

Revitalizing Auto Communities  
Environmental Response Trust

# Plants 2 and 6 Sewer Modifications Completion Update Report

**Lansing Industrial Land  
Lansing, Michigan**

September 2021

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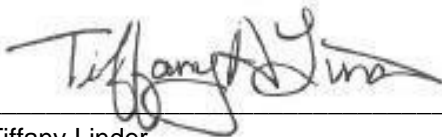
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## Acronyms and Abbreviations

APC	Adams Plating Corporation
CCTV	Closed Circuit Television
EGLE	Michigan Department of Environment, Great Lakes, and Energy
gpm	Gallons per Minute
HNV	Human Non-Cancer Screening Value
IM	Interim Measure
MDOT	Michigan Department of Transportation
Ng/L	Nanograms per liter
PFAS	Poly- and Perfluoroalkyl Substances
PFOS	Perfluorooctanesulfonic acid
RACER	Revitalizing Auto Communities Environmental Response
Report	Completion Report
Rule 57 Criteria	EGLE Rule 57 Human Non-Cancer Screening Value (HNV) for Surface Water from a Non-Drinking Water Source
Site	RACER Lansing Industrial Land

## Executive Summary

This Completion Update Report outlines modifications made to the Plant 2 and Plant 6 storm sewer systems in April 2021 to mitigate the Site's PFAS-impacted water discharges to off-Site sewers owned by the City of Lansing or the Ingham County Drain Commission. The points of compliance that were evaluated following modifications are the Plant 2 outfalls, Plant 3 outfalls and the Plant 6 outfalls along Michigan Avenue, Verlinden Avenue, and Osborn Road. Six manhole structures were filled on Plant 2 to mitigate PFAS levels near the northwest outfall and keep potentially backed up water more internal to the Site. Plant 6 work included plugging two pipes coming from Site in an Osborn Road catch basin to mitigate PFAS levels.

# 1 Introduction

Arcadis of Michigan, LLC prepared this Completion Update Report (Report) on behalf of the Revitalizing Auto Communities Environmental Response (RACER) Trust to summarize modifications made to the storm sewer systems on Plants 2 and 6 at the RACER Lansing Industrial Land (Site) located in Lansing, Michigan (**Figure 1**). These modifications were completed as an interim measure (IM) to address per- and polyfluoroalkyl substances (PFAS) off-Site discharge in the storm water and sanitary outfalls and will be part of the final corrective measure to address PFAS at the Site.

This Report outlines modifications to the Plants 2 and 6 storm sewer systems to mitigate the Site's PFAS-impacted water discharges to off-Site sewers owned by the City of Lansing or Ingham County, and modifications made in response to seeps on northern Plant 2 that appeared in December 2020. The scope of work on Plant 2 included an inspection and filling of manholes P2-MH-28 and P2-MH-29. The scope of work at Plant 6 involved plugging two pipes discharging from the Site into a City catch basin in Osborn Street. The scope of work to address the seeps included a soil and groundwater investigation, a closed-circuit television (CCTV) inspection of drainage pipes, and filling of four manholes with concrete at Plant 2.

## 1.1 Corrective Action Objectives

The corrective action objective of the storm sewer modifications is to eliminate off-Site sewer discharges exceeding the EGLE Rule 57 Human Non-Cancer Screening Value (HNV) for Surface Water from a Non-Drinking Water Source (Rule 57 criteria). The points of compliance for Plant 2 are the northwest outfall, (P2-MH-2), northeast outfall (P2-MH-9), and the southwest outfall (P2-MH-W) (**Figure 2**). The points of compliance for Plant 3 are the northwest (P3-MH-284), northeast (P3-MH-NE), and the eastern sanitary vault outfall. The Plant 6 points of compliance are the manholes in Michigan Avenue, Verlinden Avenue, and Osborn Road (**Figure 3**).

## 1.2 Sewer Work Completed

### 1.2.1 Plant 2

Following sampling in December 2018, January 2019 and March 2019, sewer modifications were completed in December 2019 and May 2020 to address PFAS discharges as outlined in the *Plants 2, 3, and 6 Storm Sewer Modifications Completion Report* (Arcadis, 2020b). Follow up sampling was completed in July 2020, which led to additional sewer modifications completed in November 2020. These storm sewer and sanitary sewer modifications are outlined in the *Plants 2, 3 & 6 Sewer Modifications Completion Report* (Arcadis, 2021a). Follow up sampling data is shown in **Table 1**.

### 1.2.2 Plant 3

Based on PFAS findings in 2017, an initial scope of work to address these impacts was completed in 2018, as outlined in the *Plant 3 Storm Sewer Modifications Completion Report* (Arcadis, 2019a). Further modifications were completed in December 2019 and May 2020 to address perfluorooctanesulfonic acid (PFOS) levels at the property outfall P3-MH-NE, which are discussed in the *Plants 2, 3, and 6 Storm Sewer Modifications Completion Report* (Arcadis, 2020b). Follow up sampling was completed in July and August 2020, and further modifications to

the storm sewer and sanitary vault were completed in November 2020 to address the PFOS exceedances of Rule 57 criteria. These modifications are noted in the *Plants 2, 3 & 6 Sewer Modifications Completion Report* (Arcadis, 2021b). Follow up sampling data is shown in **Table 2**.

### 1.2.3 Plant 6

The majority of the storm and sanitary sewer lines were cut and capped at the street curb during plant demolition activities in 2009 (**Figure 5**) (O'Brien & Gere, 2009). Sampling conducted between November 2018 and May 2019 indicated PFOS exceedances of Rule 57 criteria. An initial scope of work to address these exceedances was completed in December 2019, which is outlined in the *Plants 2, 3, and 6 Storm Sewer Modifications Completion Report* (Arcadis, 2020b). Pipe plugging in an off-Site catch basin and manhole was completed in November 2020, as well as a closed-circuit television (CCTV) inspection of the City of Lansing sewers. This work is discussed in the *Plants 2, 3 & 6 Sewer Modifications Completion Report* (Arcadis, 2021b). Follow up sampling data is shown in **Table 3**.

## 2 Plant 2 Storm Sewer Modifications

The primary tasks completed under this scope of work are described below:

1. Inspection of storm sewer manholes P2-MH-28, P2-MH-29, and associated piping near the northwest outfall
2. Filling manholes P2-MH-28 and P2-MH-29 with concrete to isolate PFAS-impacted region of the Site

Field notes for the associated activities can be referenced in **Appendix A**.

### 2.1 Manhole Inspections

Routine storm sewer sampling in March 2021 identified elevated concentrations of PFAS discharging to the outfall through the 18-inch diameter pipe originating from manholes P2-MH-28 and P2-MH-29 (**Figure 2**). The relative composition of PFAS compounds ("fingerprint") in P2-MH-29 water samples appears similar to nearby Adams Plating Corporation (APC) wells, with a proportionally high concentration of Perfluorobutanesulfonic acid. The P2-MH-29 invert and APC well MW-08-S groundwater depths are at a similar elevation, approximately 7 feet below ground surface, indicating that PFAS associated with the APC property is impacting RACER storm sewers. A comparison of APC monitoring well PFAS data to RACER storm sewers is shown in **Appendix B**. A figure showing APC well location in relation to Plant 2 storm sewer is provided in **Figure 1 of Appendix B**.

In May 2021, Arcadis inspected manholes P2-MH-28 and P2-MH-29 and performed a CCTV inspection of the piping connecting them with the outfall to determine any points of infiltration or other pipes that may be contributing to the PFAS concentrations in that area. In summary:

- No additional inverts were discovered other than those that were previously identified on sewer maps.
- No significant infiltration was observed between P2-MH-28 and P2-MH-29.
- There were some water leaks in the brick structure of P2-MH-29 that could be contributing towards the higher levels of PFAS observed in P2-MH-30 via groundwater infiltration.
- The PFAS impacts in P2-MH-29 do not appear to originate from the Site, based on chemical data from upstream and downstream manholes.

- Arcadis also identified a 4-inch diameter corrugated pipe entering P2-MH-28 from the west. The pipe appeared to be a groundwater collection tile drain pipe, although this could not be confirmed. Arcadis' contractor attempted to trace the pipe upstream with a plumbing snake but could not reach farther than 3 to 4 feet into the pipe.

Photographs of the inspection are included in the Photo Log in **Appendix C**.

## 2.2 Sewer Modifications

Two manholes (P2-MH-28 and P2-MH-29) were filled in place with concrete in April 2021 to isolate the PFAS-impacted section of the storm sewer system (**Figure 4**). The concrete used to fill the structures was designed to cure underwater to minimize the need to keep the structures dry prior to filling. The manholes were first dewatered and cleaned. Cleaning the structures improved the likelihood of a proper seal between the concrete and the existing structure to block flow through the sewers. The structures were filled with concrete to ground surface. Concrete installation followed standard construction practices including consolidation (i.e., vibrating) to eliminate air voids and ensure complete placement. The concrete cured for 2 to 3 days while Arcadis monitored for signs of cracking or settling. Sewer water and wash water from cleaning were pumped into frac tanks staged on-Site, characterized, and disposed of at an appropriate off-Site disposal facility. Typical details of a filled structure are provided on **Figure 6** and a photo log of these activities is shown in **Appendix C**.

## 3 Plant 6 Storm Sewer Modifications

Storm sewer outfall sampling in March 2021 indicated continued PFOS exceedances of Rule 57 criteria in manhole Osborne-MH-1 (**Table 3**). Low flow was observed entering Osborne-MH-1 from the city sewer line from the east. Arcadis identified an upstream catch basin, Osborn CB-2, which received flow from two apparent sewer pipes from the Site. The pipes originated from a portion of Plant 6 with known PFAS impacts to perched water. Arcadis pumped down the water in Osborn-CB-2 in May 2021 and confirmed a discharge point to the city sewer including downstream manhole Osborne-MH-1.

Sewer modifications were completed in May 2021 to mitigate potential contributions to the city sewer. Modifications consisted of plugging the two pipes from the Site. The two southeastern pipes associated with drainage from Plant 6 in Osborn-CB-2 were plugged at the catch basin using hydraulic cement (**Figure 5**). The plugs initially stopped the discharge of water, but infiltration soon occurred through the brick catch basin wall around the 4-inch high density polyethylene southeastern invert. Attempts to patch around the pipe with hydraulic cement were unsuccessful because there was too much volume of water infiltrating. While plugging the pipes did reduce the contribution of water from the pipes, a small flow of water remains through the wall of the brick catch basin structure.

A photo log of these activities is provided in **Appendix C**.

## 4 Saginaw Street Investigation and Modifications

City of Lansing personnel reportedly first observed water seeps along the south side of Saginaw Street north of Plant 2 in December 2020. RACER Trust was notified of the seeps in March 2021. The seeps were observed to the west of the overpass on Saginaw Street, in the gutter curb and grass embankment, and in two locations under the overpass on Saginaw Street (**Figure 4**). Arcadis inspected the seeps weekly beginning in March to document the locations and flow strengths.

The primary tasks completed under this scope of work included the following:

3. Soil and groundwater investigation in the northeastern Plant 2 parking lot to identify the source of the seeps
4. CCTV inspection of apparent groundwater drainage tile network beneath Saginaw Street and the sidewalk
5. Sewer modifications to move potentially backed up water more internal to the Site.

### 4.1 Inspections and Investigations

In May 2021, Arcadis performed an investigation to evaluate the source of the seeps, including six soil borings with three temporary wells installed in the northeast Plant 2 parking lot (**Figure 4**). In summary:

- Groundwater elevations in the temporary wells (843 to 846 feet above sea level) corresponded with a sand lens which aligned with the elevation of the seeps on Saginaw Street.
- Groundwater levels increase following precipitation events and correlate to increased seep activity following precipitation events.
- RACER storm sewers are elevated 8 to 10 feet higher and do not intersect the water table.
- Groundwater chemical composition of the nearest monitoring well to the seeps closely matched the seep water.
- Elevation and chemistry data indicated that the likely source of the seeps is groundwater.

The storm sewer network beneath Saginaw Street is maintained by the Michigan Department of Transportation (MDOT). A manhole north of the MDOT pump house receives water from the Saginaw Street storm drains and what appears to be a groundwater collection tile system draining the area beneath the southern sidewalk, near the seeps. The southwestern drainage pipe had a trickle flow and the southeastern pipe had moderate flow during a May 2021 inspection. Arcadis utilized a subcontractor to perform a CCTV inspection of these pipes to trace their origin and evaluate their condition.

- The southwestern drainage pipe was collapsed and no longer functioning properly. It could not be inspected by CCTV. Based on its location, the pipe likely formerly drained an area near to the seeps.
- The southeastern drainage pipe was actively flowing water, but the CCTV camera could not reach beyond 40 feet due to an elbow. There were no signs of infiltration through the pipe in the 40 feet that was inspected.

Photographs of the inspection are included in the Photo Log in **Appendix C**. Analytical and groundwater elevation data are in **Appendix D**.

## 4.2 Sewer Modifications

Storm sewer modifications were completed in April 2021 to move potentially backed up water more internal to the Site and away from the northeast outfall. Three manholes and one catch basin (P2-MH-12, P2-MH-13, P2-MH-14, and P2-CB-7) were filled in place with concrete (**Figure 4**). First the structures were dewatered and cleaned. P2-CB-7 was filled with sediment, so a soft dig machine was used to remove the sediment prior to filling. The structures were filled with concrete to ground surface. Concrete installation followed standard construction practices including consolidation (i.e., vibrating) to eliminate air voids and ensure complete placement. The concrete cured for 2 to 3 days while Arcadis monitored for signs of cracking or settling. Sewer water and wash water from cleaning were pumped into frac tanks staged on-Site, characterized, and disposed of at an appropriate off-Site disposal facility.

Typical details of a filled structure are provided on **Figure 6** and a photo log of these activities is shown in **Appendix C**.

## 5 Performance Monitoring

This section describes the performance monitoring completed to evaluate the effectiveness of the storm sewer modifications with respect to objectives and minimizing any adverse effects from completing the modifications.

### 5.1 Stormwater Monitoring Plan and Results

#### 5.1.1 Visual Inspections

The following preliminary inspections, observations, and sampling were completed on Plants 2, 3, and 6 in 2021 following the March 2021 modifications:

- May 2021 sampling event:
  - Plant 3
    - The eastern Plant 3 sanitary outfall manhole discharge pipe had no flow.
    - The Plant 3 northeast outfall manhole discharge pipe had no flow.
    - The Plant 3 northwest outfall manhole discharge pipe had no flow.
  - Plant 2
    - Low flow was observed in the Plant 2 northwest outfall manhole discharge pipe.
    - The Plant 2 northeast outfall manhole had no flow.
    - Low flow was observed in the Plant 2 southwest outfall manhole.
  - Plant 6
    - No flow was observed in the Osborn-MH-1 and Verlinden-MH-1 discharge pipes.
- Low flow was observed in the Verlinden-MH-4 and MichAve-MH-4 discharge pipes.
- May 26, 2021 runoff inspection – No discharge was noted in the Plant 3 sanitary outfall or P3-MH-NE outfall. No runoff was observed that did not exist prior to sewer modifications. Ponding continues to occur internal to the Site on all Plants but is contained onsite and generally dissipates soon after rain events in most areas.

## Plants 2 and 6 Sewer Modifications Completion Update Report

- June 22, 2021 runoff inspection – No discharge was noted in the Plant 3 sanitary outfall or P3-MH-NE outfall. No runoff was observed that did not exist prior to sewer modifications. Ponding continues to occur internal to the Site on all Plants but is contained onsite and generally dissipates soon after rain events.
- June 25, 2021 Plant 3 inspection – Runoff was noted at the Plant 3 Willow Street entrance during heavy rainfall carrying gravel used to fill potholes in the Plant 3 Willow Street parking lot from Site into the road. Over 5-inches of rain reportedly fell during this event. Note that runoff existed in this area prior to sewer modifications due to the slope of the driveway and gravel will no longer be used to fill potholes in the Plant 3 Willow Street parking lot.
- June 28, 2021 runoff inspection – No discharge was noted in the Plant 3 sanitary outfall or P3-MH-NE outfall. No runoff was observed that did not exist prior to sewer modifications. Ponding continues to occur internal to the Site on all Plants and is larger in extent than previous storm events but is contained onsite and generally dissipates soon after rain events.
- Seeps inspections March to June – In March, the seeps were observed flowing in the curb joint just north of the MDOT pump station, flowing from under the nearby overpass, and dampness in the grass embankment next to the MDOT pump station. The seeps were reduced to no visible flow as of June 2021, but damp areas of pavement remained.
- Seeps inspections Late June to July – Seeps began flowing again after accumulated rain between June 22 through 28 through the wall of the underpass and in the Saginaw Street curb joint. As of July 20, 2021, the seeps in the underpass wall have ceased or are only damp and the curb joint seep in Saginaw is still flowing.

### 5.1.2 Confirmation Sampling Results

Confirmatory dry weather sampling for PFAS was completed on Plants 2, 3, and 6 following construction in May 2021. The next outfall sampling event is scheduled for August 2021.

#### 5.1.2.1 Plant 2

Plant 2 southwest outfall manhole P2-MH-W remains below criteria and northeast outfall manhole P2-MH-9 was dry during the sampling event. Northwest outfall manhole P2-MH-2 was above Rule 57 criteria at 19.0 ng/L. A trickle flow of water is still discharging into P2-MH-30 from the pipe originating from manholes P2-MH-28 and P2-MH-29 despite filling these manholes. Full sampling results are included on **Table 1** and **Figure 2**, and laboratory reports are included in **Appendix E**.

Estimated flow rates through the manholes were also noted during the sampling event to assist with mass loading and source identification assessments throughout the storm sewer network. Flows were visually estimated and categorized by no flow, trickle (<1 gallons per minute [gpm]), low flow (1-3 gpm), and moderate flow (>3 gpm) and can be seen in **Figure 2**.

#### 5.1.2.2 Plant 3

The northwest outfall manhole P2-MH-284 continues to be below criteria. The northeast storm outfall and sanitary vault outfall continue to be dry. Plant 3 outfalls were monitored during the May 2021 sampling event and will continue to be monitored. Plant 3 sampling data is shown in **Table 2**.

### 5.1.2.3 Plant 6

Confirmatory dry weather sampling for PFAS was completed at manholes in Michigan Avenue, Verlinden Avenue, and Osborn Road following modifications in May 2021. MichAve-MH-4 (16.9 ng/L), Osborn-MH-1 (31.1 ng/L), Osborn-CB-2 (34.1 ng/L), Verlinden-MH-2 (35.3 ng/L), and Verlinden-MH-4 (16.7 ng/L) were above Rule 57 criteria for PFOS. Full Plant 6 sampling results are displayed in **Table 3** and **Figure 3**.

## 5.2 Stormwater Inspections

Increased surface ponding was expected to occur on the Site following implementation of the storm sewer modifications due to the filled structures limiting infiltration. Post-construction stormwater inspections will be performed to monitor ponding and ensure that modifications do not create unacceptable runoff onto neighboring properties. Arcadis staff will mobilize to Site to complete observations within 24 hours of at least four significant rain events (>0.25 inches of water).

The first three stormwater inspections following the March modifications were completed on May 26, 2021, June 22, 2021, and June 28, 2021 following a large storm event (5.42 inches of rainfall) on June 25-26. All ponding occurred in areas of ponding that previously existed, although the overall extent of the ponding was largest after the June 25-26 storm event. No runoff was noted on either plant that did not exist prior to modifications being completed. Runoff at the Plant 3 Willow Street entrance was observed carrying fill gravel offsite into Willow Street. This runoff pathway was preexisting prior to the sewer modifications. The presence of gravel in the runoff was new and resulted from the site occupant filling potholes in the entrance driveway. It has been communicated to the Site occupant that gravel can no longer be used to fill potholes in the Plant 3 Willow Street parking lot.

## 5.3 Performance Monitoring Progress

Storm sewer dry weather water quality sampling was completed in May 2021. May 2021 results are presented in **Figures 2** and **3** and **Tables 1**, **2**, and **3**. No samples have been collected from the Plant 3 northeast outfall manhole, the Plant 3 sanitary vault, and the Plant 2 northeast storm and sanitary outfalls following modifications, because there has not been flow discharging. Quarterly dry weather outfall sampling will continue throughout 2021 if discharge is noted. Additional storm sewer sampling and/or further modifications will be recommended based on ongoing evaluation of sample results.

## 6 Conclusion

Sewer modifications were completed on Plant 2 and 6 in April and May 2021 to address remaining exceedances of Rule 57 criteria in stormwater outfalls. Confirmation sampling indicated that the Plant 2 northwest outfall and two Plant 6 outfall discharges remain above Rule 57 Criteria for PFOS. Inspections and sampling confirm that Plant 3 outfalls continue to be below criteria or have no discharge.

APC appears to be the source of PFAS compounds in the Plant 2 northwest sewer network based on PFAS chemical fingerprinting of nearby wells (**Appendix B**). The proportion of Perfluorobutanesulfonic acid (PFBS) in P2-MH-29 matches that of the APC wells. Even though APC appears to be the source of PFAS in the Plant 2 northwest sewer network, further modifications in the northwest corner of Plant 2 will be evaluated and may include bulkheading or filling the line entering P2-MH-30 from P2-MH-29. Further modifications for Plant 6 will be assessed to address the detections in Osborn-CB-2, Verlinden Street, and downstream of ESC-2 in Michigan

## Plants 2 and 6 Sewer Modifications Completion Update Report

Avenue. Modifications may include additional manhole abandonment, catch basin replacement of Osborne-CB-2 (and coordination as necessary with the City of Lansing), bulkheading, and/or sewer lining. Quarterly outfall monitoring will be continued to assess remedy effectiveness and the need for further action. If further modifications are deemed necessary, a work plan will be submitted to EGLE and implemented upon approval of the work plan.

## 7 References

- Arcadis, 2018a. Interim Measures Work Plan: Plant 3 Storm Sewer Modifications. May 24.
- Arcadis, 2018b. Monitoring Well PFAS Summary – Plants 2 and 6 RACER Trust Site, Lansing, Michigan. September 14.
- Arcadis, 2019a. Plant 3 Storm Sewer Modifications Completion Report. January 25.
- Arcadis, 2019b. Interim Measures Workplan: Plants 2 and 3 Storm Sewer Modifications. July 16.
- Arcadis, 2019c. Interim Measures Workplan: Plant 6 Storm Sewer Modifications. October 18.
- Arcadis, 2020b. Plants 2, 3, and 6 Storm Sewer Completion Report. August 14.
- Arcadis, 2020c. Interim Measures Workplan: Plants 2, 3, and 6 Sewer Modifications. October 7.
- Arcadis, 2021b. Plants 2, 3 & 6 Sewer Modifications Completion Report. March 25.
- O'Brien & Gere, 2009. General Motors Corporation Plant 6 Demolition, Lansing, MI. May.

# Tables

**Table 1**  
**Summary of Plant 2 Storm Sewer Sampling Results**  
**Plants 2 and 6 Sewer Modifications Completion Update Report**  
**RACER Trust - Plant 2 Industrial Land, Lansing, Michigan**



Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	P2-MH-2 02/01/21	P2-MH-2 03/09/21	P2-MH-2 05/24/21	P2-MH-28 03/09/21	P2-MH-29 02/01/21	P2-MH-29 03/09/21	P2-MH-30 02/01/21	P2-MH-30 05/24/21	P2-MH-32 02/01/21	P2-MH-NW 02/01/21	P2-MH-W 03/09/21	P2-MH-W 05/24/21
<b>Results</b>														
(PFOS)	ng/L	12	10.6	11.7	19.0	2.8	58.7	31.7	29.0 [10.7]	65.2	1.5 J	7.9	1.7 J	2.4
Perfluorooctanoic acid (PFOA)	ng/L	12,000	8.7	12.6	12.8	2.0	5.8	<8.9	8.3 [8.5]	9.7	1.7 J	11.1	267	2.2
Other PFAS	ng/L	NC	56.4	106.2	111.9	87.1	325.9	503.2	92.6 [58.7]	161.2	47.5	61.2	60.7	41.2

**Notes:**

Shaded Exceeds Rule 57 Human Non-Cancer Screening  
Value for Surface Water from a Non-Drinking Water  
Source for PFOS or PFOA

NC = No criteria  
ng/L = Nanograms per liter  
PFAS = Per- and polyfluoroalkyl substances  
[ ] Indicates duplicate sample  
J = Indicates an estimated value below laboratory reporting limit  
< = The compound was analyzed for but not detected.  
All samples analyzed using USEPA Method 537M, Michigan List of 28

**Table 2**  
**Summary of Plant 3 Storm Sewer Sampling Results**  
**Plants 2 and 6 Sewer Modifications Completion Update Report**  
**RACER Trust - Plant 3 Industrial Land, Lansing, Michigan**



Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	P3-MH-284 03/09/21	P3-MH-284 05/24/21
<b>Results</b>				
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	6.3 [5.1]	11.7
Perfluorooctanoic acid (PFOA)	ng/L	12,000	2.6 [1.9 J]	1.4 J
Other PFAS	ng/L	NC	126.4 [72.1]	41.1

**Notes:**

Shaded Exceeds Rule 57 Human Non-Cancer Screening  
Value for Surface Water from a Non-Drinking Water  
Source for PFOS or PFOA

NC = No criteria

ng/L = Nanograms per liter

PFAS = Per- and polyfluoroalkyl substances

[ ] Indicates duplicate sample

J = Indicates an estimated value below laboratory reporting limit

< = The compound was analyzed for but not detected.

All samples analyzed using USEPA Method 537M, Michigan List of 28

Table 3  
 Summary of Plant 6 Storm Sewer Sampling Results  
 Plants 2 and 6 Sewer Modifications Completion Update Report  
 RACER Trust - Plant 6 Industrial Land, Lansing, Michigan

Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	MichAve-MH-3 03/09/21	MichAve-MH-3 05/24/21	MichAve-MH-4 03/09/21	MichAve-MH-4 05/24/21	Osborn-CB-2 03/09/21	Osborn-CB-2 05/24/21	Osborn-MH-1 03/09/21	Osborn-MH-1 05/24/21	P6-MH-16 03/09/21
<b>Results</b>											
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	3.4	3.8	10.8	16.9	31.4	34.1	24.7	31.1	17.8
Perfluorooctanoic acid (PFOA)	ng/L	12,000	2.7	5.5	10.8	17.8	40.3	47.3	27.4	31.7	50.4
Other PFAS	ng/L	NC	45.4	58.5	63.0	76.9	133.9	117.92	100.3	176.0	148.7

Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	P6-MH-17 03/09/21	P6-MH-18 03/09/21	P6-MH-19 03/09/21	Verlinden-MH-1 03/09/21	Verlinden-MH-1 05/24/21	Verlinden-MH-2 03/09/21	Verlinden-MH-2 05/24/21	Verlinden-MH-3 03/09/21	Verlinden-MH-3 05/24/21
<b>Results</b>											
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	19.9	11.6	12.1	7.7	6.1	9.9	35.3	9.1 [8.4]	11.3 [16.3]
Perfluorooctanoic acid (PFOA)	ng/L	12,000	72.5	46.8	862	18.9	28.4	16.5	46.1	29.8 [29.6]	28.5 [27.2]
Other PFAS	ng/L	NC	187.2	123.1	349.3	90.7	135.4	151.5	180.7	190.4 [186.8]	226.0 [228.4]

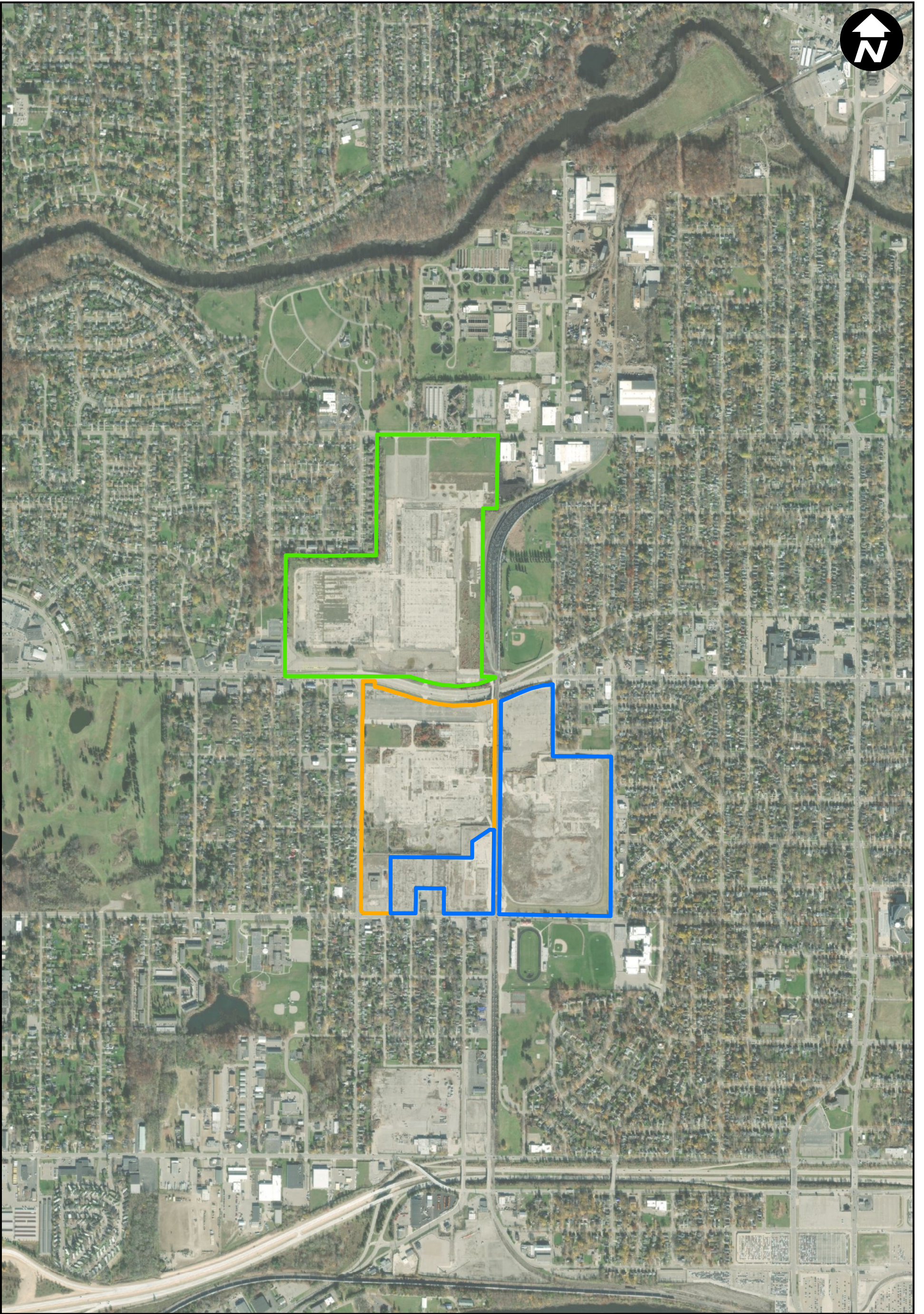
Location ID: Date Collected:	Units	MI Rule 57 SW (EGLE 2017)	Verlinden-MH-4 03/09/21	Verlinden-MH-4 05/24/21	Verlinden-MH-5 03/09/21	Verlinden-MH-5 05/24/21
<b>Results</b>						
Perfluorooctanesulfonic acid (PFOS)	ng/L	12	11.8	16.7	8.5	10.1
Perfluorooctanoic acid (PFOA)	ng/L	12,000	31.3	22.3	26.6	36.1
Other PFAS	ng/L	NC	208.7	218.3	114.7	116.5

**Notes:**

Shaded Exceeds Rule 57 Human Non-Cancer Screening  
 Value for Surface Water from a Non-Drinking Water  
 Source for PFOS or PFOA




NC = No criteria  
 ng/L = Nanograms per liter  
 PFAS = Per- and polyfluoroalkyl substances  
 [ ] Indicates duplicate sample  
 J = Indicates an estimated value below laboratory reporting limit  
 < = The compound was analyzed for but not detected.  
 All samples analyzed using USEPA Method 537M, Michigan List of 28

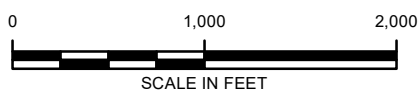
# Figures



CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TM: A. LORENZ TR: J. SALING PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
T:\\_ENV\RACER\Buffalo\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 1 - Site Location\_Shane\_05122021.mxd PLOTTED: 5/17/2021 9:17:45 AM BY: Dressback

**PLANT BOUNDARIES**

-  PLANT 2
-  PLANT 3
-  PLANT 6



NOTE: AERIAL IMAGERY FROM ESRI ARCGIS ONLINE.

RACER TRUST  
PLANTS 2, 3 & 6  
LANSING, MICHIGAN

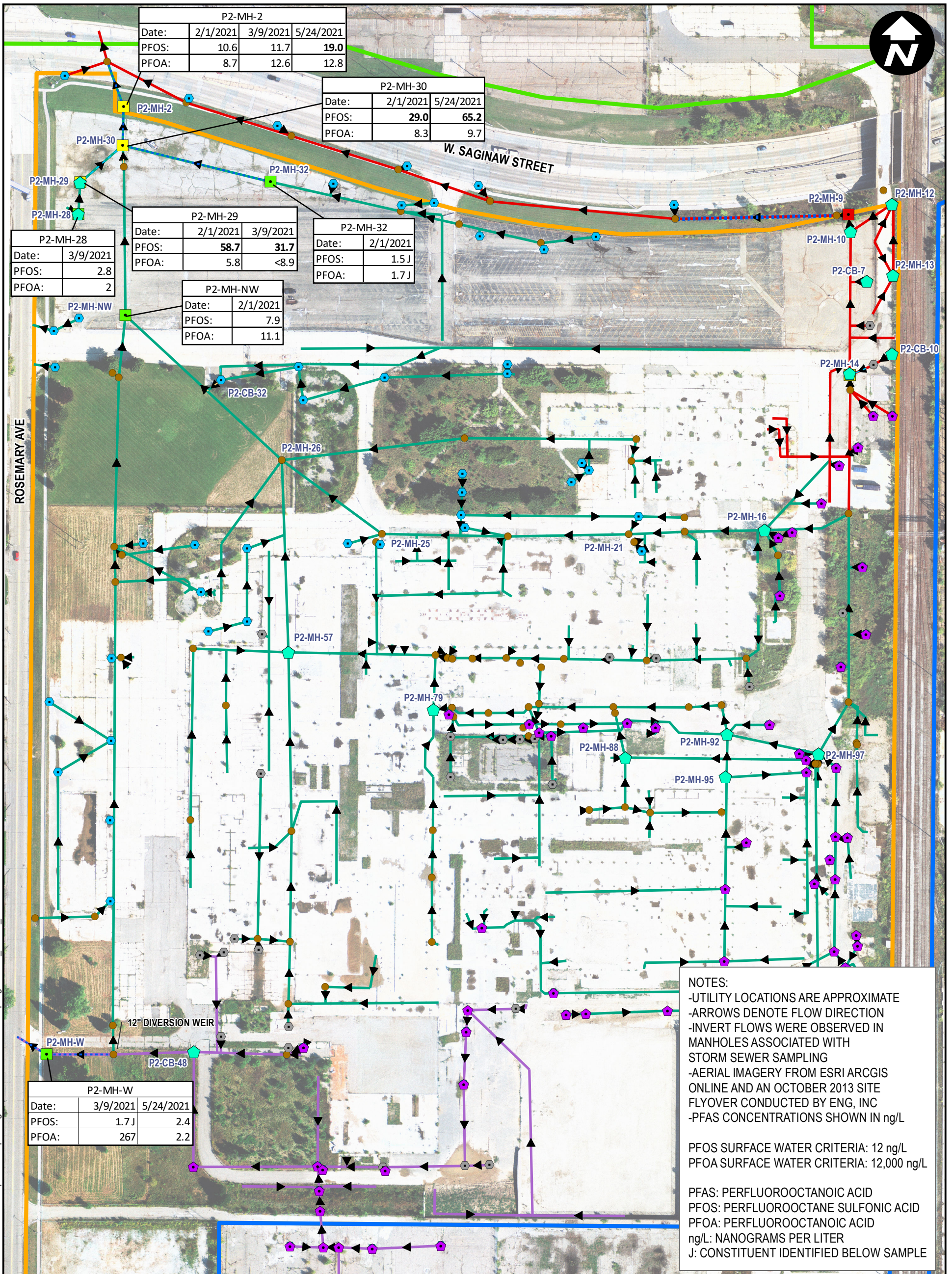
**SITE LOCATION**



FIGURE

1

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TR: J. SALING PROJECT NUMBER: 3007594.103600 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
 T:\\_ENV\RACER\Bif\Info\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 2 - Plant 2 PFAS Sampling Results\_Shane\_06152021.mxd PLOTTED: 7/26/2021 3:57:07 PM BY: Dressback

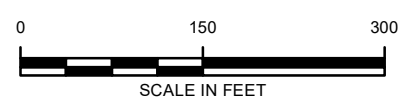


**NOTES:**  
 -UTILITY LOCATIONS ARE APPROXIMATE  
 -ARROWS DENOTE FLOW DIRECTION  
 -INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING  
 -AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC  
 -PFAS CONCENTRATIONS SHOWN IN ng/L

PFOS SURFACE WATER CRITERIA: 12 ng/L  
 PFOA SURFACE WATER CRITERIA: 12,000 ng/L

PFAS: PERFLUOROOCCTANOIC ACID  
 PFOS: PERFLUOROOCCTANE SULFONIC ACID  
 PFOA: PERFLUOROOCCTANOIC ACID  
 ng/L: NANOGRAMS PER LITER  
 J: CONSTITUENT IDENTIFIED BELOW SAMPLE

<p><b>ADJUSTMENT TYPE</b></p> <ul style="list-style-type: none"> <li><span style="color: green;">◆</span> FILLED STRUCTURE</li> <li><span style="color: purple;">◆</span> CAPPED STRUCTURE</li> <li><span style="color: grey;">●</span> COULD NOT LOCATE STRUCTURE</li> <li><span style="color: blue;">●</span> CATCH BASIN REMAINING OPEN</li> </ul> <p><b>STRUCTURES &amp; SAMPLE POINTS</b></p> <ul style="list-style-type: none"> <li><span style="color: brown;">●</span> MANHOLE</li> <li><span style="color: yellow;">■</span> MANHOLE ABOVE SURFACE WATER CRITERIA</li> <li><span style="color: green;">■</span> MANHOLE BELOW SURFACE WATER CRITERIA</li> <li><span style="color: red;">■</span> DRY MANHOLE</li> </ul>	<p><b>PLANT 2 DRAINAGE NETWORKS</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">→</span> NORTHEAST (ABANDONED)</li> <li><span style="color: green;">→</span> CENTRAL (PARTIALLY ABANDONED)</li> <li><span style="color: purple;">→</span> SOUTHWEST (ABANDONED)</li> </ul> <p><b>OBSERVED FLOW (May 2021)</b></p> <ul style="list-style-type: none"> <li><span style="color: orange;">—</span> NO FLOW</li> <li><span style="color: blue;">---</span> TRICKLE (~1 GPM OR LESS)</li> <li><span style="color: green;">---</span> LITTLE (~1-3 GPM)</li> <li><span style="color: red;">---</span> MODERATE (~3 GPM OR GREATER)</li> </ul>	<p><b>PLANT BOUNDARIES</b></p> <ul style="list-style-type: none"> <li><span style="border: 1px solid orange; display: inline-block; width: 10px; height: 10px;"></span> PLANT 2</li> <li><span style="border: 1px solid green; display: inline-block; width: 10px; height: 10px;"></span> PLANT 3</li> <li><span style="border: 1px solid blue; display: inline-block; width: 10px; height: 10px;"></span> PLANT 6</li> </ul>
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RACER TRUST  
 PLANTS 2, 3 & 6  
 LANSING, MICHIGAN

**PLANT 2 PFAS STORM SEWER SAMPLING ANALYTICAL RESULTS**

**ARCADIS**

FIGURE  
**2**



**NOTES:**  
 -UTILITY LOCATIONS ARE APPROXIMATE  
 -INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING  
 -AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC  
 -PFAS CONCENTRATIONS SHOWN IN ng/L

PFOS SURFACE WATER CRITERIA: 12 ng/L  
 PFOA SURFACE WATER CRITERIA: 12,000 ng/L

PFAS: PERFLUOROOCCTANOIC ACID  
 PFOS: PERFLUOROOCCTANE SULFONIC ACID  
 PFOA: PERFLUOROOCCTANOIC ACID  
 ng/L: NANOGRAMS PER LITER  
 J: CONSTITUENT IDENTIFIED BELOW SAMPLE

Osborn-MH-1		
Date:	3/9/2021	5/24/2021
PFOS:	24.7	31.1
PFOA:	27.4	31.7

Osborn-CB-2		
Date:	3/9/2021	5/24/2021
PFOS:	31.4	34.1
PFOA:	40.3	47.3

Verlinden-MH-1		
Date:	3/9/2021	5/24/2021
PFOS:	7.7	6.1
PFOA:	18.9	28.4

Verlinden-MH-2		
Date:	3/9/2021	5/24/2021
PFOS:	9.9	35.3
PFOA:	16.5	46.1

Verlinden-MH-3		
Date:	3/9/2021	5/24/2021
PFOS:	9.1	11.3
PFOA:	29.8	28.5

Verlinden-MH-4		
Date:	3/9/2021	5/24/2021
PFOS:	11.8	16.7
PFOA:	31.3	22.3

P6-MH-19		
Date:	3/9/2021	
PFOS:	12.1	
PFOA:	86.2	

P6-MH-18		
Date:	3/9/2021	
PFOS:	11.6	
PFOA:	46.8	

MichAve-MH-3		
Date:	3/9/2021	5/24/2021
PFOS:	3.4	3.8
PFOA:	2.7	5.5

MichAve-MH-4		
Date:	3/9/2021	5/24/2021
PFOS:	10.8	16.9
PFOA:	10.8	17.8

Verlinden-MH-5		
Date:	3/9/2021	5/24/2021
PFOS:	8.5	10.1
PFOA:	26.6	36.1

**STRUCTURES & SAMPLE POINTS**

- ◆ BULKHEAD
- ◆ FILLED STRUCTURE
- ◆ CAPPED STRUCTURE
- MANHOLE
- MANHOLE COULD NOT BE LOCATED
- ◆ CATCH BASIN REMAINING OPEN
- MANHOLE ABOVE SURFACE WATER CRITERIA
- MANHOLE BELOW SURFACE WATER CRITERIA
- DRY MANHOLE

**PLANT 6 DRAINAGE NETWORKS**

- ▶ STORM LINE
- ▶ SANITARY LINE

**OBSERVED FLOW (May)**

- NO FLOW
- TRICKLE (~1 GPM OR LESS)
- LITTLE (~1-3 GPM)
- MODERATE (~3 GPM OR GREATER)
- SEWER LINE CUT AND CAPPED AT PROPERTY LINE DURING 2014 DEMOLITION

