/L	106	50 - 150
2706-90-3-EIS	M5PFPeA	250	227	ng/L	91	50 - 150
335-76-2-EIS	M6PFDA	250	266	ng/L	106	50 - 150
2058-94-8-EIS	M7PFUnA	250	269	ng/L	108	50 - 150
754-91-6-EIS	M8FOSA	250	230	ng/L	92	50 - 150
335-67-1-EIS	M8PFOA	250	262	ng/L	105	50 - 150
1763-23-1-EIS	M8PFOS	250	255	ng/L	102	50 - 150
375-95-1-EIS	M9PFNA	250	264	ng/L	106	50 - 150
375-22-4-EIS	MPFBA	250	241	ng/L	96	50 - 150
307-55-1-EIS	MPFDoA	250	249	ng/L	100	50 - 150

Sample Results

MW-14-67_082922				
	Collect Date	08/29/2022 14:20	**Lab ID**	22208305601
	Receive Date	08/30/2022 12:00	**Matrix**	Water

PFAS Top Assay QSM B15 (Post)

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
10/07/22 11:45	751390	PFAS Top Assay QSM B15 (Post)	1	10/10/22 13:37	751501	SLR2	NA

CAS#	Parameter	Result	LOQ	Units
120226-60-0	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND	10.0	ng/L
763051-92-9	11Cl-PF3OUdS	ND	10.0	ng/L
757124-72-4	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND	10.0	ng/L
27619-97-2	6:2 Fluorotelomer sulfonic acid (6:2FTS)	ND	10.0	ng/L
39108-34-4	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	10.0	ng/L
756426-58-1	9Cl-PF3ONS	ND	10.0	ng/L
919005-14-4	ADONA	ND	10.0	ng/L
4151-50-2	NEtFOSA	ND	20.0	ng/L
2991-50-6	NEtFOSAA	ND	20.0	ng/L
1691-99-2	NEtFOSE	ND	20.0	ng/L
31506-32-8	NMeFOSA	ND	20.0	ng/L
2355-31-9	NMeFOSAA	ND	20.0	ng/L
24448-09-7	NMeFOSE	ND	20.0	ng/L
151772-58-6	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10.0	ng/L
113507-82-7	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	10.0	ng/L
13252-13-6	Perfluoro-2-proxypropanoic acid (HFPO-DA)	ND	20.0	ng/L
377-73-1	Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	10.0	ng/L
863090-89-5	Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	10.0	ng/L
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND	10.0	ng/L
375-22-4	**Perfluorobutanoic acid (PFBA)**	**34.7**	**10.0**	ng/L
335-77-3	Perfluorodecane sulfonic acid (PFDS)	ND	10.0	ng/L
335-76-2	Perfluorodecanoic acid (PFDA)	ND	10.0	ng/L
307-55-1	Perfluorododecanoic acid (PFDoA)	ND	10.0	ng/L
375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	ND	10.0	ng/L
375-85-9	**Perfluoroheptanoic acid (PFHpA)**	**26.4**	**10.0**	ng/L
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND	10.0	ng/L
307-24-4	**Perfluorohexanoic acid (PFHxA)**	**73.7**	**10.0**	ng/L
68259-12-1	Perfluorononanesulfonic acid (PFNS)	ND	10.0	ng/L
375-95-1	Perfluorononanoic acid (PFNA)	ND	10.0	ng/L
754-91-6	Perfluorooctane Sulfonamide (FOSA)	ND	10.0	ng/L
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND	10.0	ng/L
335-67-1	**Perfluorooctanoic acid (PFOA)**	**10.3**	**10.0**	ng/L
2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	ND	10.0	ng/L
2706-90-3	**Perfluoropentanoic acid (PFPeA)**	**55.6**	**10.0**	ng/L
376-06-7	Perfluorotetradecanoic acid (PFTA)	ND	10.0	ng/L
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	ND	10.0	ng/L
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND	10.0	ng/L
79780-39-5	PFDoS	ND	10.0	ng/L
67905-19-5	PFHxDA	ND	10.0	ng/L

Sample Results

MW-14-67_082922	**Collect Date**	08/29/2022 14:20	**Lab ID**	22208305601
	Receive Date	08/30/2022 12:00	**Matrix**	Water

PFAS Top Assay QSM B15 (Post) (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
10/07/22 11:45	751390	PFAS Top Assay QSM B15 (Post)	1	10/10/22 13:37	751501	SLR2	NA

CAS#	Parameter	Result	LOQ	Units
16517-11-6	PFODA	ND	10.0	ng/L

CAS#	Extracted Internal Standard(EIS)	Cal Area	Samp Area	Units	%Recovery	%Rec Limits
335-67-1-SUR	MPFOA	500	455	ng/L	91	50 - 150
4151-50-2-EIS	d-NEtFOSA	250	218	ng/L	87	50 - 150
31506-32-8-EIS	d-NMeFOSA	250	210	ng/L	84	50 - 150
2355-31-9-EIS	d3-NMeFOSAA	250	256	ng/L	103	50 - 150
2991-50-6-EIS	d5-NEtFOSAA	250	291	ng/L	116	50 - 150
24448-09-7-EIS	d7-NMeFOSE	250	207	ng/L	83	50 - 150
1691-99-2-EIS	d9-NEtFOSE	250	203	ng/L	81	50 - 150
757124-72-4-EIS	M2 4:2 FTS	250	290	ng/L	116	50 - 150
27619-97-2-EIS	M2 6:2 FTS	250	254	ng/L	101	50 - 150
39108-34-4-EIS	M2 8:2 FTS	250	278	ng/L	111	50 - 150
67905-19-5-EIS	M2PFHxDA	250	272	ng/L	109	50 - 150
376-06-7-EIS	M2PFTA	250	244	ng/L	98	50 - 150
13252-13-6-EIS	M3HFPODA	250	324	ng/L	130	50 - 150
375-73-5-EIS	M3PFBS	250	272	ng/L	109	50 - 150
355-46-4-EIS	M3PFHxS	250	275	ng/L	110	50 - 150
375-85-9-EIS	M4PFHpA	250	282	ng/L	113	50 - 150
307-24-4-EIS	M5PFHxA	250	278	ng/L	111	50 - 150
2706-90-3-EIS	M5PFPeA	250	276	ng/L	111	50 - 150
335-76-2-EIS	M6PFDA	250	273	ng/L	109	50 - 150
2058-94-8-EIS	M7PFUnA	250	268	ng/L	107	50 - 150
754-91-6-EIS	M8FOSA	250	251	ng/L	100	50 - 150
335-67-1-EIS	M8PFOA	250	284	ng/L	113	50 - 150
1763-23-1-EIS	M8PFOS	250	265	ng/L	106	50 - 150
375-95-1-EIS	M9PFNA	250	276	ng/L	110	50 - 150
375-22-4-EIS	MPFBA	250	273	ng/L	109	50 - 150
307-55-1-EIS	MPFDoA	250	248	ng/L	99	50 - 150