**PLANT BOUNDARIES**

- PLANT 2
- PLANT 6

RACER TRUST  
PLANTS 2, 3 & 6  
LANSING, MICHIGAN

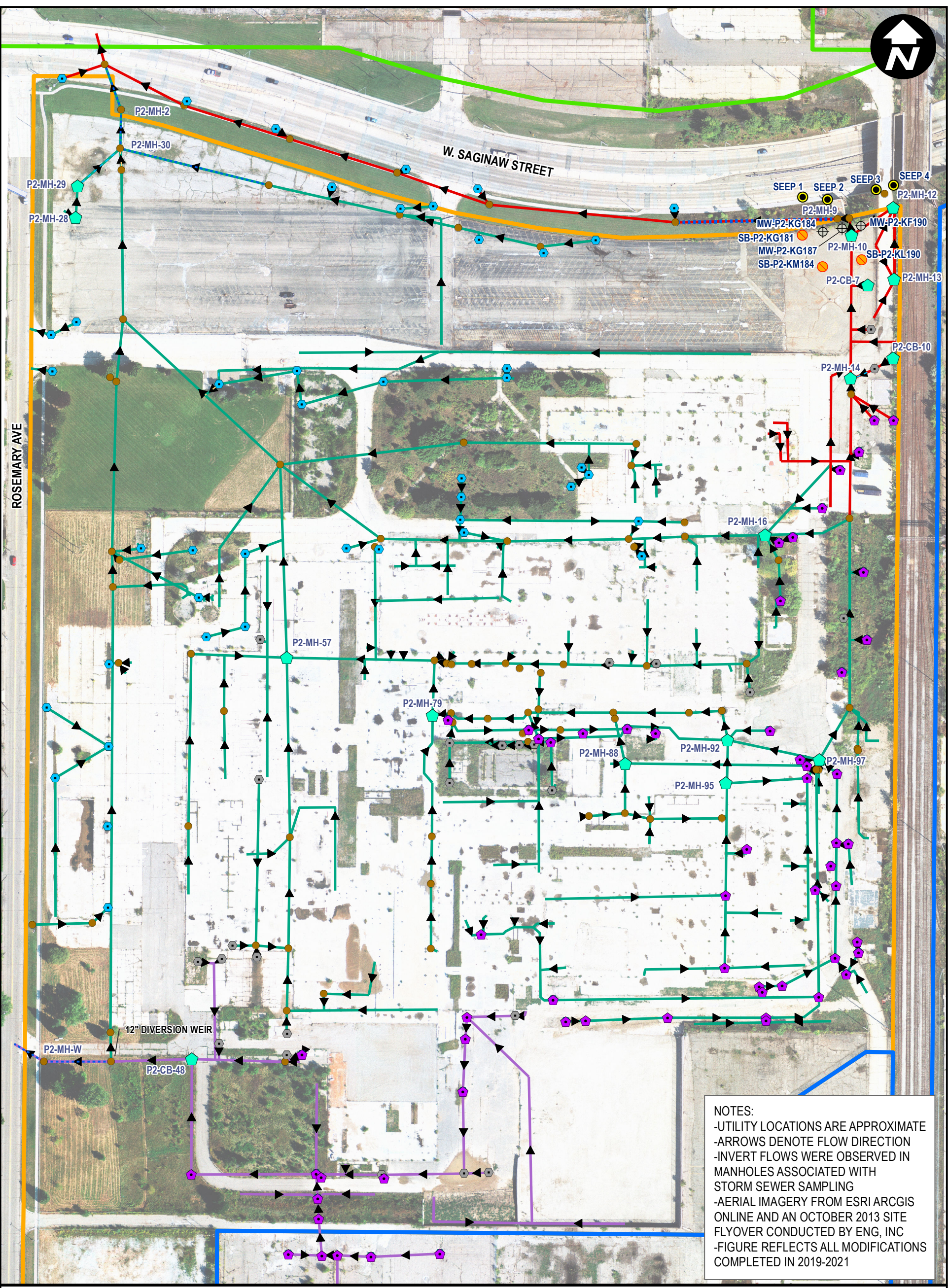
**PLANT 6 PFAS STORM SEWER SAMPLING ANALYTICAL RESULTS**

ARCADIS

SCALE IN FEET

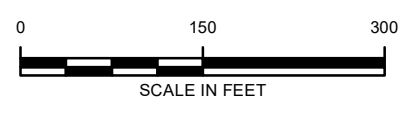
FIGURE  
**3**

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TR: A. LORENZ TM: A. LORENZ PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
 T:\ENVRACER\Buffalo\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 3 - Plant 6 PFAS Storm Sewer Sampling Analytical Results Shane 06152021.mxd PLOTTED: 7/21/2021 2:32:47 PM BY: Dressback



NOTES:  
 -UTILITY LOCATIONS ARE APPROXIMATE  
 -ARROWS DENOTE FLOW DIRECTION  
 -INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING  
 -AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC  
 -FIGURE REFLECTS ALL MODIFICATIONS COMPLETED IN 2019-2021

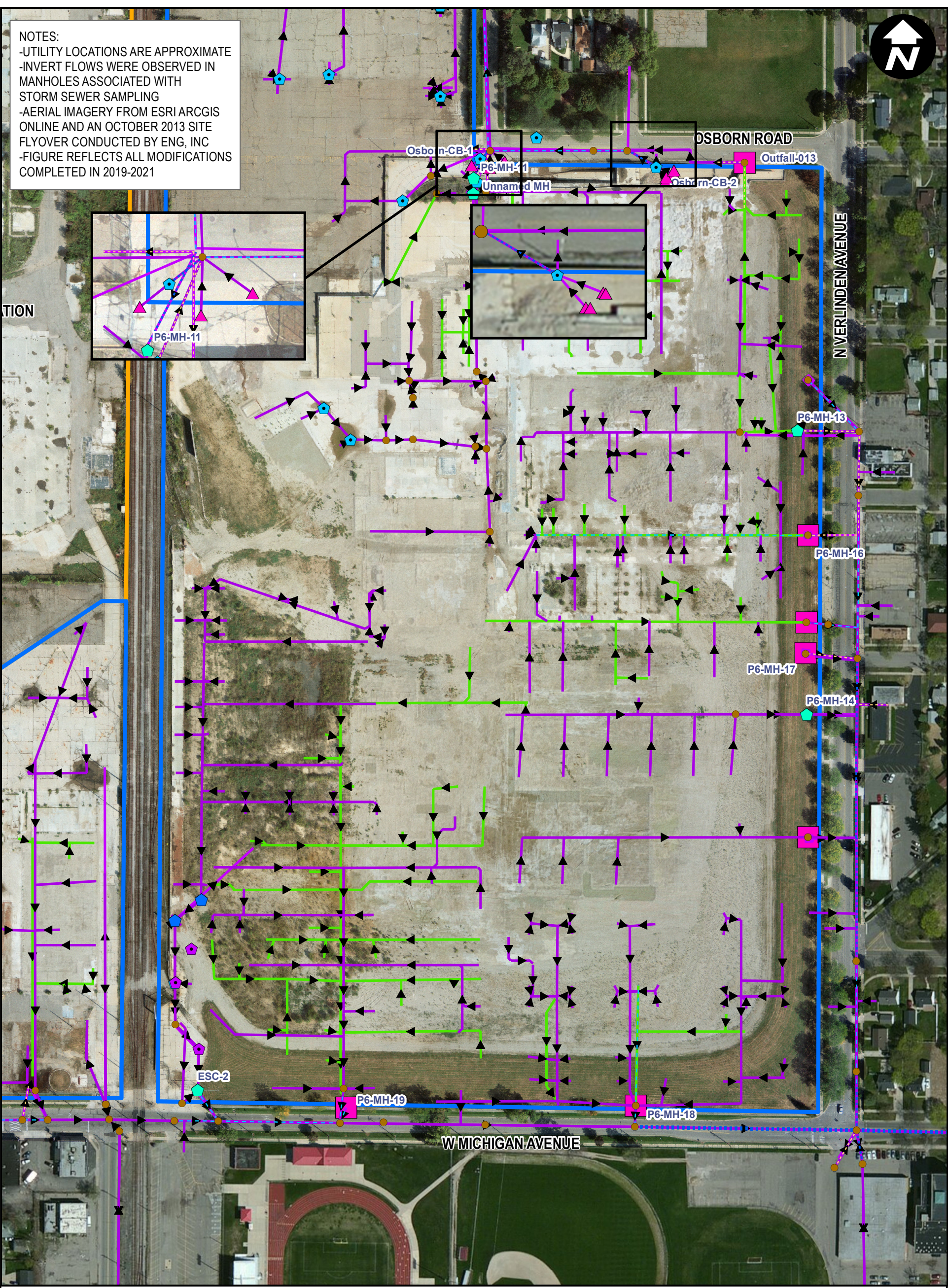
- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>ADJUSTMENT TYPE</b></p> <ul style="list-style-type: none"> <li><span style="color: green;">◆</span> FILLED STRUCTURE</li> <li><span style="color: purple;">◆</span> CAPPED STRUCTURE</li> </ul> <p><b>STRUCTURES &amp; SAMPLE POINTS</b></p> <ul style="list-style-type: none"> <li><span style="color: brown;">●</span> MANHOLE</li> <li><span style="color: grey;">●</span> COULD NOT LOCATE STRUCTURE</li> <li><span style="color: blue;">●</span> CATCH BASIN REMAINING OPEN</li> <li><span style="color: yellow;">●</span> SEEP LOCATION</li> <li><span style="color: orange;">●</span> SOIL BORING LOCATION</li> <li><span style="color: grey;">⊕</span> TEMPORARY WELL</li> </ul> | <p><b>PLANT 2 DRAINAGE NETWORKS</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">→</span> NORTHEAST (ABANDONED)</li> <li><span style="color: green;">→</span> CENTRAL (PARTIALLY ABANDONED)</li> <li><span style="color: purple;">→</span> SOUTHWEST (ABANDONED)</li> </ul> <p><b>OBSERVED FLOW (May 2021)</b></p> <ul style="list-style-type: none"> <li><span style="color: orange;">—</span> NO FLOW</li> <li><span style="color: blue;">- - -</span> TRICKLE (~1 GPM OR LESS)</li> <li><span style="color: green;">- - - -</span> LITTLE (~1-3 GPM)</li> <li><span style="color: red;">- - - - -</span> MODERATE (~3 GPM OR GREATER)</li> </ul> | <p><b>PLANT BOUNDARIES</b></p> <ul style="list-style-type: none"> <li><span style="border: 1px solid orange; display: inline-block; width: 10px; height: 10px;"></span> PLANT 2</li> <li><span style="border: 1px solid green; display: inline-block; width: 10px; height: 10px;"></span> PLANT 3</li> <li><span style="border: 1px solid blue; display: inline-block; width: 10px; height: 10px;"></span> PLANT 6</li> </ul> |
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RACER TRUST PLANTS 2, 3 & 6 LANSING, MICHIGAN	
<b>PLANT 2 STORM SEWER MODIFICATIONS</b>	
	FIGURE <span style="font-size: 24pt; font-weight: bold;">4</span>

CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TR: J. SALING PROJECT NUMBER: 3007594.103600 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
 T:\\_ENV\RACER\Buffs\01\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 4 - Plant 2 Storm Sewer Modifications\_Shane\_05122021.mxd PLOTTED: 7/21/2021 2:28:24 PM BY: Dressback

NOTES:  
 -UTILITY LOCATIONS ARE APPROXIMATE  
 -INVERT FLOWS WERE OBSERVED IN  
 MANHOLES ASSOCIATED WITH  
 STORM SEWER SAMPLING  
 -AERIAL IMAGERY FROM ESRI ARCGIS  
 ONLINE AND AN OCTOBER 2013 SITE  
 FLYOVER CONDUCTED BY ENG, INC  
 -FIGURE REFLECTS ALL MODIFICATIONS  
 COMPLETED IN 2019-2021



CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TR: J. SALING PROJECT NUMBER: 30075941 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
 T:\\_ENV\RACER\Buffalo\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 5 - Plant 6 Storm Sewer Modifications\_Shane\_05122021.mxd PLOTTED: 7/26/2021 4:04:26 PM BY: Dressback

**ADJUSTMENT**

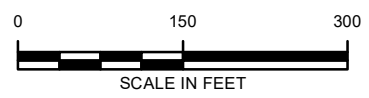
- FILLED STRUCTURE
- CAPPED STRUCTURE
- PLUGGED INVERT
- SEWER LINE CUT AND CAPPED AT PROPERTY LINE DURING 2014 DEMOLITION
- BULKHEAD
- STORM STRUCTURES**
- MANHOLE
- MANHOLE COULD NOT BE LOCATED
- CATCH BASIN REMAINING OPEN

**PLANT 6 DRAINAGE NETWORKS**

- STORM LINE
- SANITARY LINE
- OBSERVED FLOW (May 2021)**
- NO FLOW
- TRICKLE (~1 GPM OR LESS)
- LITTLE (~1-3 GPM)
- MODERATE (~3 GPM OR GREATER)

**PLANT BOUNDARIES**

- PLANT 2
- PLANT 6



RACER TRUST PLANTS 2, 3 & 6 LANSING, MICHIGAN	
<b>PLANT 6 STORM SEWER MODIFICATIONS</b>	
	FIGURE <b>5</b>



# Appendix A

## Field Notes

# Daily Log

**Project Name :** RACER Lansing

**Weather(°F) :** Sunny 40 deg

**Project Number :** 30075941

**Prepared By:** Eric Feenstra

**Purpose :** Sewer Inspection

**PPE :** Level D

**Equipment:**

Date	Time	Description of Activities
03/31/2021	08:34	P2-MH-28 has no other inputs and outputs other than known. Vac out 1 foot of water. Begin CCTV from P2-MH-28 to P2-MH-29.
03/31/2021	09:19	Done with P2 no obvious leaks in line between the 2 MH. Possible leaks in brick wall of downstream MH
03/31/2021	09:20	Vac out CB-2. No other pipes other than known. Water coming through bottom of "sediment catch" water also likely coming through walls of brick CB as well from site side
03/31/2021	10:04	Contents transferred to 4 drums in P2 staging area. Drums are labeled

**Signature:**



**Waste Management:**

Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
03/31/2021	no				Good	yes	4	55-gallon	Good	

# Daily Log

**Project Name :** RACER Lansing

**Weather(°F) :** Cloudy 30

**Project Number :** 30075941

**Prepared By:** Allyson Hartz

**Purpose :** Sewer Modifications

**PPE :** Level D

**Equipment:**

Date	Time	Description of Activities
04/16/2021	08:00	Arcadis and JSS onsite. Complete H&S tailgate and COVID assessments.
04/16/2021	08:15	JSS begins mobilizing, starting with pumping out P2-MH-14 into the frac tank.
04/16/2021	08:20	Documented the seeps on Saginaw.
04/16/2021	09:50	Begin pumping first few feet of water out of P2-MH-13 and P2-MH-12 to grass area near drum staging area.
04/16/2021	10:26	Flowable fill truck onsite, begin filling P2-MH-14.
04/16/2021	10:39	Flowable fill truck offsite. JSS will order more in order to finish filling to ground surface.
04/16/2021	10:55	Second flowable fill truck onsite. Continue filling P2-MH-14.
04/16/2021	10:57	Concrete truck onsite. Begin filling P2-MH-12 and P2-MH-13.
04/16/2021	11:10	Second flowable fill truck offsite. Finished filling P2-MH-14 to ground surface.
04/16/2021	11:21	Concrete truck offsite. Finished filling P2-MH-12 and P2-MH-13.
04/16/2021	11:52	JSS offsite.
04/16/2021	12:02	Document seeps on Saginaw. Arcadis offsite.

**Signature:** 

**Waste Management:**

Drums On Site

Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
04/16/2021	no					no				See tracker

## Other Photos



P2-MH-12 filled with concrete.



Ponded area between bridge and P2-MH-14. Taken from bridge facing south.



P2-MH-12 after pumping out. Facing north.



P2-MH-13 after pumping out. Facing north.



Ponded area between P2-MH-14 and bridge. Facing northeast.



P2-MH-14 filled with flowable fill.

## Daily Log



Ponding at P2-MH-13 and P2-MH-12 has decreased since yesterday.



P2-MH-13 filled with concrete.



P2-MH-14 after pumping out. Facing north.

# Daily Log

**Project Name :** RACER Lansing

**Weather(°F) :** Overcast, 43°

**Project Number :** 30075941

**Prepared By:** Anyssa Mandich

**Purpose :** Sewer Modifications

**PPE :** Level D

**Equipment:**

Date	Time	Description of Activities
04/30/2021	07:45	Anyssa Mandich and part of JSS crew on site. Other half of crew had flat tires.
04/30/2021	08:10	JSS crew arrived.
04/30/2021	08:15	H&S tailgate
04/30/2021	08:40	Cannot perform CSE while raining. Skid steer was also dropped off in incorrect place. Stand down, but went to each location for a walkthrough prior to starting work.
04/30/2021	09:20	JSS set up at P2-CB-7 to start soft dig. Skid steer is being re-delivered
04/30/2021	09:45	Tried to scrape off rubble to locate P2-CB-8. Unable to locate
04/30/2021	09:50	Western pipe in P2-CB-7 appears to be a 90° pipe
04/30/2021	10:20	JSS finished cleaning out P2-CB-7. 75" depth to bottom. Eastern pipe 47.75" depth to invert. Western pipe (90°) depth to opening of invert 51.5". Filled 2 drums 1/2 full with watery soil and debris
04/30/2021	11:40	Mobilized to Osborn-CB-2. Noted 4" pipe and 12" pipe coming from site
04/30/2021	12:35	The 4" pipe was leaking around the actual HDPE pipe. Attempted to placer drier hydraulic cement around this pipe, but it didn't stick. Called M. Samp and verified we will come back during dry weather to assess.
04/30/2021	13:00	JSS finished plugging pipes in Osborn-CB-2
04/30/2021	14:30	JSS ran tape up northwest HDPE invert of P2-MH-28. There was a blockage at around 1 foot up the pipe.
04/30/2021	14:35	Concrete arrived
04/30/2021	14:40	JSS filled P2-MH-29 with concrete. Used vibrator to remove air pockets.
04/30/2021	14:50	JSS filled P2-MH-28 with concrete. Used vibrator to remove air pockets.
04/30/2021	15:00	JSS filled P2-CB-7 with concrete. Used vibrator to remove air pockets
04/30/2021	15:15	JSS and Arcadis off site

**Signature:** 

<b>Waste Management:</b>										
Drums On Site										
Date	Are there any waste drums on site?	Number of Drums upon Arrival	Size of Drums	Type of Drums	Condition of Drums	Waste Drummed Today?	Number of drums Created	Size of drums	Condition of Drums	General Waste Comments
04/30/2021	no				Good	yes	2	55-gallon	Good	Drums are half full. Contain watery soil/debris.

**Other Photos**



P2-MH-29 filled



null



Osborn-CB-2 plugs



P2-CB-7 cleaned out



Osborn-CB-2 plugs



null

# Daily Log



P2-CB-7 filled



null



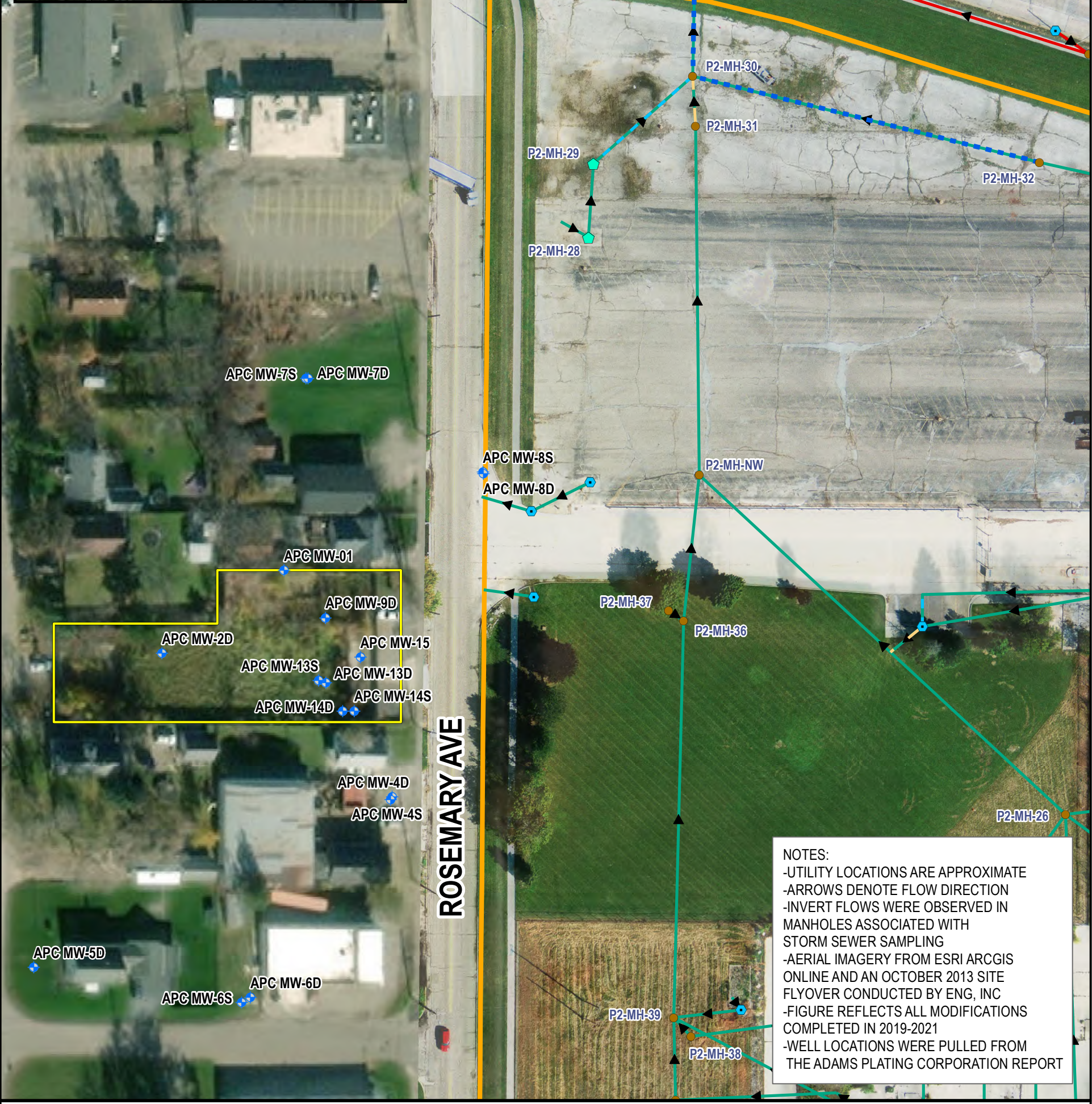
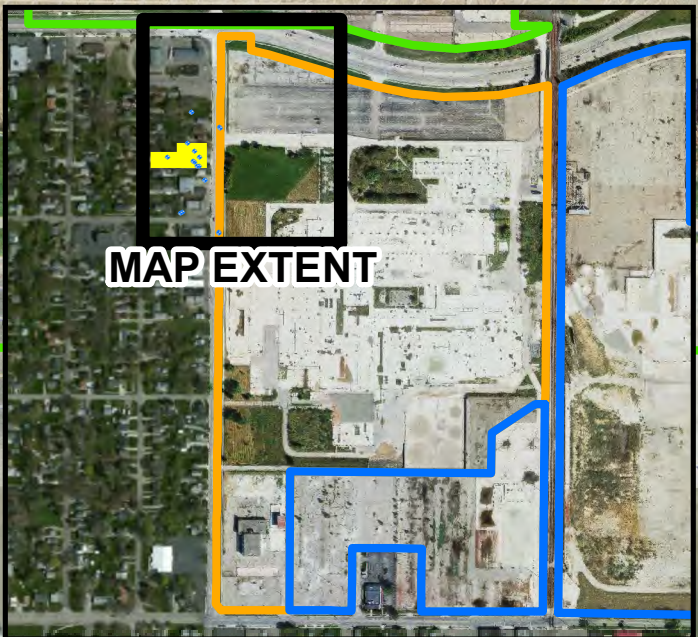
P2-CB-7 cleaned out with 90° pipe exposed



P2-MH-28 filled

# Appendix B

## PFAS Fingerprinting Results



NOTES:  
 -UTILITY LOCATIONS ARE APPROXIMATE  
 -ARROWS DENOTE FLOW DIRECTION  
 -INVERT FLOWS WERE OBSERVED IN MANHOLES ASSOCIATED WITH STORM SEWER SAMPLING  
 -AERIAL IMAGERY FROM ESRI ARCGIS ONLINE AND AN OCTOBER 2013 SITE FLYOVER CONDUCTED BY ENG, INC  
 -FIGURE REFLECTS ALL MODIFICATIONS COMPLETED IN 2019-2021  
 -WELL LOCATIONS WERE PULLED FROM THE ADAMS PLATING CORPORATION REPORT

**ADJUSTMENT TYPE**

- FILLED STRUCTURE

**STRUCTURES & SAMPLE POINTS**

- MANHOLE
- COULD NOT LOCATE STRUCTURE
- CATCH BASIN REMAINING OPEN
- APC MONITORING WELL

**PLANT 2 DRAINAGE NETWORKS**

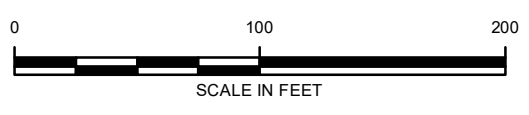
- NORTHEAST (ABANDONED)
- CENTRAL (PARTIALLY ABANDONED)

**OBSERVED FLOW (May 2021)**

- NO FLOW
- TRICKLE (~1 GPM OR LESS)
- LITTLE (~1-3 GPM)
- MODERATE (~3 GPM OR GREATER)

**PLANT BOUNDARIES**

- PLANT 2
- PLANT 3
- PLANT 6
- ADAMS PLATING AREA



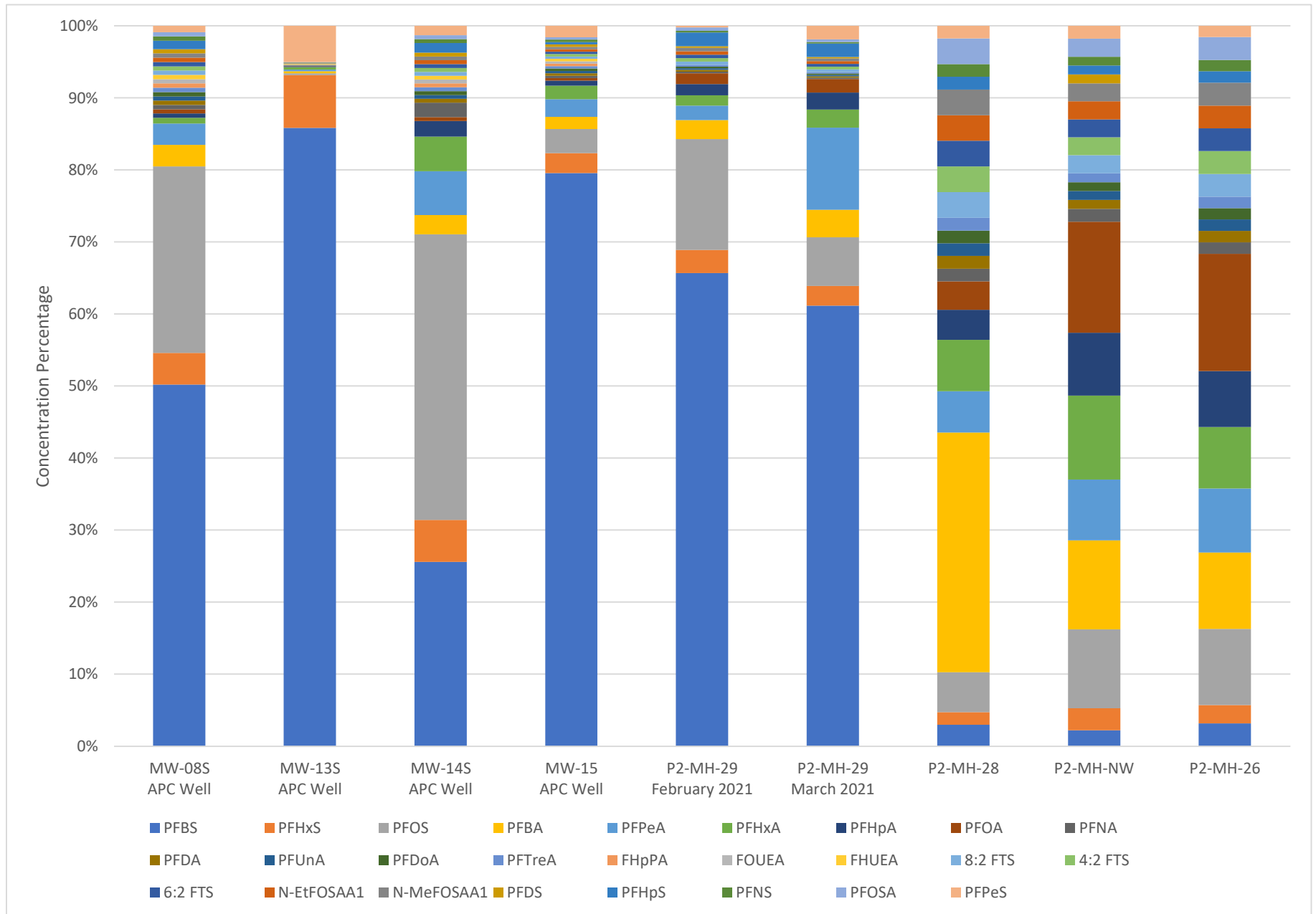
RACER TRUST  
 PLANTS 2, 3 & 6  
 LANSING, MICHIGAN

**ADAMS PLATING CORPORATION WELL LOCATIONS AND ON-SITE MANHOLE LOCATIONS**

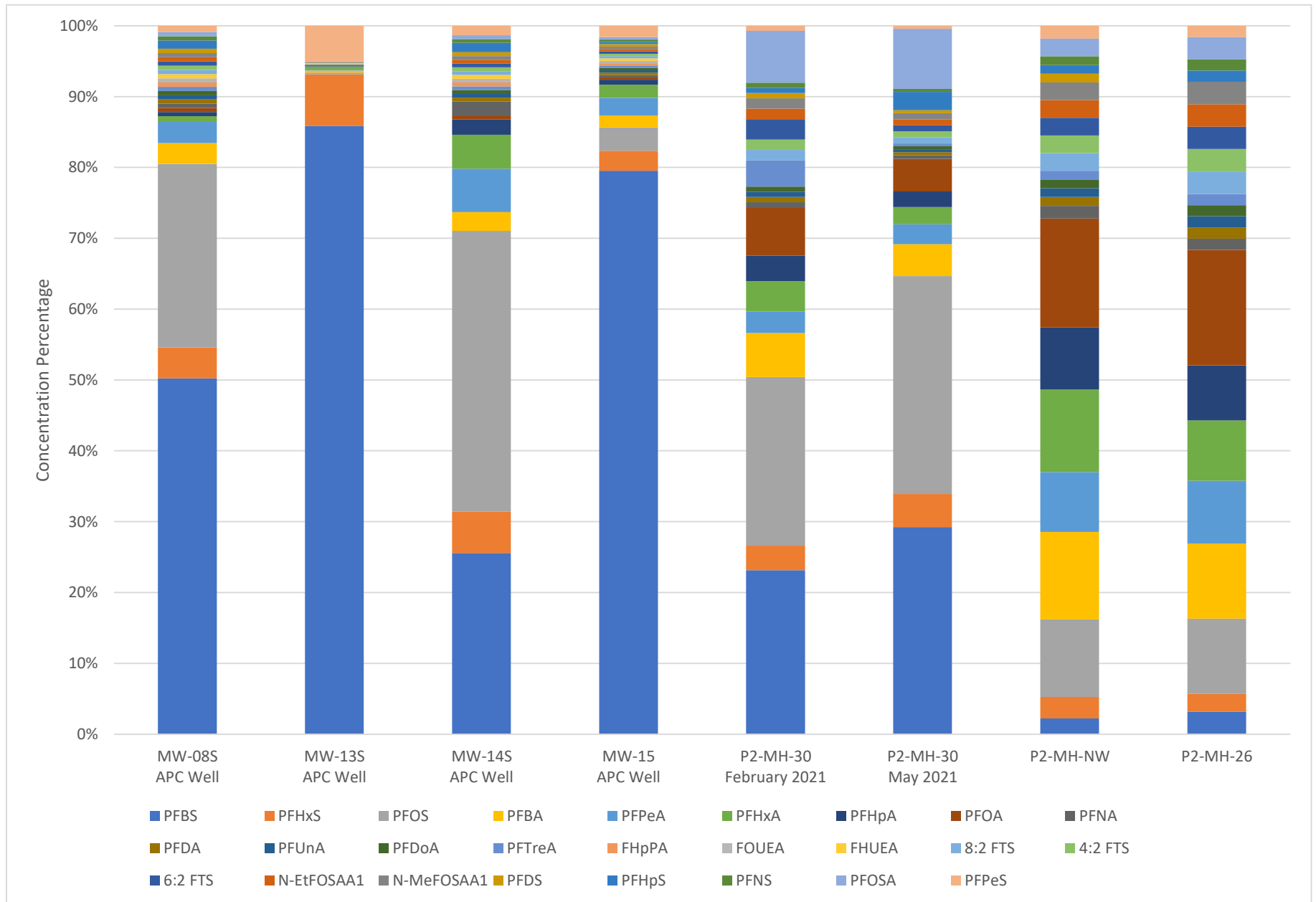


CITY: Novi DIV: ENV PIC: J. BARRETT PM: T. LINDER TR: A. LORENZ PROJECT NUMBER: 30075941.03600 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
 T:\ENV\RACER\Bulfaio\MXDs\2020 P2 P3 P6 Storm Sewer Modifications Completion Report\Figure 1 - Adams Plating Corporation Well Locations and On-Site Manhole Locations.mxd PLOTTED: 8/26/2021 12:36:47 PM BY: Dressback

PFAS Fingerprinting Results Pre-Filling  
 Plants 2 and 6 Sewer Modifications Completion Update Report  
 RACER Trust - Plant 2 Industrial Land, Lansing, Michigan



**PFAS Fingerprinting Post-Filling**  
**Plants 2 and 6 Sewer Modifications Completion Update Report**  
**RACER Trust - Plant 2 Industrial Land, Lansing, Michigan**



# Appendix C

## Photo Log

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 1**

**Description:**  
P2-MH-29 Brick  
Groundwater Infiltration

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
E. Feenstra & CCTV

**Date:** 3/31/2021



**Photograph: 2**

**Description:**  
P2-MH-28 to P2-MH-29  
no infiltration

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
E. Feenstra & CCTV

**Date:** 3/31/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 3**

**Description:**  
P2-MH-28 prior to  
cleaning

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
E. Feenstra

**Date:** 3/31/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 4**

**Description:**  
P2-MH-12 and P2-MH-13 Area Ponding

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Hartz

**Date:** 4/16/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 5**

**Description:**  
P2-MH-12 Dewatered

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Hartz

**Date:** 4/16/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 6**

**Description:**  
P2-MH-12 Filled with  
Concrete

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Hartz

**Date:** 4/16/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 7**

**Description:**  
P2-MH-13 Dewatered

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Hartz

**Date:** 4/16/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 8**

**Description:**  
P2-MH-14 Area  
Ponding

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Hartz

**Date:** 4/16/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 9**

**Description:**  
P2-MH-14 Dewatered

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Hartz

**Date:** 4/16/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 10**

**Description:**  
P2-CB-7 Partially Clean  
with Soft Dig Machine

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 4/30/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 11**

**Description:**  
P2-CB-7 Cleaned

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 4/30/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 12**

**Description:**  
P2-CB-7 Filled

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 4/30/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 13**

**Description:**  
P2-MH-28 Filled

**Location:**  
Plant 2  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 4/30/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 14**

**Description:**  
Osborn-CB-2  
Southeastern Pipes  
Plugged

**Location:**  
Plant 6  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 4/30/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 15**

**Description:**

Osborn & Stanley  
Street Stormwater  
Inspection (Osborn-CB-  
1) – Consistent with  
Pre-Sewer  
Modifications  
Conditions

**Location:**

Plant 6  
Lansing, MI

**Photograph taken by:**

A. Mandich

**Date:** 6/28/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 16**

**Description:**  
Saginaw Seeps  
Looking East

**Location:**  
Saginaw Street Seeps  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 5/17/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 17**

**Description:**

Damp Grass  
Embankment off of  
Saginaw Street

**Location:**

Saginaw Street  
Lansing, MI

**Photograph taken by:**

A. Mandich

**Date:** 5/17/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 18**

**Description:**  
Saginaw Street Seeps  
Looking West

**Location:**  
Saginaw Street  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 5/17/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 19**

**Description:**  
Saginaw Street Seep in  
Overpass Wall

**Location:**  
Saginaw Street  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 5/17/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 20**

**Description:**  
Saginaw Street Seeps  
Looking East

**Location:**  
Saginaw Street  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 7/20/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 21**

**Description:**  
Damp Grass  
Embankment off of  
Saginaw Street

**Location:**  
Saginaw Street  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 7/20/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 22**

**Description:**  
Saginaw Street Seeps  
Looking West

**Location:**  
Saginaw Street  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 7/20/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 23**

**Description:**  
Saginaw Street  
Manhole

**Location:**  
Saginaw Street  
Lansing, MI

**Photograph taken by:**  
A. Mandich

**Date:** 4/27/2021

# Photograph Log

RACER Trust  
RACER Lansing  
30075941.03600



**Photograph: 24**

**Description:**  
Saginaw Manhole  
Southeast Drain Pipe to  
Plant 2 CCTV

**Location:**  
Saginaw Street  
Lansing, MI

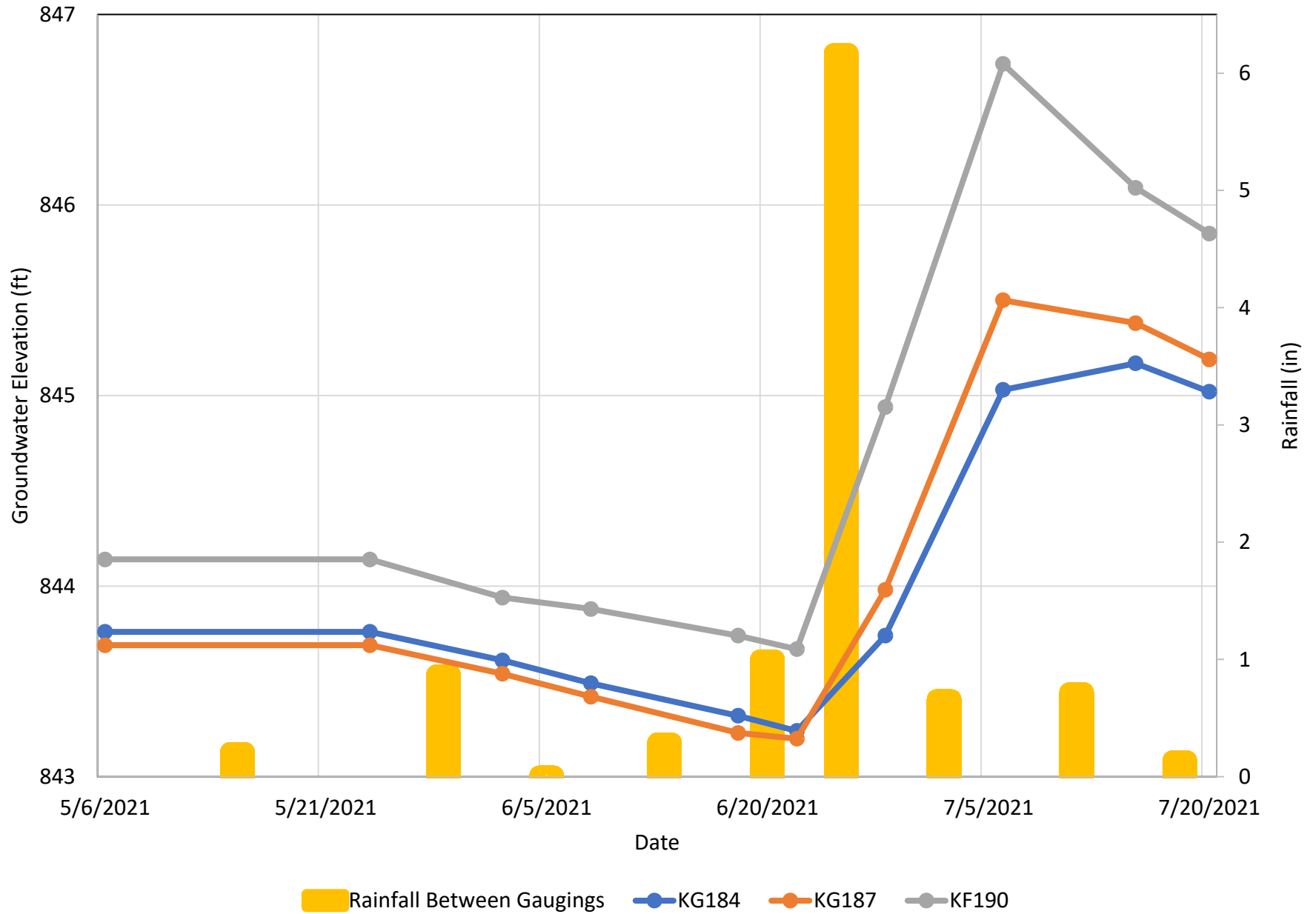
**Photograph taken by:**  
A. Mandich & CCTV

**Date:** 6/4/2021

# Appendix D

## Seeps Investigation Analytical Results and Water Levels

Temporary Well Groundwater Elevation and Precipitation  
 Plants 2 and 6 Sewer Modifications Completion Update Report  
 RACER Trust - Plant 2 Industrial Land, Lansing, Michigan



Appendix D - Table 1  
 Seeps Soil Boring Analytical  
 Plants 2 and 6 Sewer Modifications Completion Update Report  
 RACER Trust - Plant 2 Industrial Land, Lansing, Michigan



Location ID: Date Collected: Sample Name:	Units	SB-P2-SEEP 5/6/2021 SB-P2-SEEP_050621	SB-P2-KF190 5/6/2021 SB-P2-KF190_14-19	SB-P2-KG184 5/6/2021 SB-P2-KG184_15-20	SB-P2-KG187 5/6/2021 SB-P2-KG187_14-19
<b>Inorganics (Method E300.0)</b>					
Chloride	mg/L	36	18	19	18
Fluoride (Undistilled)	mg/L	ND	ND	ND	ND
Sulfate	mg/L	50	45	45	38
<b>Inorganics (Method SM2320B)</b>					
Alkalinity as CaCO3	mg/L	292	264	280	270
Carbonate Alkalinity	mg/L	ND	ND	ND	ND
<b>Inorganics (Method SM4500-CI G)</b>					
Chlorine Residual	mg/L	ND	ND	ND	ND
<b>Metals (Method E200.8)</b>					
Calcium	mg/L	94.2	850	112	306
Magnesium	mg/L	21	279	22.8	87.1
Potassium	mg/L	ND	8.5	2.94	6.79
Sodium	mg/L	2.5	36.9	37	34.3
<b>Field Parameters</b>					
pH	SU	7.58	7.23	7.17	7.26
Temperature	°C	10.3	10.8	9.2	9.5
Conductivity	mS/cm	0.74	0.522	0.653	0.421
Dissolved Oxygen	mg/L	7.57	7.3	2.3	5.97
Redox (ORP)	mV	-25.4	-53.1	-88.8	-76.3

Notes:

- °C = degrees Celsius
- ND = Not detected
- mg/L = milligrams per liter
- mS/cm = millisiemens per centimeter
- mV = millivolt
- SU = standard units



Report ID: S22431.01(01)  
Generated on 03/25/2021

Report to

Attention: Andrew Lorenz

Arcadis  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 248-809-1813 FAX:  
Email: [andrew.lorenz@arcadis.com](mailto:andrew.lorenz@arcadis.com)

Additional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet, Tiffany Linder

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery ([johnlavery@meritlabs.com](mailto:johnlavery@meritlabs.com))  
Barbara Ball ([bball@meritlabs.com](mailto:bball@meritlabs.com))

Report Summary

Lab Sample ID(s): S22431.01-S22431.02  
Project: 30075941.03600 / Racer Lansing  
Collected Date(s): 03/22/2021  
Submitted Date/Time: 03/22/2021 12:25  
Sampled by: Donald Richmond  
P.O. #: 30075941.03600

Table of Contents

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Maya Murshak  
Technical Director



## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

## Report Narrative

---

Trihalomethane results unavailable at this time

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



## Method Summary

Method	Version
E524.4	
SM4500-CI G	Standard Method 4500-CI G 2011
SM4500-CI-G	Standard Method 4500 CI G 2011



## Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S22431.01	P2-MH-01_032221	Groundwater	03/22/21 10:00
S22431.02	SEEP_032221	Groundwater	03/22/21 10:30



# Analytical Laboratory Report

Preliminary Report

Lab Sample ID: S22431.01

Sample Tag: P2-MH-01\_032221

Collected Date/Time: 03/22/2021 10:00

Matrix: Groundwater

COC Reference: 142108

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	C6H8O6/HCl	Yes	5.7	IR
1	125ml Plastic	None	Yes	5.7	IR

### Inorganics

Method: SM4500-Cl G, Run Date: 03/22/21 15:50, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine Residual*	Not detected	0.05		mg/L	1	7782-50-5	

Method: SM4500-Cl-G, Run Date: 03/22/21 15:50, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine*	Not detected	0.05		mg/L	1	7782-50-5	

### Organics

Trihalomethanes, Method: E524.4, Run Date: / /, Analyst:

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloroform*	Incomplete			ug/L		67-66-3	
Bromodichloromethane*	Incomplete			ug/L		75-27-4	
Dibromochloromethane*	Incomplete			ug/L		124-48-1	
Bromoform*	Incomplete			ug/L		75-25-2	



# Analytical Laboratory Report

Preliminary Report

Lab Sample ID: S22431.02

Sample Tag: SEEP\_032221

Collected Date/Time: 03/22/2021 10:30

Matrix: Groundwater

COC Reference: 142108

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	C6H8O6/HCl	Yes	5.7	IR
1	125ml Plastic	None	Yes	5.7	IR

### Inorganics

Method: SM4500-CI G, Run Date: 03/22/21 16:00, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine Residual*	Not detected	0.05		mg/L	1	7782-50-5	

Method: SM4500-CI-G, Run Date: 03/22/21 16:00, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine*	Not detected	0.05		mg/L	1	7782-50-5	

### Organics

Trihalomethanes, Method: E524.4, Run Date: / / , Analyst:

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloroform*	Incomplete			ug/L		67-66-3	
Bromodichloromethane*	Incomplete			ug/L		75-27-4	
Dibromochloromethane*	Incomplete			ug/L		124-48-1	
Bromoform*	Incomplete			ug/L		75-25-2	

# Merit Laboratories Login Checklist

Lab Set ID:S22431

Attention: Andrew Lorenz

Address: Arcadis  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.03600 / Racer Lansing

Submitted:03/22/2021 12:25 Login User: MMC

Phone: 248-809-1813

FAX:

Email: andrew.lorenz@arcadis.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |                                                                                                  |                                                        |
|-----|--------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 5.7 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped                                        |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |                                                                                                  |                                                                         |
|-----|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                                               |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab                                  |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC                                         |
| 09. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: Trace UPS # 1Z4664770162971138 |

## Preservation

- |     |                                                                                                  |                                                     |
|-----|--------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |                                                                                                  |                                               |
|-----|--------------------------------------------------------------------------------------------------|-----------------------------------------------|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 142108

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME: Andrew Lorenz  
 COMPANY: Arcadis  
 ADDRESS: 28550 Cabot Dr Suite 500  
 CITY: Novi STATE: MI ZIP CODE: 48377  
 PHONE NO.: 312 343 0377 FAX NO.: \_\_\_\_\_ P.O. NO.: \_\_\_\_\_  
 E-MAIL ADDRESS: andrew.lorenz@arcadis.com QUOTE NO.: \_\_\_\_\_

CONTACT NAME:  SAME  
 COMPANY: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP CODE: \_\_\_\_\_  
 PHONE NO.: \_\_\_\_\_ E-MAIL ADDRESS: \_\_\_\_\_

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: 30075941, 03600/ Racee Lansing SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Dr. Rich  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other \_\_\_\_\_  
 Special Instructions

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	Total Chlorides	Residual Chlorine	THM					
	DATE	TIME																		
22431.01	3/22/21	1000	P2-MH-01_032221	GW	4	X	X	X	X	X	X	X	X	X	X					
.02	3/22/21	1030	SEEP_032221	GW	4	X	X	X	X	X	X	X	X	X	X					

RELINQUISHED BY: Angela M. M... / Arcadis  Sampler DATE: 3/22/21 TIME: 10:05  
 RECEIVED BY: M. Caloto DATE: 3/22/21 TIME: 12:25

RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL 5.7



Report ID: S22431.01(02)+QC01  
Generated on 03/26/2021  
Replaces report S22431.01(01) generated on 03/25/2021

Report to

Attention: Andrew Lorenz  
Arcadis  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 248-809-1813 FAX:  
Email: andrew.lorenz@arcadis.com

Additional Contacts: Alex Villhauer, Marina Samp, Kaitlyn Voet, Tiffany Linder

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S22431.01-S22431.02  
Project: 30075941.03600 / Racer Lansing  
Collected Date(s): 03/22/2021  
Submitted Date/Time: 03/22/2021 12:25  
Sampled by: Donald Richmond  
P.O. #: 30075941.03600

Table of Contents

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- General Report Notes (Page 2)
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- Sample Summary (Page 5)
- QC Report (Pages 8-12)

Maya Murshak  
Technical Director



## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

## Report Narrative

---

All analyses completed



Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



## Method Summary

Method	Version
E524.4	
SM4500-CI G	Standard Method 4500-CI G 2011
SM4500-CI-G	Standard Method 4500 CI G 2011



## Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S22431.01	P2-MH-01_032221	Groundwater	03/22/21 10:00
S22431.02	SEEP_032221	Groundwater	03/22/21 10:30



# Analytical Laboratory Report

Final Report

Lab Sample ID: S22431.01

Sample Tag: P2-MH-01\_032221

Collected Date/Time: 03/22/2021 10:00

Matrix: Groundwater

COC Reference: 142108

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	C6H8O6/HCl	Yes	5.7	IR
1	125ml Plastic	None	Yes	5.7	IR

### Inorganics

Method: SM4500-CI G, Run Date: 03/22/21 15:50, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine Residual*	Not detected	0.05		mg/L	1	7782-50-5	

Method: SM4500-CI-G, Run Date: 03/22/21 15:50, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine*	Not detected	0.05		mg/L	1	7782-50-5	

### Organics

Trihalomethanes, Method: E524.4, Run Date: 03/24/21 22:40, Analyst: Trace

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloroform*	Not detected	0.50		ug/L	1	67-66-3	O
Bromodichloromethane*	Not detected	0.50		ug/L	1	75-27-4	O
Dibromochloromethane*	Not detected	5.0		ug/L	1	124-48-1	O
Bromoform*	Not detected	0.50		ug/L	1	75-25-2	O

O-Analysis performed by outside laboratory. See attached report.



**Lab Sample ID: S22431.02**

Sample Tag: SEEP\_032221

Collected Date/Time: 03/22/2021 10:30

Matrix: Groundwater

COC Reference: 142108

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	C6H8O6/HCl	Yes	5.7	IR
1	125ml Plastic	None	Yes	5.7	IR

**Inorganics**

**Method: SM4500-Cl G, Run Date: 03/22/21 16:00, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine Residual*	Not detected	0.05		mg/L	1	7782-50-5	

**Method: SM4500-Cl-G, Run Date: 03/22/21 16:00, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine*	Not detected	0.05		mg/L	1	7782-50-5	

**Organics**

**Trihalomethanes, Method: E524.4, Run Date: 03/24/21 23:18, Analyst: Trace**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloroform*	Not detected	0.50		ug/L	1	67-66-3	O
Bromodichloromethane*	Not detected	0.50		ug/L	1	75-27-4	O
Dibromochloromethane*	Not detected	5.0		ug/L	1	124-48-1	O
Bromoform*	Not detected	0.50		ug/L	1	75-25-2	O

O-Analysis performed by outside laboratory. See attached report.



# Quality Control Report

Report ID: S22431.01(02)+QC01  
Generated on 03/26/2021

Report to  
Attention: Andrew Lorenz  
Arcadis  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Report Produced by  
Merit Laboratories  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Phone: 248-809-1813 FAX:

## Report Summary

Lab Sample ID(s): S22431.01-S22431.02  
Project: 30075941.03600 / Racer Lansing  
Submitted Date/Time: 03/22/2021 12:25  
Sampled by: Donald Richmond  
P.O. #: 30075941.03600

## QC Report Sections

Cover Page (Page 8)  
Analysis Summary (Pages 9-10)  
Prep Batch Summary (Page 11)  
Batch QC Results (Page 12)

## Report Flag Descriptions

\*: QC result is outside of indicated control limits  
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball  
Quality Assurance Manager

# QC Report - Analysis Summary

Lab Sample ID: S22431.01

Sample Tag: P2-MH-01\_032221

Collected Date/Time: 03/22/2021 10:00

Matrix: Groundwater

COC Reference: 142108

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Inorganics</b>						
Chlorine Residual	SM4500-Cl G	03/22/21 15:50	CHL210322-W1	CHL210322-W1	No	BLK/LCS/MS/DUP
Chlorine	SM4500-Cl-G	03/22/21 15:50	CHL210322-W1	CHL210322-W1	No	BLK/LCS/MS/DUP

# QC Report - Analysis Summary

Lab Sample ID: S22431.02

Sample Tag: SEEP\_032221

Collected Date/Time: 03/22/2021 10:30

Matrix: Groundwater

COC Reference: 142108

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
<b>Inorganics</b>						
Chlorine Residual	SM4500-Cl G	03/22/21 16:00	CHL210322-W1	CHL210322-W1	No	BLK/LCS/MS/DUP
Chlorine	SM4500-Cl-G	03/22/21 16:00	CHL210322-W1	CHL210322-W1	No	BLK/LCS/MS/DUP

# QC Report - Prep Batch Summary

## Inorganics, Prep Batch ID: CHL210322-W1

Surrogates: No, QC Types: BLK/LCS/MS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S22431.01	Chlorine Residual	SM4500-Cl G	03/22/21 15:50	CHL210322-W1
S22431.01	Chlorine	SM4500-Cl-G	03/22/21 15:50	CHL210322-W1
S22431.02	Chlorine Residual	SM4500-Cl G	03/22/21 16:00	CHL210322-W1
S22431.02	Chlorine	SM4500-Cl-G	03/22/21 16:00	CHL210322-W1

# QC Report - Batch QC Results

## Inorganics, Prep Batch ID: CHL210322-W1

Surrogates: No, QC Types: BLK/LCS/MS/DUP

### Blank (BLK)

Lab Sample ID: CHL210322-W1.LRB1

Run in Batch: CHL210322-W1, Run Date: 03/22/2021 15:30, Prep Date: 03/22/2021, Matrix: Liquid, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Chlorine Residual		ND	0.05	mg/L
Chlorine		ND	0.05	mg/L

### Laboratory Control Sample (LCS)

Lab Sample ID: CHL210322-W1.LCS1

Run in Batch: CHL210322-W1, Run Date: 03/22/2021 15:45, Prep Date: 03/22/2021, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Chlorine Residual		100	90	110
Chlorine		100	90	110

### Matrix Spike (MS)

Lab Sample ID: CHL210322-W1.MS1, Parent Sample ID: S22431.01

Run in Batch: CHL210322-W1, Run Date: 03/22/2021 16:05, Prep Date: 03/22/2021, Matrix: Liquid, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Chlorine Residual	*	68	80	120
Chlorine	*	68	80	120

### Duplicate (DUP)

Lab Sample ID: CHL210322-W1.DP1, Parent Sample ID: S22431.01

Run in Batch: CHL210322-W1, Run Date: 03/22/2021 15:55, Prep Date: 03/22/2021, Matrix: Liquid, Dilution: 1

Analyte	Flags	RPD	RPD CL
Chlorine Residual		<1	15
Chlorine		<1	15

# Merit Laboratories Login Checklist

Lab Set ID:S22431

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941.03600 / Racer Lansing

Submitted:03/22/2021 12:25 Login User: MMC

Attention: Andrew Lorenz

Address: Arcadis  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 248-809-1813 FAX:  
Email: andrew.lorenz@arcadis.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.7
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to: Trace UPS # 1Z4664770162971138
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_



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 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 142108

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME: Andrew Lorenz  
 COMPANY: Arcadis  
 ADDRESS: 28550 Cabot Dr Suite 500  
 CITY: Novi STATE: MI ZIP CODE: 48377  
 PHONE NO.: 312 343 0377 FAX NO.: \_\_\_\_\_ P.O. NO.: \_\_\_\_\_  
 E-MAIL ADDRESS: andrew.lorenz@arcadis.com QUOTE NO.: \_\_\_\_\_

CONTACT NAME:  SAME  
 COMPANY: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP CODE: \_\_\_\_\_  
 PHONE NO.: \_\_\_\_\_ E-MAIL ADDRESS: \_\_\_\_\_

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME: 30075941, 03600/ Racee Lansing SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond / Dr. Rich  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other \_\_\_\_\_  
 Special Instructions

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	Total Chlorides	Residual Chlorine	THM					
	DATE	TIME																		
22431.01	3/22/21	1000	P2-MH-01_032221	GW	4	X	X	X	X	X	X	X	X	X	X					
.02	3/22/21	1030	SEEP_032221	GW	4	X	X	X	X	X	X	X	X	X	X					

RELINQUISHED BY: Angela M. M... / Arcadis  Sampler DATE: 3/22/21 TIME: 10:05  
 RECEIVED BY: M. Caloto DATE: 3/22/21 TIME: 12:25

RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL 5.7

Trace Analytical Laboratories, Inc.  
2241 Black Creek Road  
Muskegon, MI 49444-2673



231-773-5998 Phone  
888-979-4469 Fax  
www.trace-labs.com

March 26, 2021

Mr. John Lavery  
Merit Laboratories, Inc  
2680 East Lansing Dr.  
East Lansing, MI 48823

Phone: (517) 332-0167  
Fax: (517) 332-8020

RE: Trace Project 21C0786  
Client Project S22431

Dear Mr. Lavery:

Enclosed are your analytical results. The results of this report relate only to the samples listed in the body of this report.

All reports were examined through Trace's validation process to ensure that requirements for quality and completeness were satisfied. All reported analytical results were obtained in accordance with the methods referenced on the reports. Every practical effort was made to meet the reporting limit specifications for this work, however, some results may have raised reporting limits to correct for percent solids.

For clients that require NELAP Accreditation, Trace certifies that these test results meet all requirements of the NELAP Standard, except for those analytes with a "N" notation. These analytes have not been evaluated by NELAP at Trace's discretion and will not be reported unless requested by client.

If you have questions concerning this report, please contact me at 231.773.5998 or by email at [jmink@trace-labs.com](mailto:jmink@trace-labs.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Jon Mink".

Jon Mink  
Senior Project Manager  
Enclosures



NJDEP Accreditation No. MI008

**STATE OF MICHIGAN LABORATORY ID: 8001**

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Muskegon, MI 49444-2673



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### SAMPLE SUMMARY

Trace Project ID: 21C0786  
Client Project ID: S22431

Trace ID	Sample ID	Matrix	Collected By	Date Collected	Date Received
21C0786-01	S22431.01	Drinking Water	Client	03/22/21 10:00	03/24/21 10:15
21C0786-02	S22431.02	Drinking Water	Client	03/22/21 10:30	03/24/21 10:15

### CERTIFICATE OF ANALYSIS

STATE OF MICHIGAN LABORATORY ID: 8001

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## AN EXPLANATION OF TERMS AND SYMBOLS WHICH MAY OCCUR IN THIS REPORT

### DEFINITIONS

MS	Matrix Spike
RPD	Relative Percent Difference
DUP	Matrix Duplicate
RDL	Reporting Detection Limit
MCL	Maximum Contamination Limits as set by the Federal Safe Drinking Water Act
Not Detected	Indicates that the compound was not detected at the RDL
TNTC	Too Numerous To Count

**Results that are reported in bold or red have equalled or exceeded the MCL.**

### CERTIFICATE OF ANALYSIS

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**ANALYTICAL RESULTS**

Sample Location: S22431

Trace ID: 21C0786-01 Date Collected: 03/22/21 10:00  
 Sample Point Description: S22431.01 Date Received: 03/24/21 10:15

PARAMETERS	RESULTS	RDL	UNITS	PREPARED	BY	ANALYZED	BY	NOTES	MCL
<b>VOLATILE ORGANIC COMPOUNDS BY GC-MS</b>									
<b>Analysis Method: EPA 524.2</b>									
<i>Batch: T108434</i>									
Bromodichloromethane	Not Detected	0.50	ug/L	3/24/21 15:47	bag	3/24/21 22:40	bag	N	80
Bromoform	Not Detected	0.50	ug/L	3/24/21 15:47	bag	3/24/21 22:40	bag	N	80
Chloroform	Not Detected	0.50	ug/L	3/24/21 15:47	bag	3/24/21 22:40	bag	N	80
Dibromochloromethane	Not Detected	5.0	ug/L	3/24/21 15:47	bag	3/24/21 22:40	bag	N	No MCL
Total Trihalomethanes	Not Detected	2.0	ug/L	3/24/21 15:47	bag	3/24/21 22:40	bag	N	80
<b>Surrogates:</b>									
4-Bromofluorobenzene	93 %	46-147		3/24/21 15:47	bag	3/24/21 22:40	bag	N	
1,2-Dichlorobenzene-d4	91 %	52-135		3/24/21 15:47	bag	3/24/21 22:40	bag	N	

**CERTIFICATE OF ANALYSIS**

**STATE OF MICHIGAN LABORATORY ID: 8001**

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**ANALYTICAL RESULTS**

Sample Location: S22431

Trace ID: 21C0786-02 Date Collected: 03/22/21 10:30  
 Sample Point Description: S22431.02 Date Received: 03/24/21 10:15

PARAMETERS	RESULTS	RDL	UNITS	PREPARED	BY	ANALYZED	BY	NOTES	MCL
<b>VOLATILE ORGANIC COMPOUNDS BY GC-MS</b>									
<b>Analysis Method: EPA 524.2</b>									
<i>Batch: T108434</i>									
Bromodichloromethane	Not Detected	0.50	ug/L	3/24/21 15:47	bag	3/24/21 23:18	bag	N	80
Bromoform	Not Detected	0.50	ug/L	3/24/21 15:47	bag	3/24/21 23:18	bag	N	80
Chloroform	Not Detected	0.50	ug/L	3/24/21 15:47	bag	3/24/21 23:18	bag	N	80
Dibromochloromethane	Not Detected	5.0	ug/L	3/24/21 15:47	bag	3/24/21 23:18	bag	N	No MCL
Total Trihalomethanes	Not Detected	2.0	ug/L	3/24/21 15:47	bag	3/24/21 23:18	bag	N	80
<b>Surrogates:</b>									
4-Bromofluorobenzene	95 %	46-147		3/24/21 15:47	bag	3/24/21 23:18	bag	N	
1,2-Dichlorobenzene-d4	91 %	52-135		3/24/21 15:47	bag	3/24/21 23:18	bag	N	

**CERTIFICATE OF ANALYSIS**

**STATE OF MICHIGAN LABORATORY ID: 8001**

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**QUALITY CONTROL RESULTS**

Trace Project ID: 21C0786  
 Client Project ID: S22431

QC Batch: T108434	Analysis Description: EPA 8260B / 624 Master Compound List
QC Batch Method: EPA 524.2 Purge and Trap	Analysis Method: EPA 524.2

**METHOD BLANK: T108434-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Bromodichloromethane	ug/L	<0.50	0.50	
Bromoform	ug/L	<0.50	0.50	
Chloroform	ug/L	<0.50	0.50	
Dibromochloromethane	ug/L	<5.0	5.0	
Total Trihalomethanes	ug/L	<2.0	2.0	
4-Bromofluorobenzene (S)	%	94	46-147	
1,2-Dichlorobenzene-d4 (S)	%	91	52-135	

**LABORATORY CONTROL SAMPLE: T108434-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Bromodichloromethane	ug/L	10.0	10.0	100	70-130	
Bromoform	ug/L	10.0	10.1	101	70-130	
Chloroform	ug/L	10.0	9.64	96	70-130	
Dibromochloromethane	ug/L	10.0	9.95	100	70-130	
4-Bromofluorobenzene (S)	%	5.00	5.04	101	46-147	
1,2-Dichlorobenzene-d4 (S)	%	5.00	5.16	103	52-135	

**CERTIFICATE OF ANALYSIS**

**STATE OF MICHIGAN LABORATORY ID: 8001**

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Trace Analytical Laboratories, Inc.  
 2241 Black Creek Road  
 Muskegon, MI 49444-2673



231-773-5998 Phone  
 888-979-4469 Fax  
 www.trace-labs.com

**SAMPLE LOG IN CHECKLIST**

Trace ID #: 21C0786 Date: 3/24/21 Package Description: Styrofoam Cooler Temperature: 0.3  
 Client Name: Merit Laboratories Time: 10:15 Logged in by: ekd

**Cooler Receipt**

Cooler/samples delivered by: Trace courier  Hand delivered  Commercial courier  Name of delivery person: \_\_\_\_\_  
 UPS  FED EX  US Mail   
 Tracking Number:  Not Applicable Tracking #: 1Z A66 A77 01 6297 1138  
 COC Seals present and intact on cooler?  Not Applicable  No  Yes  
 Custody seals signed by Client?  No  Yes Client custody seal # (if applicable): \_\_\_\_\_

**Coolant and Temperature**

**Type of Coolant Used**  
 Slurry w/ crushed, cubed, or chip ice?   
 Multiple bags of ice around samples?   
 Ice Packs/ Blue Ice :   
 No Coolant Present:   
 Ice still present upon receipt (circle one): Yes No N/A

**Cooler Temperature**  
 Correction Factors: •Digital Stick Thermometer CF = -0.5°C (030930)  
 •IR Thermometer CF = -0.4°C (IR #8)  
 Representative Sample Temperature: 17.9 °C (check one below)  
 Temp Blank (Stick Thermometer)  
 Client Sample (IR Thermometer)  
 Melt Water: None °C (Use Digital Stick Thermometer)

**General**

	Yes	No	NA	Comments
All bottles arrived unbroken with labels in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Each sample point is in a sealed plastic bag?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Labels filled out completely?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
All bottle labels agree with Chain of Custody (COC)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sufficient sample to run tests requested?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
*pH checked - samples at correct pH and labeled as such?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Correct chemical preservative added to samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Air bubbles absent from VOAs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
COC filled out properly and signed by client?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
COC signed in by TRACE sample custodian?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was project manager called and samples discussed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Notes: Samples have not been acidified

**\*EMD pH Test Strips Used:**  
 pH 0-2.5 Lot: HC029115  pH 11.0-13.0 Lot: HC729101  
 Other: \_\_\_\_\_

Form 70-A.35  
 Effective 2/25/21

TRACE Analytical Laboratories, Inc.

**CERTIFICATE OF ANALYSIS**

STATE OF MICHIGAN LABORATORY ID: 8001

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# Analytical Laboratory Report

Report ID: S23920.01(01)  
Generated on 05/11/2021

---

**Report to**

Attention: Tiffany Linder  
Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 248-994-2272 FAX:  
Email: [tiffany.linder@arcadis-us.com](mailto:tiffany.linder@arcadis-us.com)

Additional Contacts: Alex Villhauer, Patrick Curry

---

**Report produced by**

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery ([johnlavery@meritlabs.com](mailto:johnlavery@meritlabs.com))  
Barbara Ball ([bball@meritlabs.com](mailto:bball@meritlabs.com))

---

**Report Summary**

Lab Sample ID(s): S23920.01-S23920.04  
Project: 30075941 / Racer Lansing  
Collected Date(s): 05/06/2021  
Submitted Date/Time: 05/06/2021 15:40  
Sampled by: Seth Turner  
P.O. #: 30075941

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Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM4500-CI G	Standard Method 4500-CI G 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (4 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S23920.01	SB-P2-SEEP-050621	Groundwater	05/06/21 14:00
S23920.02	SB-P2-KF190_14-19	Groundwater	05/06/21 14:15
S23920.03	SB-P2-KG184_15-20	Groundwater	05/06/21 14:40
S23920.04	SB-P2-KG187_14-19	Groundwater	05/06/21 15:00



# Analytical Laboratory Report

**Lab Sample ID: S23920.01**

Sample Tag: SB-P2-SEEP-050621

Collected Date/Time: 05/06/2021 14:00

Matrix: Groundwater

COC Reference: 145801

**Sample Containers**

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	15.3	IR
1	250ml Plastic	None	Yes	15.3	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	05/10/21 12:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 05/07/21 10:21, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	36	5	0.06	mg/L	5	16887-00-6	
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	
Sulfate	50	5	0.52	mg/L	5	14808-79-8	

**Method: SM2320B, Run Date: 05/11/21 11:08, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Alkalinity as CaCO3	292	2		mg/L	2		
Carbonate Alkalinity	Not detected	2		mg/L	2		

**Method: SM4500-Cl G, Run Date: 05/06/21 16:50, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine Residual*	Not detected	0.05		mg/L	1	7782-50-5	

**Metals**

**Method: E200.8, Run Date: 05/10/21 14:48, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	94.2	2.5		mg/L	50	7440-70-2	
Magnesium	21.0	2.5		mg/L	50	7439-95-4	
Potassium	Not detected	2.5		mg/L	50	7440-09-7	
Sodium	56.6	2.5		mg/L	50	7440-23-5	



# Analytical Laboratory Report

**Lab Sample ID: S23920.02**

Sample Tag: SB-P2-KF190\_14-19

Collected Date/Time: 05/06/2021 14:15

Matrix: Groundwater

COC Reference: 145801

**Sample Containers**

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	15.3	IR
1	250ml Plastic	None	Yes	15.3	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	05/10/21 12:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 05/07/21 10:31, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	18	5	0.06	mg/L	5	16887-00-6	
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	
Sulfate	45	5	0.52	mg/L	5	14808-79-8	

**Method: SM2320B, Run Date: 05/11/21 11:12, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Alkalinity as CaCO3	264	2		mg/L	2		
Carbonate Alkalinity	Not detected	2		mg/L	2		

**Method: SM4500-Cl G, Run Date: 05/06/21 17:05, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine Residual*	Not detected	0.05		mg/L	1	7782-50-5	

**Metals**

**Method: E200.8, Run Date: 05/10/21 14:49, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	850	2.5		mg/L	50	7440-70-2	
Magnesium	279	2.5		mg/L	50	7439-95-4	
Potassium	8.50	2.5		mg/L	50	7440-09-7	
Sodium	36.9	2.5		mg/L	50	7440-23-5	



# Analytical Laboratory Report

**Lab Sample ID: S23920.03**

Sample Tag: SB-P2-KG184\_15-20

Collected Date/Time: 05/06/2021 14:40

Matrix: Groundwater

COC Reference: 145801

**Sample Containers**

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	15.3	IR
1	250ml Plastic	None	Yes	15.3	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	05/10/21 12:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 05/07/21 11:22, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	19	5	0.06	mg/L	5	16887-00-6	
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	
Sulfate	45	5	0.52	mg/L	5	14808-79-8	

**Method: SM2320B, Run Date: 05/11/21 11:16, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Alkalinity as CaCO3	280	2		mg/L	2		
Carbonate Alkalinity	Not detected	2		mg/L	2		

**Method: SM4500-Cl G, Run Date: 05/06/21 17:10, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine Residual*	Not detected	0.05		mg/L	1	7782-50-5	

**Metals**

**Method: E200.8, Run Date: 05/10/21 14:52, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	112	2.5		mg/L	50	7440-70-2	
Magnesium	22.8	2.5		mg/L	50	7439-95-4	
Potassium	2.94	2.5		mg/L	50	7440-09-7	
Sodium	37.0	2.5		mg/L	50	7440-23-5	



# Analytical Laboratory Report

**Lab Sample ID: S23920.04**

Sample Tag: SB-P2-KG187\_14-19

Collected Date/Time: 05/06/2021 15:00

Matrix: Groundwater

COC Reference: 145801

**Sample Containers**

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	15.3	IR
1	250ml Plastic	None	Yes	15.3	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	05/10/21 12:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 05/07/21 11:32, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	18	5	0.06	mg/L	5	16887-00-6	
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	
Sulfate	38	5	0.52	mg/L	5	14808-79-8	

**Method: SM2320B, Run Date: 05/11/21 11:18, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Alkalinity as CaCO3	270	2		mg/L	2		
Carbonate Alkalinity	Not detected	2		mg/L	2		

**Method: SM4500-Cl G, Run Date: 05/06/21 17:15, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chlorine Residual*	Not detected	0.05		mg/L	1	7782-50-5	

**Metals**

**Method: E200.8, Run Date: 05/10/21 14:54, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	306	2.5		mg/L	50	7440-70-2	
Magnesium	87.1	2.5		mg/L	50	7439-95-4	
Potassium	6.79	2.5		mg/L	50	7440-09-7	
Sodium	34.3	2.5		mg/L	50	7440-23-5	

# Merit Laboratories Login Checklist

Lab Set ID:S23920

Client:ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941 / Racer Lansing

Submitted:05/06/2021 15:40 Login User: REJ

Attention: Tiffany Linder

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 248-994-2272

FAX:

Email: tiffany.linder@arcadis-us.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 15.3
02.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S23920      Submitted: 05/06/2021 15:40

Client: ARCADIS\_NOVI (ARCADIS U.S., Inc.)

Project: 30075941 / Racer Lansing

Initial Preservation Check: 05/06/2021 16:01 REJ

Preservation Recheck (E200.8): N/A

Attention: Tiffany Linder

Address: Arcadis US, Inc.  
28550 Cabot Drive  
Suite 500  
Novi, MI 48377

Phone: 248-994-2272

FAX:

Email: [tiffany.linder@arcadis-us.com](mailto:tiffany.linder@arcadis-us.com)

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S23920.01	125ml Plastic HNO3	<2			
S23920.02	125ml Plastic HNO3	<2			
S23920.03	125ml Plastic HNO3	<2			
S23920.04	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

145801

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME: Tiffany Linder, Alex Villhauer, Patrick Curry  
 COMPANY: Arcadis  
 ADDRESS: 28550 Cabot Dr  
 CITY: Novi STATE: MI ZIP CODE: 48377  
 PHONE NO. FAX NO. P.O. NO.  
 E-MAIL ADDRESS: Tiffany.Linder@arcadis.com  
Alex.Villhauer@arcadis.com, Patrick.Curry@arcadis.com QUOTE NO.

CONTACT NAME:  SAME  
 COMPANY:  
 ADDRESS:  
 CITY: STATE: ZIP CODE:  
 PHONE NO. E-MAIL ADDRESS:

PROJECT NO./NAME: 30075941 / Racer Lansing SAMPLER(S) - PLEASE PRINT/SIGN NAME: Sean Turner / Alex Villhauer  
 TURNAROUND TIME REQUIRED:  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER  
 DELIVERABLES REQUIRED:  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

# Containers & Preservatives  
 Certifications:  OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations:  Detroit  New York  
 Other  
 Special Instructions

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives							OTHER	Special Instructions
	DATE	TIME				NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH			
23920.01	5/6/21	1400	SB-P2-SEE P_050621	GW	2	1	1						X	
.02		1415	SB-P2-KF190-14-19	GW	2	1	1						X	
.03		1440	SB-P2-KG184-15-20	GW	2	1	1						X	
.04		1500	SB-P2-KG187-14-19	GW	2	1	1						X	

RELINQUISHED BY: stturner/Arcadis  Sampler DATE: 5/6/21 TIME: 1340  
 RECEIVED BY: [Signature] DATE: 5/6/21 TIME: 1540  
 RELINQUISHED BY: DATE: TIME:  
 RECEIVED BY: DATE: TIME:

RELINQUISHED BY: DATE: TIME:  
 RECEIVED BY: DATE: TIME:  
 SEAL NO. SEAL INTACT YES  NO  INITIALS  
 SEAL NO. SEAL INTACT YES  NO  INITIALS  
 NOTES: TEMP. ON ARRIVAL 15.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

# Appendix E

## Analytical Results

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

### Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03700

SGS Job Number: FA81615

Sampling Dates: 12/09/20 - 12/10/20

### Report to:

Arcadis  
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Total number of pages in report: 101



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in black ink that reads "Norm Farmer".

**Norm Farmer**  
Technical Director

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Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
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## Sample Summary

**Arcadis**

**Job No: FA81615**

**Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30042872.03700**

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
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**This report contains results reported as ND = Not detected. The following applies:  
Organics ND = Not detected above the MDL**

FA81615-1	12/09/20	09:03	AMEW12/11/20	AQ	Water	MICHAVE-MH-3_120920
FA81615-1D	12/09/20	09:03	AMEW12/11/20	AQ	Water Dup/MSD	MICHAVE-MH-3_120920
FA81615-1S	12/09/20	09:03	AMEW12/11/20	AQ	Water Matrix Spike	MICHAVE-MH-3_120920
FA81615-2	12/09/20	09:40	AMEW12/11/20	AQ	Water	MICHAVE-MH-4_120920
FA81615-3	12/09/20	10:04	AMEW12/11/20	AQ	Water	VERLINDEN-MH-5_120920
FA81615-4	12/09/20	10:20	AMEW12/11/20	AQ	Water	VERLINDEN-MH-4_120920
FA81615-5	12/09/20	10:45	AMEW12/11/20	AQ	Water	VERLINDEN-MH-3_120920
FA81615-6	12/09/20	11:03	AMEW12/11/20	AQ	Water	VERLINDEN-MH-2_120920
FA81615-7	12/09/20	11:16	AMEW12/11/20	AQ	Water	VERLINDEN-MH-1_120920
FA81615-8	12/09/20	12:08	AMEW12/11/20	AQ	Water	OSBORN-MH-1_120920
FA81615-9	12/09/20	00:00	AMEW12/11/20	AQ	Water	DUP-01_120920
FA81615-10	12/09/20	12:39	AMEW12/11/20	AQ	Water	P6-MH-19_120920



## Sample Summary (continued)

**Arcadis**

**Job No: FA81615**

**Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30042872.03700**

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FA81615-11	12/09/20	13:05	AMEW12/11/20	AQ	Water	P6-MH-18_120920
FA81615-12	12/09/20	13:24	AMEW12/11/20	AQ	Water	P6-MH-17_120920
FA81615-13	12/09/20	13:50	AMEW12/11/20	AQ	Water	P6-MH-16_120920
FA81615-14	12/09/20	15:15	AMEW12/11/20	AQ	Water	P3-MH-290_120920
FA81615-15	12/09/20	14:55	AMEW12/11/20	AQ	Water	P3-MH-297_120920
FA81615-16	12/09/20	15:35	AMEW12/11/20	AQ	Water	P3-MH-284_120920
FA81615-17	12/09/20	00:00	AMEW12/11/20	AQ	Water	DUP-02_120920
FA81615-18	12/10/20	09:05	AMEW12/11/20	AQ	Water	P2-MH-2_121020
FA81615-19	12/10/20	09:20	AMEW12/11/20	AQ	Water	P2-MH-30_121020
FA81615-20	12/10/20	11:50	AMEW12/11/20	AQ	Water	P2-CB-32_121020
FA81615-20D	12/10/20	11:50	AMEW12/11/20	AQ	Water Dup/MSD	P2-CB-32_121020
FA81615-20S	12/10/20	11:50	AMEW12/11/20	AQ	Water Matrix Spike	P2-CB-32_121020
FA81615-21	12/10/20	12:10	AMEW12/11/20	AQ	Water	P2-MH-26_121020



## Sample Summary (continued)

**Arcadis**

**Job No: FA81615**

**Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30042872.03700**

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FA81615-22	12/10/20	12:15	AMEW12/11/20	AQ	Field Blank Water	FB-01_121020
FA81615-23	12/10/20	12:20	AMEW12/11/20	AQ	Equipment Blank	EB-01_121020
FA81615-24	12/10/20	09:43	AMEW12/11/20	AQ	Water	P2-MH-NW_121020
FA81615-25	12/10/20	10:05	AMEW12/11/20	AQ	Water	P2-MH-14_121020
FA81615-26	12/10/20	10:55	AMEW12/11/20	AQ	Water	P2-MH-25_121020
FA81615-27	12/10/20	11:25	AMEW12/11/20	AQ	Water	P2-MH-W_121020
FA81615-28	12/10/20	00:00	AMEW12/11/20	AQ	Water	DUP-03_121020

## Summary of Hits

Job Number: FA81615  
 Account: Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI  
 Collected: 12/09/20 thru 12/10/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**FA81615-1 MICHAVE-MH-3\_120920**

Perfluorobutanoic acid	0.0044	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0023	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0016 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0030	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0026	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0014 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0038	0.0020	0.0010	ug/l	EPA 537M BY ID

**FA81615-2 MICHAVE-MH-4\_120920**

Perfluorobutanoic acid	0.0096	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0078	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0077	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0091	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0161	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0017 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0023	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0019 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0126	0.0020	0.0010	ug/l	EPA 537M BY ID

**FA81615-3 VERLINDEN-MH-5\_120920**

Perfluorobutanoic acid	0.0209	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0685	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0510	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0315	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0439	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0034	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0015 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0025	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0013 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0122	0.0020	0.0010	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate	0.0167	0.0080	0.0020	ug/l	EPA 537M BY ID

**FA81615-4 VERLINDEN-MH-4\_120920**

Perfluorobutanoic acid	0.0438	0.0042	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.183	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.116	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0457	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0351	0.0021	0.0010	ug/l	EPA 537M BY ID

## Summary of Hits

Job Number: FA81615  
 Account: Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI  
 Collected: 12/09/20 thru 12/10/20

2

Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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		Perfluorononanoic acid	0.0029	0.0021	0.0010	ug/l	EPA 537M BY ID
		Perfluorodecanoic acid	0.0015 J	0.0021	0.0010	ug/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	0.0055	0.0021	0.0010	ug/l	EPA 537M BY ID
		Perfluoropentanesulfonic acid	0.0014 J	0.0021	0.0010	ug/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	0.0021	0.0021	0.0010	ug/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	0.0169	0.0021	0.0010	ug/l	EPA 537M BY ID

FA81615-5 VERLINDEN-MH-3\_120920

		Perfluorobutanoic acid	0.0347	0.0040	0.0020	ug/l	EPA 537M BY ID
		Perfluoropentanoic acid	0.144	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorohexanoic acid	0.0964	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluoroheptanoic acid	0.0438	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorooctanoic acid	0.0314	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorononanoic acid	0.0028	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorodecanoic acid	0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	0.0076	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluoropentanesulfonic acid	0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	0.0033	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	0.0111	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-6 VERLINDEN-MH-2\_120920

		Perfluorobutanoic acid	0.0222	0.0040	0.0020	ug/l	EPA 537M BY ID
		Perfluoropentanoic acid	0.0774	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorohexanoic acid	0.120	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluoroheptanoic acid	0.0431	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorooctanoic acid	0.0215	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorononanoic acid	0.0019 J	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	0.0033	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluoropentanesulfonic acid	0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	0.0021	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	0.0092	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-7 VERLINDEN-MH-1\_120920

		Perfluorobutanoic acid	0.0177	0.0040	0.0020	ug/l	EPA 537M BY ID
		Perfluoropentanoic acid	0.0340	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorohexanoic acid	0.0316	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluoroheptanoic acid	0.0217	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorooctanoic acid	0.0405	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorononanoic acid	0.0024	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	0.0040	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluoropentanesulfonic acid	0.0021	0.0020	0.0010	ug/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	0.0038	0.0020	0.0010	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA81615  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 12/09/20 thru 12/10/20

2

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		0.0081	0.0020	0.0010	ug/l	EPA 537M BY ID
FA81615-8	OSBORN-MH-1_120920					
Perfluorobutanoic acid		0.0203	0.0042	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0247	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0221	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0182	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0397	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0058	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0047	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0020 J	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0016 J	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0240	0.0021	0.0010	ug/l	EPA 537M BY ID
FA81615-9	DUP-01_120920					
Perfluorobutanoic acid		0.0357	0.0042	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.155	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.102	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0454	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0321	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0026	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0071	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0035	0.0021	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0113	0.0021	0.0010	ug/l	EPA 537M BY ID
FA81615-10	P6-MH-19_120920					
Perfluorobutanoic acid		0.0391	0.0045	0.0023	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.135	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.112	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0608	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0871	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0056	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0080	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluoroundecanoic acid		0.0016 J	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorododecanoic acid		0.0015 J	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0021 J	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0038	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0023	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0116	0.0023	0.0011	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA81615  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 12/09/20 thru 12/10/20

2

Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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**FA81615-11 P6-MH-18\_120920**

Perfluorobutanoic acid	0.0171	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0264	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0306	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0225	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0619	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0058	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0014 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0023	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0016 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0139	0.0020	0.0010	ug/l	EPA 537M BY ID

**FA81615-12 P6-MH-17\_120920**

Perfluorobutanoic acid	0.0312	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0551	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0544	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0595	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.120	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0157	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0095	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0039	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0023	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0291	0.0020	0.0010	ug/l	EPA 537M BY ID

**FA81615-13 P6-MH-16\_120920**

Perfluorobutanoic acid	0.0220	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0263	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0293	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0203	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0459	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0036	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0017 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0025	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0015 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0033	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0186	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid	0.0022	0.0020	0.0010	ug/l	EPA 537M BY ID

**FA81615-14 P3-MH-290\_120920**

Perfluorobutanoic acid	0.0029 J	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0020	0.0020	0.0010	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA81615  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 12/09/20 thru 12/10/20

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Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**FA81615-15 P3-MH-297\_120920**

Perfluorooctanesulfonic acid 0.0024 0.0020 0.0010 ug/l EPA 537M BY ID

**FA81615-16 P3-MH-284\_120920**

Perfluorobutanoic acid 0.0030 J 0.0040 0.0020 ug/l EPA 537M BY ID  
 Perfluorobutanesulfonic acid 0.0010 J 0.0020 0.0010 ug/l EPA 537M BY ID  
 Perfluorooctanesulfonic acid 0.0033 0.0020 0.0010 ug/l EPA 537M BY ID

**FA81615-17 DUP-02\_120920**

Perfluorobutanoic acid 0.0027 J 0.0036 0.0018 ug/l EPA 537M BY ID  
 Perfluorooctanesulfonic acid 0.0015 J 0.0018 0.00089 ug/l EPA 537M BY ID

**FA81615-18 P2-MH-2\_121020**

Perfluorobutanoic acid 0.0066 0.0040 0.0020 ug/l EPA 537M BY ID  
 Perfluoropentanoic acid 0.0041 0.0020 0.0010 ug/l EPA 537M BY ID  
 Perfluorohexanoic acid 0.0038 0.0020 0.0010 ug/l EPA 537M BY ID  
 Perfluoroheptanoic acid 0.0031 0.0020 0.0010 ug/l EPA 537M BY ID  
 Perfluorooctanoic acid 0.0069 0.0020 0.0010 ug/l EPA 537M BY ID  
 Perfluorobutanesulfonic acid 0.0105 0.0020 0.0010 ug/l EPA 537M BY ID  
 Perfluorohexanesulfonic acid 0.0028 0.0020 0.0010 ug/l EPA 537M BY ID  
 Perfluorooctanesulfonic acid 0.0101 0.0020 0.0010 ug/l EPA 537M BY ID

**FA81615-19 P2-MH-30\_121020**

Perfluorobutanoic acid 0.0080 0.0037 0.0019 ug/l EPA 537M BY ID  
 Perfluoropentanoic acid 0.0024 0.0019 0.00093 ug/l EPA 537M BY ID  
 Perfluorooctanoic acid 0.0066 0.0019 0.00093 ug/l EPA 537M BY ID  
 Perfluorononanoic acid 0.0012 J 0.0019 0.00093 ug/l EPA 537M BY ID  
 Perfluorobutanesulfonic acid 0.106 0.0019 0.00093 ug/l EPA 537M BY ID  
 Perfluoropentanesulfonic acid 0.0029 0.0019 0.00093 ug/l EPA 537M BY ID  
 Perfluorohexanesulfonic acid 0.0103 0.0019 0.00093 ug/l EPA 537M BY ID  
 Perfluoroheptanesulfonic acid 0.0059 0.0019 0.00093 ug/l EPA 537M BY ID  
 Perfluorooctanesulfonic acid 0.0847 0.0019 0.00093 ug/l EPA 537M BY ID

**FA81615-20 P2-CB-32\_121020**

Perfluorobutanoic acid 0.0119 0.0038 0.0019 ug/l EPA 537M BY ID  
 Perfluoropentanoic acid 0.0017 J 0.0019 0.00096 ug/l EPA 537M BY ID  
 Perfluorohexanoic acid 0.0011 J 0.0019 0.00096 ug/l EPA 537M BY ID  
 Perfluorooctanoic acid 0.0011 J 0.0019 0.00096 ug/l EPA 537M BY ID

## Summary of Hits

Job Number: FA81615  
 Account: Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI  
 Collected: 12/09/20 thru 12/10/20

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Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorobutanesulfonic acid	0.0014 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0032	0.0019	0.00096	ug/l	EPA 537M BY ID

FA81615-21 P2-MH-26\_121020

Perfluorobutanoic acid	0.0067	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0056	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0054	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0049	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0103	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0020	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0016 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0067	0.0020	0.0010	ug/l	EPA 537M BY ID

FA81615-22 FB-01\_121020

No hits reported in this sample.