Subcontract Work

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	Subcontract Work	1	10/21/22 12:36	NA	CW	NA

CAS#	Parameter	Result	LOQ	Units
SHIP-000	Ship Result	*		mg/L

Sample Results

P6-SB-07_082922	**Collect Date**	08/29/2022 15:20	**Lab ID**	22208305602
	Receive Date	08/30/2022 12:00	**Matrix**	Water

PFAS Top Assay QSM B15 (Pre)

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
10/08/22 09:00	750661	PFAS Top Assay QSM B15 (Pre)	1	10/11/22 00:46	751527	SLR2	NA

CAS#	Parameter	Result	LOQ	Units
120226-60-0	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND	10.0	ng/L
763051-92-9	11Cl-PF3OUdS	ND	10.0	ng/L
757124-72-4	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND	10.0	ng/L
27619-97-2	6:2 Fluorotelomer sulfonic acid (6:2FTS)	ND	10.0	ng/L
39108-34-4	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	10.0	ng/L
756426-58-1	9Cl-PF3ONS	ND	10.0	ng/L
919005-14-4	ADONA	ND	10.0	ng/L
4151-50-2	NEtFOSA	ND	20.0	ng/L
2991-50-6	NEtFOSAA	ND	20.0	ng/L
1691-99-2	NEtFOSE	ND	20.0	ng/L
31506-32-8	NMeFOSA	ND	20.0	ng/L
2355-31-9	NMeFOSAA	ND	20.0	ng/L
24448-09-7	NMeFOSE	ND	20.0	ng/L
151772-58-6	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10.0	ng/L
113507-82-7	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	10.0	ng/L
13252-13-6	Perfluoro-2-proxypropanoic acid (HFPO-DA)	ND	20.0	ng/L
377-73-1	Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	10.0	ng/L
863090-89-5	Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	10.0	ng/L
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND	10.0	ng/L
375-22-4	**Perfluorobutanoic acid (PFBA)**	**248**	**10.0**	ng/L
335-77-3	Perfluorodecane sulfonic acid (PFDS)	ND	10.0	ng/L
335-76-2	**Perfluorodecanoic acid (PFDA)**	**25.4**	**10.0**	ng/L
307-55-1	Perfluorododecanoic acid (PFDoA)	ND	10.0	ng/L
375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	ND	10.0	ng/L
375-85-9	**Perfluoroheptanoic acid (PFHpA)**	**829**	**10.0**	ng/L
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND	10.0	ng/L
307-24-4	**Perfluorohexanoic acid (PFHxA)**	**983**	**10.0**	ng/L
68259-12-1	Perfluorononanesulfonic acid (PFNS)	ND	10.0	ng/L
375-95-1	**Perfluorononanoic acid (PFNA)**	**119**	**10.0**	ng/L
754-91-6	Perfluorooctane Sulfonamide (FOSA)	ND	10.0	ng/L
1763-23-1	**Perfluorooctanesulfonic acid (PFOS)**	**48.8**	**10.0**	ng/L
335-67-1	**Perfluorooctanoic acid (PFOA)**	**1190**	**10.0**	ng/L
2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	ND	10.0	ng/L
2706-90-3	**Perfluoropentanoic acid (PFPeA)**	**940**	**10.0**	ng/L
376-06-7	Perfluorotetradecanoic acid (PFTA)	ND	10.0	ng/L
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	ND	10.0	ng/L
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND	10.0	ng/L
79780-39-5	PFDoS	ND	10.0	ng/L
67905-19-5	PFHxDA	ND	10.0	ng/L

Sample Results

P6-SB-07_082922	**Collect Date**	08/29/2022 15:20	**Lab ID**	22208305602
	Receive Date	08/30/2022 12:00	**Matrix**	Water

PFAS Top Assay QSM B15 (Pre) (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
10/08/22 09:00	750661	PFAS Top Assay QSM B15 (Pre)	1	10/11/22 00:46	751527	SLR2	NA

CAS#	Parameter	Result	LOQ	Units
16517-11-6	PFODA	ND	10.0	ng/L

CAS#	Extracted Internal Standard(EIS)	Cal Area	Samp Area	Units	%Recovery	%Rec Limits
335-67-1-SUR	MPFOA	500	487	ng/L	97	50 - 150
4151-50-2-EIS	d-NEtFOSA	250	132	ng/L	53	50 - 150
31506-32-8-EIS	d-NMeFOSA	250	161	ng/L	64	50 - 150
2355-31-9-EIS	d3-NMeFOSAA	250	251	ng/L	100	50 - 150
2991-50-6-EIS	d5-NEtFOSAA	250	272	ng/L	109	50 - 150
24448-09-7-EIS	d7-NMeFOSE	250	163	ng/L	65	50 - 150
1691-99-2-EIS	d9-NEtFOSE	250	148	ng/L	59	50 - 150
757124-72-4-EIS	M2 4:2 FTS	250	323	ng/L	129	50 - 150
27619-97-2-EIS	M2 6:2 FTS	250	255	ng/L	102	50 - 150
39108-34-4-EIS	M2 8:2 FTS	250	286	ng/L	115	50 - 150
67905-19-5-EIS	M2PFHxDA	250	281	ng/L	112	50 - 150
376-06-7-EIS	M2PFTA	250	237	ng/L	95	50 - 150
13252-13-6-EIS	M3HFPODA	250	260	ng/L	104	50 - 150
375-73-5-EIS	M3PFBS	250	263	ng/L	105	50 - 150
355-46-4-EIS	M3PFHxS	250	261	ng/L	104	50 - 150
375-85-9-EIS	M4PFHpA	250	267	ng/L	107	50 - 150
307-24-4-EIS	M5PFHxA	250	264	ng/L	106	50 - 150
2706-90-3-EIS	M5PFPeA	250	252	ng/L	101	50 - 150
335-76-2-EIS	M6PFDA	250	274	ng/L	109	50 - 150
2058-94-8-EIS	M7PFUnA	250	274	ng/L	109	50 - 150
754-91-6-EIS	M8FOSA	250	232	ng/L	93	50 - 150
335-67-1-EIS	M8PFOA	250	263	ng/L	105	50 - 150
1763-23-1-EIS	M8PFOS	250	260	ng/L	104	50 - 150
375-95-1-EIS	M9PFNA	250	276	ng/L	110	50 - 150
375-22-4-EIS	MPFBA	250	248	ng/L	99	50 - 150
307-55-1-EIS	MPFDoA	250	260	ng/L	104	50 - 150