FA81615-23 EB-01\_121020

No hits reported in this sample.

FA81615-24 P2-MH-NW\_121020

Perfluorobutanoic acid	0.0060	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0038	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0036	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0027	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0059	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0018 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0015 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0090	0.0020	0.0010	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate	0.0021 J	0.0080	0.0020	ug/l	EPA 537M BY ID

FA81615-25 P2-MH-14\_121020

Perfluorobutanoic acid	0.0178	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0244	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0184	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0162	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0308	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0036	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0034	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0025	0.0020	0.0010	ug/l	EPA 537M BY ID

## Summary of Hits

Job Number: FA81615  
 Account: Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI  
 Collected: 12/09/20 thru 12/10/20

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Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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Perfluorohexanesulfonic acid		0.0150	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0788	0.0020	0.0010	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0033 J	0.0080	0.0020	ug/l	EPA 537M BY ID

**FA81615-26 P2-MH-25\_121020**

Perfluorobutanoic acid		0.0083	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0073	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0069	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0065	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0132	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0013 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0018 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0013 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0073	0.0020	0.0010	ug/l	EPA 537M BY ID

**FA81615-27 P2-MH-W\_121020**

Perfluorobutanoic acid		0.0031 J	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0025	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0026	0.0020	0.0010	ug/l	EPA 537M BY ID

**FA81615-28 DUP-03\_121020**

Perfluorobutanoic acid		0.0083	0.0040	0.0020	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0074	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0068	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0063	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0140	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0016 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0012 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0011 J	0.0020	0.0010	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0077	0.0020	0.0010	ug/l	EPA 537M BY ID

## Sample Results

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## Report of Analysis

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# Report of Analysis

3.1  
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<b>Client Sample ID:</b> MICHAVE-MH-3_120920	
<b>Lab Sample ID:</b> FA81615-1	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9269.D	1	12/17/20 02:33	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
<b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>						
375-22-4	Perfluorobutanoic acid	0.0044	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0023	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0016	0.0020	0.0010	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0012	0.0020	0.0010	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0030	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid <sup>a</sup>	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid <sup>a</sup>	ND	0.0020	0.0010	ug/l	
<b>PERFLUOROALKYL SULFONIC ACIDS</b>						
375-73-5	Perfluorobutanesulfonic acid	0.0026	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
<b>PERFLUORO OCTANESULFONAMIDES</b>						
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
<b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b>						
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
<b>FLUOROTELOMER SULFONATES</b>						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> MICHAVE-MH-3_120920	
<b>Lab Sample ID:</b> FA81615-1	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%		35-135%
	13C5-PFPeA	60%		50-150%
	13C5-PFHxA	66%		50-150%
	13C4-PFHpA	71%		50-150%
	13C8-PFOA	76%		50-150%
	13C9-PFNA	80%		50-150%
	13C6-PFDA	81%		50-150%
	13C7-PFUnDA	76%		40-140%
	13C2-PFDoDA	63%		40-140%
	13C2-PFTeDA	16% <sup>b</sup>		30-130%
	13C3-PFBS	62%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	40%		30-130%
	d3-MeFOSAA	94%		50-150%
	d5-EtFOSAA	87%		50-150%
	13C2-4:2FTS	69%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	93%		50-150%
	13C3-HFPO-DA	59%		50-150%

- (a) Associated ID Standard outside control limits, Confirmed by batch QC.
- (b) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> MICHAVE-MH-4_120920	
<b>Lab Sample ID:</b> FA81615-2	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9274.D	1	12/17/20 03:51	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9306.D	5	12/17/20 14:31	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0096	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0078	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0077	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0091	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0161	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0017	0.0020	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0023	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0012	0.0020	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0019	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0126	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

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3

Client Sample ID:	MICHAVE-MH-4_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-2	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%	78%	35-135%
	13C5-PFPeA	61%	77%	50-150%
	13C5-PFHxA	66%	81%	50-150%
	13C4-PFHpA	71%	83%	50-150%
	13C8-PFOA	76%	86%	50-150%
	13C9-PFNA	82%	92%	50-150%
	13C6-PFDA	85%	94%	50-150%
	13C7-PFUnDA	82%	88%	40-140%
	13C2-PFDoDA	69%	82%	40-140%
	13C2-PFTeDA	29% <sup>b</sup>	61%	30-130%
	13C3-PFBS	62%	77%	50-150%
	13C3-PFHxS	74%	82%	50-150%
	13C8-PFOS	79%	81%	50-150%
	13C8-FOSA	44%	81%	30-130%
	d3-MeFOSAA	102%	105%	50-150%
	d5-EtFOSAA	98%	91%	50-150%
	13C2-4:2FTS	69%	86%	50-150%
	13C2-6:2FTS	87%	98%	50-150%
	13C2-8:2FTS	99%	101%	50-150%
	13C3-HFPO-DA	59%	77%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b>	VERLINDEN-MH-5_120920	<b>Date Sampled:</b>	12/09/20
<b>Lab Sample ID:</b>	FA81615-3	<b>Date Received:</b>	12/11/20
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537M BY ID EPA 537 MOD		
<b>Project:</b>	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9275.D	1	12/17/20 04:06	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9307.D	5	12/17/20 14:46	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0209	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0685	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0510	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0315	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0439	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0034	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0015	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	
72629-94-8	Perfluorotridecanoic acid <sup>b</sup>	ND <sup>a</sup>	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid <sup>b</sup>	ND <sup>a</sup>	0.010	0.0050	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0025	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0013	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0122	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0167	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	VERLINDEN-MH-5_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-3	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND <sup>a</sup>	0.040	0.010	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	78%	35-135%
	13C5-PFPeA	62%	76%	50-150%
	13C5-PFHxA	67%	80%	50-150%
	13C4-PFHpA	72%	82%	50-150%
	13C8-PFOA	76%	85%	50-150%
	13C9-PFNA	78%	89%	50-150%
	13C6-PFDA	72%	84%	50-150%
	13C7-PFUnDA	53%	76%	40-140%
	13C2-PFDoDA	25% <sup>c</sup>	58%	40-140%
	13C2-PFTeDA	5% <sup>c</sup>	18%	30-130%
	13C3-PFBS	62%	81%	50-150%
	13C3-PFHxS	74%	83%	50-150%
	13C8-PFOS	70%	81%	50-150%
	13C8-FOSA	41%	80%	30-130%
	d3-MeFOSAA	79%	87%	50-150%
	d5-EtFOSAA	68%	79%	50-150%
	13C2-4:2FTS	70%	85%	50-150%
	13C2-6:2FTS	86%	96%	50-150%
	13C2-8:2FTS	82%	87%	50-150%
	13C3-HFPO-DA	60%	70%	50-150%

- (a) Result is from Run# 2
- (b) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b>	VERLINDEN-MH-4_120920	<b>Date Sampled:</b>	12/09/20
<b>Lab Sample ID:</b>	FA81615-4	<b>Date Received:</b>	12/11/20
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537M BY ID EPA 537 MOD		
<b>Project:</b>	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9276.D	1	12/17/20 04:21	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9308.D	5	12/17/20 15:01	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	240 ml	1.0 ml
Run #2	240 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0438	0.0042	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.183	0.0021	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.116	0.0021	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0457	0.0021	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0351	0.0021	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0029	0.0021	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0015	0.0021	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0021	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.010	0.0052	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.010	0.0052	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0055	0.0021	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0014	0.0021	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0021	0.0021	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0169	0.0021	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0042	0.0021	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0042	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0042	0.0021	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

### Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-4_120920	
<b>Lab Sample ID:</b> FA81615-4	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0042	0.0021	ug/l
919005-14-4	ADONA	ND	0.0083	0.0021	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0083	0.0021	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0083	0.0021	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%	74%	35-135%
	13C5-PFPeA	63%	78%	50-150%
	13C5-PFHxA	68%	80%	50-150%
	13C4-PFHpA	74%	82%	50-150%
	13C8-PFOA	76%	84%	50-150%
	13C9-PFNA	80%	87%	50-150%
	13C6-PFDA	79%	88%	50-150%
	13C7-PFUnDA	72%	78%	40-140%
	13C2-PFDoDA	56%	69%	40-140%
	13C2-PFTeDA	12% <sup>b</sup>	49%	30-130%
	13C3-PFBS	63%	79%	50-150%
	13C3-PFHxS	76%	81%	50-150%
	13C8-PFOS	75%	85%	50-150%
	13C8-FOSA	39%	73%	30-130%
	d3-MeFOSAA	89%	93%	50-150%
	d5-EtFOSAA	83%	85%	50-150%
	13C2-4:2FTS	72%	84%	50-150%
	13C2-6:2FTS	86%	93%	50-150%
	13C2-8:2FTS	92%	94%	50-150%
	13C3-HFPO-DA	62%	72%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-3_120920	
<b>Lab Sample ID:</b> FA81615-5	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9277.D	1	12/17/20 04:37	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
<b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>						
375-22-4	Perfluorobutanoic acid	0.0347	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.144	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0964	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0438	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0314	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0028	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0011	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
<b>PERFLUOROALKYL SULFONIC ACIDS</b>						
375-73-5	Perfluorobutanesulfonic acid	0.0076	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0012	0.0020	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0033	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0111	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
<b>PERFLUORO OCTANESULFONAMIDES</b>						
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
<b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b>						
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
<b>FLUOROTELOMER SULFONATES</b>						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-3_120920	
<b>Lab Sample ID:</b> FA81615-5	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%		35-135%
	13C5-PFPeA	64%		50-150%
	13C5-PFHxA	70%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	86%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	85%		40-140%
	13C2-PFTeDA	82%		30-130%
	13C3-PFBS	66%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	83%		50-150%
	13C8-FOSA	50%		30-130%
	d3-MeFOSAA	106%		50-150%
	d5-EtFOSAA	113%		50-150%
	13C2-4:2FTS	73%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	103%		50-150%
	13C3-HFPO-DA	63%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-2_120920	
<b>Lab Sample ID:</b> FA81615-6	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9278.D	1	12/17/20 04:52	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9309.D	5	12/17/20 15:17	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0222	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0774	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.120	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0431	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0215	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0019	0.0020	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0033	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0012	0.0020	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0021	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0092	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: VERLINDEN-MH-2_120920		Date Sampled: 12/09/20
Lab Sample ID: FA81615-6		Date Received: 12/11/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%	77%	35-135%
	13C5-PFPeA	63%	79%	50-150%
	13C5-PFHxA	68%	82%	50-150%
	13C4-PFHpA	74%	86%	50-150%
	13C8-PFOA	77%	87%	50-150%
	13C9-PFNA	84%	94%	50-150%
	13C6-PFDA	84%	94%	50-150%
	13C7-PFUnDA	79%	90%	40-140%
	13C2-PFDoDA	56%	81%	40-140%
	13C2-PFTeDA	12% <sup>b</sup>	42%	30-130%
	13C3-PFBS	64%	81%	50-150%
	13C3-PFHxS	77%	86%	50-150%
	13C8-PFOS	80%	89%	50-150%
	13C8-FOSA	39%	81%	30-130%
	d3-MeFOSAA	100%	107%	50-150%
	d5-EtFOSAA	99%	96%	50-150%
	13C2-4:2FTS	73%	86%	50-150%
	13C2-6:2FTS	87%	99%	50-150%
	13C2-8:2FTS	98%	100%	50-150%
	13C3-HFPO-DA	61%	75%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-1_120920	
<b>Lab Sample ID:</b> FA81615-7	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9279.D	1	12/17/20 05:08	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0177	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0340	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0316	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0217	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0405	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0024	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0040	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0021	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0038	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0081	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	VERLINDEN-MH-1_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-7	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	56%		35-135%
	13C5-PFPeA	58%		50-150%
	13C5-PFHxA	65%		50-150%
	13C4-PFHpA	72%		50-150%
	13C8-PFOA	77%		50-150%
	13C9-PFNA	84%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	92%		40-140%
	13C2-PFDoDA	89%		40-140%
	13C2-PFTeDA	91%		30-130%
	13C3-PFBS	62%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	81%		50-150%
	13C8-FOSA	49%		30-130%
	d3-MeFOSAA	104%		50-150%
	d5-EtFOSAA	107%		50-150%
	13C2-4:2FTS	68%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	104%		50-150%
	13C3-HFPO-DA	60%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> OSBORN-MH-1_120920	
<b>Lab Sample ID:</b> FA81615-8	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9280.D	1	12/17/20 05:23	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9310.D	5	12/17/20 15:32	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	240 ml	1.0 ml
Run #2	240 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0203	0.0042	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0247	0.0021	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0221	0.0021	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0182	0.0021	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0397	0.0021	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0058	0.0021	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0047	0.0021	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND <sup>a</sup>	0.010	0.0052	ug/l	
72629-94-8	Perfluorotridecanoic acid <sup>b</sup>	ND <sup>a</sup>	0.010	0.0052	ug/l	
376-06-7	Perfluorotetradecanoic acid <sup>b</sup>	ND <sup>a</sup>	0.010	0.0052	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0021	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0021	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0016	0.0021	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0240	0.0021	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0042	0.0021	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0042	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0042	0.0021	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis



<b>Client Sample ID:</b> OSBORN-MH-1_120920	<b>Date Sampled:</b> 12/09/20
<b>Lab Sample ID:</b> FA81615-8	<b>Date Received:</b> 12/11/20
<b>Matrix:</b> AQ - Water	<b>Percent Solids:</b> n/a
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0042	0.0021	ug/l	
919005-14-4	ADONA	ND	0.0083	0.0021	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0083	0.0021	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND <sup>a</sup>	0.042	0.010	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	54%	74%	35-135%
	13C5-PFPeA	62%	79%	50-150%
	13C5-PFHxA	67%	83%	50-150%
	13C4-PFHpA	71%	84%	50-150%
	13C8-PFOA	74%	87%	50-150%
	13C9-PFNA	77%	91%	50-150%
	13C6-PFDA	74%	89%	50-150%
	13C7-PFUnDA	57%	80%	40-140%
	13C2-PFDoDA	25% <sup>c</sup>	59%	40-140%
	13C2-PFTeDA	8% <sup>c</sup>	17%	30-130%
	13C3-PFBS	64%	79%	50-150%
	13C3-PFHxS	76%	82%	50-150%
	13C8-PFOS	72%	81%	50-150%
	13C8-FOSA	30%	60%	30-130%
	d3-MeFOSAA	72%	114%	50-150%
	d5-EtFOSAA	70%	107%	50-150%
	13C2-4:2FTS	71%	87%	50-150%
	13C2-6:2FTS	84%	101%	50-150%
	13C2-8:2FTS	88%	101%	50-150%
	13C3-HFPO-DA	61%	75%	50-150%

- (a) Result is from Run# 2
- (b) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> DUP-01_120920	
<b>Lab Sample ID:</b> FA81615-9	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9281.D	1	12/17/20 05:39	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9311.D	5	12/17/20 15:48	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	240 ml	1.0 ml
Run #2	240 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0357	0.0042	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.155	0.0021	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.102	0.0021	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0454	0.0021	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0321	0.0021	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0026	0.0021	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0021	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0021	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid <sup>a</sup>	ND <sup>b</sup>	0.010	0.0052	ug/l	
376-06-7	Perfluorotetradecanoic acid <sup>a</sup>	ND <sup>b</sup>	0.010	0.0052	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0071	0.0021	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0021	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0035	0.0021	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0113	0.0021	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0042	0.0021	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0042	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0042	0.0021	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

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3

Client Sample ID: DUP-01_120920		Date Sampled: 12/09/20
Lab Sample ID: FA81615-9		Date Received: 12/11/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0083	0.0021	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0042	0.0021	ug/l	
919005-14-4	ADONA	ND	0.0083	0.0021	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0083	0.0021	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0083	0.0021	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	54%	70%	35-135%
	13C5-PFPeA	59%	72%	50-150%
	13C5-PFHxA	64%	75%	50-150%
	13C4-PFHpA	68%	77%	50-150%
	13C8-PFOA	71%	78%	50-150%
	13C9-PFNA	74%	84%	50-150%
	13C6-PFDA	74%	83%	50-150%
	13C7-PFUnDA	67%	77%	40-140%
	13C2-PFDoDA	48%	67%	40-140%
	13C2-PFTeDA	6% <sup>c</sup>	20% <sup>c</sup>	30-130%
	13C3-PFBS	59%	71%	50-150%
	13C3-PFHxS	70%	78%	50-150%
	13C8-PFOS	69%	76%	50-150%
	13C8-FOSA	36%	72%	30-130%
	d3-MeFOSAA	86%	93%	50-150%
	d5-EtFOSAA	81%	86%	50-150%
	13C2-4:2FTS	67%	79%	50-150%
	13C2-6:2FTS	80%	89%	50-150%
	13C2-8:2FTS	85%	88%	50-150%
	13C3-HFPO-DA	58%	69%	50-150%

- (a) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (b) Result is from Run# 2
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P6-MH-19_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-10	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9284.D	1	12/17/20 06:25	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9312.D	5	12/17/20 16:03	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	220 ml	1.0 ml
Run #2	220 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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## PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0391	0.0045	0.0023	ug/l	
2706-90-3	Perfluoropentanoic acid	0.135	0.0023	0.0011	ug/l	
307-24-4	Perfluorohexanoic acid	0.112	0.0023	0.0011	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0608	0.0023	0.0011	ug/l	
335-67-1	Perfluorooctanoic acid	0.0871	0.0023	0.0011	ug/l	
375-95-1	Perfluorononanoic acid	0.0056	0.0023	0.0011	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080	0.0023	0.0011	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0016	0.0023	0.0011	ug/l	J
307-55-1	Perfluorododecanoic acid	0.0015	0.0023	0.0011	ug/l	J
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.011	0.0057	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.011	0.0057	ug/l	

## PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0023	0.0011	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0038	0.0023	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0023	0.0011	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0023	0.0011	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0116	0.0023	0.0011	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0023	0.0011	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0023	0.0011	ug/l	

## PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0045	0.0023	ug/l	
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## PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0045	0.0023	ug/l	
2991-50-6	EtFOSAA	ND	0.0045	0.0023	ug/l	

## FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P6-MH-19_120920		Date Sampled: 12/09/20
Lab Sample ID: FA81615-10		Date Received: 12/11/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0091	0.0023	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0045	0.0023	ug/l	
919005-14-4	ADONA	ND	0.0091	0.0023	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0091	0.0023	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0091	0.0023	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%	73%	35-135%
	13C5-PFPeA	61%	74%	50-150%
	13C5-PFHxA	66%	76%	50-150%
	13C4-PFHpA	71%	79%	50-150%
	13C8-PFOA	73%	81%	50-150%
	13C9-PFNA	79%	85%	50-150%
	13C6-PFDA	81%	86%	50-150%
	13C7-PFUnDA	77%	83%	40-140%
	13C2-PFDoDA	67%	76%	40-140%
	13C2-PFTeDA	28% <sup>b</sup>	49%	30-130%
	13C3-PFBS	60%	78%	50-150%
	13C3-PFHxS	72%	78%	50-150%
	13C8-PFOS	73%	77%	50-150%
	13C8-FOSA	45%	73%	30-130%
	d3-MeFOSAA	94%	93%	50-150%
	d5-EtFOSAA	86%	85%	50-150%
	13C2-4:2FTS	70%	80%	50-150%
	13C2-6:2FTS	82%	91%	50-150%
	13C2-8:2FTS	90%	90%	50-150%
	13C3-HFPO-DA	59%	69%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

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ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P6-MH-18_120920	
<b>Lab Sample ID:</b> FA81615-11	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9285.D	1	12/17/20 06:40	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9313.D	5	12/17/20 16:19	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0171	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0264	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0306	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0225	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0619	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0058	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0014	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0023	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0016	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0139	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P6-MH-18_120920	
<b>Lab Sample ID:</b> FA81615-11	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	54%	69%	35-135%
	13C5-PFPeA	59%	72%	50-150%
	13C5-PFHxA	63%	74%	50-150%
	13C4-PFHpA	68%	77%	50-150%
	13C8-PFOA	71%	79%	50-150%
	13C9-PFNA	75%	85%	50-150%
	13C6-PFDA	76%	85%	50-150%
	13C7-PFUnDA	73%	80%	40-140%
	13C2-PFDoDA	62%	75%	40-140%
	13C2-PFTeDA	27% <sup>b</sup>	49%	30-130%
	13C3-PFBS	58%	73%	50-150%
	13C3-PFHxS	70%	77%	50-150%
	13C8-PFOS	72%	79%	50-150%
	13C8-FOSA	38%	72%	30-130%
	d3-MeFOSAA	93%	95%	50-150%
	d5-EtFOSAA	89%	84%	50-150%
	13C2-4:2FTS	67%	80%	50-150%
	13C2-6:2FTS	79%	88%	50-150%
	13C2-8:2FTS	88%	89%	50-150%
	13C3-HFPO-DA	59%	70%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P6-MH-17_120920	
<b>Lab Sample ID:</b> FA81615-12	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9286.D	1	12/17/20 06:56	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0312	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0551	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0544	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0595	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.120	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0157	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0095	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0039	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0023	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0291	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P6-MH-17_120920	
<b>Lab Sample ID:</b> FA81615-12	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%		35-135%
	13C5-PFPeA	62%		50-150%
	13C5-PFHxA	68%		50-150%
	13C4-PFHpA	71%		50-150%
	13C8-PFOA	75%		50-150%
	13C9-PFNA	79%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	75%		40-140%
	13C2-PFDoDA	65%		40-140%
	13C2-PFTeDA	38%		30-130%
	13C3-PFBS	61%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	46%		30-130%
	d3-MeFOSAA	95%		50-150%
	d5-EtFOSAA	89%		50-150%
	13C2-4:2FTS	71%		50-150%
	13C2-6:2FTS	84%		50-150%
	13C2-8:2FTS	89%		50-150%
	13C3-HFPO-DA	61%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P6-MH-16_120920	
<b>Lab Sample ID:</b> FA81615-13	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9287.D	1	12/17/20 07:11	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9314.D	5	12/17/20 16:34	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0220	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0263	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0293	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0203	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0459	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0036	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0017	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	
72629-94-8	Perfluorotridecanoic acid <sup>b</sup>	ND <sup>a</sup>	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid <sup>b</sup>	ND <sup>a</sup>	0.010	0.0050	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0025	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0015	0.0020	0.0010	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0033	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0186	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0022	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>a</sup>	0.020	0.010	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P6-MH-16_120920	
<b>Lab Sample ID:</b> FA81615-13	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND <sup>a</sup>	0.040	0.010	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%	66%	35-135%
	13C5-PFPeA	59%	73%	50-150%
	13C5-PFHxA	64%	75%	50-150%
	13C4-PFHpA	68%	80%	50-150%
	13C8-PFOA	71%	80%	50-150%
	13C9-PFNA	73%	85%	50-150%
	13C6-PFDA	68%	82%	50-150%
	13C7-PFUnDA	53%	73%	40-140%
	13C2-PFDoDA	25% <sup>c</sup>	57%	40-140%
	13C2-PFTeDA	5% <sup>c</sup>	14% <sup>c</sup>	30-130%
	13C3-PFBS	60%	73%	50-150%
	13C3-PFHxS	71%	78%	50-150%
	13C8-PFOS	64%	78%	50-150%
	13C8-FOSA	26% <sup>c</sup>	62%	30-130%
	d3-MeFOSAA	77%	91%	50-150%
	d5-EtFOSAA	72%	82%	50-150%
	13C2-4:2FTS	67%	81%	50-150%
	13C2-6:2FTS	79%	91%	50-150%
	13C2-8:2FTS	80%	86%	50-150%
	13C3-HFPO-DA	58%	71%	50-150%

(a) Result is from Run# 2

(b) Associated ID Standard outside control limits, Confirmed by re-analysis.

(c) Outside control limits.

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P3-MH-290_120920	
<b>Lab Sample ID:</b> FA81615-14	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9288.D	1	12/17/20 07:27	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9315.D	5	12/17/20 16:49	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0029	0.0040	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0020	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P3-MH-290_120920	
<b>Lab Sample ID:</b> FA81615-14	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%	82%	35-135%
	13C5-PFPeA	61%	78%	50-150%
	13C5-PFHxA	66%	79%	50-150%
	13C4-PFHpA	70%	85%	50-150%
	13C8-PFOA	74%	87%	50-150%
	13C9-PFNA	78%	92%	50-150%
	13C6-PFDA	80%	96%	50-150%
	13C7-PFUnDA	78%	91%	40-140%
	13C2-PFDoDA	62%	82%	40-140%
	13C2-PFTeDA	18% <sup>b</sup>	44%	30-130%
	13C3-PFBS	62%	79%	50-150%
	13C3-PFHxS	73%	86%	50-150%
	13C8-PFOS	73%	89%	50-150%
	13C8-FOSA	46%	92%	30-130%
	d3-MeFOSAA	103%	109%	50-150%
	d5-EtFOSAA	104%	101%	50-150%
	13C2-4:2FTS	69%	83%	50-150%
	13C2-6:2FTS	84%	99%	50-150%
	13C2-8:2FTS	94%	99%	50-150%
	13C3-HFPO-DA	59%	76%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P3-MH-297_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-15	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9289.D	1	12/17/20 07:42	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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## PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

## PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0024	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

## PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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## PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

## FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P3-MH-297_120920	
Lab Sample ID:	FA81615-15	Date Sampled: 12/09/20
Matrix:	AQ - Water	Date Received: 12/11/20
Method:	EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%		35-135%
	13C5-PFPeA	59%		50-150%
	13C5-PFHxA	63%		50-150%
	13C4-PFHpA	68%		50-150%
	13C8-PFOA	73%		50-150%
	13C9-PFNA	75%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	71%		40-140%
	13C2-PFDoDA	67%		40-140%
	13C2-PFTeDA	65%		30-130%
	13C3-PFBS	60%		50-150%
	13C3-PFHxS	68%		50-150%
	13C8-PFOS	68%		50-150%
	13C8-FOSA	62%		30-130%
	d3-MeFOSAA	84%		50-150%
	d5-EtFOSAA	78%		50-150%
	13C2-4:2FTS	66%		50-150%
	13C2-6:2FTS	81%		50-150%
	13C2-8:2FTS	82%		50-150%
	13C3-HFPO-DA	57%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P3-MH-284_120920	Date Sampled:	12/09/20
Lab Sample ID:	FA81615-16	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9290.D	1	12/17/20 07:58	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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## PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0030	0.0040	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

## PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0010	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0033	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

## PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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## PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

## FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P3-MH-284_120920	
<b>Lab Sample ID:</b> FA81615-16	<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%		35-135%
	13C5-PFPeA	57%		50-150%
	13C5-PFHxA	61%		50-150%
	13C4-PFHpA	65%		50-150%
	13C8-PFOA	69%		50-150%
	13C9-PFNA	74%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	67%		40-140%
	13C2-PFTeDA	45%		30-130%
	13C3-PFBS	58%		50-150%
	13C3-PFHxS	68%		50-150%
	13C8-PFOS	70%		50-150%
	13C8-FOSA	46%		30-130%
	d3-MeFOSAA	96%		50-150%
	d5-EtFOSAA	92%		50-150%
	13C2-4:2FTS	64%		50-150%
	13C2-6:2FTS	76%		50-150%
	13C2-8:2FTS	88%		50-150%
	13C3-HFPO-DA	56%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> DUP-02_120920		
<b>Lab Sample ID:</b> FA81615-17		<b>Date Sampled:</b> 12/09/20
<b>Matrix:</b> AQ - Water		<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD		<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q60365.D	1	12/23/20 22:37	NAF	12/22/20 08:30	OP83473	S2Q883
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0027	0.0036	0.0018	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: DUP-02_120920		Date Sampled: 12/09/20
Lab Sample ID: FA81615-17		Date Received: 12/11/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	68%		35-135%
	13C5-PFPeA	65%		50-150%
	13C5-PFHxA	63%		50-150%
	13C4-PFHpA	58%		50-150%
	13C8-PFOA	63%		50-150%
	13C9-PFNA	67%		50-150%
	13C6-PFDA	74%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	74%		40-140%
	13C2-PFTeDA	75%		30-130%
	13C3-PFBS	67%		50-150%
	13C3-PFHxS	63%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	40%		30-130%
	d3-MeFOSAA	104%		50-150%
	d5-EtFOSAA	100%		50-150%
	13C2-4:2FTS	63%		50-150%
	13C2-6:2FTS	69%		50-150%
	13C2-8:2FTS	80%		50-150%
	13C3-HFPO-DA	72%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-2_121020	
<b>Lab Sample ID:</b> FA81615-18	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9292.D	1	12/17/20 08:29	MV	12/15/20 08:00	OP83388	S4Q127
Run #2	4Q9319.D	5	12/17/20 17:51	MV	12/15/20 08:00	OP83388	S4Q128

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0066	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0041	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0038	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0031	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0069	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.010	0.0050	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0105	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0028	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0101	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>a</sup>	0.020	0.010	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P2-MH-2_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-18	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%	69%	35-135%
	13C5-PFPeA	54%	69%	50-150%
	13C5-PFHxA	58%	72%	50-150%
	13C4-PFHpA	64%	75%	50-150%
	13C8-PFOA	68%	78%	50-150%
	13C9-PFNA	73%	84%	50-150%
	13C6-PFDA	74%	85%	50-150%
	13C7-PFUnDA	68%	79%	40-140%
	13C2-PFDoDA	48%	69%	40-140%
	13C2-PFTeDA	10% <sup>b</sup>	34%	30-130%
	13C3-PFBS	55%	67%	50-150%
	13C3-PFHxS	66%	74%	50-150%
	13C8-PFOS	70%	78%	50-150%
	13C8-FOSA	25% <sup>b</sup>	52%	30-130%
	d3-MeFOSAA	83%	98%	50-150%
	d5-EtFOSAA	79%	88%	50-150%
	13C2-4:2FTS	62%	78%	50-150%
	13C2-6:2FTS	78%	88%	50-150%
	13C2-8:2FTS	88%	90%	50-150%
	13C3-HFPO-DA	54%	64%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-30_121020	
<b>Lab Sample ID:</b> FA81615-19	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q60366.D	1	12/23/20 22:51	NAF	12/22/20 08:30	OP83473	S2Q883
Run #2							

Run #	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0080	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0024	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0066	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	0.0012	0.0019	0.00093	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.106	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0029	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0103	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0059	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0847	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA <sup>a</sup>	ND	0.0037	0.0019	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	

**FLUOROTELOMER SULFONATES**

27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

**NEXT GENERATION PFAS ANALYTES**

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P2-MH-30_121020	
<b>Lab Sample ID:</b> FA81615-19	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
13252-13-6	HFPO-DA (GenX)	ND	0.0037	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9CI-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11CI-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%		35-135%
	13C5-PFPeA	50%		50-150%
	13C5-PFHxA	47% <sup>b</sup>		50-150%
	13C4-PFHpA	46% <sup>b</sup>		50-150%
	13C8-PFOA	54%		50-150%
	13C9-PFNA	59%		50-150%
	13C6-PFDA	68%		50-150%
	13C7-PFUnDA	66%		40-140%
	13C2-PFDoDA	67%		40-140%
	13C2-PFTeDA	54%		30-130%
	13C3-PFBS	55%		50-150%
	13C3-PFHxS	53%		50-150%
	13C8-PFOS	69%		50-150%
	13C8-FOSA	20% <sup>b</sup>		30-130%
	d3-MeFOSAA	89%		50-150%
	d5-EtFOSAA	96%		50-150%
	13C2-4:2FTS	47% <sup>b</sup>		50-150%
	13C2-6:2FTS	59%		50-150%
	13C2-8:2FTS	75%		50-150%
	13C3-HFPO-DA	57%		50-150%

(a) Associated ID Standard outside control limits. Confirmed by re-extraction and reanalysis.

(b) Outside control limits.

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-CB-32_121020	
<b>Lab Sample ID:</b> FA81615-20	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9225.D	1	12/16/20 15:14	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0119	0.0038	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0017	0.0019	0.00096	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0011	0.0019	0.00096	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00096	ug/l	
335-67-1	Perfluorooctanoic acid	0.0011	0.0019	0.00096	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00096	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00096	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00096	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0019	0.00096	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0032	0.0019	0.00096	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00096	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0038	0.0019	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0038	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0038	0.0019	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P2-CB-32_121020		Date Sampled: 12/10/20
Lab Sample ID: FA81615-20		Date Received: 12/11/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0038	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0077	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0077	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	72%		35-135%
	13C5-PFPeA	75%		50-150%
	13C5-PFHxA	79%		50-150%
	13C4-PFHpA	83%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	85%		40-140%
	13C2-PFDoDA	69%		40-140%
	13C2-PFTeDA	33%		30-130%
	13C3-PFBS	76%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	84%		50-150%
	13C8-FOSA	62%		30-130%
	d3-MeFOSAA	93%		50-150%
	d5-EtFOSAA	91%		50-150%
	13C2-4:2FTS	82%		50-150%
	13C2-6:2FTS	93%		50-150%
	13C2-8:2FTS	99%		50-150%
	13C3-HFPO-DA	70%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-26_121020	
<b>Lab Sample ID:</b> FA81615-21	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9296.D	1	12/17/20 09:38	MV	12/15/20 08:00	OP83388	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0067	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0056	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0054	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0049	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0103	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0016	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0067	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P2-MH-26_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-21	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%		35-135%
	13C5-PFPeA	62%		50-150%
	13C5-PFHxA	66%		50-150%
	13C4-PFHpA	70%		50-150%
	13C8-PFOA	73%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	74%		40-140%
	13C2-PFDoDA	69%		40-140%
	13C2-PFTeDA	55%		30-130%
	13C3-PFBS	61%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	39%		30-130%
	d3-MeFOSAA	91%		50-150%
	d5-EtFOSAA	94%		50-150%
	13C2-4:2FTS	70%		50-150%
	13C2-6:2FTS	83%		50-150%
	13C2-8:2FTS	91%		50-150%
	13C3-HFPO-DA	62%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> FB-01_121020	
<b>Lab Sample ID:</b> FA81615-22	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Field Blank Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9228.D	1	12/16/20 16:01	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	FB-01_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-22	Date Received:	12/11/20
Matrix:	AQ - Field Blank Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	82%		50-150%
	13C5-PFHxA	83%		50-150%
	13C4-PFHpA	84%		50-150%
	13C8-PFOA	84%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	88%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	86%		40-140%
	13C2-PFTeDA	82%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	84%		50-150%
	13C8-FOSA	93%		30-130%
	d3-MeFOSAA	89%		50-150%
	d5-EtFOSAA	83%		50-150%
	13C2-4:2FTS	83%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	92%		50-150%
	13C3-HFPO-DA	75%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> EB-01_121020	
<b>Lab Sample ID:</b> FA81615-23	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Equipment Blank	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9229.D	1	12/16/20 16:16	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: EB-01_121020		Date Sampled: 12/10/20
Lab Sample ID: FA81615-23		Date Received: 12/11/20
Matrix: AQ - Equipment Blank		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	84%		35-135%
	13C5-PFPeA	88%		50-150%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	90%		50-150%
	13C8-PFOA	89%		50-150%
	13C9-PFNA	91%		50-150%
	13C6-PFDA	93%		50-150%
	13C7-PFUnDA	93%		40-140%
	13C2-PFDoDA	88%		40-140%
	13C2-PFTeDA	80%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	88%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	98%		30-130%
	d3-MeFOSAA	93%		50-150%
	d5-EtFOSAA	86%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	94%		50-150%
	13C2-8:2FTS	96%		50-150%
	13C3-HFPO-DA	81%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-NW_121020	
<b>Lab Sample ID:</b> FA81615-24	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9230.D	1	12/16/20 16:32	MV	12/14/20 13:00	OP83375	S4Q127
Run #2	4Q9196.D	10	12/15/20 22:52	MV	12/14/20 13:00	OP83375	S4Q126

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0060	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0038	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0036	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0027	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0059	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.020	0.010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.020	0.010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0018	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0090	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0021	0.0080	0.0020	ug/l	J

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P2-MH-NW_121020	
<b>Lab Sample ID:</b> FA81615-24	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%	81%	35-135%
	13C5-PFPeA	62%	82%	50-150%
	13C5-PFHxA	67%	85%	50-150%
	13C4-PFHpA	72%	87%	50-150%
	13C8-PFOA	75%	86%	50-150%
	13C9-PFNA	78%	94%	50-150%
	13C6-PFDA	75%	91%	50-150%
	13C7-PFUnDA	68%	86%	40-140%
	13C2-PFDoDA	54%	76%	40-140%
	13C2-PFTeDA	20% <sup>b</sup>	50%	30-130%
	13C3-PFBS	62%	83%	50-150%
	13C3-PFHxS	75%	85%	50-150%
	13C8-PFOS	72%	88%	50-150%
	13C8-FOSA	38%	97%	30-130%
	d3-MeFOSAA	79%	104%	50-150%
	d5-EtFOSAA	75%	77%	50-150%
	13C2-4:2FTS	71%	87%	50-150%
	13C2-6:2FTS	84%	107%	50-150%
	13C2-8:2FTS	86%	97%	50-150%
	13C3-HFPO-DA	62%	90%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-14_121020	
<b>Lab Sample ID:</b> FA81615-25	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9231.D	1	12/16/20 16:47	MV	12/14/20 13:00	OP83375	S4Q127
Run #2	4Q9197.D	10	12/15/20 23:08	MV	12/14/20 13:00	OP83375	S4Q126

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0178	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0244	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0184	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0162	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0308	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0036	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0011	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.020	0.010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.020	0.010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0034	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0025	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0150	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0012	0.0020	0.0010	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0788	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>a</sup>	0.040	0.020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0033	0.0080	0.0020	ug/l	J

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P2-MH-14_121020	
<b>Lab Sample ID:</b> FA81615-25	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	61%	83%	35-135%
	13C5-PFPeA	67%	85%	50-150%
	13C5-PFHxA	73%	88%	50-150%
	13C4-PFHpA	77%	87%	50-150%
	13C8-PFOA	79%	87%	50-150%
	13C9-PFNA	81%	93%	50-150%
	13C6-PFDA	76%	83%	50-150%
	13C7-PFUnDA	63%	74%	40-140%
	13C2-PFDoDA	40%	59%	40-140%
	13C2-PFTeDA	4% <sup>b</sup>	32%	30-130%
	13C3-PFBS	65%	85%	50-150%
	13C3-PFHxS	79%	89%	50-150%
	13C8-PFOS	77%	87%	50-150%
	13C8-FOSA	28% <sup>b</sup>	67%	30-130%
	d3-MeFOSAA	75%	95%	50-150%
	d5-EtFOSAA	70%	71%	50-150%
	13C2-4:2FTS	76%	92%	50-150%
	13C2-6:2FTS	89%	106%	50-150%
	13C2-8:2FTS	88%	88%	50-150%
	13C3-HFPO-DA	67%	93%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-25_121020	
<b>Lab Sample ID:</b> FA81615-26	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9232.D	1	12/16/20 17:02	MV	12/14/20 13:00	OP83375	S4Q127
Run #2	4Q9198.D	10	12/15/20 23:23	MV	12/14/20 13:00	OP83375	S4Q126

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0083	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0073	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0069	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0065	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0132	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0013	0.0020	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>a</sup>	0.020	0.010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>	0.020	0.010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0018	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0013	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0073	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>a</sup>	0.040	0.020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P2-MH-25_121020		Date Sampled: 12/10/20
Lab Sample ID: FA81615-26		Date Received: 12/11/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%	84%	35-135%
	13C5-PFPeA	65%	83%	50-150%
	13C5-PFHxA	69%	86%	50-150%
	13C4-PFHpA	74%	88%	50-150%
	13C8-PFOA	76%	86%	50-150%
	13C9-PFNA	79%	91%	50-150%
	13C6-PFDA	76%	88%	50-150%
	13C7-PFUnDA	68%	85%	40-140%
	13C2-PFDoDA	51%	73%	40-140%
	13C2-PFTeDA	14% <sup>b</sup>	52%	30-130%
	13C3-PFBS	63%	82%	50-150%
	13C3-PFHxS	78%	84%	50-150%
	13C8-PFOS	75%	80%	50-150%
	13C8-FOSA	29% <sup>b</sup>	81%	30-130%
	d3-MeFOSAA	74%	105%	50-150%
	d5-EtFOSAA	72%	84%	50-150%
	13C2-4:2FTS	72%	88%	50-150%
	13C2-6:2FTS	86%	108%	50-150%
	13C2-8:2FTS	89%	95%	50-150%
	13C3-HFPO-DA	64%	90%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-W_121020	
<b>Lab Sample ID:</b> FA81615-27	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9233.D	1	12/16/20 17:18	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
---------	----------	--------	----	-----	-------	---

**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0031	0.0040	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid	0.0012	0.0020	0.0010	ug/l	J
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0025	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0026	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P2-MH-W_121020	Date Sampled:	12/10/20
Lab Sample ID:	FA81615-27	Date Received:	12/11/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	67%		50-150%
	13C5-PFHxA	74%		50-150%
	13C4-PFHpA	80%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	91%		50-150%
	13C7-PFUnDA	88%		40-140%
	13C2-PFDoDA	83%		40-140%
	13C2-PFTeDA	86%		30-130%
	13C3-PFBS	67%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	87%		30-130%
	d3-MeFOSAA	91%		50-150%
	d5-EtFOSAA	83%		50-150%
	13C2-4:2FTS	76%		50-150%
	13C2-6:2FTS	92%		50-150%
	13C2-8:2FTS	95%		50-150%
	13C3-HFPO-DA	66%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> DUP-03_121020	
<b>Lab Sample ID:</b> FA81615-28	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4Q9234.D	1	12/16/20 17:33	MV	12/14/20 13:00	OP83375	S4Q127
Run #2							

Run #	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
<b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>						
375-22-4	Perfluorobutanoic acid	0.0083	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0074	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0068	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0063	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0140	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0016	0.0020	0.0010	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0012	0.0020	0.0010	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
<b>PERFLUOROALKYL SULFONIC ACIDS</b>						
375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0020	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0020	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0077	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
<b>PERFLUORO OCTANESULFONAMIDES</b>						
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
<b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b>						
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
<b>FLUOROTELOMER SULFONATES</b>						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> DUP-03_121020	
<b>Lab Sample ID:</b> FA81615-28	<b>Date Sampled:</b> 12/10/20
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 12/11/20
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%		35-135%
	13C5-PFPeA	61%		50-150%
	13C5-PFHxA	65%		50-150%
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	72%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	81%		40-140%
	13C2-PFDoDA	81%		40-140%
	13C2-PFTeDA	77%		30-130%
	13C3-PFBS	60%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	42%		30-130%
	d3-MeFOSAA	82%		50-150%
	d5-EtFOSAA	86%		50-150%
	13C2-4:2FTS	68%		50-150%
	13C2-6:2FTS	80%		50-150%
	13C2-8:2FTS	93%		50-150%
	13C3-HFPO-DA	60%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Misc. Forms

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### Custody Documents and Other Forms

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**Includes the following where applicable:**

- Certification Exceptions
- Chain of Custody

# Parameter Certification Exceptions

Job Number: FA81615  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.  
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

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Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, FL 32811  
TEL: 407-425-6700 FAX: 407-425-0707  
www.sgs.com

Client / Reporting Information		Project Information		Analytical Information		Matrix Codes											
Company Name: Arcadis		Project Name: RACER Lansing PFAS Delineation				DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid											
Address: 28550 Cabot Dr. Ste. 500		Street: Lansing															
City: Novi State: MI Zip: 48377		City: Lansing State: MI															
Project Contact: Marina Samp marina.samp@arcadis.com Email: Phone #: 248-994-2318		Project #: 30042872.03600 Fax #:															
Sampler(s) Name(s) (Printed) Sampler 1: A. Mandich Sampler 2: E. Witherspoon		Client Purchase Order #: 30042872.03600															
SGS Orlando Sample #	Field ID / Point of Collection	DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	NOI	NOH	NO3	NO2	PHOS	NOH-ZNA	DI WATER	NOH	LAB USE ONLY
1	MichAve-MH-3-120920	12/9/20	0903 AM	WW	WW	6	X										
2	MichAve-MH-4-120920	12/9/20	0940 AM	WW	WW	2	X										
3	Verlinden-MH-5-120920	12/9/20	1004 AM	WW	WW	2	X										
4	Verlinden-MH-4-120920	12/9/20	1020 AM	WW	WW	2	X										
5	Verlinden-MH-3-120920	12/9/20	1045 AM	WW	WW	2	X										
6	Verlinden-MH-2-120920	12/9/20	1103 AM	WW	WW	2	X										
7	Verlinden-MH-1-120920	12/9/20	1116 AM	WW	WW	2	X										
8	Osborn-MH-1-120920	12/9/20	1208 AM	WW	WW	2	X										
9	DUP-OI-120920	12/9/20		AM	WW	2	X										
Turnaround Time (Business days)		Data Deliverable Information		Comments / Remarks													
10 Day (Business) Approved By: / Date:		<input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY) <input checked="" type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC) <input type="checkbox"/> REDT1 (EPA LEVEL 3) <input type="checkbox"/> FULLT1 (EPA LEVEL 4) <input checked="" type="checkbox"/> EDD'S		MichAve-MH-3-120920 is a MS/MSD  Email Results to Andrew Lorenz andrew.lorenz@arcadis.com  WW = Waste Water													
7 Day 5 Day 3 Day RUSH 2 Day RUSH 1 Day RUSH Other		Rush T/A Data Available VIA Email or Lablink															
Relinquished by Sampler/Affiliation		Date Time:		Received By/Affiliation		Relinquished By/Affiliation		Date Time:		Received By/Affiliation		Date Time:		Received By/Affiliation			
1 A. Mandich		12/10/20 1600		2 FedEx		3 FX		12/11/20		C. Ortega							
5				6		7		8									
Lab Use Only: Cooler Temperature (s) Celsius (corrected):		24 0.4 1.4															

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http://www.sgs.com/en/terms-and-conditions



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SGS North America Inc - Orlando  
Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, FL 32811  
TEL: 407-425-6700 FAX: 407-425-0707  
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FA81615

SGS - ORLANDO JOB # :

PAGE 2 OF 3

Client / Reporting Information		Project Information		Analytical Information										Matrix Codes			
Company Name: Arcadis		Project Name: RIVER Lansing PEAS Delimitation												DW - Drinking Water			
Address: 28550 Cabot Dr. Ste 500		Street												GW - Ground Water			
City: Novi State: MI Zip: 48377		City: Lansing State: MI												WW - Water			
Project Contact: Marina Samp Email: marina.samp@arcadis.com		Project #: 30042872.03600												SW - Surface Water			
Phone #: 248-994-2318		Fax #: 30042872.03600												SO - Soil			
Sampler(s) Name(s) (Printed): A. Marchich Sampler 2: E. Wilkespoon		Client Purchase Order #: 30042872.03600												SL - Sludge			
SGS Orlando Sample #		COLLECTION		CONTAINER INFORMATION										LIQ - Other Liquid			
Field ID / Point of Collection		DATE	TIME	SAMPLED BY	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NO3	NO2	NO	SO4	NO3+NO2	DI WATER	MEDI	AIR - Air
10	P6-MH-19-120920	12/9/20	1239 AM	WW	2	X											SOL - Other Solid
11	P6-MH-18-120920	12/9/20	1305 AM	WW	2	X											LAB USE ONLY
12	P6-MH-17-120920	12/9/20	1324 AM	WW	2	X											
13	P6-MH-16-120920	12/9/20	1350 AM	WW	2	X											
	<del>P3-MH-297-120920</del>	<del>12/9/20</del>	<del>1515 AM</del>	<del>WW</del>	<del>2</del>	<del>X</del>											
14	P3-MH-290-120920	12/9/20	1515 AM	WW	2	X											
16	P3-MH-297-120920	12/9/20	1455 AM	WW	2	X											
16	P3-MH-284-120920	12/9/20	1535 AM	WW	2	X											
17	DWP-02-120920	12/9/20		WW	2	X											
18	P2-MH-2-121020	12/10/20	0905 AM	WW	2	X											
19	P2-MH-30-121020	12/10/20	0920 AM	WW	2	X											
Turnaround Time ( Business days)		Data Deliverable Information		Comments / Remarks													
<input checked="" type="checkbox"/> 10 Day (Business) <input type="checkbox"/> 7 Day <input type="checkbox"/> 5 Day <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> Other		Approved By / Date: _____ <input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY) <input checked="" type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC) <input type="checkbox"/> REDT1 (EPA LEVEL 3) <input type="checkbox"/> FULLT1 (EPA LEVEL 4) <input checked="" type="checkbox"/> EDD'S		Email results to Andrew Lorenz andrew.lorenz@arcadis.com WW = Waste Water													
Rush T/A Data Available VIA Email or Lablink		Sample Custody must be documented below each time samples change possession, including courier delivery.															
Relinquished by/Sampler/Affiliation 1 <i>Andrew Marchich</i>	Date Time: 12/10/20 1600	Received By/Affiliation 2 <i>FedEx</i>	Relinquished By/Affiliation 3 <i>PX</i>	Date Time: 12/11/20 1000	Received By/Affiliation 4 <i>Andrew Lorenz</i>												
Relinquished by/Affiliation 5	Date Time:	Received By/Affiliation 6	Relinquished By/Affiliation 7	Date Time:	Received By/Affiliation 8												
Lab Use Only : Cooler Temperature (s) Celsius (corrected): 24		http://www.sgs.com/en/terms-and-conditions															

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FA81615: Chain of Custody

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## SGS Sample Receipt Summary

Job Number: FA81615

Client: ARCADIS

Project: RACER LANSING PFAS DELINEATION

Date / Time Received: 12/11/2020 10:00:00 AM

Delivery Method: FED EX

Airbill #'s: 923153824608

Therm ID: IR 1;

Therm CF: 0.2;

# of Coolers: 3

Cooler Temps (Raw Measured) °C: Cooler 1: (0.2); Cooler 2: (2.2); Cooler 3: (1.6);

Cooler Temps (Corrected) °C: Cooler 1: (0.4); Cooler 2: (2.4); Cooler 3: (1.8);

**Cooler Information**

Y or N

- |                             |                                     |                          |
|-----------------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present    | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Temp criteria achieved   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Cooler temp verification | <u>IR Gun</u>                       |                          |
| 5. Cooler media             | <u>Ice (Bag)</u>                    |                          |

**Trip Blank Information**

Y or N N/A

- |                                |                          |                          |                                     |
|--------------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC    | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|                                | <u>W or S</u>            |                          | <u>N/A</u>                          |
| 3. Type Of TB Received         | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Sample Information**

Y or N N/A

- |                                                     |                                     |                                     |                                     |
|-----------------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Sample labels present on bottles                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Samples preserved properly                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 3. Sufficient volume/containers recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Condition of sample                              | <u>Intact</u>                       |                                     |                                     |
| 5. Sample recvd within HT                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 6. Dates/Times/IDs on COC match Sample Label        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 7. VOCs have headspace                              | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8. Bottles received for unspecified tests           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 9. Compositing instructions clear                   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10. Voa Soil Kits/Jars received past 48hrs?         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11. % Solids Jar received?                          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12. Residual Chlorine Present?                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Misc. Information**

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_ Number of 5035 Field Kits: \_\_\_\_\_ Number of Lab Filtered Metals: \_\_\_\_\_  
 Test Strip Lot #: pH 0-3 230315 pH 10-12 219813A Other: (Specify) \_\_\_\_\_  
 Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments

SM001  
Rev. Date 05/24/17

Technician: CARLOSD

Date: 12/11/2020 10:00:00

Reviewer: \_\_\_\_\_

Date: \_\_\_\_\_

FA81615: Chain of Custody

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4.2  
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## MS Semi-volatiles

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### QC Data Summaries

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**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Instrument Blank

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q127-IBLK	4Q9222.D	1	12/16/20	MV	n/a	n/a	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-20, FA81615-21, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	92% 50-150%
	13C9-PFNA	96% 50-150%
	13C8-PFOS	90% 50-150%

5.1.1  
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# Instrument Blank

Job Number: FA81615  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q128-IBLK	4Q9303.D	1	12/17/20	MV	n/a	n/a	S4Q128

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-2, FA81615-3, FA81615-4, FA81615-6, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-13, FA81615-14, FA81615-18

CAS No.	Compound	Result	RL	MDL	Units	Q
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
763051-92-911Cl-PF3OUdS (F-53B Minor)		ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	96% 50-150%
	13C9-PFNA	101% 50-150%
	13C8-PFOS	96% 50-150%

5.1.2  
5

# Method Blank Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-MB	4Q9179.D	1	12/15/20	MV	12/14/20	OP83375	S4Q126

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	82% 35-135%
	13C5-PFPeA	89% 50-150%
	13C5-PFHxA	89% 50-150%
	13C4-PFHpA	92% 50-150%

## Method Blank Summary

**Job Number:** FA81615  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-MB	4Q9179.D	1	12/15/20	MV	12/14/20	OP83375	S4Q126

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	89% 50-150%
	13C9-PFNA	93% 50-150%
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	92% 40-140%
	13C2-PFDoDA	86% 40-140%
	13C2-PFTeDA	84% 30-130%
	13C3-PFBS	90% 50-150%
	13C3-PFHxS	89% 50-150%
	13C8-PFOS	86% 50-150%
	13C8-FOSA	106% 30-130%
	d3-MeFOSAA	90% 50-150%
	d5-EtFOSAA	84% 50-150%
	13C2-4:2FTS	90% 50-150%
	13C2-6:2FTS	96% 50-150%
	13C2-8:2FTS	96% 50-150%
	13C3-HFPO-DA	82% 50-150%

# Method Blank Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-MB	4Q9268.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	79% 35-135%
	13C5-PFPeA	85% 50-150%
	13C5-PFHxA	85% 50-150%
	13C4-PFHpA	86% 50-150%

5.1.4  
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## Method Blank Summary

**Job Number:** FA81615  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-MB	4Q9268.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9,  
 FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-  
 19, FA81615-21

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	86% 50-150%
	13C9-PFNA	89% 50-150%
	13C6-PFDA	88% 50-150%
	13C7-PFUnDA	85% 40-140%
	13C2-PFDoDA	83% 40-140%
	13C2-PFTeDA	85% 30-130%
	13C3-PFBS	84% 50-150%
	13C3-PFHxS	85% 50-150%
	13C8-PFOS	85% 50-150%
	13C8-FOSA	105% 30-130%
	d3-MeFOSAA	92% 50-150%
	d5-EtFOSAA	90% 50-150%
	13C2-4:2FTS	86% 50-150%
	13C2-6:2FTS	90% 50-150%
	13C2-8:2FTS	91% 50-150%
	13C3-HFPO-DA	76% 50-150%

5.1.4  
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# Method Blank Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-MB	2Q60362.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0019	0.00093	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0019	0.00093	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0019	0.00093	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	
754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EiFOSAA	ND	0.0037	0.0019	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0037	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	85% 35-135%
	13C5-PFPeA	85% 50-150%
	13C5-PFHxA	87% 50-150%
	13C4-PFHpA	85% 50-150%

5.1.5  
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## Method Blank Summary

Job Number: FA81615  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-MB	2Q60362.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	88% 50-150%
	13C9-PFNA	86% 50-150%
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	90% 40-140%
	13C2-PFDoDA	88% 40-140%
	13C2-PFTeDA	84% 30-130%
	13C3-PFBS	86% 50-150%
	13C3-PFHxS	86% 50-150%
	13C8-PFOS	92% 50-150%
	13C8-FOSA	86% 30-130%
	d3-MeFOSAA	96% 50-150%
	d5-EtFOSAA	94% 50-150%
	13C2-4:2FTS	81% 50-150%
	13C2-6:2FTS	84% 50-150%
	13C2-8:2FTS	85% 50-150%

# Instrument Blank

Job Number: FA81615  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S4Q126-IBLK	4Q9165.D	1	12/15/20	MV	n/a	n/a	S4Q126

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA81615-24, FA81615-25, FA81615-26

CAS No.	Compound	Result	RL	MDL	Units	Q
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFHpA	88% 50-150%
	13C8-PFOA	87% 50-150%
	13C9-PFNA	91% 50-150%
	13C3-PFBS	88% 50-150%
	13C3-PFHxS	88% 50-150%
	13C8-PFOS	85% 50-150%

# Instrument Blank

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q883-IBLK	2Q60312.D	1	12/23/20	NAF	n/a	n/a	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA81615-17, FA81615-19

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C5-PFHxA	93%	50-150%
	13C4-PFHpA	92%	50-150%
	13C8-PFOA	96%	50-150%
	13C9-PFNA	96%	50-150%

5.1.7  
5

# Instrument Blank

**Job Number:** FA81615  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q883-IBLK	2Q60312.D	1	12/23/20	NAF	n/a	n/a	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	Limits
	13C6-PFDA	101% 50-150%
	13C7-PFUnDA	100% 50-150%
	13C2-PFDoDA	101% 50-150%
	13C2-PFTeDA	103% 50-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	90% 50-150%
	13C8-PFOS	98% 50-150%
	d3-MeFOSAA	103% 50-150%
	d5-EtFOSAA	104% 50-150%

5.1.7  
5

# Blank Spike Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-BS	4Q9178.D	1	12/15/20	MV	12/14/20	OP83375	S4Q126

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0766	96	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0737	92	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0735	92	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0735	92	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0749	94	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0722	90	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0752	94	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0735	92	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0742	93	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0770	96	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0758	95	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0763	95	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0736	92	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0719	90	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0762	95	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0755	94	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0746	93	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0671	84	60-130
754-91-6	PFOSA	0.08	0.0692	87	70-130
2355-31-9	MeFOSAA	0.08	0.0721	90	70-130
2991-50-6	EiFOSAA	0.08	0.0741	93	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0730	91	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0735	92	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0734	92	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0741	93	60-140
919005-14-4	ADONA	0.08	0.0709	89	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0686	86	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0744	93	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	85%	35-135%
	13C5-PFPeA	94%	50-150%
	13C5-PFHxA	95%	50-150%
	13C4-PFHpA	95%	50-150%

\* = Outside of Control Limits.

5.2.1  
5

# Blank Spike Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-BS	4Q9178.D	1	12/15/20	MV	12/14/20	OP83375	S4Q126

The QC reported here applies to the following samples: Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	94%	50-150%
	13C9-PFNA	98%	50-150%
	13C6-PFDA	96%	50-150%
	13C7-PFUnDA	95%	40-140%
	13C2-PFDoDA	90%	40-140%
	13C2-PFTeDA	92%	30-130%
	13C3-PFBS	93%	50-150%
	13C3-PFHxS	95%	50-150%
	13C8-PFOS	94%	50-150%
	13C8-FOSA	106%	30-130%
	d3-MeFOSAA	89%	50-150%
	d5-EtFOSAA	86%	50-150%
	13C2-4:2FTS	99%	50-150%
	13C2-6:2FTS	104%	50-150%
	13C2-8:2FTS	105%	50-150%
	13C3-HFPO-DA	86%	50-150%

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-BS	4Q9267.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0775	97	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0758	95	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0753	94	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0751	94	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0764	96	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0748	94	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0766	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0754	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0763	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0787	98	65-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0794	99	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0767	96	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0735	92	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0757	95	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0791	99	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0783	98	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0767	96	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0683	85	60-130
754-91-6	PFOSA	0.08	0.0728	91	70-130
2355-31-9	MeFOSAA	0.08	0.0755	94	70-130
2991-50-6	EiFOSAA	0.08	0.0763	95	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0749	94	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0751	94	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0757	95	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0745	93	60-140
919005-14-4	ADONA	0.08	0.0726	91	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0683	85	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0742	93	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	83%	35-135%
	13C5-PFPeA	89%	50-150%
	13C5-PFHxA	90%	50-150%
	13C4-PFHpA	91%	50-150%

\* = Outside of Control Limits.

5.2.2  
5

# Blank Spike Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-BS	4Q9267.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	90%	50-150%
	13C9-PFNA	94%	50-150%
	13C6-PFDA	92%	50-150%
	13C7-PFUnDA	89%	40-140%
	13C2-PFDoDA	86%	40-140%
	13C2-PFTeDA	89%	30-130%
	13C3-PFBS	89%	50-150%
	13C3-PFHxS	88%	50-150%
	13C8-PFOS	88%	50-150%
	13C8-FOSA	106%	30-130%
	d3-MeFOSAA	92%	50-150%
	d5-EtFOSAA	90%	50-150%
	13C2-4:2FTS	95%	50-150%
	13C2-6:2FTS	99%	50-150%
	13C2-8:2FTS	101%	50-150%
	13C3-HFPO-DA	81%	50-150%

\* = Outside of Control Limits.

5.2.2  
5

# Blank Spike Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-BS	2Q60361.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.0741	0.0662	89	70-130
2706-90-3	Perfluoropentanoic acid	0.0741	0.0672	91	70-130
307-24-4	Perfluorohexanoic acid	0.0741	0.0658	89	70-130
375-85-9	Perfluoroheptanoic acid	0.0741	0.0682	92	70-130
335-67-1	Perfluorooctanoic acid	0.0741	0.0678	92	70-130
375-95-1	Perfluorononanoic acid	0.0741	0.0644	87	70-130
335-76-2	Perfluorodecanoic acid	0.0741	0.0655	88	70-130
2058-94-8	Perfluoroundecanoic acid	0.0741	0.0661	89	70-130
307-55-1	Perfluorododecanoic acid	0.0741	0.0669	90	70-130
72629-94-8	Perfluorotridecanoic acid	0.0741	0.0660	89	65-130
376-06-7	Perfluorotetradecanoic acid	0.0741	0.0650	88	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0741	0.0638	86	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0741	0.0626	85	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0741	0.0672	91	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0741	0.0674	91	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0741	0.0678	92	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0741	0.0660	89	65-130
335-77-3	Perfluorodecanesulfonic acid	0.0741	0.0631	85	60-130
754-91-6	PFOSA	0.0741	0.0658	89	70-130
2355-31-9	MeFOSAA	0.0741	0.0640	86	70-130
2991-50-6	EiFOSAA	0.0741	0.0641	87	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.0741	0.0668	90	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0741	0.0662	89	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.0741	0.0654	88	70-130
13252-13-6	HFPO-DA (GenX)	0.0741	0.0530	72	60-140
919005-14-4	ADONA	0.0741	0.0627	85	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.0741	0.0712	96	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.0741	0.0635	86	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	80%	35-135%
	13C5-PFPeA	80%	50-150%
	13C5-PFHxA	81%	50-150%
	13C4-PFHpA	80%	50-150%

\* = Outside of Control Limits.

5.2.3  
5

# Blank Spike Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-BS	2Q60361.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	83%	50-150%
	13C9-PFNA	82%	50-150%
	13C6-PFDA	87%	50-150%
	13C7-PFUnDA	85%	40-140%
	13C2-PFDoDA	83%	40-140%
	13C2-PFTeDA	81%	30-130%
	13C3-PFBS	81%	50-150%
	13C3-PFHxS	80%	50-150%
	13C8-PFOS	86%	50-150%
	13C8-FOSA	78%	30-130%
	d3-MeFOSAA	92%	50-150%
	d5-EtFOSAA	88%	50-150%
	13C2-4:2FTS	80%	50-150%
	13C2-6:2FTS	83%	50-150%
	13C2-8:2FTS	85%	50-150%

\* = Outside of Control Limits.

# Matrix Spike Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-MS	2Q60371.D	1	12/24/20	NAF	12/22/20	OP83473	S2Q883
FA81780-1	2Q60370.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	Compound	FA81780-1 ug/l	Spike Q	MS ug/l	MS %	Limits	
375-22-4	Perfluorobutanoic acid	0.0070		0.0714	0.0686	86	70-130
2706-90-3	Perfluoropentanoic acid	0.0182		0.0714	0.0819	89	70-130
307-24-4	Perfluorohexanoic acid	0.0163		0.0714	0.0763	84	70-130
375-85-9	Perfluoroheptanoic acid	0.0087		0.0714	0.0727	90	70-130
335-67-1	Perfluorooctanoic acid	0.0082		0.0714	0.0708	88	70-130
375-95-1	Perfluorononanoic acid	0.0011	J	0.0714	0.0622	86	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0615	86	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0631	88	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0633	89	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0613	86	65-130
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0605	85	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0039		0.0714	0.0631	83	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0044		0.0714	0.0616	80	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0359		0.0714	0.102	93	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0016	J	0.0714	0.0681	93	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0699		0.0714	0.136	93	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0611	86	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0587	82	60-130
754-91-6	PFOSA	ND		0.0714	0.0626	88	70-130
2355-31-9	MeFOSAA	ND		0.0714	0.0622	87	70-130
2991-50-6	EiFOSAA	ND		0.0714	0.0613	86	70-130
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0714	0.0625	87	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0623	87	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0631	88	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0497	70	60-140
919005-14-4	ADONA	ND		0.0714	0.0587	82	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0654	92	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0598	84	60-140

CAS No.	ID Standard Recoveries	MS	FA81780-1	Limits
	13C4-PFBA	78%	82%	35-135%
	13C5-PFPeA	78%	82%	50-150%
	13C5-PFHxA	80%	84%	50-150%
	13C4-PFHpA	78%	83%	50-150%

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-MS	2Q60371.D	1	12/24/20	NAF	12/22/20	OP83473	S2Q883
FA81780-1	2Q60370.D	1	12/23/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	MS	FA81780-1	Limits
	13C8-PFOA	81%	87%	50-150%
	13C9-PFNA	80%	85%	50-150%
	13C6-PFDA	84%	91%	50-150%
	13C7-PFUnDA	79%	87%	40-140%
	13C2-PFDoDA	76%	85%	40-140%
	13C2-PFTeDA	79%	87%	30-130%
	13C3-PFBS	80%	84%	50-150%
	13C3-PFHxS	75%	83%	50-150%
	13C8-PFOS	84%	91%	50-150%
	13C8-FOSA	79%	87%	30-130%
	d3-MeFOSAA	86%	95%	50-150%
	d5-EtFOSAA	82%	90%	50-150%
	13C2-4:2FTS	77%	78%	50-150%
	13C2-6:2FTS	82%	82%	50-150%
	13C2-8:2FTS	81%	84%	50-150%
	13C3-HFPO-DA		95%	50-150%

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-MS	4Q9226.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127
OP83375-MSD	4Q9227.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127
FA81615-20	4Q9225.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	Compound	FA81615-20 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD	
375-22-4	Perfluorobutanoic acid	0.0119		0.0741	0.0817	94	0.0769	0.0847	95	4	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0017	J	0.0741	0.0692	91	0.0769	0.0721	92	4	70-130/30
307-24-4	Perfluorohexanoic acid	0.0011	J	0.0741	0.0690	92	0.0769	0.0721	92	4	70-130/30
375-85-9	Perfluoroheptanoic acid	ND		0.0741	0.0693	94	0.0769	0.0719	93	4	70-130/30
335-67-1	Perfluorooctanoic acid	0.0011	J	0.0741	0.0709	94	0.0769	0.0730	93	3	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0741	0.0672	91	0.0769	0.0701	91	4	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0688	93	0.0769	0.0718	93	4	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0674	91	0.0769	0.0701	91	4	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0689	93	0.0769	0.0720	94	4	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.0927	125	0.0769	0.0926	120	0	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0741	0.0695	94	0.0769	0.0733	95	5	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0014	J	0.0741	0.0694	92	0.0769	0.0739	94	6	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0741	0.0721	97	0.0769	0.0759	99	5	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0741	0.0689	93	0.0769	0.0717	93	4	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0741	0.0749	101	0.0769	0.0769	100	3	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0032		0.0741	0.0712	92	0.0769	0.0742	92	4	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0696	94	0.0769	0.0713	93	2	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0559	75	0.0769	0.0563	73	1	60-130/30
754-91-6	PFOSA	ND		0.0741	0.0676	91	0.0769	0.0694	90	3	70-130/30
2355-31-9	MeFOSAA	ND		0.0741	0.0674	91	0.0769	0.0709	92	5	70-130/30
2991-50-6	EtFOSAA	ND		0.0741	0.0688	93	0.0769	0.0725	94	5	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0741	0.0665	90	0.0769	0.0701	91	5	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0741	0.0676	91	0.0769	0.0705	92	4	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0741	0.0678	92	0.0769	0.0713	93	5	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0741	0.0703	95	0.0769	0.0745	97	6	60-140/30
919005-14-4	ADONA	ND		0.0741	0.0628	85	0.0769	0.0671	87	7	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0741	0.0616	83	0.0769	0.0644	84	4	60-140/30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		0.0741	0.0708	96	0.0769	0.0757	98	7	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA81615-20	Limits
	13C4-PFBA	64%	66%	72%	35-135%
	13C5-PFPeA	69%	70%	75%	50-150%
	13C5-PFHxA	73%	73%	79%	50-150%
	13C4-PFHpA	77%	77%	83%	50-150%

\* = Outside of Control Limits.

5.4.1  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83375-MS	4Q9226.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127
OP83375-MSD	4Q9227.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127
FA81615-20	4Q9225.D	1	12/16/20	MV	12/14/20	OP83375	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-20, FA81615-22, FA81615-23, FA81615-24, FA81615-25, FA81615-26, FA81615-27, FA81615-28

CAS No.	ID Standard Recoveries	MS	MSD	FA81615-20	Limits
	13C8-PFOA	80%	79%	85%	50-150%
	13C9-PFNA	84%	82%	90%	50-150%
	13C6-PFDA	85%	82%	90%	50-150%
	13C7-PFUnDA	83%	78%	85%	40-140%
	13C2-PFDoDA	68%	62%	69%	40-140%
	13C2-PFTeDA	38%	38%	33%	30-130%
	13C3-PFBS	71%	70%	76%	50-150%
	13C3-PFHxS	77%	77%	83%	50-150%
	13C8-PFOS	80%	77%	84%	50-150%
	13C8-FOSA	61%	65%	62%	30-130%
	d3-MeFOSAA	89%	84%	93%	50-150%
	d5-EtFOSAA	89%	84%	91%	50-150%
	13C2-4:2FTS	81%	80%	82%	50-150%
	13C2-6:2FTS	92%	91%	93%	50-150%
	13C2-8:2FTS	99%	94%	99%	50-150%
	13C3-HFPO-DA	66%	65%	70%	50-150%

\* = Outside of Control Limits.

5.4.1  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-MS	4Q9272.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127
OP83388-MSD	4Q9273.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127
FA81615-1	4Q9269.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	Compound	FA81615-1 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0044	0.0741	0.0775	99	0.08	0.0788	93	2	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0023	0.0741	0.0726	95	0.08	0.0749	91	3	70-130/30
307-24-4	Perfluorohexanoic acid	0.0016	J 0.0741	0.0714	94	0.08	0.0735	90	3	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0012	J 0.0741	0.0722	96	0.08	0.0744	92	3	70-130/30
335-67-1	Perfluorooctanoic acid	0.0030	0.0741	0.0758	98	0.08	0.0774	93	2	70-130/30
375-95-1	Perfluorononanoic acid	ND	0.0741	0.0693	94	0.08	0.0701	88	1	70-130/30
335-76-2	Perfluorodecanoic acid	ND	0.0741	0.0709	96	0.08	0.0733	92	3	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND	0.0741	0.0701	95	0.08	0.0721	90	3	70-130/30
307-55-1	Perfluorododecanoic acid	ND	0.0741	0.0717	97	0.08	0.0726	91	1	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND	0.0741	0.134	181*	0.08	0.0786	98	52*	65-130/30
376-06-7	Perfluorotetradecanoic acid	ND	0.0741	0.0732	99	0.08	0.0763	95	4	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0026	0.0741	0.0731	95	0.08	0.0793	96	8	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0741	0.0799	108	0.08	0.0843	105	5	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0014	J 0.0741	0.0712	94	0.08	0.0746	92	5	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0741	0.0782	106	0.08	0.0766	96	2	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.0741	0.0716	92	0.08	0.0756	90	5	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND	0.0741	0.0662	89	0.08	0.0636	80	4	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND	0.0741	0.0498	67	0.08	0.0398	50*	22	60-130/30
754-91-6	PFOSA	ND	0.0741	0.0700	95	0.08	0.0718	90	3	70-130/30
2355-31-9	MeFOSAA	ND	0.0741	0.0715	97	0.08	0.0740	93	3	70-130/30
2991-50-6	EtFOSAA	ND	0.0741	0.0735	99	0.08	0.0766	96	4	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0741	0.0705	95	0.08	0.0716	90	2	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0741	0.0695	94	0.08	0.0726	91	4	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0741	0.0698	94	0.08	0.0726	91	4	70-130/30
13252-13-6	HFPO-DA (GenX)	ND	0.0741	0.0725	98	0.08	0.0757	95	4	60-140/30
919005-14-4	ADONA	ND	0.0741	0.0657	89	0.08	0.0675	84	3	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0741	0.0623	84	0.08	0.0652	82	5	60-140/30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0741	0.0997	135	0.08	0.124	155*	22	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA81615-1	Limits
	13C4-PFBA	59%	60%	59%	35-135%
	13C5-PFPeA	61%	62%	60%	50-150%
	13C5-PFHxA	67%	67%	66%	50-150%
	13C4-PFHpA	73%	73%	71%	50-150%

\* = Outside of Control Limits.

5.4.2  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83388-MS	4Q9272.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127
OP83388-MSD	4Q9273.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127
FA81615-1	4Q9269.D	1	12/17/20	MV	12/15/20	OP83388	S4Q127

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-1, FA81615-2, FA81615-3, FA81615-4, FA81615-5, FA81615-6, FA81615-7, FA81615-8, FA81615-9, FA81615-10, FA81615-11, FA81615-12, FA81615-13, FA81615-14, FA81615-15, FA81615-16, FA81615-18, FA81615-19, FA81615-21

CAS No.	ID Standard Recoveries	MS	MSD	FA81615-1	Limits
13C8-PFOA		77%	77%	76%	50-150%
13C9-PFNA		84%	80%	80%	50-150%
13C6-PFDA		86%	77%	81%	50-150%
13C7-PFUnDA		77%	60%	76%	40-140%
13C2-PFDoDA		45%	25%* a	63%	40-140%
13C2-PFTeDA		8%* a	9%* a	16%* a	30-130%
13C3-PFBS		65%	62%	62%	50-150%
13C3-PFHxS		76%	76%	74%	50-150%
13C8-PFOS		82%	73%	76%	50-150%
13C8-FOSA		34%	28%* a	40%	30-130%
d3-MeFOSAA		89%	72%	94%	50-150%
d5-EtFOSAA		85%	64%	87%	50-150%
13C2-4:2FTS		75%	75%	69%	50-150%
13C2-6:2FTS		92%	91%	86%	50-150%
13C2-8:2FTS		104%	91%	93%	50-150%
13C3-HFPO-DA		59%	60%	59%	50-150%

(a) Outside control limits.

\* = Outside of Control Limits.

5.4.2  
5

# Duplicate Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-DUP	2Q60373.D	1	12/24/20	NAF	12/22/20	OP83473	S2Q883
FA81780-2 <sup>a</sup>	2Q60372.D	1.5	12/24/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	Compound	FA81780-2 ug/l	DUP Q	ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.0108		0.0070		43*	30
2706-90-3	Perfluoropentanoic acid	0.0283		0.0184		42*	30
307-24-4	Perfluorohexanoic acid	0.0258		0.0164		45*	30
375-85-9	Perfluoroheptanoic acid	0.0140		0.0092		41*	30
335-67-1	Perfluorooctanoic acid	0.0132		0.0086		42*	30
375-95-1	Perfluorononanoic acid	0.0018	J	0.0011	J	48*	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0063		0.0039		47*	30
2706-91-4	Perfluoropentanesulfonic acid	0.0069		0.0045		42*	30
355-46-4	Perfluorohexanesulfonic acid	0.0548		0.0361		41*	30
375-92-8	Perfluoroheptanesulfonic acid	0.0025	J	0.0018		33*	30
1763-23-1	Perfluorooctanesulfonic acid	0.110		0.0716		42*	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EiFOSAA	ND		ND		nc	30
757124-72-44:2	Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA81780-2	Limits
	13C4-PFBA	81%	126%	35-135%
	13C5-PFPeA	81%	125%	50-150%
	13C5-PFHxA	83%	127%	50-150%
	13C4-PFHpA	81%	126%	50-150%

\* = Outside of Control Limits.

5.5.1  
5

# Duplicate Summary

Job Number: FA81615  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83473-DUP	2Q60373.D	1	12/24/20	NAF	12/22/20	OP83473	S2Q883
FA81780-2 <sup>a</sup>	2Q60372.D	1.5	12/24/20	NAF	12/22/20	OP83473	S2Q883

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA81615-17, FA81615-19

CAS No.	ID Standard Recoveries	DUP	FA81780-2	Limits
	13C8-PFOA	85%	131%	50-150%
	13C9-PFNA	84%	130%	50-150%
	13C6-PFDA	89%	137%	50-150%
	13C7-PFUnDA	85%	128%	40-140%
	13C2-PFDoDA	83%	125%	40-140%
	13C2-PFTeDA	86%	129%	30-130%
	13C3-PFBS	82%	129%	50-150%
	13C3-PFHxS	83%	132%	50-150%
	13C8-PFOS	90%	140%	50-150%
	13C8-FOSA	84%	137%* <sup>b</sup>	30-130%
	d3-MeFOSAA	92%	138%	50-150%
	d5-EtFOSAA	89%	134%	50-150%
	13C2-4:2FTS	77%	121%	50-150%
	13C2-6:2FTS	82%	129%	50-150%
	13C2-8:2FTS	84%	126%	50-150%
	13C3-HFPO-DA		147%	50-150%

(a) Dilution due to sample clogging SPE cartridge, only partial volume was extracted.

(b) Outside control limits.

\* = Outside of Control Limits.

5.5.1  
5

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

**Arcadis**

**Racer Lansing PFAS Delineation; Lansing, MI**

**30042872.03700**

**SGS Job Number: FA82792**

**Sampling Date: 02/01/21**

**Report to:**

**Arcadis**  
**300 S Washington Sq Suite 315**  
**Lansing, MI 48933**  
**marina.samp@arcadis.com; alex.villhauer@arcadis.com;**  
**kaitlyn.voet@arcadis.com; tiffany.linder@arcadis.com**  
**ATTN: Alex Villhauer**

**Total number of pages in report: 44**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

**Norm Farmer**  
**Technical Director**

**Client Service contact: Andrea Colby 407-425-6700**

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FI002), NY(12022), SC(96038001)  
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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## Sample Summary

**Arcadis**

**Job No: FA82792**

**Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30042872.03700**

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
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**This report contains results reported as ND = Not detected. The following applies:  
Organics ND = Not detected above the MDL**

FA82792-1	02/01/21	09:59	AMAH02/02/21	AQ	Ground Water	P2-MH-NW_020121
FA82792-2	02/01/21	10:30	AMAH02/02/21	AQ	Ground Water	P2-MH-32_020121
FA82792-2D	02/01/21	10:30	AMAH02/02/21	AQ	Water Dup/MSD	P2-MH-32_020121
FA82792-2S	02/01/21	10:30	AMAH02/02/21	AQ	Water Matrix Spike	P2-MH-32_020121
FA82792-3	02/01/21	12:28	AMAH02/02/21	AQ	Ground Water	P2-MH-29_020121
FA82792-4	02/01/21	13:00	AMAH02/02/21	AQ	Ground Water	P2-MH-30_020121
FA82792-5	02/01/21	13:17	AMAH02/02/21	AQ	Ground Water	P2-MH-2_020121
FA82792-6	02/01/21	00:00	AMAH02/02/21	AQ	Ground Water	DUP-01_020121
FA82792-7	02/01/21	13:20	AMAH02/02/21	AQ	Field Blank Water	FB-01_020121
FA82792-8	02/01/21	13:26	AMAH02/02/21	AQ	Equipment Blank	EB-01_020121

# Summary of Hits

**Job Number:** FA82792  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 02/01/21

2

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA82792-1	P2-MH-NW_020121					
Perfluorobutanoic acid		0.0089	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0061	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0084	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0063	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0111	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0022	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0079	0.0018	0.00089	ug/l	EPA 537M BY ID
FA82792-2	P2-MH-32_020121					
Perfluorobutanoic acid		0.0102	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0019	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0052	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
FA82792-3	P2-MH-29_020121					
Perfluorobutanoic acid		0.0101	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid <sup>a</sup>		0.0077	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid <sup>a</sup>		0.0055	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0059	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0058	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid <sup>a</sup>		0.251	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0124	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		0.0073	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0587	0.0018	0.00089	ug/l	EPA 537M BY ID
FA82792-4	P2-MH-30_020121					
Perfluorobutanoic acid		0.0076	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0037	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0052	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0044	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0083	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0282	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0042	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0290	0.0018	0.00089	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0035 J	0.0071	0.0018	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA82792  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 02/01/21

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**FA82792-5 P2-MH-2\_020121**

Perfluorobutanoic acid	0.0074	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0036	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0056	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0041	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0087	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0010 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0070	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0106	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA82792-6 DUP-01\_020121**

Perfluorobutanoic acid	0.0077	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0043	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0060	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0049	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0085	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0064	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0025	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0107	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA82792-7 FB-01\_020121**

No hits reported in this sample.

**FA82792-8 EB-01\_020121**

No hits reported in this sample.