Sample Results

P6-SB-07_082922	**Collect Date**	08/29/2022 15:20	**Lab ID**	22208305602
	Receive Date	08/30/2022 12:00	**Matrix**	Water

PFAS Top Assay QSM B15 (Post)

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
10/07/22 11:45	751390	PFAS Top Assay QSM B15 (Post)	1	10/10/22 13:52	751501	SLR2	NA

CAS#	Parameter	Result	LOQ	Units
120226-60-0	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND	10.0	ng/L
763051-92-9	11Cl-PF3OUdS	ND	10.0	ng/L
757124-72-4	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND	10.0	ng/L
27619-97-2	6:2 Fluorotelomer sulfonic acid (6:2FTS)	ND	10.0	ng/L
39108-34-4	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	10.0	ng/L
756426-58-1	9Cl-PF3ONS	ND	10.0	ng/L
919005-14-4	ADONA	ND	10.0	ng/L
4151-50-2	NEtFOSA	ND	20.0	ng/L
2991-50-6	NEtFOSAA	ND	20.0	ng/L
1691-99-2	NEtFOSE	ND	20.0	ng/L
31506-32-8	NMeFOSA	ND	20.0	ng/L
2355-31-9	NMeFOSAA	ND	20.0	ng/L
24448-09-7	NMeFOSE	ND	20.0	ng/L
151772-58-6	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10.0	ng/L
113507-82-7	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	10.0	ng/L
13252-13-6	Perfluoro-2-proxypropanoic acid (HFPO-DA)	ND	20.0	ng/L
377-73-1	Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	10.0	ng/L
863090-89-5	Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	10.0	ng/L
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND	10.0	ng/L
375-22-4	**Perfluorobutanoic acid (PFBA)**	**301**	**10.0**	ng/L
335-77-3	Perfluorodecane sulfonic acid (PFDS)	ND	10.0	ng/L
335-76-2	**Perfluorodecanoic acid (PFDA)**	**22.1**	**10.0**	ng/L
307-55-1	Perfluorododecanoic acid (PFDoA)	ND	10.0	ng/L
375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	ND	10.0	ng/L
375-85-9	**Perfluoroheptanoic acid (PFHpA)**	**725**	**10.0**	ng/L
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND	10.0	ng/L
307-24-4	**Perfluorohexanoic acid (PFHxA)**	**910**	**10.0**	ng/L
68259-12-1	Perfluorononanesulfonic acid (PFNS)	ND	10.0	ng/L
375-95-1	**Perfluorononanoic acid (PFNA)**	**98.0**	**10.0**	ng/L
754-91-6	Perfluorooctane Sulfonamide (FOSA)	ND	10.0	ng/L
1763-23-1	**Perfluorooctanesulfonic acid (PFOS)**	**41.4**	**10.0**	ng/L
335-67-1	**Perfluorooctanoic acid (PFOA)**	**972**	**10.0**	ng/L
2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	ND	10.0	ng/L
2706-90-3	**Perfluoropentanoic acid (PFPeA)**	**960**	**10.0**	ng/L
376-06-7	Perfluorotetradecanoic acid (PFTA)	ND	10.0	ng/L
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	ND	10.0	ng/L
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND	10.0	ng/L
79780-39-5	PFDoS	ND	10.0	ng/L
67905-19-5	PFHxDA	ND	10.0	ng/L

Sample Results

P6-SB-07_082922				
	Collect Date	08/29/2022 15:20	**Lab ID**	22208305602
	Receive Date	08/30/2022 12:00	**Matrix**	Water

PFAS Top Assay QSM B15 (Post) (Continued)

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
10/07/22 11:45	751390	PFAS Top Assay QSM B15 (Post)	1	10/10/22 13:52	751501	SLR2	NA

CAS#	Parameter	Result	LOQ	Units
16517-11-6	PFODA	ND	10.0	ng/L

CAS#	Extracted Internal Standard(EIS)	Cal Area	Samp Area	Units	%Recovery	%Rec Limits
335-67-1-SUR	MPFOA	500	428	ng/L	86	50 - 150
4151-50-2-EIS	d-NEtFOSA	250	205	ng/L	82	50 - 150
31506-32-8-EIS	d-NMeFOSA	250	195	ng/L	78	50 - 150
2355-31-9-EIS	d3-NMeFOSAA	250	235	ng/L	94	50 - 150
2991-50-6-EIS	d5-NEtFOSAA	250	261	ng/L	105	50 - 150
24448-09-7-EIS	d7-NMeFOSE	250	195	ng/L	78	50 - 150
1691-99-2-EIS	d9-NEtFOSE	250	185	ng/L	74	50 - 150
757124-72-4-EIS	M2 4:2 FTS	250	291	ng/L	116	50 - 150
27619-97-2-EIS	M2 6:2 FTS	250	246	ng/L	99	50 - 150
39108-34-4-EIS	M2 8:2 FTS	250	271	ng/L	108	50 - 150
67905-19-5-EIS	M2PFHxDA	250	284	ng/L	114	50 - 150
376-06-7-EIS	M2PFTA	250	249	ng/L	99	50 - 150
13252-13-6-EIS	M3HFPODA	250	327	ng/L	131	50 - 150
375-73-5-EIS	M3PFBS	250	277	ng/L	111	50 - 150
355-46-4-EIS	M3PFHxS	250	274	ng/L	110	50 - 150
375-85-9-EIS	M4PFHpA	250	273	ng/L	109	50 - 150
307-24-4-EIS	M5PFHxA	250	269	ng/L	108	50 - 150
2706-90-3-EIS	M5PFPeA	250	266	ng/L	107	50 - 150
335-76-2-EIS	M6PFDA	250	254	ng/L	102	50 - 150
2058-94-8-EIS	M7PFUnA	250	256	ng/L	102	50 - 150
754-91-6-EIS	M8FOSA	250	222	ng/L	89	50 - 150
335-67-1-EIS	M8PFOA	250	267	ng/L	107	50 - 150
1763-23-1-EIS	M8PFOS	250	250	ng/L	100	50 - 150
375-95-1-EIS	M9PFNA	250	264	ng/L	106	50 - 150
375-22-4-EIS	MPFBA	250	271	ng/L	108	50 - 150
307-55-1-EIS	MPFDoA	250	247	ng/L	99	50 - 150