(a) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

## Sample Results

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## Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> P2-MH-NW_020121	
<b>Lab Sample ID:</b> FA82792-1	<b>Date Sampled:</b> 02/01/21
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 02/02/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63078.D	1	02/13/21 06:35	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2 <sup>a</sup>	2Q63172.D	5	02/14/21 22:14	NAF	02/10/21 08:40	OP84056	S2Q919

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0089	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0061	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0084	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0063	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0111	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0013	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid <sup>b</sup>	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0016	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0013	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0022	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0079	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA <sup>b</sup>	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.1  
3

Client Sample ID:	P2-MH-NW_020121	
Lab Sample ID:	FA82792-1	Date Sampled: 02/01/21
Matrix:	AQ - Ground Water	Date Received: 02/02/21
Method:	EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	68%	86%	35-135%
	13C5-PFPeA	69%	86%	50-150%
	13C5-PFHxA	66%	85%	50-150%
	13C4-PFHpA	67%	84%	50-150%
	13C8-PFOA	71%	84%	50-150%
	13C9-PFNA	77%	87%	50-150%
	13C6-PFDA	74%	86%	50-150%
	13C7-PFUnDA	70%	80%	40-140%
	13C2-PFDoDA	68%	74%	40-140%
	13C2-PFTeDA	24% <sup>c</sup>	39%	30-130%
	13C3-PFBS	71%	85%	50-150%
	13C3-PFHxS	72%	83%	50-150%
	13C8-PFOS	74%	85%	50-150%
	13C8-FOSA	20% <sup>c</sup>	52%	30-130%
	d3-MeFOSAA	102%	94%	40-140%
	d5-EtFOSAA	102%	86%	40-140%
	13C2-4:2FTS	66%	84%	50-150%
	13C2-6:2FTS	76%	91%	50-150%
	13C2-8:2FTS	85%	89%	50-150%
	13C3-HFPO-DA	63%	89%	50-150%

- (a) Confirmation run.
- (b) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

32  
3

<b>Client Sample ID:</b> P2-MH-32_020121	
<b>Lab Sample ID:</b> FA82792-2	<b>Date Sampled:</b> 02/01/21
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 02/02/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63435.D	1	02/17/21 20:20	NAF	02/16/21 12:40	OP84148	S2Q922
Run #2 <sup>a</sup>	2Q63173.D	5	02/14/21 22:29	NAF	02/10/21 08:40	OP84056	S2Q919

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0102	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0015	0.0018	0.00089	ug/l	J
307-24-4	Perfluorohexanoic acid	0.0019	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0052	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0017	0.0018	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA <sup>b</sup>	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

32  
3

Client Sample ID: P2-MH-32_020121		Date Sampled: 02/01/21
Lab Sample ID: FA82792-2		Date Received: 02/02/21
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	56%	76%	35-135%
	13C5-PFPeA	60%	76%	50-150%
	13C5-PFHxA	59%	73%	50-150%
	13C4-PFHpA	59%	73%	50-150%
	13C8-PFOA	70%	77%	50-150%
	13C9-PFNA	79%	78%	50-150%
	13C6-PFDA	90%	81%	50-150%
	13C7-PFUnDA	86%	76%	40-140%
	13C2-PFDoDA	93%	69%	40-140%
	13C2-PFTeDA	67%	17% <sup>c</sup>	30-130%
	13C3-PFBS	58%	76%	50-150%
	13C3-PFHxS	71%	76%	50-150%
	13C8-PFOS	90%	88%	50-150%
	13C8-FOSA	16% <sup>c</sup>	21% <sup>c</sup>	30-130%
	d3-MeFOSAA	83%	100%	40-140%
	d5-EtFOSAA	90%	95%	40-140%
	13C2-4:2FTS	50%	73%	50-150%
	13C2-6:2FTS	70%	83%	50-150%
	13C2-8:2FTS	101%	89%	50-150%
	13C3-HFPO-DA	80%	84%	50-150%

- (a) Confirmation run.
- (b) Associated ID Standard outside control limits, Confirmed by batch QC.
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-29_020121	
<b>Lab Sample ID:</b> FA82792-3	<b>Date Sampled:</b> 02/01/21
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 02/02/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63438.D	1	02/17/21 21:05	NAF	02/16/21 12:40	OP84148	S2Q922
Run #2 <sup>a</sup>	2Q63082.D	1	02/13/21 07:34	NAF	02/10/21 08:40	OP84056	S2Q918

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0101	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid <sup>b</sup>	0.0077	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid <sup>b</sup>	0.0055	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0059	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0058	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid <sup>b</sup>	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid <sup>b</sup>	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid <sup>b</sup>	0.251	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid <sup>b</sup>	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0124	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0073	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0587	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA <sup>b</sup>	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate <sup>b</sup>	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P2-MH-29_020121	Date Sampled:	02/01/21
Lab Sample ID:	FA82792-3	Date Received:	02/02/21
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Mino <sup>b</sup> )	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	39%	28% <sup>c</sup>	35-135%
	13C5-PFPeA	45% <sup>c</sup>	31% <sup>c</sup>	50-150%
	13C5-PFHxA	45% <sup>c</sup>	30% <sup>c</sup>	50-150%
	13C4-PFHpA	50%	34% <sup>c</sup>	50-150%
	13C8-PFOA	64%	41% <sup>c</sup>	50-150%
	13C9-PFNA	78%	51%	50-150%
	13C6-PFDA	80%	55%	50-150%
	13C7-PFUnDA	56%	52%	40-140%
	13C2-PFDoDA	35% <sup>c</sup>	46%	40-140%
	13C2-PFTeDA	33%	14% <sup>c</sup>	30-130%
	13C3-PFBS	49% <sup>c</sup>	39% <sup>c</sup>	50-150%
	13C3-PFHxS	68%	46% <sup>c</sup>	50-150%
	13C8-PFOS	84%	55%	50-150%
	13C8-FOSA	11% <sup>c</sup>	7% <sup>c</sup>	30-130%
	d3-MeFOSAA	59%	57%	40-140%
	d5-EtFOSAA	61%	62%	40-140%
	13C2-4:2FTS	39% <sup>c</sup>	26% <sup>c</sup>	50-150%
	13C2-6:2FTS	64%	39% <sup>c</sup>	50-150%
	13C2-8:2FTS	87%	59%	50-150%
	13C3-HFPO-DA	65%	35% <sup>c</sup>	50-150%

(a) Confirmation run for ID Standard Recoveries.

(b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

(c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-30_020121	
<b>Lab Sample ID:</b> FA82792-4	<b>Date Sampled:</b> 02/01/21
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 02/02/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63083.D	1	02/13/21 07:49	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2 <sup>a</sup>	2Q63177.D	5	02/14/21 23:28	NAF	02/10/21 08:40	OP84056	S2Q919

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0076	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0037	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0052	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0044	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0083	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid <sup>b</sup>	ND <sup>c</sup>	0.0089	0.0045	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0282	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0042	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0290	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>c</sup>	0.018	0.0089	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0035	0.0071	0.0018	ug/l	J

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	P2-MH-30_020121	
Lab Sample ID:	FA82792-4	Date Sampled: 02/01/21
Matrix:	AQ - Ground Water	Date Received: 02/02/21
Method:	EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	61%	83%	35-135%
	13C5-PFPeA	64%	83%	50-150%
	13C5-PFHxA	62%	81%	50-150%
	13C4-PFHpA	64%	81%	50-150%
	13C8-PFOA	69%	84%	50-150%
	13C9-PFNA	74%	87%	50-150%
	13C6-PFDA	70%	87%	50-150%
	13C7-PFUnDA	64%	83%	40-140%
	13C2-PFDoDA	56%	73%	40-140%
	13C2-PFTeDA	12% <sup>d</sup>	21% <sup>d</sup>	30-130%
	13C3-PFBS	67%	85%	50-150%
	13C3-PFHxS	71%	80%	50-150%
	13C8-PFOS	75%	89%	50-150%
	13C8-FOSA	15% <sup>d</sup>	41%	30-130%
	d3-MeFOSAA	90%	96%	40-140%
	d5-EtFOSAA	89%	89%	40-140%
	13C2-4:2FTS	61%	80%	50-150%
	13C2-6:2FTS	71%	87%	50-150%
	13C2-8:2FTS	80%	91%	50-150%
	13C3-HFPO-DA	59%	84%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (c) Result is from Run# 2
- (d) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-2_020121	
<b>Lab Sample ID:</b> FA82792-5	<b>Date Sampled:</b> 02/01/21
<b>Matrix:</b> AQ - Ground Water	<b>Date Received:</b> 02/02/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63086.D	1	02/13/21 08:33	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2 <sup>a</sup>	2Q63178.D	5	02/14/21 23:42	NAF	02/10/21 08:40	OP84056	S2Q919

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0074	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0036	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0056	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0041	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0087	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0012	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0010	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0070	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0106	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA <sup>b</sup>	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

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Client Sample ID: P2-MH-2_020121		Date Sampled: 02/01/21
Lab Sample ID: FA82792-5		Date Received: 02/02/21
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUds (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%	75%	35-135%
	13C5-PFPeA	61%	73%	50-150%
	13C5-PFHxA	59%	72%	50-150%
	13C4-PFHpA	61%	72%	50-150%
	13C8-PFOA	64%	73%	50-150%
	13C9-PFNA	66%	74%	50-150%
	13C6-PFDA	65%	73%	50-150%
	13C7-PFUnDA	58%	64%	40-140%
	13C2-PFDoDA	55%	55%	40-140%
	13C2-PFTeDA	33%	27% <sup>c</sup>	30-130%
	13C3-PFBS	64%	73%	50-150%
	13C3-PFHxS	66%	72%	50-150%
	13C8-PFOS	66%	70%	50-150%
	13C8-FOSA	23% <sup>c</sup>	54%	30-130%
	d3-MeFOSAA	88%	77%	40-140%
	d5-EtFOSAA	91%	76%	40-140%
	13C2-4:2FTS	58%	73%	50-150%
	13C2-6:2FTS	67%	78%	50-150%
	13C2-8:2FTS	70%	71%	50-150%
	13C3-HFPO-DA	57%	76%	50-150%

- (a) Confirmation run for ID Standard Recoveries.
- (b) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> DUP-01_020121		
<b>Lab Sample ID:</b> FA82792-6		<b>Date Sampled:</b> 02/01/21
<b>Matrix:</b> AQ - Ground Water		<b>Date Received:</b> 02/02/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD		<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63087.D	1	02/13/21 08:48	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2 <sup>a</sup>	2Q63179.D	5	02/14/21 23:57	NAF	02/10/21 08:40	OP84056	S2Q919

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0077	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0043	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0060	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0049	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0085	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0064	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0025	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0107	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA <sup>b</sup>	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: DUP-01_020121		Date Sampled: 02/01/21
Lab Sample ID: FA82792-6		Date Received: 02/02/21
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUds (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	67%	84%	35-135%
	13C5-PFPeA	69%	83%	50-150%
	13C5-PFHxA	66%	80%	50-150%
	13C4-PFHpA	68%	80%	50-150%
	13C8-PFOA	73%	83%	50-150%
	13C9-PFNA	76%	86%	50-150%
	13C6-PFDA	75%	93%	50-150%
	13C7-PFUnDA	73%	90%	40-140%
	13C2-PFDoDA	76%	83%	40-140%
	13C2-PFTeDA	40%	50%	30-130%
	13C3-PFBS	72%	82%	50-150%
	13C3-PFHxS	74%	83%	50-150%
	13C8-PFOS	78%	89%	50-150%
	13C8-FOSA	21% <sup>c</sup>	55%	30-130%
	d3-MeFOSAA	104%	100%	40-140%
	d5-EtFOSAA	110%	103%	40-140%
	13C2-4:2FTS	65%	82%	50-150%
	13C2-6:2FTS	77%	91%	50-150%
	13C2-8:2FTS	86%	93%	50-150%
	13C3-HFPO-DA	63%	89%	50-150%

- (a) Confirmation run for ID Standard Recoveries.
- (b) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> FB-01_020121	
<b>Lab Sample ID:</b> FA82792-7	<b>Date Sampled:</b> 02/01/21
<b>Matrix:</b> AQ - Field Blank Water	<b>Date Received:</b> 02/02/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63088.D	1	02/13/21 09:03	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: FB-01_020121		Date Sampled: 02/01/21
Lab Sample ID: FA82792-7		Date Received: 02/02/21
Matrix: AQ - Field Blank Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	89%		35-135%
	13C5-PFPeA	90%		50-150%
	13C5-PFHxA	90%		50-150%
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	96%		50-150%
	13C7-PFUnDA	97%		40-140%
	13C2-PFDoDA	101%		40-140%
	13C2-PFTeDA	108%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	92%		50-150%
	13C8-PFOS	91%		50-150%
	13C8-FOSA	88%		30-130%
	d3-MeFOSAA	107%		40-140%
	d5-EtFOSAA	105%		40-140%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	85%		50-150%
	13C2-8:2FTS	90%		50-150%
	13C3-HFPO-DA	83%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> EB-01_020121	
<b>Lab Sample ID:</b> FA82792-8	<b>Date Sampled:</b> 02/01/21
<b>Matrix:</b> AQ - Equipment Blank	<b>Date Received:</b> 02/02/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q63089.D	1	02/13/21 09:17	NAF	02/10/21 08:40	OP84056	S2Q918
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound



## Report of Analysis



Client Sample ID: EB-01_020121		Date Sampled: 02/01/21
Lab Sample ID: FA82792-8		Date Received: 02/02/21
Matrix: AQ - Equipment Blank		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	91%		35-135%
	13C5-PFPeA	93%		50-150%
	13C5-PFHxA	92%		50-150%
	13C4-PFHpA	93%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	94%		50-150%
	13C6-PFDA	96%		50-150%
	13C7-PFUnDA	98%		40-140%
	13C2-PFDoDA	101%		40-140%
	13C2-PFTeDA	99%		30-130%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	93%		50-150%
	13C8-FOSA	87%		30-130%
	d3-MeFOSAA	107%		40-140%
	d5-EtFOSAA	108%		40-140%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	92%		50-150%
	13C3-HFPO-DA	88%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Misc. Forms

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### Custody Documents and Other Forms

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**Includes the following where applicable:**

- Certification Exceptions
- Chain of Custody

# Parameter Certification Exceptions

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.  
 The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

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# SGS Sample Receipt Summary

Job Number: FA82792

Client: ARCADIS

Project: RACER LANSING PFAS DELINEATION

Date / Time Received: 2/2/2021 9:30:00 AM

Delivery Method: FED EX

Airbill #'s: 923153837582

Therm ID: IR 1;

Therm CF: -1.8;

# of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.8);

Cooler Temps (Corrected) °C: Cooler 1: (2.0);

**Cooler Information**

Y or N

- 1. Custody Seals Present
- 2. Custody Seals Intact
- 3. Temp criteria achieved
- 4. Cooler temp verification IR Gun
- 5. Cooler media Ice (Bag)

**Trip Blank Information**

Y or N N/A

- 1. Trip Blank present / cooler
  - 2. Trip Blank listed on COC
- W or S N/A
- 3. Type Of TB Received

**Sample Information**

Y or N N/A

- 1. Sample labels present on bottles
- 2. Samples preserved properly
- 3. Sufficient volume/containers recvd for analysis:
- 4. Condition of sample Intact
- 5. Sample recvd within HT
- 6. Dates/Times/IDs on COC match Sample Label
- 7. VOCs have headspace
- 8. Bottles received for unspecified tests
- 9. Compositing instructions clear
- 10. Voa Soil Kits/Jars received past 48hrs?
- 11. % Solids Jar received?
- 12. Residual Chlorine Present?

**Misc. Information**

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_

Number of 5035 Field Kits: \_\_\_\_\_

Number of Lab Filtered Metals: \_\_\_\_\_

Test Strip Lot #'s: pH 0-3 230315

pH 10-12 219813A

Other: (Specify) \_\_\_\_\_

Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments

SM001  
Rev. Date 05/24/17

Technician: CARLOSD

Date: 2/2/2021 9:30:00 AM

Reviewer: \_\_\_\_\_

Date: \_\_\_\_\_

**FA82792: Chain of Custody**

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## MS Semi-volatiles

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### QC Data Summaries

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#### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Method Blank Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-MB	2Q63065.D	1	02/13/21	NAF	02/10/21	OP84056	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	81% 35-135%
	13C5-PFPeA	82% 50-150%
	13C5-PFHxA	81% 50-150%
	13C4-PFHpA	81% 50-150%

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# Method Blank Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-MB	2Q63065.D	1	02/13/21	NAF	02/10/21	OP84056	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	83% 50-150%
	13C9-PFNA	84% 50-150%
	13C6-PFDA	84% 50-150%
	13C7-PFUnDA	83% 40-140%
	13C2-PFDoDA	78% 40-140%
	13C2-PFTeDA	41% 30-130%
	13C3-PFBS	81% 50-150%
	13C3-PFHxS	83% 50-150%
	13C8-PFOS	82% 50-150%
	13C8-FOSA	73% 30-130%
	d3-MeFOSAA	87% 40-140%
	d5-EtFOSAA	86% 40-140%
	13C2-4:2FTS	77% 50-150%
	13C2-6:2FTS	76% 50-150%
	13C2-8:2FTS	78% 50-150%
	13C3-HFPO-DA	80% 50-150%

5.1.1  
5

# Method Blank Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-MB	2Q63431.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19Cl	PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-911Cl	PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	96% 35-135%
	13C5-PFPeA	102% 50-150%
	13C5-PFHxA	106% 50-150%
	13C4-PFHpA	103% 50-150%

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## Method Blank Summary

**Job Number:** FA82792  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-MB	2Q63431.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	106% 50-150%
	13C9-PFNA	104% 50-150%
	13C6-PFDA	103% 50-150%
	13C7-PFUnDA	101% 40-140%
	13C2-PFDoDA	106% 40-140%
	13C2-PFTeDA	98% 30-130%
	13C3-PFBS	89% 50-150%
	13C3-PFHxS	101% 50-150%
	13C8-PFOS	102% 50-150%
	13C8-FOSA	97% 30-130%
	d3-MeFOSAA	94% 40-140%
	d5-EtFOSAA	98% 40-140%
	13C2-4:2FTS	88% 50-150%
	13C2-6:2FTS	95% 50-150%
	13C2-8:2FTS	98% 50-150%
	13C3-HFPO-DA	125% 50-150%

# Instrument Blank

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q918-IBLK	2Q63014.D	1	02/12/21	NAF	n/a	n/a	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	89% 50-150%
	13C5-PFPeA	89% 50-150%
	13C5-PFHxA	89% 50-150%
	13C4-PFHpA	89% 50-150%

# Instrument Blank

Job Number: FA82792  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q918-IBLK	2Q63014.D	1	02/12/21	NAF	n/a	n/a	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	91% 50-150%
	13C9-PFNA	92% 50-150%
	13C6-PFDA	95% 50-150%
	13C7-PFUnDA	98% 50-150%
	13C2-PFDoDA	104% 50-150%
	13C2-PFTeDA	120% 50-150%
	13C3-PFBS	90% 50-150%
	13C3-PFHxS	91% 50-150%
	13C8-PFOS	90% 50-150%
	13C8-FOSA	90% 50-150%
	d3-MeFOSAA	105% 50-150%
	d5-EtFOSAA	108% 50-150%
	13C2-4:2FTS	83% 50-150%
	13C2-6:2FTS	83% 50-150%
	13C2-8:2FTS	87% 50-150%

# Instrument Blank

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q919-IBLK	2Q63137.D	1	02/14/21	NAF	n/a	n/a	S2Q919

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-4

CAS No.	Compound	Result	RL	MDL	Units	Q
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	100% 50-150%
	13C5-PFPeA	99% 50-150%
	13C5-PFHxA	99% 50-150%
	13C4-PFHpA	100% 50-150%
	13C8-PFOA	100% 50-150%
	13C9-PFNA	99% 50-150%
	13C6-PFDA	101% 50-150%
	13C7-PFUnDA	100% 50-150%
	13C2-PFDoDA	100% 50-150%
	13C2-PFTeDA	99% 50-150%
	13C3-PFBS	100% 50-150%
	13C3-PFHxS	100% 50-150%
	13C8-PFOS	100% 50-150%
	13C8-FOSA	104% 50-150%
	d3-MeFOSAA	101% 50-150%
	d5-EtFOSAA	98% 50-150%
	13C2-4:2FTS	94% 50-150%
	13C2-6:2FTS	95% 50-150%
	13C2-8:2FTS	93% 50-150%
	13C3-HFPO-DA	97% 50-150%

5.1.4  
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# Instrument Blank

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q922-IBLK	2Q63403.D	1	02/17/21	NAF	n/a	n/a	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-2, FA82792-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19Cl	PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-911Cl	PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	104% 50-150%
	13C5-PFPeA	111% 50-150%
	13C5-PFHxA	114% 50-150%
	13C4-PFHpA	110% 50-150%

# Instrument Blank

Job Number: FA82792  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q922-IBLK	2Q63403.D	1	02/17/21	NAF	n/a	n/a	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA82792-2, FA82792-3

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	114% 50-150%
	13C9-PFNA	113% 50-150%
	13C6-PFDA	112% 50-150%
	13C7-PFUnDA	114% 50-150%
	13C2-PFDoDA	118% 50-150%
	13C2-PFTeDA	117% 50-150%
	13C3-PFBS	108% 50-150%
	13C3-PFHxS	105% 50-150%
	13C8-PFOS	109% 50-150%
	13C8-FOSA	114% 50-150%
	d3-MeFOSAA	107% 50-150%
	d5-EtFOSAA	111% 50-150%
	13C2-4:2FTS	102% 50-150%
	13C2-6:2FTS	105% 50-150%
	13C2-8:2FTS	105% 50-150%
	13C3-HFPO-DA	127% 50-150%

5.1.5  
5

# Blank Spike Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-BS	2Q63064.D	1	02/13/21	NAF	02/10/21	OP84056	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0726	91	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0781	98	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0749	94	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0764	96	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0761	95	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0758	95	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0739	92	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0751	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0723	90	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0661	83	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0754	94	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0753	94	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0761	95	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0740	93	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0777	97	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0762	95	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0775	97	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0694	87	60-130
754-91-6	PFOSA	0.08	0.0773	97	70-130
2355-31-9	MeFOSAA	0.08	0.0758	95	70-130
2991-50-6	EiFOSAA	0.08	0.0740	93	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0758	95	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0757	95	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0764	96	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0701	88	70-130
919005-14-4	ADONA	0.08	0.0715	89	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0647	81	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0674	84	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	84%	35-135%
	13C5-PFPeA	85%	50-150%
	13C5-PFHxA	84%	50-150%
	13C4-PFHpA	85%	50-150%

\* = Outside of Control Limits.

5.2.1  
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# Blank Spike Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-BS	2Q63064.D	1	02/13/21	NAF	02/10/21	OP84056	S2Q918

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	84%	50-150%
	13C9-PFNA	88%	50-150%
	13C6-PFDA	88%	50-150%
	13C7-PFUnDA	90%	40-140%
	13C2-PFDoDA	95%	40-140%
	13C2-PFTeDA	57%	30-130%
	13C3-PFBS	84%	50-150%
	13C3-PFHxS	87%	50-150%
	13C8-PFOS	84%	50-150%
	13C8-FOSA	74%	30-130%
	d3-MeFOSAA	95%	40-140%
	d5-EtFOSAA	96%	40-140%
	13C2-4:2FTS	84%	50-150%
	13C2-6:2FTS	82%	50-150%
	13C2-8:2FTS	88%	50-150%
	13C3-HFPO-DA	84%	50-150%

\* = Outside of Control Limits.

5.2.1  
5

# Blank Spike Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-BS	2Q63430.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0777	97	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0695	87	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0742	93	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0702	88	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0742	93	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0699	87	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0757	95	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0754	94	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0756	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0670	84	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0722	90	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0804	101	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0827	103	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0717	90	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0762	95	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0715	89	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0741	93	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0760	95	60-130
754-91-6	PFOSA	0.08	0.0731	91	70-130
2355-31-9	MeFOSAA	0.08	0.0772	97	70-130
2991-50-6	EiFOSAA	0.08	0.0754	94	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0805	101	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0772	97	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0762	95	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0602	75	70-130
919005-14-4	ADONA	0.08	0.0668	84	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0702	88	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0694	87	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	105%	35-135%
	13C5-PFPeA	112%	50-150%
	13C5-PFHxA	116%	50-150%
	13C4-PFHpA	112%	50-150%

\* = Outside of Control Limits.

5.2.2  
5

# Blank Spike Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-BS	2Q63430.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	114%	50-150%
	13C9-PFNA	113%	50-150%
	13C6-PFDA	113%	50-150%
	13C7-PFUnDA	113%	40-140%
	13C2-PFDoDA	116%	40-140%
	13C2-PFTeDA	103%	30-130%
	13C3-PFBS	97%	50-150%
	13C3-PFHxS	108%	50-150%
	13C8-PFOS	114%	50-150%
	13C8-FOSA	99%	30-130%
	d3-MeFOSAA	102%	40-140%
	d5-EtFOSAA	105%	40-140%
	13C2-4:2FTS	102%	50-150%
	13C2-6:2FTS	110%	50-150%
	13C2-8:2FTS	112%	50-150%
	13C3-HFPO-DA	136%	50-150%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-MS	2Q63174.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919
OP84056-MSD	2Q63175.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919
FA82792-2 <sup>a</sup>	2Q63173.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	Compound	FA82792-2 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD	
375-22-4	Perfluorobutanoic acid	0.0097	J	0.0714	0.0778	94	0.0714	0.0767	92	1	70-130/30
2706-90-3	Perfluoropentanoic acid	ND		0.0714	0.0721	96	0.0714	0.0725	97	1	70-130/30
307-24-4	Perfluorohexanoic acid	ND		0.0714	0.0723	98	0.0714	0.0678	91	6	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0045	J	0.0714	0.0679	92	0.0714	0.0694	94	2	70-130/30
335-67-1	Perfluorooctanoic acid	ND		0.0714	0.0729	100	0.0714	0.0704	96	3	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0683	96	0.0714	0.0671	94	2	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0695	97	0.0714	0.0705	99	1	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0701	98	0.0714	0.0680	95	3	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0716	100	0.0714	0.0686	96	4	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0608	85	0.0714	0.0448	63	30	60-140/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0677	95	0.0714	0.0676	95	0	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0758	106	0.0714	0.0691	97	9	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0745	104	0.0714	0.0739	103	1	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0677	95	0.0714	0.0713	100	5	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0710	99	0.0714	0.0766	107	8	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0714	0.0770	108	0.0714	0.0645	90	18	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0664	93	0.0714	0.0644	90	3	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0621	87	0.0714	0.0580	81	7	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0694	97	0.0714	0.0687	96	1	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0700	98	0.0714	0.0705	99	1	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0696	97	0.0714	0.0686	96	1	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0714	0.0722	101	0.0714	0.0690	97	5	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0711	100	0.0714	0.0709	99	0	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0734	103	0.0714	0.0703	98	4	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0665	93	0.0714	0.0624	87	6	70-130/30
919005-14-4	ADONA	ND		0.0714	0.0620	87	0.0714	0.0607	85	2	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0633	89	0.0714	0.0644	90	2	60-140/30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0659	92	0.0714	0.0665	93	1	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA82792-2	Limits
	13C4-PFBA	68%	78%	76%	35-135%
	13C5-PFPeA	68%	77%	76%	50-150%
	13C5-PFHxA	64%	75%	73%	50-150%
	13C4-PFHpA	66%	76%	73%	50-150%

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84056-MS	2Q63174.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919
OP84056-MSD	2Q63175.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919
FA82792-2 <sup>a</sup>	2Q63173.D	5	02/14/21	NAF	02/10/21	OP84056	S2Q919

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-1, FA82792-4, FA82792-5, FA82792-6, FA82792-7, FA82792-8

CAS No.	ID Standard Recoveries	MS	MSD	FA82792-2	Limits
	13C8-PFOA	68%	78%	77%	50-150%
	13C9-PFNA	69%	81%	78%	50-150%
	13C6-PFDA	70%	80%	81%	50-150%
	13C7-PFUnDA	65%	79%	76%	40-140%
	13C2-PFDoDA	59%	69%	69%	40-140%
	13C2-PFTeDA	38%	20%*	17%* <sup>b</sup>	30-130%
	13C3-PFBS	70%	80%	76%	50-150%
	13C3-PFHxS	69%	76%	76%	50-150%
	13C8-PFOS	66%	84%	88%	50-150%
	13C8-FOSA	35%	27%*	21%* <sup>b</sup>	30-130%
	d3-MeFOSAA	85%	98%	100%	40-140%
	d5-EtFOSAA	79%	97%	95%	40-140%
	13C2-4:2FTS	69%	80%	73%	50-150%
	13C2-6:2FTS	78%	90%	83%	50-150%
	13C2-8:2FTS	78%	94%	89%	50-150%
	13C3-HFPO-DA	70%	86%	84%	50-150%

(a) Confirmation run.

(b) Outside control limits.

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-MS	2Q63436.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922
OP84148-MSD	2Q63437.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922
FA82792-2	2Q63435.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	Compound	FA82792-2 ug/l	Spike Q	ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0102		0.0714	0.0784	95	0.0714	0.0738	89	6	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0015	J	0.0714	0.0647	88	0.0714	0.0609	83	6	70-130/30
307-24-4	Perfluorohexanoic acid	0.0019		0.0714	0.0686	93	0.0714	0.0629	85	9	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0052		0.0714	0.0677	87	0.0714	0.0605	77	11	70-130/30
335-67-1	Perfluorooctanoic acid	0.0017	J	0.0714	0.0698	95	0.0714	0.0657	90	6	70-130/30
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0622	87	0.0714	0.0591	83	5	70-130/30
335-76-2	Perfluorodecanoic acid	ND		0.0714	0.0682	95	0.0714	0.0633	89	7	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND		0.0714	0.0689	96	0.0714	0.0654	92	5	70-130/30
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0675	94	0.0714	0.0638	89	6	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0454	64	0.0714	0.0501	70	10	60-140/30
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0671	94	0.0714	0.0620	87	8	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND		0.0714	0.0779	109	0.0714	0.0710	99	9	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0714	0.0850	119	0.0714	0.0749	105	13	70-130/30
355-46-4	Perfluorohexanesulfonic acid	ND		0.0714	0.0679	95	0.0714	0.0618	87	9	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0801	112	0.0714	0.0724	101	10	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0015	J	0.0714	0.0654	89	0.0714	0.0596	81	9	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0619	87	0.0714	0.0634	89	2	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0540	76	0.0714	0.0613	86	13	60-130/30
754-91-6	PFOSA	ND		0.0714	0.0687	96	0.0714	0.0652	91	5	70-130/30
2355-31-9	MeFOSAA	ND		0.0714	0.0706	99	0.0714	0.0667	93	6	70-130/30
2991-50-6	EtFOSAA	ND		0.0714	0.0696	97	0.0714	0.0641	90	8	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0714	0.0734	103	0.0714	0.0695	97	5	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0713	100	0.0714	0.0674	94	6	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0714	0.0685	96	0.0714	0.0647	91	6	70-130/30
13252-13-6	HFPO-DA (GenX)	ND		0.0714	0.0532	74	0.0714	0.0490	69*	8	70-130/30
919005-14-4	ADONA	ND		0.0714	0.0549	77	0.0714	0.0510	71	7	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0714	0.0655	92	0.0714	0.0589	82	11	60-140/30
763051-92-911	Cl-PF3OUdS (F-53B Minor)	ND		0.0714	0.0858	120	0.0714	0.0584	82	38*	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA82792-2	Limits
	13C4-PFBA	53%	58%	56%	35-135%
	13C5-PFPeA	58%	62%	60%	50-150%
	13C5-PFHxA	58%	63%	59%	50-150%
	13C4-PFHpA	58%	63%	59%	50-150%

\* = Outside of Control Limits.

5.3.2  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA82792  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84148-MS	2Q63436.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922
OP84148-MSD	2Q63437.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922
FA82792-2	2Q63435.D	1	02/17/21	NAF	02/16/21	OP84148	S2Q922

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA82792-2, FA82792-3

CAS No.	ID Standard Recoveries	MS	MSD	FA82792-2	Limits
	13C8-PFOA	68%	73%	70%	50-150%
	13C9-PFNA	79%	85%	79%	50-150%
	13C6-PFDA	84%	96%	90%	50-150%
	13C7-PFUnDA	68%	96%	86%	40-140%
	13C2-PFDoDA	47%	100%	93%	40-140%
	13C2-PFTeDA	37%	46%	67%	30-130%
	13C3-PFBS	56%	61%	58%	50-150%
	13C3-PFHxS	67%	75%	71%	50-150%
	13C8-PFOS	88%	96%	90%	50-150%
	13C8-FOSA	11%* a	17%* a	16%* a	30-130%
	d3-MeFOSAA	70%	90%	83%	40-140%
	d5-EtFOSAA	70%	101%	90%	40-140%
	13C2-4:2FTS	52%	55%	50%	50-150%
	13C2-6:2FTS	72%	77%	70%	50-150%
	13C2-8:2FTS	98%	113%	101%	50-150%
	13C3-HFPO-DA	75%	81%	80%	50-150%

(a) Outside control limits.

\* = Outside of Control Limits.

5.3.2  
5

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

**Arcadis**

**Racer Lansing PFAS Delineation; Lansing, MI**

**30042872.03700**

**SGS Job Number: FA83814**

**Sampling Date: 03/09/21**

**Report to:**

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**Total number of pages in report: 101**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

**Norm Farmer**  
**Technical Director**

**Client Service contact: Andrea Colby 407-425-6700**

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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## Sample Summary

**Arcadis**

**Job No: FA83814**

**Racer Lansing PFAS Delineation; Lansing, MI**  
**Project No: 30042872.03700**

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
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**This report contains results reported as ND = Not detected. The following applies:**  
**Organics ND = Not detected above the MDL**

FA83814-1	03/09/21	09:10	AMAH03/11/21	AQ	Water	MICH AVE-MH-3_030921
FA83814-1D	03/09/21	09:10	AMAH03/11/21	AQ	Water Dup/MSD	MICH AVE-MH-3_030921
FA83814-1S	03/09/21	09:10	AMAH03/11/21	AQ	Water Matrix Spike	MICH AVE-MH-3_030921
FA83814-2	03/09/21	09:35	AMAH03/11/21	AQ	Water	MICH AVE-MH-4_030921
FA83814-3	03/09/21	10:00	AMAH03/11/21	AQ	Water	VERLINDEN-MH-5_030921
FA83814-4	03/09/21	10:15	AMAH03/11/21	AQ	Water	VERLINDEN-MH-4_030921
FA83814-5	03/09/21	10:35	AMAH03/11/21	AQ	Water	VERLINDEN-MH-3_030921
FA83814-6	03/09/21	00:00	AMAH03/11/21	AQ	Water	DUP-01_030921
FA83814-7	03/09/21	10:55	AMAH03/11/21	AQ	Water	VERLINDEN-MH-2_030921
FA83814-8	03/09/21	11:10	AMAH03/11/21	AQ	Water	VERLINDEN-MH-1_030921
FA83814-9	03/09/21	11:35	AMAH03/11/21	AQ	Water	OSBORN-CB-2_030921
FA83814-10	03/09/21	11:55	AMAH03/11/21	AQ	Water	OSBORN-MH-1_030921



## Sample Summary (continued)

**Arcadis**

**Job No: FA83814**

**Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30042872.03700**

Sample Number	Collected		Matrix Code	Type	Client Sample ID	
	Date	Time By				
FA83814-11	03/09/21	13:10 AMAH	03/11/21	AQ	Water	P6-MH-17_030921
FA83814-12	03/09/21	13:25 AMAH	03/11/21	AQ	Water	P6-MH-16_030921
FA83814-13	03/09/21	13:50 AMAH	03/11/21	AQ	Water	P6-MH-18_030921
FA83814-14	03/09/21	14:10 AMAH	03/11/21	AQ	Water	P6-MH-19_030921
FA83814-15	03/09/21	14:45 AMAH	03/11/21	AQ	Water	P3-MH-284_030921
FA83814-16	03/09/21	00:00 AMAH	03/11/21	AQ	Water	DUP-02_030921
FA83814-17	03/09/21	15:25 AMAH	03/11/21	AQ	Water	P2-MH-28_030921
FA83814-18	03/09/21	15:35 AMAH	03/11/21	AQ	Water	P2-MH-29_030921
FA83814-19	03/09/21	15:50 AMAH	03/11/21	AQ	Water	P2-MH-2_030921
FA83814-20	03/09/21	16:15 AMAH	03/11/21	AQ	Water	P2-MH-W_030921
FA83814-21	03/09/21	16:30 AMAH	03/11/21	AQ	Equipment Blank	EB-01_030921
FA83814-22	03/09/21	16:35 AMAH	03/11/21	AQ	Field Blank Water	FB-01_030921

## Summary of Hits

**Job Number:** FA83814  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 03/09/21

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method	
FA83814-1	MICH AVE-MH-3_030921						
		Perfluorobutanoic acid	0.0069	0.0036	0.0018	ug/l	EPA 537M BY ID
		Perfluoropentanoic acid	0.0029	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorohexanoic acid	0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluoroheptanoic acid	0.0020	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorooctanoic acid	0.0027	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	0.0034	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	0.0034	0.0018	0.00089	ug/l	EPA 537M BY ID
FA83814-2	MICH AVE-MH-4_030921						
		Perfluorobutanoic acid	0.0097	0.0036	0.0018	ug/l	EPA 537M BY ID
		Perfluoropentanoic acid	0.0064	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorohexanoic acid	0.0074	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluoroheptanoic acid	0.0065	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorooctanoic acid	0.0108	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorononanoic acid	0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	0.0044	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	0.0108	0.0018	0.00089	ug/l	EPA 537M BY ID
FA83814-3	VERLINDEN-MH-5_030921						
		Perfluorobutanoic acid	0.0119	0.0036	0.0018	ug/l	EPA 537M BY ID
		Perfluoropentanoic acid	0.0253	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorohexanoic acid	0.0232	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluoroheptanoic acid	0.0164	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorooctanoic acid	0.0266	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorononanoic acid	0.0024	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	0.0060	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	0.0085	0.0018	0.00089	ug/l	EPA 537M BY ID
		6:2 Fluorotelomer sulfonate	0.0042 J	0.0071	0.0018	ug/l	EPA 537M BY ID
FA83814-4	VERLINDEN-MH-4_030921						
		Perfluorobutanoic acid	0.0231	0.0036	0.0018	ug/l	EPA 537M BY ID
		Perfluoropentanoic acid	0.0673	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorohexanoic acid	0.0466	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluoroheptanoic acid	0.0269	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorooctanoic acid	0.0313	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorononanoic acid	0.0029	0.0018	0.00089	ug/l	EPA 537M BY ID
		Perfluorodecanoic acid	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID

## Summary of Hits

Job Number: FA83814  
 Account: Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI  
 Collected: 03/09/21

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Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorobutanesulfonic acid		0.0036	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0046	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0118	0.0018	0.00089	ug/l	EPA 537M BY ID

### FA83814-5 VERLINDEN-MH-3\_030921

Perfluorobutanoic acid		0.0219	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0610	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0445	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0277	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0298	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0024	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.00090 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0032	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0037	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0091	0.0018	0.00089	ug/l	EPA 537M BY ID

### FA83814-6 DUP-01\_030921

Perfluorobutanoic acid		0.0213	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0601	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0440	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0256	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0296	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0039	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0034	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0084	0.0018	0.00089	ug/l	EPA 537M BY ID

### FA83814-7 VERLINDEN-MH-2\_030921

Perfluorobutanoic acid		0.0186	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0392	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0323	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0187	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0165	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0045	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0024	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0099	0.0018	0.00089	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA83814  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 03/09/21

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Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**FA83814-8 VERLINDEN-MH-1\_030921**

Perfluorobutanoic acid	0.0098	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0121	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0168	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0109	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0189	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0018	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0040	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0022	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0077	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA83814-9 OSBORN-CB-2\_030921**

Perfluorobutanoic acid	0.0184	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0159	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0250	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0150	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0403	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0051	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0030	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0066	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0314	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA83814-10 OSBORN-MH-1\_030921**

Perfluorobutanoic acid	0.0125	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0172	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0151	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0164	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0274	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0056	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.0060	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0010 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0247	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA83814-11 P6-MH-17\_030921**

Perfluorobutanoic acid	0.0193	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0425	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0393	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0412	0.0018	0.00089	ug/l	EPA 537M BY ID

## Summary of Hits

Job Number: FA83814  
 Account: Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI  
 Collected: 03/09/21

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Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorooctanoic acid		0.0725	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0113	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0056	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0199	0.0018	0.00089	ug/l	EPA 537M BY ID

FA83814-12 P6-MH-16\_030921

Perfluorobutanoic acid		0.0186	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0334	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0347	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0229	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0504	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0047	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0020	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0020	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0029	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0178	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanesulfonic acid		0.0051	0.0018	0.00089	ug/l	EPA 537M BY ID

FA83814-13 P6-MH-18\_030921

Perfluorobutanoic acid		0.0142	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0169	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0248	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0185	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0468	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0054	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0116	0.0018	0.00089	ug/l	EPA 537M BY ID

FA83814-14 P6-MH-19\_030921

Perfluorobutanoic acid <sup>a</sup>		0.0345	0.0039	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid <sup>a</sup>		0.0899	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorohexanoic acid <sup>a</sup>		0.0903	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid <sup>a</sup>		0.0643	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanoic acid <sup>b</sup>		0.862	0.019	0.0096	ug/l	EPA 537M BY ID
Perfluorononanoic acid <sup>a</sup>		0.0053	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorodecanoic acid <sup>a</sup>		0.0051	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluoroundecanoic acid <sup>a</sup>		0.0015 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorododecanoic acid <sup>a</sup>		0.0036	0.0019	0.00096	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA83814  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 03/09/21

2

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorotridecanoic acid <sup>a</sup>	0.0017 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid <sup>a</sup>	0.0015 J	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid <sup>a</sup>	0.0021	0.0019	0.00096	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid <sup>a</sup>	0.0121	0.0019	0.00096	ug/l	EPA 537M BY ID

**FA83814-15 P3-MH-284\_030921**

Perfluorobutanoic acid <sup>a</sup>	0.0076	0.0043	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid <sup>a</sup>	0.0221	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid <sup>a</sup>	0.0018 J	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanoic acid <sup>a</sup>	0.0026	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid <sup>a</sup>	0.0011 J	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid <sup>a</sup>	0.0063	0.0021	0.0011	ug/l	EPA 537M BY ID

**FA83814-16 DUP-02\_030921**

Perfluorobutanoic acid <sup>a</sup>	0.0066	0.0043	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid <sup>a</sup>	0.0181	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid <sup>a</sup>	0.0022	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanoic acid <sup>a</sup>	0.0019 J	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid <sup>a</sup>	0.0051	0.0021	0.0011	ug/l	EPA 537M BY ID

**FA83814-17 P2-MH-28\_030921**

Perfluorobutanoic acid	0.0168	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0029	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0036	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0020	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0028	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA83814-18 P2-MH-29\_030921**

Perfluoropentanoic acid <sup>b</sup>	0.0537	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid <sup>b</sup>	0.0118 J	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid <sup>b</sup>	0.0111 J	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid <sup>b</sup>	0.288	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid <sup>b</sup>	0.0129 J	0.018	0.0089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0317	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA83814-19 P2-MH-2\_030921**

Perfluorobutanoic acid	0.0105	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0062	0.0018	0.00089	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA83814  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 03/09/21

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		0.0097	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0073	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0126	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0035	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0117	0.0018	0.00089	ug/l	EPA 537M BY ID

FA83814-20 P2-MH-W\_030921

		0.0053	0.0036	0.0018	ug/l	EPA 537M BY ID
		0.0028	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0022	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0051	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.267	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID

FA83814-21 EB-01\_030921

		0.0020 B	0.0018	0.00089	ug/l	EPA 537M BY ID
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FA83814-22 FB-01\_030921

No hits reported in this sample.

- (a) Dilution due to sample clogging SPE cartridge, only partial volume was extracted.
- (b) Dilution required due to matrix interference (ID recovery standard failure).
- (c) Original value reported as confirmation was even higher.

### Sample Results

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### Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> MICH AVE-MH-3_030921	
<b>Lab Sample ID:</b> FA83814-1	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35205.D	1	03/15/21 20:39	NG	03/13/21 08:45	OP84486	S3Q518
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0069	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0029	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0021	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0020	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0027	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0034	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0012	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0034	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> MICH AVE-MH-3_030921	<b>Date Sampled:</b> 03/09/21
<b>Lab Sample ID:</b> FA83814-1	<b>Date Received:</b> 03/11/21
<b>Matrix:</b> AQ - Water	<b>Percent Solids:</b> n/a
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	65%		50-150%
	13C5-PFHxA	62%		50-150%
	13C4-PFHpA	64%		50-150%
	13C8-PFOA	68%		50-150%
	13C9-PFNA	70%		50-150%
	13C6-PFDA	70%		50-150%
	13C7-PFUnDA	68%		40-140%
	13C2-PFDoDA	64%		40-140%
	13C2-PFTeDA	36%		30-130%
	13C3-PFBS	64%		50-150%
	13C3-PFHxS	65%		50-150%
	13C8-PFOS	67%		50-150%
	13C8-FOSA	34%		30-130%
	d3-MeFOSAA	122%		40-140%
	d5-EtFOSAA	127%		40-140%
	13C2-4:2FTS	68%		50-150%
	13C2-6:2FTS	75%		50-150%
	13C2-8:2FTS	78%		50-150%
	13C3-HFPO-DA	52%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

32  
3

Client Sample ID:	MICH AVE-MH-4_030921	Date Sampled:	03/09/21
Lab Sample ID:	FA83814-2	Date Received:	03/11/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35208.D	1	03/15/21 21:27	NG	03/13/21 08:45	OP84486	S3Q518
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0097	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0064	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0074	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0065	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0108	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0012	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0044	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0108	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

32  
3

<b>Client Sample ID:</b> MICH AVE-MH-4_030921	
<b>Lab Sample ID:</b> FA83814-2	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%		35-135%
	13C5-PFPeA	67%		50-150%
	13C5-PFHxA	64%		50-150%
	13C4-PFHpA	64%		50-150%
	13C8-PFOA	66%		50-150%
	13C9-PFNA	65%		50-150%
	13C6-PFDA	65%		50-150%
	13C7-PFUnDA	64%		40-140%
	13C2-PFDoDA	62%		40-140%
	13C2-PFTeDA	62%		30-130%
	13C3-PFBS	66%		50-150%
	13C3-PFHxS	64%		50-150%
	13C8-PFOS	62%		50-150%
	13C8-FOSA	36%		30-130%
	d3-MeFOSAA	119%		40-140%
	d5-EtFOSAA	124%		40-140%
	13C2-4:2FTS	68%		50-150%
	13C2-6:2FTS	73%		50-150%
	13C2-8:2FTS	72%		50-150%
	13C3-HFPO-DA	54%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-5_030921 <b>Lab Sample ID:</b> FA83814-3 <b>Matrix:</b> AQ - Water <b>Method:</b> EPA 537M BY ID EPA 537 MOD <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	<b>Date Sampled:</b> 03/09/21 <b>Date Received:</b> 03/11/21 <b>Percent Solids:</b> n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35209.D	1	03/15/21 21:43	NG	03/13/21 08:45	OP84486	S3Q518
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0119	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0253	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0232	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0164	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0266	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0024	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0060	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0085	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0042	0.0071	0.0018	ug/l	J

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	VERLINDEN-MH-5_030921	Date Sampled:	03/09/21
Lab Sample ID:	FA83814-3	Date Received:	03/11/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	62%		35-135%
	13C5-PFPeA	66%		50-150%
	13C5-PFHxA	63%		50-150%
	13C4-PFHpA	65%		50-150%
	13C8-PFOA	68%		50-150%
	13C9-PFNA	67%		50-150%
	13C6-PFDA	67%		50-150%
	13C7-PFUnDA	61%		40-140%
	13C2-PFDoDA	55%		40-140%
	13C2-PFTeDA	33%		30-130%
	13C3-PFBS	64%		50-150%
	13C3-PFHxS	64%		50-150%
	13C8-PFOS	61%		50-150%
	13C8-FOSA	43%		30-130%
	d3-MeFOSAA	113%		40-140%
	d5-EtFOSAA	112%		40-140%
	13C2-4:2FTS	68%		50-150%
	13C2-6:2FTS	75%		50-150%
	13C2-8:2FTS	73%		50-150%
	13C3-HFPO-DA	53%		50-150%

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	VERLINDEN-MH-4_030921	Date Sampled:	03/09/21
Lab Sample ID:	FA83814-4	Date Received:	03/11/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35210.D	1	03/15/21 21:59	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>a</sup>	3Q35261.D	5	03/16/21 11:41	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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## PERFLUOROALKYL CARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0231	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0673	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0466	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0269	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0313	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0029	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0015	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

## PERFLUOROALKYL SULFONIC ACIDS

375-73-5	Perfluorobutanesulfonic acid	0.0036	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0046	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0118	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

## PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND <sup>b</sup>	0.018	0.0089	ug/l	
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## PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

## FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-4_030921	<b>Date Sampled:</b> 03/09/21
<b>Lab Sample ID:</b> FA83814-4	<b>Date Received:</b> 03/11/21
<b>Matrix:</b> AQ - Water	<b>Percent Solids:</b> n/a
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	69%	35-135%
	13C5-PFPeA	67%	78%	50-150%
	13C5-PFHxA	64%	77%	50-150%
	13C4-PFHpA	64%	76%	50-150%
	13C8-PFOA	68%	81%	50-150%
	13C9-PFNA	68%	80%	50-150%
	13C6-PFDA	69%	78%	50-150%
	13C7-PFUnDA	68%	75%	40-140%
	13C2-PFDoDA	67%	72%	40-140%
	13C2-PFTeDA	64%	70%	30-130%
	13C3-PFBS	66%	78%	50-150%
	13C3-PFHxS	64%	75%	50-150%
	13C8-PFOS	64%	73%	50-150%
	13C8-FOSA	29% <sup>c</sup>	49%	30-130%
	d3-MeFOSAA	120%	119%	40-140%
	d5-EtFOSAA	121%	123%	40-140%
	13C2-4:2FTS	68%	80%	50-150%
	13C2-6:2FTS	74%	81%	50-150%
	13C2-8:2FTS	74%	77%	50-150%
	13C3-HFPO-DA	53%	69%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-3_030921	
<b>Lab Sample ID:</b> FA83814-5	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35211.D	1	03/15/21 22:15	NG	03/13/21 08:45	OP84486	S3Q518
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0219	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0610	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0445	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0277	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0298	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0024	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.00090	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0032	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0037	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0091	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID:	VERLINDEN-MH-3_030921	Date Sampled:	03/09/21
Lab Sample ID:	FA83814-5	Date Received:	03/11/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	71%		50-150%
	13C5-PFHxA	68%		50-150%
	13C4-PFHpA	67%		50-150%
	13C8-PFOA	71%		50-150%
	13C9-PFNA	71%		50-150%
	13C6-PFDA	72%		50-150%
	13C7-PFUnDA	70%		40-140%
	13C2-PFDoDA	68%		40-140%
	13C2-PFTeDA	48%		30-130%
	13C3-PFBS	70%		50-150%
	13C3-PFHxS	66%		50-150%
	13C8-PFOS	65%		50-150%
	13C8-FOSA	35%		30-130%
	d3-MeFOSAA	124%		40-140%
	d5-EtFOSAA	128%		40-140%
	13C2-4:2FTS	72%		50-150%
	13C2-6:2FTS	76%		50-150%
	13C2-8:2FTS	77%		50-150%
	13C3-HFPO-DA	57%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> DUP-01_030921	
<b>Lab Sample ID:</b> FA83814-6	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35214.D	1	03/15/21 23:03	NG	03/13/21 08:45	OP84486	S3Q518
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0213	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0601	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0440	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0256	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0296	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0021	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0039	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0013	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0034	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0084	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> DUP-01_030921	
<b>Lab Sample ID:</b> FA83814-6	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%		35-135%
	13C5-PFPeA	70%		50-150%
	13C5-PFHxA	66%		50-150%
	13C4-PFHpA	66%		50-150%
	13C8-PFOA	71%		50-150%
	13C9-PFNA	71%		50-150%
	13C6-PFDA	73%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	76%		40-140%
	13C2-PFTeDA	72%		30-130%
	13C3-PFBS	68%		50-150%
	13C3-PFHxS	66%		50-150%
	13C8-PFOS	68%		50-150%
	13C8-FOSA	30%		30-130%
	d3-MeFOSAA	128%		40-140%
	d5-EtFOSAA	133%		40-140%
	13C2-4:2FTS	70%		50-150%
	13C2-6:2FTS	76%		50-150%
	13C2-8:2FTS	77%		50-150%
	13C3-HFPO-DA	56%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b>	VERLINDEN-MH-2_030921	<b>Date Sampled:</b>	03/09/21
<b>Lab Sample ID:</b>	FA83814-7	<b>Date Received:</b>	03/11/21
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537M BY ID EPA 537 MOD		
<b>Project:</b>	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35215.D	1	03/15/21 23:19	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>a</sup>	3Q35262.D	5	03/16/21 11:57	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0186	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0392	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0323	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0187	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0165	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0021	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0015	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0045	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0024	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0099	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>b</sup>	0.018	0.0089	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

### Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-2_030921	
<b>Lab Sample ID:</b> FA83814-7	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%	77%	35-135%
	13C5-PFPeA	64%	77%	50-150%
	13C5-PFHxA	60%	74%	50-150%
	13C4-PFHpA	60%	75%	50-150%
	13C8-PFOA	63%	78%	50-150%
	13C9-PFNA	63%	79%	50-150%
	13C6-PFDA	62%	78%	50-150%
	13C7-PFUnDA	59%	72%	40-140%
	13C2-PFDoDA	54%	68%	40-140%
	13C2-PFTeDA	50%	54%	30-130%
	13C3-PFBS	65%	77%	50-150%
	13C3-PFHxS	62%	75%	50-150%
	13C8-PFOS	60%	75%	50-150%
	13C8-FOSA	17% <sup>c</sup>	45%	30-130%
	d3-MeFOSAA	110%	124%	40-140%
	d5-EtFOSAA	116%	128%	40-140%
	13C2-4:2FTS	64%	80%	50-150%
	13C2-6:2FTS	70%	81%	50-150%
	13C2-8:2FTS	72%	81%	50-150%
	13C3-HFPO-DA	50%	69%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-1_030921	
<b>Lab Sample ID:</b> FA83814-8	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35216.D	1	03/15/21 23:35	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>a</sup>	3Q35263.D	5	03/16/21 12:13	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0098	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0121	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0168	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0109	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0189	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0018	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0040	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0022	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0077	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>b</sup>	0.018	0.0089	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-1_030921	
<b>Lab Sample ID:</b> FA83814-8	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	75%	35-135%
	13C5-PFPeA	64%	79%	50-150%
	13C5-PFHxA	60%	76%	50-150%
	13C4-PFHpA	61%	76%	50-150%
	13C8-PFOA	67%	81%	50-150%
	13C9-PFNA	67%	83%	50-150%
	13C6-PFDA	70%	84%	50-150%
	13C7-PFUnDA	71%	77%	40-140%
	13C2-PFDoDA	70%	76%	40-140%
	13C2-PFTeDA	67%	73%	30-130%
	13C3-PFBS	63%	76%	50-150%
	13C3-PFHxS	61%	75%	50-150%
	13C8-PFOS	64%	77%	50-150%
	13C8-FOSA	25% <sup>c</sup>	54%	30-130%
	d3-MeFOSAA	127%	126%	40-140%
	d5-EtFOSAA	128%	129%	40-140%
	13C2-4:2FTS	63%	80%	50-150%
	13C2-6:2FTS	71%	85%	50-150%
	13C2-8:2FTS	77%	82%	50-150%
	13C3-HFPO-DA	52%	68%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> OSBORN-CB-2_030921	
<b>Lab Sample ID:</b> FA83814-9	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35217.D	1	03/15/21 23:51	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>a</sup>	3Q35264.D	5	03/16/21 12:29	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0184	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0159	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0250	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0150	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0403	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0051	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0030	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND <sup>b</sup>	0.0089	0.0045	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>b</sup>	0.0089	0.0045	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>b</sup>	0.0089	0.0045	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.0012	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0066	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0314	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> OSBORN-CB-2_030921	
<b>Lab Sample ID:</b> FA83814-9	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND <sup>b</sup>	0.036	0.0089	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	63%	76%	35-135%
	13C5-PFPeA	66%	78%	50-150%
	13C5-PFHxA	63%	79%	50-150%
	13C4-PFHpA	63%	75%	50-150%
	13C8-PFOA	66%	80%	50-150%
	13C9-PFNA	66%	79%	50-150%
	13C6-PFDA	64%	78%	50-150%
	13C7-PFUnDA	56%	71%	40-140%
	13C2-PFDoDA	37% <sup>c</sup>	61%	40-140%
	13C2-PFTeDA	25% <sup>c</sup>	34%	30-130%
	13C3-PFBS	65%	77%	50-150%
	13C3-PFHxS	64%	78%	50-150%
	13C8-PFOS	62%	76%	50-150%
	13C8-FOSA	33%	58%	30-130%
	d3-MeFOSAA	110%	116%	40-140%
	d5-EtFOSAA	107%	116%	40-140%
	13C2-4:2FTS	68%	80%	50-150%
	13C2-6:2FTS	71%	81%	50-150%
	13C2-8:2FTS	70%	78%	50-150%
	13C3-HFPO-DA	53%	72%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> OSBORN-MH-1_030921	
<b>Lab Sample ID:</b> FA83814-10	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q64858.D	1	03/21/21 12:43	NAF	03/19/21 13:00	OP84565	S2Q942
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0125	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0172	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0151	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0164	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0274	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0056	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0060	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0010	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0014	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0247	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	OSBORN-MH-1_030921	<b>Date Sampled:</b>	03/09/21
<b>Lab Sample ID:</b>	FA83814-10	<b>Date Received:</b>	03/11/21
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537M BY ID EPA 537 MOD		
<b>Project:</b>	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%		35-135%
	13C5-PFPeA	66%		50-150%
	13C5-PFHxA	62%		50-150%
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	67%		50-150%
	13C9-PFNA	73%		50-150%
	13C6-PFDA	76%		50-150%
	13C7-PFUnDA	75%		40-140%
	13C2-PFDoDA	69%		40-140%
	13C2-PFTeDA	60%		30-130%
	13C3-PFBS	71%		50-150%
	13C3-PFHxS	69%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	33%		30-130%
	d3-MeFOSAA	80%		40-140%
	d5-EtFOSAA	80%		40-140%
	13C2-4:2FTS	68%		50-150%
	13C2-6:2FTS	78%		50-150%
	13C2-8:2FTS	89%		50-150%
	13C3-HFPO-DA	56%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P6-MH-17_030921	
<b>Lab Sample ID:</b> FA83814-11	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q64859.D	1	03/21/21 13:00	NAF	03/19/21 13:00	OP84565	S2Q942
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0193	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0425	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0393	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0412	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0725	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0113	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0056	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0013	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0016	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0199	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P6-MH-17_030921	
<b>Lab Sample ID:</b> FA83814-11	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	73%		35-135%
	13C5-PFPeA	72%		50-150%
	13C5-PFHxA	69%		50-150%
	13C4-PFHpA	77%		50-150%
	13C8-PFOA	75%		50-150%
	13C9-PFNA	82%		50-150%
	13C6-PFDA	84%		50-150%
	13C7-PFUnDA	83%		40-140%
	13C2-PFDoDA	74%		40-140%
	13C2-PFTeDA	52%		30-130%
	13C3-PFBS	73%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	78%		50-150%
	13C8-FOSA	45%		30-130%
	d3-MeFOSAA	91%		40-140%
	d5-EtFOSAA	89%		40-140%
	13C2-4:2FTS	73%		50-150%
	13C2-6:2FTS	87%		50-150%
	13C2-8:2FTS	88%		50-150%
	13C3-HFPO-DA	60%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P6-MH-16_030921	
<b>Lab Sample ID:</b> FA83814-12	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q64860.D	1	03/21/21 13:16	NAF	03/19/21 13:00	OP84565	S2Q942
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0186	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0334	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0347	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0229	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0504	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0047	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0020	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0020	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0029	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0178	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0051	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P6-MH-16_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-12		Date Received: 03/11/21
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUds (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	66%		35-135%
	13C5-PFPeA	66%		50-150%
	13C5-PFHxA	64%		50-150%
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	68%		50-150%
	13C9-PFNA	73%		50-150%
	13C6-PFDA	73%		50-150%
	13C7-PFUnDA	71%		40-140%
	13C2-PFDoDA	58%		40-140%
	13C2-PFTeDA	40%		30-130%
	13C3-PFBS	69%		50-150%
	13C3-PFHxS	68%		50-150%
	13C8-PFOS	65%		50-150%
	13C8-FOSA	28% <sup>a</sup>		30-130%
	d3-MeFOSAA	74%		40-140%
	d5-EtFOSAA	73%		40-140%
	13C2-4:2FTS	67%		50-150%
	13C2-6:2FTS	80%		50-150%
	13C2-8:2FTS	77%		50-150%
	13C3-HFPO-DA	55%		50-150%

(a) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P6-MH-18_030921	
<b>Lab Sample ID:</b> FA83814-13	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35221.D	1	03/16/21 00:55	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>a</sup>	3Q35268.D	5	03/16/21 13:35	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0142	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0169	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0248	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0185	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0468	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0054	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0011	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0116	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>b</sup>	0.018	0.0089	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P6-MH-18_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-13		Date Received: 03/11/21
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND <sup>b</sup>	0.018	0.0089	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	73%	35-135%
	13C5-PFPeA	62%	73%	50-150%
	13C5-PFHxA	59%	72%	50-150%
	13C4-PFHpA	59%	74%	50-150%
	13C8-PFOA	63%	77%	50-150%
	13C9-PFNA	65%	77%	50-150%
	13C6-PFDA	66%	76%	50-150%
	13C7-PFUnDA	64%	71%	40-140%
	13C2-PFDoDA	62%	67%	40-140%
	13C2-PFTeDA	60%	65%	30-130%
	13C3-PFBS	60%	71%	50-150%
	13C3-PFHxS	59%	75%	50-150%
	13C8-PFOS	59%	71%	50-150%
	13C8-FOSA	22% <sup>c</sup>	35%	30-130%
	d3-MeFOSAA	115%	114%	40-140%
	d5-EtFOSAA	114%	111%	40-140%
	13C2-4:2FTS	63%	75%	50-150%
	13C2-6:2FTS	68%	77%	50-150%
	13C2-8:2FTS	71%	72%	50-150%
	13C3-HFPO-DA	48% <sup>c</sup>	66%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P6-MH-19_030921	
<b>Lab Sample ID:</b> FA83814-14	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	3Q35222.D	1.08	03/16/21 01:11	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>b</sup>	3Q35269.D	10.8	03/16/21 13:51	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0345	0.0039	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0899	0.0019	0.00096	ug/l	
307-24-4	Perfluorohexanoic acid	0.0903	0.0019	0.00096	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0643	0.0019	0.00096	ug/l	
335-67-1	Perfluorooctanoic acid	0.862 <sup>c</sup>	0.019	0.0096	ug/l	
375-95-1	Perfluorononanoic acid	0.0053	0.0019	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	0.0051	0.0019	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0015	0.0019	0.00096	ug/l	J
307-55-1	Perfluorododecanoic acid	0.0036	0.0019	0.00096	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0017	0.0019	0.00096	ug/l	J
376-06-7	Perfluorotetradecanoic acid	ND <sup>c</sup>	0.019	0.0096	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0015	0.0019	0.00096	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0021	0.0019	0.00096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0121	0.0019	0.00096	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00096	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0039	0.0019	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0039	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0039	0.0019	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P6-MH-19_030921	
<b>Lab Sample ID:</b> FA83814-14	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	0.0019	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND <sup>c</sup>	0.039	0.019	ug/l	
919005-14-4	ADONA	ND	0.0077	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0077	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0077	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	71%	35-135%
	13C5-PFPeA	61%	73%	50-150%
	13C5-PFHxA	58%	71%	50-150%
	13C4-PFHpA	58%	72%	50-150%
	13C8-PFOA	59%	75%	50-150%
	13C9-PFNA	62%	73%	50-150%
	13C6-PFDA	60%	68%	50-150%
	13C7-PFUnDA	52%	56%	40-140%
	13C2-PFDoDA	44%	48%	40-140%
	13C2-PFTeDA	27% <sup>d</sup>	33%	30-130%
	13C3-PFBS	61%	73%	50-150%
	13C3-PFHxS	61%	72%	50-150%
	13C8-PFOS	56%	72%	50-150%
	13C8-FOSA	33%	49%	30-130%
	d3-MeFOSAA	94%	90%	40-140%
	d5-EtFOSAA	92%	89%	40-140%
	13C2-4:2FTS	63%	74%	50-150%
	13C2-6:2FTS	64%	74%	50-150%
	13C2-8:2FTS	62%	62%	50-150%
	13C3-HFPO-DA	48% <sup>d</sup>	69%	50-150%

- (a) Dilution due to sample clogging SPE cartridge, only partial volume was extracted.
- (b) Dilution required due to matrix interference (ID recovery standard failure).
- (c) Result is from Run# 2
- (d) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P3-MH-284_030921	
<b>Lab Sample ID:</b> FA83814-15	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	3Q35270.D	1.2	03/16/21 14:07	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>b</sup>	3Q35225.D	12.2	03/16/21 01:59	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0076	0.0043	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0221	0.0021	0.0011	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0021	0.0011	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0018	0.0021	0.0011	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0026	0.0021	0.0011	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0021	0.0011	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0021	0.0011	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0011	ug/l	
307-55-1	Perfluorododecanoic acid	ND <sup>c</sup>	0.022	0.011	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND <sup>c</sup>	0.022	0.011	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0021	0.0011	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0021	0.0011	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0021	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0021	0.0011	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0011	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0063	0.0021	0.0011	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0011	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0011	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>c</sup>	0.044	0.022	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0043	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0043	0.0021	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P3-MH-284_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-15		Date Received: 03/11/21
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0043	0.0021	ug/l	
919005-14-4	ADONA	ND	0.0086	0.0021	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0086	0.0021	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND <sup>c</sup>	0.087	0.022	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	70%	76%	35-135%
	13C5-PFPeA	70%	77%	50-150%
	13C5-PFHxA	65%	77%	50-150%
	13C4-PFHpA	65%	76%	50-150%
	13C8-PFOA	67%	79%	50-150%
	13C9-PFNA	67%	79%	50-150%
	13C6-PFDA	62%	76%	50-150%
	13C7-PFUnDA	51%	59%	40-140%
	13C2-PFDoDA	38% <sup>d</sup>	41%	40-140%
	13C2-PFTeDA	34%	35%	30-130%
	13C3-PFBS	68%	78%	50-150%
	13C3-PFHxS	65%	79%	50-150%
	13C8-PFOS	63%	74%	50-150%
	13C8-FOSA	19% <sup>d</sup>	34%	30-130%
	d3-MeFOSAA	107%	94%	40-140%
	d5-EtFOSAA	115%	106%	40-140%
	13C2-4:2FTS	70%	78%	50-150%
	13C2-6:2FTS	75%	79%	50-150%
	13C2-8:2FTS	70%	68%	50-150%
	13C3-HFPO-DA	56%	67%	50-150%

- (a) Dilution due to sample clogging SPE cartridge, only partial volume was extracted.
- (b) Dilution required due to matrix interference (ID recovery standard failure).
- (c) Result is from Run# 2
- (d) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b>	DUP-02_030921	<b>Date Sampled:</b>	03/09/21
<b>Lab Sample ID:</b>	FA83814-16	<b>Date Received:</b>	03/11/21
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537M BY ID EPA 537 MOD		
<b>Project:</b>	Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	3Q35273.D	1.2	03/16/21 14:55	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>b</sup>	3Q35226.D	12.2	03/16/21 02:15	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0066	0.0043	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0181	0.0021	0.0011	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0021	0.0011	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0022	0.0021	0.0011	ug/l	
335-67-1	Perfluorooctanoic acid	0.0019	0.0021	0.0011	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0021	0.0011	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0021	0.0011	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0011	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0021	0.0011	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0021	0.0011	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>c</sup>	0.022	0.011	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0021	0.0011	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0021	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0021	0.0011	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0011	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0051	0.0021	0.0011	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0011	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0011	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0043	0.0021	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0043	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0043	0.0021	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: DUP-02_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-16		Date Received: 03/11/21
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0043	0.0021	ug/l	
919005-14-4	ADONA	ND	0.0086	0.0021	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0086	0.0021	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0086	0.0021	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	69%	79%	35-135%
	13C5-PFPeA	70%	83%	50-150%
	13C5-PFHxA	66%	81%	50-150%
	13C4-PFHpA	65%	82%	50-150%
	13C8-PFOA	69%	84%	50-150%
	13C9-PFNA	69%	83%	50-150%
	13C6-PFDA	67%	82%	50-150%
	13C7-PFUnDA	60%	68%	40-140%
	13C2-PFDoDA	45%	56%	40-140%
	13C2-PFTeDA	28% <sup>d</sup>	39%	30-130%
	13C3-PFBS	67%	81%	50-150%
	13C3-PFHxS	65%	79%	50-150%
	13C8-PFOS	66%	86%	50-150%
	13C8-FOSA	43%	81%	30-130%
	d3-MeFOSAA	124%	114%	40-140%
	d5-EtFOSAA	129%	117%	40-140%
	13C2-4:2FTS	70%	82%	50-150%
	13C2-6:2FTS	75%	83%	50-150%
	13C2-8:2FTS	76%	76%	50-150%
	13C3-HFPO-DA	56%	69%	50-150%

- (a) Dilution due to sample clogging SPE cartridge, only partial volume was extracted.
- (b) Dilution required due to matrix interference (ID recovery standard failure).
- (c) Result is from Run# 2
- (d) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-28_030921	
<b>Lab Sample ID:</b> FA83814-17	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35274.D	1	03/16/21 15:11	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>a</sup>	3Q35227.D	10	03/16/21 02:32	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0168	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0029	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0036	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0021	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0020	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0028	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>b</sup>	0.036	0.018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P2-MH-28_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-17		Date Received: 03/11/21
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND <sup>b</sup>	0.036	0.018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	61%	75%	35-135%
	13C5-PFPeA	61%	75%	50-150%
	13C5-PFHxA	55%	72%	50-150%
	13C4-PFHpA	56%	75%	50-150%
	13C8-PFOA	60%	79%	50-150%
	13C9-PFNA	62%	78%	50-150%
	13C6-PFDA	60%	77%	50-150%
	13C7-PFUnDA	54%	64%	40-140%
	13C2-PFDoDA	40%	48%	40-140%
	13C2-PFTeDA	33%	41%	30-130%
	13C3-PFBS	61%	73%	50-150%
	13C3-PFHxS	59%	71%	50-150%
	13C8-PFOS	58%	75%	50-150%
	13C8-FOSA	15% <sup>c</sup>	43%	30-130%
	d3-MeFOSAA	111%	114%	40-140%
	d5-EtFOSAA	106%	103%	40-140%
	13C2-4:2FTS	60%	77%	50-150%
	13C2-6:2FTS	65%	81%	50-150%
	13C2-8:2FTS	71%	76%	50-150%
	13C3-HFPO-DA	48% <sup>c</sup>	63%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-29_030921	
<b>Lab Sample ID:</b> FA83814-18	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35275.D	1	03/16/21 15:27	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>a</sup>	3Q35228.D	10	03/16/21 02:48	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND <sup>b</sup>	0.036	0.018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0537 <sup>b</sup>	0.018	0.0089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0118 <sup>b</sup>	0.018	0.0089	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0111 <sup>b</sup>	0.018	0.0089	ug/l	J
335-67-1	Perfluorooctanoic acid	ND <sup>b</sup>	0.018	0.0089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.288 <sup>b</sup>	0.018	0.0089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND <sup>b</sup>	0.018	0.0089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0129 <sup>b</sup>	0.018	0.0089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND <sup>b</sup>	0.018	0.0089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0317	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA <sup>c</sup>	ND <sup>b</sup>	0.036	0.018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND <sup>b</sup>	0.071	0.018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P2-MH-29_030921	
<b>Lab Sample ID:</b> FA83814-18	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND <sup>b</sup>	0.036	0.018	ug/l	
919005-14-4	ADONA	ND <sup>b</sup>	0.071	0.018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	33% <sup>d</sup>	64%	35-135%
	13C5-PFPeA	40% <sup>d</sup>	69%	50-150%
	13C5-PFHxA	34% <sup>d</sup>	66%	50-150%
	13C4-PFHpA	38% <sup>d</sup>	66%	50-150%
	13C8-PFOA	48% <sup>d</sup>	72%	50-150%
	13C9-PFNA	56%	73%	50-150%
	13C6-PFDA	61%	78%	50-150%
	13C7-PFUnDA	63%	80%	40-140%
	13C2-PFDoDA	65%	76%	40-140%
	13C2-PFTeDA	54%	67%	30-130%
	13C3-PFBS	42% <sup>d</sup>	71%	50-150%
	13C3-PFHxS	44% <sup>d</sup>	65%	50-150%
	13C8-PFOS	56%	73%	50-150%
	13C8-FOSA	7% <sup>d</sup>	28% <sup>d</sup>	30-130%
	d3-MeFOSAA	107%	134%	40-140%
	d5-EtFOSAA	118%	133%	40-140%
	13C2-4:2FTS	34% <sup>d</sup>	70%	50-150%
	13C2-6:2FTS	51%	77%	50-150%
	13C2-8:2FTS	70%	83%	50-150%
	13C3-HFPO-DA	31% <sup>d</sup>	54%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (d) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-2_030921	
<b>Lab Sample ID:</b> FA83814-19	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q35276.D	1	03/16/21 15:43	NG	03/13/21 08:45	OP84486	S3Q518
Run #2 <sup>a</sup>	3Q35229.D	10	03/16/21 03:04	NG	03/13/21 08:45	OP84486	S3Q518

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0105	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0062	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0097	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0073	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0126	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0017	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND <sup>b</sup>	0.018	0.0089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0035	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0117	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>b</sup>	0.036	0.018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P2-MH-2_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-19		Date Received: 03/11/21
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND <sup>b</sup>	0.036	0.018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	58%	70%	35-135%
	13C5-PFPeA	62%	75%	50-150%
	13C5-PFHxA	57%	75%	50-150%
	13C4-PFHpA	57%	73%	50-150%
	13C8-PFOA	61%	77%	50-150%
	13C9-PFNA	62%	75%	50-150%
	13C6-PFDA	59%	73%	50-150%
	13C7-PFUnDA	52%	64%	40-140%
	13C2-PFDoDA	40%	51%	40-140%
	13C2-PFTeDA	23% <sup>c</sup>	34%	30-130%
	13C3-PFBS	59%	76%	50-150%
	13C3-PFHxS	59%	75%	50-150%
	13C8-PFOS	60%	69%	50-150%
	13C8-FOSA	13% <sup>c</sup>	35%	30-130%
	d3-MeFOSAA	99%	108%	40-140%
	d5-EtFOSAA	98%	102%	40-140%
	13C2-4:2FTS	61%	77%	50-150%
	13C2-6:2FTS	67%	80%	50-150%
	13C2-8:2FTS	67%	68%	50-150%
	13C3-HFPO-DA	49% <sup>c</sup>	63%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-W_030921	
<b>Lab Sample ID:</b> FA83814-20	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q64543.D	1	03/16/21 18:08	NAF	03/15/21 09:30	OP84499	S2Q938
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0053	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0028	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0022	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0051	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.267	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0011	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0011	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0017	0.0018	0.00089	ug/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: P2-MH-W_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-20		Date Received: 03/11/21
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX) <sup>a</sup>	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	72%		35-135%
	13C5-PFPeA	74%		50-150%
	13C5-PFHxA	72%		50-150%
	13C4-PFHpA	77%		50-150%
	13C8-PFOA	79%		50-150%
	13C9-PFNA	86%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	78%		40-140%
	13C2-PFDoDA	66%		40-140%
	13C2-PFTeDA	34%		30-130%
	13C3-PFBS	74%		50-150%
	13C3-PFHxS	75%		50-150%
	13C8-PFOS	79%		50-150%
	13C8-FOSA	58%		30-130%
	d3-MeFOSAA	82%		40-140%
	d5-EtFOSAA	76%		40-140%
	13C2-4:2FTS	75%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	84%		50-150%
	13C3-HFPO-DA	60%		50-150%

(a) Associated BS recovery outside control limits.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> EB-01_030921	
<b>Lab Sample ID:</b> FA83814-21	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Equipment Blank	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q64420.D	1	03/15/21 00:38	NAF	03/12/21 10:00	OP84474	S2Q936
Run #2 <sup>a</sup>	3Q35370.D	1	03/18/21 20:44	NG	03/16/21 09:30	OP84515	S3Q520

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid <sup>b</sup>	0.0020	0.0018	0.00089	ug/l	B
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: EB-01_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-21		Date Received: 03/11/21
Matrix: AQ - Equipment Blank		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	93%	88%	35-135%
	13C5-PFPeA	93%	88%	50-150%
	13C5-PFHxA	92%	88%	50-150%
	13C4-PFHpA	94%	88%	50-150%
	13C8-PFOA	91%	87%	50-150%
	13C9-PFNA	92%	82%	50-150%
	13C6-PFDA	88%	75%	50-150%
	13C7-PFUnDA	87%	74%	40-140%
	13C2-PFDoDA	85%	77%	40-140%
	13C2-PFTeDA	82%	77%	30-130%
	13C3-PFBS	93%	87%	50-150%
	13C3-PFHxS	88%	86%	50-150%
	13C8-PFOS	86%	70%	50-150%
	13C8-FOSA	80%	67%	30-130%
	d3-MeFOSAA	84%	101%	40-140%
	d5-EtFOSAA	90%	108%	40-140%
	13C2-4:2FTS	89%	83%	50-150%
	13C2-6:2FTS	80%	82%	50-150%
	13C2-8:2FTS	86%	69%	50-150%
	13C3-HFPO-DA	91%	74%	50-150%

- (a) Re-extract results reported because they were significantly higher than original results. Confirmation run.
- (b) Original value reported as confirmation was even higher.

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> FB-01_030921	
<b>Lab Sample ID:</b> FA83814-22	<b>Date Sampled:</b> 03/09/21
<b>Matrix:</b> AQ - Field Blank Water	<b>Date Received:</b> 03/11/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q64421.D	1	03/15/21 00:55	NAF	03/12/21 10:00	OP84474	S2Q936
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: FB-01_030921		Date Sampled: 03/09/21
Lab Sample ID: FA83814-22		Date Received: 03/11/21
Matrix: AQ - Field Blank Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	88%		35-135%
	13C5-PFPeA	87%		50-150%
	13C5-PFHxA	87%		50-150%
	13C4-PFHpA	87%		50-150%
	13C8-PFOA	87%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	80%		40-140%
	13C2-PFDoDA	76%		40-140%
	13C2-PFTeDA	79%		30-130%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	83%		50-150%
	13C8-PFOS	78%		50-150%
	13C8-FOSA	77%		30-130%
	d3-MeFOSAA	78%		40-140%
	d5-EtFOSAA	78%		40-140%
	13C2-4:2FTS	83%		50-150%
	13C2-6:2FTS	79%		50-150%
	13C2-8:2FTS	81%		50-150%
	13C3-HFPO-DA	87%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Misc. Forms

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### Custody Documents and Other Forms

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**Includes the following where applicable:**

- Certification Exceptions
- Chain of Custody

# Parameter Certification Exceptions

Job Number: FA83814  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.  
The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

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SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, FL 32811  
TEL: 407-425-6700 FAX: 407-425-0707  
www.sgs.com

FA83814

SGS - ORLANDO JOB #:

PAGE 2 OF 2

SGS - ORLANDO Quote # SKIFF #

Client / Reporting Information			Project Information			Analytical Information										Matrix Codes													
Company Name: <b>Arcadis</b>			Project Name: <b>KACER Lansing PEAS Delineation</b>			(Vertical text on right side of table) EPA 821-A-03-001 (M1-L18-R2)										DW - Drinking Water													
Address: <b>28550 Cabot Dr. Ste. 500</b>			Street													GW - Ground Water													
City: <b>Novi</b> State: <b>MI</b> Zip: <b>48317</b>			City: <b>Lansing</b> State: <b>MI</b>													WW - Water													
Project Contact: <b>Marina Samp</b> Email: <b>marina.samp@arcadis.com</b>			Project # <b>30075941.03600</b>													SW - Surface Water													
Phone #: <b>248-994-2318</b>			Fax #													SO - Soil													
Sampler(s) Name(s) (Printed): <b>A. Mandich</b> Sampler 2: <b>A. Hartz</b>			Client Purchase Order # <b>30075941.03600</b>			SL - Sludge																							
SGS Orlando Sample #	Field ID / Point of Collection		DATE		TIME		SAMPLED BY:		MATRIX		TOTAL # OF BOTTLES		OTHER		NONE		HCl		NaOH		H2SO4		NACH2NA		DIWATER		MEDI		LAB USE ONLY
13	P6-MH-18-030921		3/9/21		1350		AM		WW		2		X																
14	P6-MH-19-030921		3/9/21		1410		AM		WW		2		X																
15	P3-MH-28-030921		3/9/21		1445		AM		WW		2		X																
16	DUP-02-030921		3/9/21		-		AM		WW		2		X																
17	P2-MH-28-030921		3/9/21		1525		AM		WW		2		X																
18	P2-MH-29-030921		3/9/21		1535		AM		WW		2		X																
19	P2-MH-2-030921		3/9/21		1550		AM		WW		2		X																
20	P2-MH-W-030921		3/9/21		1615		AM		WW		2		X																
21	FB-01-030921		3/9/21		1630		AM		WW		2		X																
22	FB-01-030921		3/9/21		1635		AM		WW		2		X																
Turnaround Time (Business days)			Data Deliverable Information			Comments / Remarks																							
<input checked="" type="checkbox"/> 10 Day (Business) <input type="checkbox"/> 7 Day <input type="checkbox"/> 5 Day <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> Other _____			Approved By: / Date: _____			<input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY) <input checked="" type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC) <input type="checkbox"/> REDT1 (EPA LEVEL 3) <input type="checkbox"/> FULLT1 (EPA LEVEL 4) <input checked="" type="checkbox"/> EDD'S										Email results to Andrew Lorenz andrew.lorenz@arcadis.com and marina.samp@arcadis.com  WW = Waste water  INITIAL ASSESSMENT LABEL VERIFICATION _____													
Rush T/A Data Available VIA Email or Lablink												Sample Custody must be documented below each time samples change possession, including courier delivery.																	
Relinquished by Sampler/Affiliation: <b>Mandich/Arcadis</b>			Date Time: <b>3/10/21/0945</b>			Received By/Affiliation: <b>FedEx</b>			Relinquished By/Affiliation: <b>FX</b>			Date Time: <b>3/11/21</b>			Received By/Affiliation: <b>Petty</b>			3/11/21											
Relinquished by/Affiliation: _____			Date Time: _____			Received By/Affiliation: _____			Relinquished By/Affiliation: _____			Date Time: _____			Received By/Affiliation: _____			4/6											
5			6			7			8			8																	

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## SGS Sample Receipt Summary

Job Number: FA83814

Client: ARCADIS

Project: RACER LANSING

Date / Time Received: 3/11/2021 9:40:00 AM

Delivery Method: FX

Airbill #'s: 7731 2640 1759

Therm ID: IR 1; Therm CF: -1.8; # of Coolers: 2  
 Cooler Temps (Raw Measured) °C: Cooler 1: (3.8); Cooler 2: (4.2);  
 Cooler Temps (Corrected) °C: Cooler 1: (2.0); Cooler 2: (2.4);

**Cooler Information**

	Y	or	N
1. Custody Seals Present	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Temp criteria achieved	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

**Sample Information**

	Y	or	N	N/A
1. Sample labels present on bottles	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Samples preserved properly	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3. Sufficient volume/containers recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Condition of sample	Intact			
5. Sample recvd within HT	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
6. Dates/Times/IDs on COC match Sample Label	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
7. VOCs have headspace	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
9. Compositing instructions clear	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Voa Soil Kits/Jars received past 48hrs?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. % Solids Jar received?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
12. Residual Chlorine Present?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Trip Blank Information**

	Y	or	N	N/A
1. Trip Blank present / cooler	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Trip Blank listed on COC	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
	W	or	S	N/A
3. Type Of TB Received	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Misc. Information**

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_ Number of 5035 Field Kits: \_\_\_\_\_ Number of Lab Filtered Metals: \_\_\_\_\_  
 Test Strip Lot #'s: pH 0-3 \_\_\_\_\_ 230315 \_\_\_\_\_ pH 10-12 \_\_\_\_\_ 219813A \_\_\_\_\_ Other: (Specify) \_\_\_\_\_  
 Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments

SM001 Rev. Date 05/24/17 Technician: PETERH Date: 3/11/2021 9:40:00 AM Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_

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## MS Semi-volatiles

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### QC Data Summaries

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#### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Method Blank Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-MB	2Q64419.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0016	0.0018	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	83% 35-135%
	13C5-PFPeA	83% 50-150%
	13C5-PFHxA	83% 50-150%
	13C4-PFHpA	82% 50-150%