Subcontract Work

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	Subcontract Work	1	10/21/22 12:36	NA	CW	NA

CAS#	Parameter	Result	LOQ	Units
SHIP-000	Ship Result	*		mg/L

LC-MS/MS QC Summary

Analytical Batch		MB751390		LCS751390		LCSD751390	
751501	Client ID	2405471		2405472		2405473	
Prep Batch	Lab ID	MB		LCS		LCSD	
751390	Sample Type	10/07/22		10/07/22 11:45		10/07/22 11:45	
Prep Method	Prep Date	11:45		10/10/22 12:52		10/10/22 13:07	
PFAS Top Assay QSM B15 (Post)	Analysis Date	10/10/22		Water		Water	
	Matrix	12:37					
		Water					

PFAS Top Assay QSM B15 (Post)		Units	ng/L	Spike			Control	Spike				
		Result	LOQ	Added	Result	%R	Limits%R	Added	Result	%R	RPD	RPD Limit
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	ND	10.0	193	223	116	70 - 130	193	213	110	5	20
11Cl-PF3OUdS	763051-92-9	ND	10.0	189	205	109	70 - 130	189	203	108	1	20
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	ND	10.0	187	208	111	70 - 130	187	198	106	5	20
6:2 Fluorotelomer sulfonic acid (6:2FTS)	27619-97-2	ND	10.0	190	206	108	70 - 130	190	209	110	1	20
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	ND	10.0	192	215	112	70 - 130	192	209	109	3	20
9Cl-PF3ONS	756426-58-1	ND	10.0	187	204	110	70 - 130	187	196	105	4	20
ADONA	919005-14-4	ND	10.0	189	207	110	70 - 130	189	195	103	6	20
NEtFOSA	4151-50-2	ND	20.0	200	233	116	70 - 130	200	206	103	12	20
NEtFOSAA	2991-50-6	ND	20.0	200	207	103	70 - 130	200	196	98	5	20
NEtFOSE	1691-99-2	ND	20.0	200	223	112	70 - 130	200	219	109	2	20
NMeFOSA	31506-32-8	ND	20.0	200	237	119	70 - 130	200	220	110	7	20
NMeFOSAA	2355-31-9	ND	20.0	200	225	113	70 - 130	200	212	106	6	20
NMeFOSE	24448-09-7	ND	20.0	200	216	108	70 - 130	200	214	107	1	20
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	ND	10.0	200	221	111	70 - 130	200	209	104	6	20
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	113507-82-7	ND	10.0	178	194	109	70 - 130	178	186	105	4	20
Perfluoro-2-proxypropanoic acid (HFPO-DA)	13252-13-6	ND	20.0	400	437	109	70 - 130	400	445	111	2	20
Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	ND	10.0	200	219	110	70 - 130	200	214	107	3	20
Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	ND	10.0	200	212	106	70 - 130	200	206	103	3	20
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ND	10.0	177	195	110	70 - 130	177	191	107	2	20
Perfluorobutanoic acid (PFBA)	375-22-4	ND	10.0	200	221	110	70 - 130	200	216	108	2	20
Perfluorodecane sulfonic acid (PFDS)	335-77-3	ND	10.0	193	216	112	70 - 130	193	206	107	5	20
Perfluorodecanoic acid (PFDA)	335-76-2	ND	10.0	200	219	109	70 - 130	200	216	108	1	20
Perfluorododecanoic acid (PFDoA)	307-55-1	ND	10.0	200	219	109	70 - 130	200	211	106	3	20
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	ND	10.0	191	211	111	70 - 130	191	205	108	3	20
Perfluoroheptanoic acid (PFHpA)	375-85-9	ND	10.0	200	217	108	70 - 130	200	211	105	3	20
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ND	10.0	183	201	110	70 - 130	183	195	107	3	20
Perfluorohexanoic acid (PFHxA)	307-24-4	ND	10.0	200	219	110	70 - 130	200	214	107	2	20
Perfluorononanesulfonic acid (PFNS)	68259-12-1	ND	10.0	192	208	108	70 - 130	192	207	108	1	20
Perfluorononanoic acid (PFNA)	375-95-1	ND	10.0	200	219	109	70 - 130	200	210	105	4	20
Perfluorooctane Sulfonamide (FOSA)	754-91-6	ND	10.0	200	229	115	70 - 130	200	219	110	4	20
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ND	10.0	186	208	112	70 - 130	186	194	104	7	20
Perfluorooctanoic acid (PFOA)	335-67-1	ND	10.0	200	220	110	70 - 130	200	209	104	5	20
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ND	10.0	188	212	113	70 - 130	188	205	109	3	20
Perfluoropentanoic acid (PFPeA)	2706-90-3	ND	10.0	200	221	110	70 - 130	200	216	108	2	20
Perfluorotetradecanoic acid (PFTA)	376-06-7	ND	10.0	200	218	109	70 - 130	200	216	108	1	20
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ND	10.0	200	216	108	70 - 130	200	220	110	2	20
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ND	10.0	200	215	107	70 - 130	200	209	105	3	20
PFDoS	79780-39-5	ND	10.0	194	202	104	70 - 130	194	206	106	2	20
PFHxDA	67905-19-5	ND	10.0	200	222	111	70 - 130	200	234	117	5	20
PFODA	16517-11-6	ND	10.0	200	187	93	70 - 130	200	208	104	11	20
Extracted Internal Standard(EIS)	**CAS#**	**Area**	**%R**	**CalArea**	**Area**	**%R**	**Limits**	**CalArea**	**Area**	**%**	**RPD**	**Limit**
d3-NMeFOSAA	2355-31-9-EIS	217	87	250	225	90	50 - 150	250	231	92	NA	NA
d5-NEtFOSAA	2991-50-6-EIS	247	99	250	253	101	50 - 150	250	256	102	NA	NA
d7-NMeFOSE	24448-09-7-EIS	169	68	250	179	71	50 - 150	250	169	68	NA	NA
d9-NEtFOSE	1691-99-2-EIS	168	67	250	173	69	50 - 150	250	169	68	NA	NA
d-NEtFOSA	4151-50-2-EIS	151	60	250	160	64	50 - 150	250	162	65	NA	NA
d-NMeFOSA	31506-32-8-EIS	146	58	250	158	63	50 - 150	250	153	61	NA	NA
M2 4:2 FTS	757124-72-4-EIS	225	90	250	223	89	50 - 150	250	235	94	NA	NA
M2 6:2 FTS	27619-97-2-EIS	206	83	250	207	83	50 - 150	250	222	89	NA	NA
M2 8:2 FTS	39108-34-4-EIS	236	95	250	223	89	50 - 150	250	248	99	NA	NA
M2PFHxDA	67905-19-5-EIS	232	93	250	239	95	50 - 150	250	261	104	NA	NA
M2PFTA	376-06-7-EIS	201	80	250	208	83	50 - 150	250	228	91	NA	NA
M3HFPODA	13252-13-6-EIS	243	97	250	275	110	50 - 150	250	249	100	NA	NA
M3PFBS	375-73-5-EIS	208	83	250	218	87	50 - 150	250	221	88	NA	NA
M3PFHxS	355-46-4-EIS	212	85	250	222	89	50 - 150	250	230	92	NA	NA
M4PFHpA	375-85-9-EIS	219	88	250	229	92	50 - 150	250	219	88	NA	NA
M5PFHxA	307-24-4-EIS	215	86	250	230	92	50 - 150	250	216	86	NA	NA
M5PFPeA	2706-90-3-EIS	210	84	250	223	89	50 - 150	250	211	84	NA	NA

LC-MS/MS QC Summary

Analytical Batch	Client ID	MB751390	LCS751390	LCSD751390
751501	Lab ID	2405471	2405472	2405473
Prep Batch	Sample Type	MB	LCS	LCSD
751390	Prep Date	10/07/22 11:45	10/07/22 11:45	10/07/22 11:45
Prep Method	Analysis Date	10/10/22 12:37	10/10/22 12:52	10/10/22 13:07
PFAS Top Assay QSM B15 (Post)	Matrix	Water	Water	Water

PFAS Top Assay QSM B15 (Post)		Units Result	ng/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
M6PFDA	335-76-2-EIS	227	91	250	230	92	50 - 150	250	223	89	NA	NA
M7PFUnA	2058-94-8-EIS	224	90	250	233	93	50 - 150	250	232	93	NA	NA
M8FOSA	754-91-6-EIS	199	80	250	205	82	50 - 150	250	197	79	NA	NA
M8PFOA	335-67-1-EIS	220	88	250	228	91	50 - 150	250	224	90	NA	NA
M8PFOS	1763-23-1-EIS	214	85	250	222	89	50 - 150	250	237	95	NA	NA
M9PFNA	375-95-1-EIS	223	89	250	227	91	50 - 150	250	222	89	NA	NA
MPFBA	375-22-4-EIS	207	83	250	222	89	50 - 150	250	208	83	NA	NA
MPFDoA	307-55-1-EIS	214	85	250	219	88	50 - 150	250	232	93	NA	NA
MPFOA	335-67-1-SUR	448	90	500	463	93	50 - 150	500	434	87	NA	NA

LC-MS/MS QC Summary

Analytical Batch		MB750661		LCS750661				LCSD750661				
751527	Client ID	2400713		2400714				2400715				
Prep Batch	Lab ID	MB		LCS				LCSD				
750661	Sample Type	10/08/22		10/08/22 09:00				10/08/22 09:00				
Prep Method	Prep Date	09:00		10/11/22 00:02				10/11/22 00:17				
PFAS Top Assay QSM B15 (Pre)	Analysis Date	10/10/22		Water				Water				
	Matrix	23:48										
		Water										

PFAS Top Assay QSM B15 (Pre)		Units	ng/L	Spike			Control	Spike				
		Result	LOQ	Added	Result	%R	Limits%R	Added	Result	%R	RPD	RPD Limit
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	ND	10.0	193	191	99	70 - 130	193	193	100	1	20
11Cl-PF3OUdS	763051-92-9	ND	10.0	189	203	108	70 - 130	189	199	106	2	20
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	ND	10.0	187	228	122	70 - 130	187	204	109	11	20
6:2 Fluorotelomer sulfonic acid (6:2FTS)	27619-97-2	ND	10.0	190	216	114	70 - 130	190	211	111	2	20
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	ND	10.0	192	213	111	70 - 130	192	212	111	0	20
9Cl-PF3ONS	756426-58-1	ND	10.0	187	202	108	70 - 130	187	194	104	4	20
ADONA	919005-14-4	ND	10.0	189	206	109	70 - 130	189	193	102	6	20
NEtFOSA	4151-50-2	ND	20.0	200	215	107	70 - 130	200	187	93	14	20
NEtFOSAA	2991-50-6	ND	20.0	200	213	107	70 - 130	200	207	104	3	20
NEtFOSE	1691-99-2	ND	20.0	200	213	107	70 - 130	200	201	101	6	20
NMeFOSA	31506-32-8	ND	20.0	200	220	110	70 - 130	200	188	94	15	20
NMeFOSAA	2355-31-9	ND	20.0	200	231	115	70 - 130	200	216	108	7	20
NMeFOSE	24448-09-7	ND	20.0	200	222	111	70 - 130	200	202	101	10	20
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	151772-58-6	ND	10.0	200	207	103	70 - 130	200	196	98	5	20
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	113507-82-7	ND	10.0	178	197	110	70 - 130	178	186	104	6	20
Perfluoro-2-proxypropanoic acid (HFPO-DA)	13252-13-6	ND	20.0	400	451	113	70 - 130	400	436	109	3	20
Perfluoro-3-methoxypropanoic acid (PFMPA)	377-73-1	ND	10.0	200	205	102	70 - 130	200	196	98	5	20
Perfluoro-4-methoxybutanoic acid (PFMBA)	863090-89-5	ND	10.0	200	210	105	70 - 130	200	199	100	5	20
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ND	10.0	177	193	109	70 - 130	177	186	105	4	20
Perfluorobutanoic acid (PFBA)	375-22-4	ND	10.0	200	217	109	70 - 130	200	203	102	7	20
Perfluorodecane sulfonic acid (PFDS)	335-77-3	ND	10.0	193	205	106	70 - 130	193	196	102	4	20
Perfluorodecanoic acid (PFDA)	335-76-2	ND	10.0	200	214	107	70 - 130	200	206	103	4	20
Perfluorododecanoic acid (PFDoA)	307-55-1	ND	10.0	200	220	110	70 - 130	200	209	105	5	20
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	ND	10.0	191	215	113	70 - 130	191	200	105	7	20
Perfluoroheptanoic acid (PFHpA)	375-85-9	ND	10.0	200	214	107	70 - 130	200	206	103	4	20
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	ND	10.0	183	195	107	70 - 130	183	187	102	4	20
Perfluorohexanoic acid (PFHxA)	307-24-4	ND	10.0	200	211	106	70 - 130	200	199	99	6	20
Perfluorononanesulfonic acid (PFNS)	68259-12-1	ND	10.0	192	205	107	70 - 130	192	193	100	6	20
Perfluorononanoic acid (PFNA)	375-95-1	ND	10.0	200	217	109	70 - 130	200	206	103	5	20
Perfluorooctane Sulfonamide (FOSA)	754-91-6	ND	10.0	200	214	107	70 - 130	200	208	104	3	20
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	ND	10.0	186	198	106	70 - 130	186	188	101	5	20
Perfluorooctanoic acid (PFOA)	335-67-1	ND	10.0	200	219	109	70 - 130	200	206	103	6	20
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	ND	10.0	188	200	106	70 - 130	188	193	102	4	20
Perfluoropentanoic acid (PFPeA)	2706-90-3	ND	10.0	200	216	108	70 - 130	200	206	103	5	20
Perfluorotetradecanoic acid (PFTA)	376-06-7	ND	10.0	200	213	107	70 - 130	200	204	102	4	20
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ND	10.0	200	218	109	70 - 130	200	199	100	9	20
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ND	10.0	200	217	108	70 - 130	200	204	102	6	20
PFDoS	79780-39-5	ND	10.0	194	192	99	70 - 130	194	199	102	4	20
PFHxDA	67905-19-5	ND	10.0	200	210	105	70 - 130	200	205	102	3	20
PFODA	16517-11-6	ND	10.0	200	178	89	70 - 130	200	201	100	12	20
Extracted Internal Standard(EIS)	**CAS#**	**Area**	**%R**	**CalArea**	**Area**	**%R**	**Limits**	**CalArea**	**Area**	**%**	**RPD**	**Limit**
d3-NMeFOSAA	2355-31-9-EIS	257	103	250	245	98	50 - 150	250	258	103	NA	NA
d5-NEtFOSAA	2991-50-6-EIS	266	106	250	266	106	50 - 150	250	274	109	NA	NA
d7-NMeFOSE	24448-09-7-EIS	188	75	250	192	77	50 - 150	250	201	80	NA	NA
d9-NEtFOSE	1691-99-2-EIS	161	64	250	195	78	50 - 150	250	206	82	NA	NA
d-NEtFOSA	4151-50-2-EIS	103	**41***	250	143	57	50 - 150	250	155	62	NA	NA
d-NMeFOSA	31506-32-8-EIS	112	**45***	250	144	58	50 - 150	250	165	66	NA	NA
M2 4:2 FTS	757124-72-4-EIS	286	115	250	254	102	50 - 150	250	277	111	NA	NA
M2 6:2 FTS	27619-97-2-EIS	277	111	250	257	103	50 - 150	250	260	104	NA	NA
M2 8:2 FTS	39108-34-4-EIS	277	111	250	275	110	50 - 150	250	278	111	NA	NA
M2PFHxDA	67905-19-5-EIS	261	104	250	266	106	50 - 150	250	292	117	NA	NA
M2PFTA	376-06-7-EIS	241	96	250	232	93	50 - 150	250	245	98	NA	NA
M3HFPODA	13252-13-6-EIS	264	106	250	239	96	50 - 150	250	252	101	NA	NA
M3PFBS	375-73-5-EIS	267	107	250	248	99	50 - 150	250	254	102	NA	NA
M3PFHxS	355-46-4-EIS	269	107	250	244	98	50 - 150	250	256	102	NA	NA
M4PFHpA	375-85-9-EIS	276	110	250	259	104	50 - 150	250	268	107	NA	NA
M5PFHxA	307-24-4-EIS	273	109	250	257	103	50 - 150	250	266	106	NA	NA
M5PFPeA	2706-90-3-EIS	274	110	250	252	101	50 - 150	250	261	104	NA	NA

LC-MS/MS QC Summary

Analytical Batch	Client ID	MB750661		LCS750661				LCSD750661				
751527	Lab ID	2400713		2400714				2400715				
Prep Batch	Sample Type	MB		LCS				LCSD				
750661	Prep Date	10/08/22 09:00		10/08/22 09:00				10/08/22 09:00				
Prep Method	Analysis Date	10/10/22 23:48		10/11/22 00:02				10/11/22 00:17				
PFAS Top Assay QSM B15 (Pre)	Matrix	Water		Water				Water				
PFAS Top Assay QSM B15 (Pre)		Units Result	ng/L LOQ	Spike Added	Result	%R	Control Limits%R	Spike Added	Result	%R	RPD	RPD Limit
M6PFDA	335-76-2-EIS	273	109	250	262	105	50 - 150	250	270	108	NA	NA
M7PFUnA	2058-94-8-EIS	267	107	250	264	106	50 - 150	250	277	111	NA	NA
M8FOSA	754-91-6-EIS	212	85	250	217	87	50 - 150	250	211	85	NA	NA
M8PFOA	335-67-1-EIS	277	111	250	256	103	50 - 150	250	268	107	NA	NA
M8PFOS	1763-23-1-EIS	260	104	250	253	101	50 - 150	250	260	104	NA	NA
M9PFNA	375-95-1-EIS	277	111	250	262	105	50 - 150	250	271	108	NA	NA
MPFBA	375-22-4-EIS	265	106	250	243	97	50 - 150	250	257	103	NA	NA
MPFDoA	307-55-1-EIS	261	104	250	248	99	50 - 150	250	264	105	NA	NA
MPFOA	335-67-1-SUR	532	106	500	521	104	50 - 150	500	533	107	NA	NA

Top Assay Pre/Post Summary

Client ID	MW-14-67_082922				P6-SB-07_082922			
LAB ID	22208305601				22208305602			
Collected	08/29/22 14:20				08/29/22 15:20			
Matrix	Water				Water			
Units	ng/L				ng/L			
PFAS Top Assay QSM B15	**PRE**	**POST**	**DIFF**	**RPD(%)**	**PRE**	**POST**	**DIFF**	**RPD(%)**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ND	ND	0	0	ND	ND	0	0
11Cl-PF3OUdS	ND	ND	0	0	ND	ND	0	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND	ND	0	0	ND	ND	0	0
6:2 Fluorotelomer sulfonic acid (6:2FTS)	ND	ND	0	0	ND	ND	0	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND	ND	0	0	ND	ND	0	0
9Cl-PF3ONS	ND	ND	0	0	ND	ND	0	0
ADONA	ND	ND	0	0	ND	ND	0	0
NEtFOSA	ND	ND	0	0	ND	ND	0	0
NEtFOSAA	ND	ND	0	0	ND	ND	0	0
NEtFOSE	ND	ND	0	0	ND	ND	0	0
NMeFOSA	ND	ND	0	0	ND	ND	0	0
NMeFOSAA	ND	ND	0	0	ND	ND	0	0
NMeFOSE	ND	ND	0	0	ND	ND	0	0
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	ND	0	0	ND	ND	0	0
PFDoS	ND	ND	0	0	ND	ND	0	0
PFHxDA	ND	ND	0	0	ND	ND	0	0
PFODA	ND	ND	0	0	ND	ND	0	0
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	ND	0	0	ND	ND	0	0
Perfluoro-2-proxypropanoic acid (HFPO-DA)	ND	ND	0	0	ND	ND	0	0
Perfluoro-3-methoxypropanoic acid (PFMPA)	ND	ND	0	0	ND	ND	0	0
Perfluoro-4-methoxybutanoic acid (PFMBA)	ND	ND	0	0	ND	ND	0	0
Perfluorobutanesulfonic acid (PFBS)	ND	ND	0	0	ND	ND	0	0
Perfluorobutanoic acid (PFBA)	34.0	34.7	0.7	2	248	301	53	19.3
Perfluorodecane sulfonic acid (PFDS)	ND	ND	0	0	ND	ND	0	0
Perfluorodecanoic acid (PFDA)	ND	ND	0	0	25.4	22.1	-3.3	13.9
Perfluorododecanoic acid (PFDoA)	ND	ND	0	0	ND	ND	0	0
Perfluoroheptanesulfonic acid (PFHpS)	ND	ND	0	0	ND	ND	0	0
Perfluoroheptanoic acid (PFHpA)	30.6	26.4	-4.2	14.7	829	725	-104	13.4
Perfluorohexanesulfonic acid (PFHxS)	ND	ND	0	0	ND	ND	0	0
Perfluorohexanoic acid (PFHxA)	81.8	73.7	-8.1	10.4	983	910	-73	7.7
Perfluorononanesulfonic acid (PFNS)	ND	ND	0	0	ND	ND	0	0
Perfluorononanoic acid (PFNA)	ND	ND	0	0	119	98.0	-21	19.4
Perfluorooctane Sulfonamide (FOSA)	ND	ND	0	0	ND	ND	0	0
Perfluorooctanesulfonic acid (PFOS)	ND	ND	0	0	48.8	41.4	-7.4	16.4
Perfluorooctanoic acid (PFOA)	11.6	10.3	-1.3	11.9	1190	972	-218	20.2
Perfluoropentanesulfonic acid (PFPeS)	ND	ND	0	0	ND	ND	0	0
Perfluoropentanoic acid (PFPeA)	61.2	55.6	-5.6	9.6	940	960	20	2.1
Perfluorotetradecanoic acid (PFTA)	ND	ND	0	0	ND	ND	0	0
Perfluorotridecanoic acid (PFTrDA)	ND	ND	0	0	ND	ND	0	0
Perfluoroundecanoic acid (PFUnA)	ND	ND	0	0	ND	ND	0	0

Plant 6

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Wor

ALL SHAD

Client ID: 5562 - Arcadis of Michigan LLC
SDG: 222083056
PM: RWe

Company: Arcadis	Billing Information:
Address: 28550 Cabot Drive, Suite 500	
Report To: Kaitlyn.Hunt@arcadis.com	Email To: Kaitlyn.Hunt@arcadis.com
Copy To: Tiffany.Linder@arcadis.com	Site Collection Info/Address:
Customer Project Name/Number: RACER Lansing / 30112892	State: MI County/City: Ingham Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET
Phone: 947-777-5215 Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Austin Westhuis	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Standard Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [X] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply) Field Filtered (if applicable): [ ] Yes [X] No Analysis:

Container Preservative Ty: U U

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: AOF	Analyses: PFAS Top Assay	Lab Profile/Line:
MW-14-67_082922	GW	G	8/29/22	1420	—	—		5	X	X	1
P6-SB-07_082922	GW	G	8/29/22	1520	—	—		5	X	X	2

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips: _____	
Sample pH Acceptable	Y N NA
pH Strips: _____	
Sulfide Present	Y N NA
Lead Acetate Strips: _____	

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: 5902 7253 6461

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2812110

Samples received via: (FEDEX) UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: _____
Cooler 1 Temp Upon Receipt: _____oC
Cooler 1 Therm Corr. Factor: _____oC
Cooler 1 Corrected Temp: _____oC
Comments:
0.7642

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO
Page: _____ of: _____

Relinquished by/Company: (Signature) Arcadis	Date/Time: 8/29/22 1715	Received by/Company: (Signature) FedEx	Date/Time: 8/29/22 1715
Relinquished by/Company: (Signature) FedEx	Date/Time: 8/30/22 12:00	Received by/Company: (Signature)	Date/Time: 8/30/22 12:00
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

SAMPLE RECEIVING CHECKLIST

SAMPLE DELIVERY GROUP 222083056	
Client **PM** RWe 5562 - Arcadis of Michigan LLC	**Transport Method** FEDEX
Profile Number 299944	**Received By** Roberts, George S.
Line Item(s) 1 - TOP, AOF	**Receive Date(s)** 08/30/22

CHECKLIST	YES	NO
Samples received with proper thermal preservation?	☑	☐
Radioactivity is <1600 cpm? If no, record cpm value in notes section.	☑	☐
COC relinquished and complete (including sampleIDs, collect times, and sampler)?	☑	☐
All containers received in good condition and within hold time?	☑	☐
All sample labels and containers received match the chain of custody?	☑	☐
Preservative added to any containers?	☐	☑
If received, was headspace for VOC water containers < 6mm?	☑	☐
Samples collected in containers provided by Pace Gulf Coast?	☑	☐

COOLERS

Airbill	Thermometer ID: E42	Temp °C
590272536961		0.7

DISCREPANCIES

None

LAB PRESERVATIONS

None

NOTES

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster, PA 17601
Tel: (717)656-2300

Laboratory Job ID: 410-96708-1
Client Project/Site: 222083056

For:
Pace Analytical Gulf Coast
7979 Innovation Park Drive
Baton Rouge, Louisiana 70820

Attn: Ms. Ruth Welsh

Elizabeth P. Martin

Authorized for release by:
10/21/2022 12:03:23 PM
Elizabeth Martin, Project Manager
Elizabeth.Martin@et.eurofinsus.com

Designee for

Nicole Brown, Project Manager
(717)471-3265
Nicole.Brown@et.eurofinsus.com

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Elizabeth P. Martin

Elizabeth Martin
Project Manager
10/21/2022 12:03:23 PM

Table of Contents

Definitions/Glossary

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

Qualifiers

LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-96708-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-96708-1

Receipt
The samples were received on 9/3/2022 9:46 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.9°C.

Receipt Exceptions
The Field Sampler was not listed on the Chain of Custody.

LCMS
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

Client Sample ID: MW-14-67_082922 — Lab Sample ID: 410-96708-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Adsorbable Organic Fluorine (AOF)	1.2	J	2.0	1.0	ug/L	1		ELLE SOP	Total/NA

Client Sample ID: P6-SB-07_082922 — Lab Sample ID: 410-96708-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Adsorbable Organic Fluorine (AOF)	5.6		2.0	1.0	ug/L	1		ELLE SOP	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

Client Sample ID: MW-14-67_082922

Lab Sample ID: 410-96708-1

Date Collected: 08/29/22 14:20
Matrix: Water
Date Received: 09/03/22 09:46

Method: ELLE - Lancaster ELLE SOP - Total or Organic Fluorine by Combustion Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Adsorbable Organic Fluorine (AOF)	1.2	J	2.0	1.0	ug/L		10/18/22 15:55	10/19/22 12:06	1

Client Sample ID: P6-SB-07_082922

Lab Sample ID: 410-96708-2

Date Collected: 08/29/22 15:20
Matrix: Water
Date Received: 09/03/22 09:46

Method: ELLE - Lancaster ELLE SOP - Total or Organic Fluorine by Combustion Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Adsorbable Organic Fluorine (AOF)	5.6		2.0	1.0	ug/L		10/18/22 15:55	10/19/22 12:42	1

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

Method: ELLE SOP - Total or Organic Fluorine by Combustion Ion Chromatography

Lab Sample ID: MB 410-307906/1-A
Matrix: Water
Analysis Batch: 307675

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 307906

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Adsorbable Organic Fluorine (AOF)	ND		2.0	1.0	ug/L		10/18/22 15:55	10/18/22 18:25	1

Lab Sample ID: LCS 410-307906/2-A
Matrix: Water
Analysis Batch: 307675

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 307906

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Adsorbable Organic Fluorine (AOF)			20.2	20.4		ug/L		101	50 - 150		

Lab Sample ID: LCSD 410-307906/3-A
Matrix: Water
Analysis Batch: 307675

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 307906

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Adsorbable Organic Fluorine (AOF)			20.2	20.5		ug/L		101	50 - 150	1	20

QC Association Summary

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

LCMS

Analysis Batch: 307675

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-96708-1	MW-14-67_082922	Total/NA	Water	ELLE SOP	307906
410-96708-2	P6-SB-07_082922	Total/NA	Water	ELLE SOP	307906
MB 410-307906/1-A	Method Blank	Total/NA	Water	ELLE SOP	307906
LCS 410-307906/2-A	Lab Control Sample	Total/NA	Water	ELLE SOP	307906
LCSD 410-307906/3-A	Lab Control Sample Dup	Total/NA	Water	ELLE SOP	307906

Prep Batch: 307906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-96708-1	MW-14-67_082922	Total/NA	Water	NONE	
410-96708-2	P6-SB-07_082922	Total/NA	Water	NONE	
MB 410-307906/1-A	Method Blank	Total/NA	Water	NONE	
LCS 410-307906/2-A	Lab Control Sample	Total/NA	Water	NONE	
LCSD 410-307906/3-A	Lab Control Sample Dup	Total/NA	Water	NONE	

Lab Chronicle

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

Client Sample ID: MW-14-67_082922

Lab Sample ID: 410-96708-1

Date Collected: 08/29/22 14:20

Matrix: Water

Date Received: 09/03/22 09:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	NONE			307906	F9DU	ELLE	10/18/22 15:55
Total/NA	Analysis	ELLE SOP		1	307675	F9DU	ELLE	10/19/22 12:06

Client Sample ID: P6-SB-07_082922

Lab Sample ID: 410-96708-2

Date Collected: 08/29/22 15:20

Matrix: Water

Date Received: 09/03/22 09:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	NONE			307906	F9DU	ELLE	10/18/22 15:55
Total/NA	Analysis	ELLE SOP		1	307675	F9DU	ELLE	10/19/22 12:42

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Louisiana	NELAP	02055	06-30-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
ELLE SOP	NONE	Water	Adsorbable Organic Fluorine (AOF)

Method Summary

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

Method	Method Description	Protocol	Laboratory
ELLE SOP	Total or Organic Fluorine by Combustion Ion Chromatography	ELLE - Lancaster	ELLE
NONE	Preparation, Fluorine	ELLE - Lancaster	ELLE

Protocol References:

ELLE - Lancaster = Eurofins Lancaster, Facility Standard Operating Procedure.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Pace Analytical Gulf Coast
Project/Site: 222083056

Job ID: 410-96708-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-96708-1	MW-14-67_082922	Water	08/29/22 14:20	09/03/22 09:46
410-96708-2	P6-SB-07_082922	Water	08/29/22 15:20	09/03/22 09:46

Chain of Custody

410-96708 Chain of Custody

Pace Analytical®

PAGC Baton Rouge Laboratory

Workorder: 222083056 **Workorder Name:** **Results Requested By:** 15 day TAT

Report / Invoice To:			Requested Analysis
PM: Ruth Welsh	Nicole Brown		
Pace Analytical Gulf Coast	Eurofins Lancaster Labs	P.O. 222083056	
7979 Innovation Park Drive	2425 New Holland Pike		
Baton Rouge, LA 70820	Lancaster, PA 17601		
Phone (412) 209-8995	(717) 656-2300		
Email: ruth.welsh@pacelabs.com			
State of Sample Origin:			

Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Preserved Containers: None	AOF	LAB USE ONLY
1	MW-14-67_082922	8/29/2022 14:20	22208305601	GW	2	X	
2	P6-SB-07_082922	8/29/2022 15:20	22208305602	GW	2	X	
3							
4							
5							
6							
7							
8							
9							

Transfers	[redacted]	[redacted]	[redacted]	Date/Time	Comments
1	[signature]	9/2/22 (7:00)	FedEx		
2					
3			[signature]	9-3-22 946	

Cooler Temperature on Receipt 2.90 °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact Y or N

MB 2.9

Login Sample Receipt Checklist

Client: Pace Analytical Gulf Coast

Job Number: 410-96708-1

Login Number: 96708
List Number: 1
Creator: Ballard, Megan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Refer to Job Narrative for details.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	