5.1.1  
5

# Method Blank Summary

**Job Number:** FA83814  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-MB	2Q64419.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	78% 50-150%
	13C9-PFNA	80% 50-150%
	13C6-PFDA	80% 50-150%
	13C7-PFUnDA	76% 40-140%
	13C2-PFDoDA	73% 40-140%
	13C2-PFTeDA	72% 30-130%
	13C3-PFBS	83% 50-150%
	13C3-PFHxS	78% 50-150%
	13C8-PFOS	73% 50-150%
	13C8-FOSA	68% 30-130%
	d3-MeFOSAA	74% 40-140%
	d5-EtFOSAA	75% 40-140%
	13C2-4:2FTS	79% 50-150%
	13C2-6:2FTS	69% 50-150%
	13C2-8:2FTS	79% 50-150%

5.1.1  
5

# Method Blank Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-MB	2Q64517.D	1	03/16/21	NAF	03/12/21	OP84474	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0017	0.0018	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	88% 35-135%
	13C5-PFPeA	83% 50-150%
	13C5-PFHxA	82% 50-150%
	13C4-PFHpA	85% 50-150%

5.1.2  
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## Method Blank Summary

**Job Number:** FA83814  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-MB	2Q64517.D	1	03/16/21	NAF	03/12/21	OP84474	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	80% 50-150%
	13C9-PFNA	84% 50-150%
	13C6-PFDA	83% 50-150%
	13C7-PFUnDA	81% 40-140%
	13C2-PFDoDA	77% 40-140%
	13C2-PFTeDA	75% 30-130%
	13C3-PFBS	85% 50-150%
	13C3-PFHxS	83% 50-150%
	13C8-PFOS	77% 50-150%
	13C8-FOSA	75% 30-130%
	d3-MeFOSAA	74% 40-140%
	d5-EtFOSAA	73% 40-140%
	13C2-4:2FTS	80% 50-150%
	13C2-6:2FTS	67% 50-150%
	13C2-8:2FTS	80% 50-150%

# Method Blank Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84486-MB	3Q35203.D	1	03/15/21	NG	03/13/21	OP84486	S3Q518

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-1, FA83814-2, FA83814-3, FA83814-4, FA83814-5, FA83814-6, FA83814-7, FA83814-8, FA83814-9, FA83814-12, FA83814-13, FA83814-14, FA83814-15, FA83814-16, FA83814-17, FA83814-18, FA83814-19

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	72% 35-135%
	13C5-PFPeA	73% 50-150%
	13C5-PFHxA	73% 50-150%
	13C4-PFHpA	74% 50-150%

5.1.3  
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# Method Blank Summary

**Job Number:** FA83814  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84486-MB	3Q35203.D	1	03/15/21	NG	03/13/21	OP84486	S3Q518

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-1, FA83814-2, FA83814-3, FA83814-4, FA83814-5, FA83814-6, FA83814-7, FA83814-8, FA83814-9,  
 FA83814-12, FA83814-13, FA83814-14, FA83814-15, FA83814-16, FA83814-17, FA83814-18, FA83814-19

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	75% 50-150%
	13C9-PFNA	72% 50-150%
	13C6-PFDA	69% 50-150%
	13C7-PFUnDA	67% 40-140%
	13C2-PFDoDA	68% 40-140%
	13C2-PFTeDA	59% 30-130%
	13C3-PFBS	72% 50-150%
	13C3-PFHxS	72% 50-150%
	13C8-PFOS	67% 50-150%
	13C8-FOSA	67% 30-130%
	d3-MeFOSAA	96% 40-140%
	d5-EtFOSAA	102% 40-140%
	13C2-4:2FTS	70% 50-150%
	13C2-6:2FTS	70% 50-150%
	13C2-8:2FTS	63% 50-150%
	13C3-HFPO-DA	65% 50-150%

5.1.3  
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# Method Blank Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84499-MB	2Q64539.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-20

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	
754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C5-PFHxA	93% 50-150%
	13C4-PFHpA	94% 50-150%
	13C8-PFOA	95% 50-150%
	13C9-PFNA	96% 50-150%

5.1.4  
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## Method Blank Summary

**Job Number:** FA83814  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84499-MB	2Q64539.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-20

CAS No.	ID Standard Recoveries	Limits
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	86% 40-140%
	13C2-PFDoDA	79% 40-140%
	13C2-PFTeDA	63% 30-130%
	13C3-PFBS	92% 50-150%
	13C3-PFHxS	92% 50-150%
	13C8-PFOS	85% 50-150%
	d3-MeFOSAA	83% 40-140%
	d5-EtFOSAA	81% 40-140%
	13C3-HFPO-DA	74% 50-150%

# Method Blank Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84565-MB	2Q64855.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-10, FA83814-11, FA83814-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C5-PFHxA	73%	50-150%
	13C4-PFHpA	79%	50-150%
	13C8-PFOA	76%	50-150%
	13C9-PFNA	78%	50-150%

5.1.5  
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## Method Blank Summary

Job Number: FA83814  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84565-MB	2Q64855.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-10, FA83814-11, FA83814-12

CAS No.	ID Standard Recoveries	Limits
	13C6-PFDA	79% 50-150%
	13C7-PFUnDA	78% 40-140%
	13C2-PFDoDA	71% 40-140%
	13C2-PFTeDA	68% 30-130%
	13C3-PFBS	76% 50-150%
	13C3-PFHxS	76% 50-150%
	13C8-PFOS	73% 50-150%
	d3-MeFOSAA	64% 40-140%
	d5-EtFOSAA	61% 40-140%

# Instrument Blank

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q936-IBLK	2Q64372.D	1	03/14/21	NAF	n/a	n/a	S2Q936

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA83814-22

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	97%	50-150%
	13C5-PFPeA	94%	50-150%
	13C5-PFHxA	94%	50-150%
	13C4-PFHpA	98%	50-150%

5.1.6  
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# Instrument Blank

Job Number: FA83814  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q936-IBLK	2Q64372.D	1	03/14/21	NAF	n/a	n/a	S2Q936

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA83814-22

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	99% 50-150%
	13C9-PFNA	98% 50-150%
	13C6-PFDA	99% 50-150%
	13C7-PFUnDA	100% 50-150%
	13C2-PFDoDA	97% 50-150%
	13C2-PFTeDA	85% 50-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	96% 50-150%
	13C8-PFOS	97% 50-150%
	13C8-FOSA	95% 50-150%
	d3-MeFOSAA	88% 50-150%
	d5-EtFOSAA	92% 50-150%
	13C2-4:2FTS	89% 50-150%
	13C2-6:2FTS	92% 50-150%
	13C2-8:2FTS	90% 50-150%

5.1.6  
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# Instrument Blank

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q518-IBLK	3Q35183.D	1	03/15/21	NG	n/a	n/a	S3Q518

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA83814-1, FA83814-2, FA83814-3, FA83814-4, FA83814-5, FA83814-6, FA83814-7, FA83814-8, FA83814-9, FA83814-12, FA83814-13, FA83814-14, FA83814-15, FA83814-16, FA83814-17, FA83814-18, FA83814-19

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	93% 50-150%
	13C5-PFPeA	94% 50-150%
	13C5-PFHxA	94% 50-150%
	13C4-PFHpA	95% 50-150%

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Job Number: FA83814  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q518-IBLK	3Q35183.D	1	03/15/21	NG	n/a	n/a	S3Q518

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA83814-1, FA83814-2, FA83814-3, FA83814-4, FA83814-5, FA83814-6, FA83814-7, FA83814-8, FA83814-9, FA83814-12, FA83814-13, FA83814-14, FA83814-15, FA83814-16, FA83814-17, FA83814-18, FA83814-19

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	95% 50-150%
	13C9-PFNA	94% 50-150%
	13C6-PFDA	95% 50-150%
	13C7-PFUnDA	94% 50-150%
	13C2-PFDoDA	98% 50-150%
	13C2-PFTeDA	97% 50-150%
	13C3-PFBS	92% 50-150%
	13C3-PFHxS	93% 50-150%
	13C8-PFOS	93% 50-150%
	13C8-FOSA	97% 50-150%
	d3-MeFOSAA	131% 50-150%
	d5-EtFOSAA	141% 50-150%
	13C2-4:2FTS	90% 50-150%
	13C2-6:2FTS	89% 50-150%
	13C2-8:2FTS	86% 50-150%

5.1.7  
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Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q938-IBLK	2Q64514.D	1	03/16/21	NAF	n/a	n/a	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA83814-20

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	107% 50-150%
	13C5-PFPeA	101% 50-150%
	13C5-PFHxA	99% 50-150%
	13C4-PFHpA	102% 50-150%

5.1.8  
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Job Number: FA83814  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q938-IBLK	2Q64514.D	1	03/16/21	NAF	n/a	n/a	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA83814-20

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	102% 50-150%
	13C9-PFNA	107% 50-150%
	13C6-PFDA	109% 50-150%
	13C7-PFUnDA	113% 50-150%
	13C2-PFDoDA	109% 50-150%
	13C2-PFTeDA	109% 50-150%
	13C3-PFBS	102% 50-150%
	13C3-PFHxS	104% 50-150%
	13C8-PFOS	103% 50-150%
	13C8-FOSA	117% 50-150%
	d3-MeFOSAA	100% 50-150%
	d5-EtFOSAA	100% 50-150%
	13C2-4:2FTS	96% 50-150%
	13C2-6:2FTS	103% 50-150%
	13C2-8:2FTS	104% 50-150%

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Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q942-IBLK	2Q64851.D	1	03/21/21	NAF	n/a	n/a	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA83814-10, FA83814-11, FA83814-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	99%	50-150%
	13C5-PFPeA	91%	50-150%
	13C5-PFHxA	88%	50-150%
	13C4-PFHpA	98%	50-150%

5.1.9  
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# Instrument Blank

Job Number: FA83814  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q942-IBLK	2Q64851.D	1	03/21/21	NAF	n/a	n/a	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA83814-10, FA83814-11, FA83814-12

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	92% 50-150%
	13C9-PFNA	98% 50-150%
	13C6-PFDA	104% 50-150%
	13C7-PFUnDA	107% 50-150%
	13C2-PFDoDA	103% 50-150%
	13C2-PFTeDA	96% 50-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	96% 50-150%
	13C8-PFOS	92% 50-150%
	13C8-FOSA	108% 50-150%
	d3-MeFOSAA	91% 50-150%
	d5-EtFOSAA	88% 50-150%
	13C2-4:2FTS	88% 50-150%
	13C2-6:2FTS	97% 50-150%
	13C2-8:2FTS	100% 50-150%

5.1.9  
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# Blank Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-BS	2Q64418.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.0714	0.0706	99	70-130
2706-90-3	Perfluoropentanoic acid	0.0714	0.0712	100	70-130
307-24-4	Perfluorohexanoic acid	0.0714	0.0702	98	70-130
375-85-9	Perfluoroheptanoic acid	0.0714	0.0701	98	70-130
335-67-1	Perfluorooctanoic acid	0.0714	0.0720	101	70-130
375-95-1	Perfluorononanoic acid	0.0714	0.0697	98	70-130
335-76-2	Perfluorodecanoic acid	0.0714	0.0703	98	70-130
2058-94-8	Perfluoroundecanoic acid	0.0714	0.0715	100	70-130
307-55-1	Perfluorododecanoic acid	0.0714	0.0706	99	70-130
72629-94-8	Perfluorotridecanoic acid	0.0714	0.0689	96	60-140
376-06-7	Perfluorotetradecanoic acid	0.0714	0.0707	99	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0714	0.0695	97	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0714	0.0685	96	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0714	0.0726	102	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0714	0.0733	103	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0714	0.0707	99	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0714	0.0679	95	65-130
335-77-3	Perfluorodecanesulfonic acid	0.0714	0.0644	90	60-130
754-91-6	PFOSA	0.0714	0.0680	95	70-130
2355-31-9	MeFOSAA	0.0714	0.0717	100	70-130
2991-50-6	EiFOSAA	0.0714	0.0708	99	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.0714	0.0708	99	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0714	0.0728	102	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.0714	0.0720	101	70-130
13252-13-6	HFPO-DA (GenX)	0.0714	0.0681	95	70-130
919005-14-4	ADONA	0.0714	0.0655	92	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.0714	0.0614	86	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.0714	0.0690	97	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	86%	35-135%
	13C5-PFPeA	86%	50-150%
	13C5-PFHxA	87%	50-150%
	13C4-PFHpA	86%	50-150%

\* = Outside of Control Limits.

5.2.1  
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# Blank Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-BS	2Q64418.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	88%	50-150%
	13C9-PFNA	88%	50-150%
	13C6-PFDA	86%	50-150%
	13C7-PFUnDA	82%	40-140%
	13C2-PFDoDA	78%	40-140%
	13C2-PFTeDA	79%	30-130%
	13C3-PFBS	86%	50-150%
	13C3-PFHxS	81%	50-150%
	13C8-PFOS	81%	50-150%
	13C8-FOSA	78%	30-130%
	d3-MeFOSAA	78%	40-140%
	d5-EtFOSAA	79%	40-140%
	13C2-4:2FTS	86%	50-150%
	13C2-6:2FTS	85%	50-150%
	13C2-8:2FTS	87%	50-150%

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84486-BS	3Q35202.D	1	03/15/21	NG	03/13/21	OP84486	S3Q518

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-1, FA83814-2, FA83814-3, FA83814-4, FA83814-5, FA83814-6, FA83814-7, FA83814-8, FA83814-9, FA83814-12, FA83814-13, FA83814-14, FA83814-15, FA83814-16, FA83814-17, FA83814-18, FA83814-19

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0795	99	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0804	101	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0829	104	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0852	107	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0810	101	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0806	101	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0826	103	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0777	97	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0803	100	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0766	96	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0800	100	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0827	103	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0853	107	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0830	104	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0826	103	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0790	99	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0814	102	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0773	97	60-130
754-91-6	PFOSA	0.08	0.0816	102	70-130
2355-31-9	MeFOSAA	0.08	0.0819	102	70-130
2991-50-6	EiFOSAA	0.08	0.0812	102	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0815	102	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0785	98	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0802	100	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0871	109	70-130
919005-14-4	ADONA	0.08	0.0840	105	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0743	93	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0766	96	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	75%	35-135%
	13C5-PFPeA	77%	50-150%
	13C5-PFHxA	77%	50-150%
	13C4-PFHpA	78%	50-150%

\* = Outside of Control Limits.

5.2.2  
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# Blank Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84486-BS	3Q35202.D	1	03/15/21	NG	03/13/21	OP84486	S3Q518

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-1, FA83814-2, FA83814-3, FA83814-4, FA83814-5, FA83814-6, FA83814-7, FA83814-8, FA83814-9, FA83814-12, FA83814-13, FA83814-14, FA83814-15, FA83814-16, FA83814-17, FA83814-18, FA83814-19

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	78%	50-150%
	13C9-PFNA	78%	50-150%
	13C6-PFDA	78%	50-150%
	13C7-PFUnDA	76%	40-140%
	13C2-PFDoDA	73%	40-140%
	13C2-PFTeDA	71%	30-130%
	13C3-PFBS	75%	50-150%
	13C3-PFHxS	76%	50-150%
	13C8-PFOS	74%	50-150%
	13C8-FOSA	71%	30-130%
	d3-MeFOSAA	105%	40-140%
	d5-EtFOSAA	108%	40-140%
	13C2-4:2FTS	77%	50-150%
	13C2-6:2FTS	77%	50-150%
	13C2-8:2FTS	75%	50-150%
	13C3-HFPO-DA	69%	50-150%

\* = Outside of Control Limits.

5.2.2  
5

# Blank Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84499-BS	2Q64538.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-20

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.0714	0.0694	97	70-130
2706-90-3	Perfluoropentanoic acid	0.0714	0.0790	111	70-130
307-24-4	Perfluorohexanoic acid	0.0714	0.0755	106	70-130
375-85-9	Perfluoroheptanoic acid	0.0714	0.0797	112	70-130
335-67-1	Perfluorooctanoic acid	0.0714	0.0746	104	70-130
375-95-1	Perfluorononanoic acid	0.0714	0.0788	110	70-130
335-76-2	Perfluorodecanoic acid	0.0714	0.0775	108	70-130
2058-94-8	Perfluoroundecanoic acid	0.0714	0.0725	101	70-130
307-55-1	Perfluorododecanoic acid	0.0714	0.0767	107	70-130
72629-94-8	Perfluorotridecanoic acid	0.0714	0.0595	83	60-140
376-06-7	Perfluorotetradecanoic acid	0.0714	0.0774	108	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0714	0.0762	107	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0714	0.0790	111	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0714	0.0788	110	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0714	0.0789	110	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0714	0.0722	101	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0714	0.0781	109	65-130
335-77-3	Perfluorodecanesulfonic acid	0.0714	0.0685	96	60-130
754-91-6	PFOSA	0.0714	0.0758	106	70-130
2355-31-9	MeFOSAA	0.0714	0.0804	113	70-130
2991-50-6	EiFOSAA	0.0714	0.0774	108	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.0714	0.0788	110	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0714	0.0767	107	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.0714	0.0799	112	70-130
13252-13-6	HFPO-DA (GenX)	0.0714	0.0985	138*	70-130
919005-14-4	ADONA	0.0714	0.0704	99	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.0714	0.0658	92	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.0714	0.0762	107	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C5-PFHxA	88%	50-150%
	13C4-PFHpA	89%	50-150%
	13C8-PFOA	90%	50-150%
	13C9-PFNA	88%	50-150%

\* = Outside of Control Limits.

5.2.3  
5

# Blank Spike Summary

Job Number: FA83814  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84499-BS	2Q64538.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-20

CAS No.	ID Standard Recoveries	BSP	Limits
	13C6-PFDA	85%	50-150%
	13C7-PFUnDA	80%	40-140%
	13C2-PFDoDA	68%	40-140%
	13C2-PFTeDA	36%	30-130%
	13C3-PFBS	86%	50-150%
	13C3-PFHxS	85%	50-150%
	13C8-PFOS	81%	50-150%
	d3-MeFOSAA	74%	40-140%
	d5-EtFOSAA	73%	40-140%
	13C3-HFPO-DA	72%	50-150%

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84565-BS	2Q64854.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-10, FA83814-11, FA83814-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0684	86	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0898	112	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0773	97	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0784	98	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0799	100	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0896	112	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0801	100	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0769	96	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0770	96	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0612	77	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0847	106	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0784	98	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0835	104	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0797	100	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0827	103	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0799	100	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0845	106	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0687	86	60-130
754-91-6	PFOSA	0.08	0.0780	98	70-130
2355-31-9	MeFOSAA	0.08	0.0818	102	70-130
2991-50-6	EiFOSAA	0.08	0.0786	98	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0795	99	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0812	102	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0797	100	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0992	124	70-130
919005-14-4	ADONA	0.08	0.0773	97	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0712	89	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0784	98	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C5-PFHxA	79%	50-150%
	13C4-PFHpA	87%	50-150%
	13C8-PFOA	82%	50-150%
	13C9-PFNA	85%	50-150%

\* = Outside of Control Limits.

5.2.4  
5

# Blank Spike Summary

Job Number: FA83814  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84565-BS	2Q64854.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-10, FA83814-11, FA83814-12

CAS No.	ID Standard Recoveries	BSP	Limits
	13C6-PFDA	88%	50-150%
	13C7-PFUnDA	87%	40-140%
	13C2-PFDoDA	75%	40-140%
	13C2-PFTeDA	55%	30-130%
	13C3-PFBS	84%	50-150%
	13C3-PFHxS	85%	50-150%
	13C8-PFOS	84%	50-150%
	d3-MeFOSAA	66%	40-140%
	d5-EtFOSAA	59%	40-140%

\* = Outside of Control Limits.

# Matrix Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-MS	2Q64423.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936
FA83818-1	2Q64422.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936
FA83818-1	2Q64518.D	1	03/16/21	NAF	03/12/21	OP84474	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	Compound	FA83818-1 ug/l	Spike Q	MS ug/l	MS %	Limits	
375-22-4	Perfluorobutanoic acid	ND		0.0741	0.0743	100	70-130
2706-90-3	Perfluoropentanoic acid	ND		0.0741	0.0754	102	70-130
307-24-4	Perfluorohexanoic acid	ND		0.0741	0.0734	99	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.0741	0.0722	97	70-130
335-67-1	Perfluorooctanoic acid	ND		0.0741	0.0761	103	70-130
375-95-1	Perfluorononanoic acid	ND		0.0741	0.0744	100	70-130
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0736	99	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0738	100	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0735	99	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.0710	96	60-140
376-06-7	Perfluorotetradecanoic acid	ND <sup>a</sup>		0.0741	0.0732	99	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.0741	0.0751	101	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.0741	0.0744	100	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.0741	0.0749	101	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0741	0.0772	104	70-130
1763-23-1	Perfluorooctanesulfonic acid	ND		0.0741	0.0760	103	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0722	97	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0669	90	60-130
754-91-6	PFOSA	ND		0.0741	0.0731	99	70-130
2355-31-9	MeFOSAA	ND		0.0741	0.0738	100	70-130
2991-50-6	EiFOSAA	ND		0.0741	0.0745	101	70-130
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0741	0.0760	103	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0741	0.0781	105	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0741	0.0752	102	70-130
13252-13-6	HFPO-DA (GenX)	ND		0.0741	0.0723	98	70-130
919005-14-4	ADONA	ND		0.0741	0.0688	93	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		0.0741	0.0655	88	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		0.0741	0.0732	99	60-140

CAS No.	ID Standard Recoveries	MS	FA83818-1	FA83818-1	Limits
	13C4-PFBA	94%	95%	95%	35-135%
	13C5-PFPeA	94%	95%	91%	50-150%
	13C5-PFHxA	93%	95%	90%	50-150%
	13C4-PFHpA	95%	96%	92%	50-150%

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-MS	2Q64423.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936
FA83818-1	2Q64422.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936
FA83818-1	2Q64518.D	1	03/16/21	NAF	03/12/21	OP84474	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	ID Standard Recoveries	MS	FA83818-1	FA83818-1	Limits
	13C8-PFOA	96%	98%	92%	50-150%
	13C9-PFNA	95%	96%	94%	50-150%
	13C6-PFDA	95%	94%	93%	50-150%
	13C7-PFUnDA	90%	85%	89%	40-140%
	13C2-PFDoDA	83%	65%	80%	40-140%
	13C2-PFTeDA	85%	27%* b	71%	30-130%
	13C3-PFBS	92%	94%	93%	50-150%
	13C3-PFHxS	93%	94%	94%	50-150%
	13C8-PFOS	88%	89%	90%	50-150%
	13C8-FOSA	89%	90%	93%	30-130%
	d3-MeFOSAA	90%	86%	81%	40-140%
	d5-EtFOSAA	88%	88%	80%	40-140%
	13C2-4:2FTS	94%	91%	88%	50-150%
	13C2-6:2FTS	94%	92%	89%	50-150%
	13C2-8:2FTS	97%	89%	90%	50-150%
	13C3-HFPO-DA		95%	79%	50-150%

(a) Result is from Run #2.

(b) Outside control limits.

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84499-MS	2Q64545.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938
FA83838-9 <sup>a</sup>	2Q64544.D	1.9	03/16/21	NAF	03/15/21	OP84499	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-20

CAS No.	Compound	FA83838-9 ug/l	Spike Q	MS ug/l	MS %	Limits	
375-22-4	Perfluorobutanoic acid	0.0121	I	0.16	0.162	94	70-130
2706-90-3	Perfluoropentanoic acid	0.0151		0.16	0.187	107	70-130
307-24-4	Perfluorohexanoic acid	0.0117		0.16	0.178	104	70-130
375-85-9	Perfluoroheptanoic acid	0.0080		0.16	0.180	108	70-130
335-67-1	Perfluorooctanoic acid	0.0144		0.16	0.181	104	70-130
375-95-1	Perfluorononanoic acid	0.0050	I	0.16	0.176	107	70-130
335-76-2	Perfluorodecanoic acid	0.0076	U	0.16	0.167	104	70-130
2058-94-8	Perfluoroundecanoic acid	0.0076	U	0.16	0.154	96	70-130
307-55-1	Perfluorododecanoic acid	0.0076	U	0.16	0.169	106	70-130
72629-94-8	Perfluorotridecanoic acid	0.0076	U	0.16	0.171	107	60-140
376-06-7	Perfluorotetradecanoic acid	0.0076	U	0.16	0.172	108	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0057	I	0.16	0.167	101	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0076	U	0.16	0.163	102	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0189		0.16	0.181	101	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0076	U	0.16	0.158	99	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.167		0.16	0.310	89	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0076	U	0.16	0.166	104	65-130
335-77-3	Perfluorodecanesulfonic acid	0.0076	U	0.16	0.151	94	60-130
754-91-6	PFOSA	0.015	U	0.16	0.155	97	70-130
2355-31-9	MeFOSAA	0.015	U	0.16	0.172	108	70-130
2991-50-6	EiFOSAA	0.015	U	0.16	0.170	106	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.030	U	0.16	0.169	106	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.030	U	0.16	0.161	101	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.030	U	0.16	0.171	107	70-130
13252-13-6	HFPO-DA (GenX)	0.015	U	0.16	0.205	128	70-130
919005-14-4	ADONA	0.030	U	0.16	0.154	96	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.030	U	0.16	0.138	86	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.030	U	0.16	0.153	96	60-140

CAS No.	ID Standard Recoveries	MS	FA83838-9	Limits
	13C5-PFHxA	73%	110%	50-150%
	13C4-PFHpA	77%	116%	50-150%
	13C8-PFOA	74%	112%	50-150%
	13C9-PFNA	75%	104%	50-150%

\* = Outside of Control Limits.

5.3.2  
5

# Matrix Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84499-MS	2Q64545.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938
FA83838-9 <sup>a</sup>	2Q64544.D	1.9	03/16/21	NAF	03/15/21	OP84499	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-20

CAS No.	ID Standard Recoveries	MS	FA83838-9	Limits
	13C6-PFDA	71%	94%	50-150%
	13C7-PFUnDA	68%	92%	40-140%
	13C2-PFDoDA	60%	92%	40-140%
	13C2-PFTeDA	60%	91%	30-130%
	13C3-PFBS	76%	112%	50-150%
	13C3-PFHxS	72%	100%	50-150%
	13C8-PFOS	66%	88%	50-150%
	d3-MeFOSAA	71%	92%	40-140%
	d5-EtFOSAA	67%	92%	40-140%
	13C3-HFPO-DA	58%	87%	50-150%

(a) Dilution due to sample clogging SPE cartridge, only partial volume was extracted.

\* = Outside of Control Limits.

5.3.2  
5

# Matrix Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84565-MS	2Q64863.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942
FA83945-4A	2Q64861.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942
FA83945-4A <sup>a</sup>	2Q64862.D	5	03/21/21	NAF	03/19/21	OP84565	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-10, FA83814-11, FA83814-12

CAS No.	Compound	FA83945-4A Spike		MS	MS	Limits
		ug/l	Q ug/l	ug/l	%	
375-22-4	Perfluorobutanoic acid	0.0915	0.16	0.231	87	70-130
2706-90-3	Perfluoropentanoic acid	0.0142	0.16	0.187	108	70-130
307-24-4	Perfluorohexanoic acid	0.0041	0.16	0.167	102	70-130
375-85-9	Perfluoroheptanoic acid	0.0027 I	0.16	0.160	98	70-130
335-67-1	Perfluorooctanoic acid	0.0056	0.16	0.166	100	70-130
375-95-1	Perfluorononanoic acid	0.0040 U	0.16	0.170	106	70-130
335-76-2	Perfluorodecanoic acid	0.0040 U	0.16	0.170	106	70-130
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.16	0.161	101	70-130
307-55-1	Perfluorododecanoic acid	0.0040 U	0.16	0.160	100	70-130
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.16	0.0704	44*	60-140
376-06-7	Perfluorotetradecanoic acid	0.020 U <sup>b</sup>	0.16	0.159	99	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0040 U	0.16	0.167	104	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.0040 U	0.16	0.183	114	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0028 I	0.16	0.164	101	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.0040 U	0.16	0.170	106	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.0022 I	0.16	0.168	104	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	0.16	0.158	99	65-130
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	0.16	0.131	82	60-130
754-91-6	PFOSA	0.0080 U	0.16	0.152	95	70-130
2355-31-9	MeFOSAA	0.0080 U	0.16	0.162	101	70-130
2991-50-6	EiFOSAA	0.0080 U	0.16	0.173	108	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.016 U	0.16	0.165	103	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0113 I	0.16	0.178	104	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.016 U	0.16	0.161	101	70-130
13252-13-6	HFPO-DA (GenX)	0.0080 U	0.16	0.202	126	70-130
919005-14-4	ADONA	0.016 U	0.16	0.149	93	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.016 U	0.16	0.158	99	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.016 U	0.16	0.192	120	60-140

CAS No.	ID Standard Recoveries	MS	FA83945-4A	FA83945-4A	Limits
	13C5-PFHxA	63%	63%	69%	50-150%
	13C4-PFHpA	69%	72%	74%	50-150%
	13C8-PFOA	68%	71%	72%	50-150%
	13C9-PFNA	71%	73%	71%	50-150%

\* = Outside of Control Limits.

5.3.3  
5

# Matrix Spike Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84565-MS	2Q64863.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942
FA83945-4A	2Q64861.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942
FA83945-4A <sup>a</sup>	2Q64862.D	5	03/21/21	NAF	03/19/21	OP84565	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-10, FA83814-11, FA83814-12

CAS No.	ID Standard Recoveries	MS	FA83945-4A	FA83945-4A	Limits
	13C6-PFDA	63%	66%	70%	50-150%
	13C7-PFUnDA	51%	53%	58%	40-140%
	13C2-PFDoDA	31%* c	33%* c	41%	40-140%
	13C2-PFTeDA	7%* c	9%* c	14%* c	30-130%
	13C3-PFBS	61%	65%	72%	50-150%
	13C3-PFHxS	67%	69%	79%	50-150%
	13C8-PFOS	63%	65%	66%	50-150%
	d3-MeFOSAA	29%* c	31%* c	36%* c	40-140%
	d5-EtFOSAA	24%* c	27%* c	31%* c	40-140%
	13C3-HFPO-DA		50%	57%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run #2.
- (c) Outside control limits.

\* = Outside of Control Limits.

5.3.3  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84486-MS	3Q35206.D	1	03/15/21	NG	03/13/21	OP84486	S3Q518
OP84486-MSD	3Q35310.D	1	03/17/21	NG	03/13/21	OP84486	S3Q518
FA83814-1	3Q35205.D	1	03/15/21	NG	03/13/21	OP84486	S3Q518

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-1, FA83814-2, FA83814-3, FA83814-4, FA83814-5, FA83814-6, FA83814-7, FA83814-8, FA83814-9, FA83814-12, FA83814-13, FA83814-14, FA83814-15, FA83814-16, FA83814-17, FA83814-18, FA83814-19

CAS No.	Compound	FA83814-1 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0069	0.0714	0.0768	98	0.0714	0.0769	98	0	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0029	0.0714	0.0781	105	0.0714	0.0830	112	6	70-130/30
307-24-4	Perfluorohexanoic acid	0.0021	0.0714	0.0764	104	0.0714	0.0779	106	2	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0020	0.0714	0.0766	104	0.0714	0.0791	108	3	70-130/30
335-67-1	Perfluorooctanoic acid	0.0027	0.0714	0.0747	101	0.0714	0.0737	99	1	70-130/30
375-95-1	Perfluorononanoic acid	ND	0.0714	0.0703	98	0.0714	0.0723	101	3	70-130/30
335-76-2	Perfluorodecanoic acid	ND	0.0714	0.0740	104	0.0714	0.0744	104	1	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND	0.0714	0.0694	97	0.0714	0.0707	99	2	70-130/30
307-55-1	Perfluorododecanoic acid	ND	0.0714	0.0712	100	0.0714	0.0739	103	4	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND	0.0714	0.0486	68	0.0714	0.0798	112	49*	60-140/30
376-06-7	Perfluorotetradecanoic acid	ND	0.0714	0.0702	98	0.0714	0.0728	102	4	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0034	0.0714	0.0792	106	0.0714	0.0835	112	5	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0714	0.0771	108	0.0714	0.0776	109	1	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0012 J	0.0714	0.0800	110	0.0714	0.0790	109	1	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0714	0.0727	102	0.0714	0.0805	113	10	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0034	0.0714	0.0724	97	0.0714	0.0750	100	4	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND	0.0714	0.0725	101	0.0714	0.0752	105	4	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND	0.0714	0.0634	89	0.0714	0.0698	98	10	60-130/30
754-91-6	PFOSA	ND	0.0714	0.0726	102	0.0714	0.0750	105	3	70-130/30
2355-31-9	MeFOSAA	ND	0.0714	0.0752	105	0.0714	0.0760	106	1	70-130/30
2991-50-6	EtFOSAA	ND	0.0714	0.0734	103	0.0714	0.0748	105	2	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0714	0.0727	102	0.0714	0.0731	102	1	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0714	0.0691	97	0.0714	0.0698	98	1	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0714	0.0739	103	0.0714	0.0726	102	2	70-130/30
13252-13-6	HFPO-DA (GenX)	ND	0.0714	0.0805	113	0.0714	0.0799	112	1	70-130/30
919005-14-4	ADONA	ND	0.0714	0.0729	102	0.0714	0.0732	102	0	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0714	0.0659	92	0.0714	0.0623	87	6	60-140/30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0714	0.0823	115	0.0714	0.0608	85	30	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA83814-1	Limits
13C4-PFBA		64%	37%	63%	35-135%
13C5-PFPeA		66%	38%* a	65%	50-150%
13C5-PFHxA		63%	36%* a	62%	50-150%
13C4-PFHpA		65%	38%* a	64%	50-150%

\* = Outside of Control Limits.

5.4.1  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84486-MS	3Q35206.D	1	03/15/21	NG	03/13/21	OP84486	S3Q518
OP84486-MSD	3Q35310.D	1	03/17/21	NG	03/13/21	OP84486	S3Q518
FA83814-1	3Q35205.D	1	03/15/21	NG	03/13/21	OP84486	S3Q518

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-1, FA83814-2, FA83814-3, FA83814-4, FA83814-5, FA83814-6, FA83814-7, FA83814-8, FA83814-9, FA83814-12, FA83814-13, FA83814-14, FA83814-15, FA83814-16, FA83814-17, FA83814-18, FA83814-19

CAS No.	ID Standard Recoveries	MS	MSD	FA83814-1	Limits
	13C8-PFOA	69%	40%* a	68%	50-150%
	13C9-PFNA	70%	40%* a	70%	50-150%
	13C6-PFDA	71%	40%* a	70%	50-150%
	13C7-PFUnDA	67%	38%* a	68%	40-140%
	13C2-PFDoDA	53%	40%	64%	40-140%
	13C2-PFTeDA	31%	48%	36%	30-130%
	13C3-PFBS	65%	38%* a	64%	50-150%
	13C3-PFHxS	64%	37%* a	65%	50-150%
	13C8-PFOS	66%	36%* a	67%	50-150%
	13C8-FOSA	33%	27%* a	34%	30-130%
	d3-MeFOSAA	122%	64%	122%	40-140%
	d5-EtFOSAA	125%	65%	127%	40-140%
	13C2-4:2FTS	71%	41%* a	68%	50-150%
	13C2-6:2FTS	79%	46%* a	75%	50-150%
	13C2-8:2FTS	79%	43%* a	78%	50-150%
	13C3-HFPO-DA	53%	31%* a	52%	50-150%

(a) Outside control limits.

\* = Outside of Control Limits.

5.4.1  
5

# Duplicate Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-DUP	2Q64425.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936
FA83818-2 <sup>a</sup>	2Q64424.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936
FA83818-2 <sup>b</sup>	2Q64519.D	1	03/16/21	NAF	03/12/21	OP84474	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	Compound	FA83818-2 ug/l	DUP Q	ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	ND		ND		nc	30
2706-90-3	Perfluoropentanoic acid	ND		ND		nc	30
307-24-4	Perfluorohexanoic acid	ND		ND		nc	30
375-85-9	Perfluoroheptanoic acid	ND		ND		nc	30
335-67-1	Perfluorooctanoic acid	0.0018	B	0.0029	B	47*	30
375-95-1	Perfluorononanoic acid	ND		ND		nc	30
335-76-2	Perfluorodecanoic acid	ND		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	ND		ND		nc	30
307-55-1	Perfluorododecanoic acid	ND		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	ND		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	ND		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	ND		ND		nc	30
2706-91-4	Perfluoropentanesulfonic acid	ND		ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	ND		ND		nc	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	ND		ND		nc	30
68259-12-1	Perfluorononanesulfonic acid	ND		ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	ND		ND		nc	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EiFOSAA	ND		ND		nc	30
757124-72-44:2	Fluorotelomer sulfonate	ND		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	ND		ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30
13252-13-6	HFPO-DA (GenX)	ND		ND		nc	30
919005-14-4	ADONA	ND		ND		nc	30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND		ND		nc	30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA83818-2	FA83818-2	Limits
	13C4-PFBA	94%	88%	92%	35-135%
	13C5-PFPeA	95%	88%	88%	50-150%
	13C5-PFHxA	96%	89%	88%	50-150%
	13C4-PFHpA	94%	89%	92%	50-150%

\* = Outside of Control Limits.

5.5.1  
5

# Duplicate Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84474-DUP	2Q64425.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936
FA83818-2 <sup>a</sup>	2Q64424.D	1	03/15/21	NAF	03/12/21	OP84474	S2Q936
FA83818-2 <sup>b</sup>	2Q64519.D	1	03/16/21	NAF	03/12/21	OP84474	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-22

CAS No.	ID Standard Recoveries	DUP	FA83818-2	FA83818-2	Limits
	13C8-PFOA	95%	91%	89%	50-150%
	13C9-PFNA	94%	89%	92%	50-150%
	13C6-PFDA	91%	88%	91%	50-150%
	13C7-PFUnDA	89%	82%	87%	40-140%
	13C2-PFDoDA	85%	78%	80%	40-140%
	13C2-PFTeDA	86%	80%	75%	30-130%
	13C3-PFBS	95%	88%	89%	50-150%
	13C3-PFHxS	91%	86%	91%	50-150%
	13C8-PFOS	84%	83%	83%	50-150%
	13C8-FOSA	88%	84%	91%	30-130%
	d3-MeFOSAA	87%	85%	78%	40-140%
	d5-EtFOSAA	90%	83%	80%	40-140%
	13C2-4:2FTS	90%	84%	85%	50-150%
	13C2-6:2FTS	87%	80%	83%	50-150%
	13C2-8:2FTS	86%	83%	87%	50-150%
	13C3-HFPO-DA		88%	78%	50-150%

(a) Insufficient sample for re-extraction.

(b) Confirmation run.

\* = Outside of Control Limits.

5.5.1  
5

# Duplicate Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84499-DUP	2Q64547.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938
FA83838-10	2Q64546.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-20

CAS No.	Compound	FA83838-10 DUP		Q	RPD	Limits
		ug/l	Q ug/l			
375-22-4	Perfluorobutanoic acid	0.0103	0.0106		3	30
2706-90-3	Perfluoropentanoic acid	0.0105	0.0112		6	30
307-24-4	Perfluorohexanoic acid	0.0082	0.0082		0	30
375-85-9	Perfluoroheptanoic acid	0.0050	0.0054		8	30
335-67-1	Perfluorooctanoic acid	0.0088	0.0090		2	30
375-95-1	Perfluorononanoic acid	0.0033 I	0.0038 J		14	30
335-76-2	Perfluorodecanoic acid	0.0040 U	ND		nc	30
2058-94-8	Perfluoroundecanoic acid	0.0040 U	ND		nc	30
307-55-1	Perfluorododecanoic acid	0.0040 U	ND		nc	30
72629-94-8	Perfluorotridecanoic acid	0.0040 U	ND		nc	30
376-06-7	Perfluorotetradecanoic acid	0.0040 U	ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0070	0.0066		6	30
2706-91-4	Perfluoropentanesulfonic acid	0.0040 U	ND		nc	30
355-46-4	Perfluorohexanesulfonic acid	0.0155	0.0183		17	30
375-92-8	Perfluoroheptanesulfonic acid	0.0040 U	ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0870	0.105		19	30
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	ND		nc	30
754-91-6	PFOSA	0.0080 U	ND		nc	30
2355-31-9	MeFOSAA	0.0080 U	ND		nc	30
2991-50-6	EiFOSAA	0.0080 U	ND		nc	30
757124-72-44:2	Fluorotelomer sulfonate	0.016 U	ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.016 U	ND		nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.016 U	ND		nc	30
13252-13-6	HFPO-DA (GenX)	0.0080 U	ND		nc	30
919005-14-4	ADONA	0.016 U	ND		nc	30
756426-58-19	Cl-PF3ONS (F-53B Major)	0.016 U	ND		nc	30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.016 U	ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA83838-10	Limits
	13C5-PFHxA	72%	82%	50-150%
	13C4-PFHpA	74%	86%	50-150%
	13C8-PFOA	73%	85%	50-150%
	13C9-PFNA	70%	86%	50-150%

\* = Outside of Control Limits.

5.5.2  
5

## Duplicate Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84499-DUP	2Q64547.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938
FA83838-10	2Q64546.D	1	03/16/21	NAF	03/15/21	OP84499	S2Q938

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-20

CAS No.	ID Standard Recoveries	DUP	FA83838-10	Limits
	13C6-PFDA	66%	82%	50-150%
	13C7-PFUnDA	60%	78%	40-140%
	13C2-PFDoDA	53%	69%	40-140%
	13C2-PFTeDA	50%	67%	30-130%
	13C3-PFBS	71%	81%	50-150%
	13C3-PFHxS	66%	78%	50-150%
	13C8-PFOS	58%	74%	50-150%
	d3-MeFOSAA	65%	82%	40-140%
	d5-EtFOSAA	60%	76%	40-140%
	13C3-HFPO-DA	58%	65%	50-150%

\* = Outside of Control Limits.

5.5.2  
5

# Duplicate Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84565-DUP	2Q64857.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942
DA32709-2	2Q64856.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-10, FA83814-11, FA83814-12

CAS No.	Compound	DA32709-2 ug/l	DUP Q ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	ND	ND	nc		30
2706-90-3	Perfluoropentanoic acid	ND	ND	nc		30
307-24-4	Perfluorohexanoic acid	ND	ND	nc		30
375-85-9	Perfluoroheptanoic acid	ND	ND	nc		30
335-67-1	Perfluorooctanoic acid	ND	ND	nc		30
375-95-1	Perfluorononanoic acid	ND	ND	nc		30
335-76-2	Perfluorodecanoic acid	ND	ND	nc		30
2058-94-8	Perfluoroundecanoic acid	ND	ND	nc		30
307-55-1	Perfluorododecanoic acid	ND	ND	nc		30
72629-94-8	Perfluorotridecanoic acid	ND	ND	nc		30
376-06-7	Perfluorotetradecanoic acid	ND	ND	nc		30
375-73-5	Perfluorobutanesulfonic acid	ND	ND	nc		30
2706-91-4	Perfluoropentanesulfonic acid	ND	ND	nc		30
355-46-4	Perfluorohexanesulfonic acid	ND	ND	nc		30
375-92-8	Perfluoroheptanesulfonic acid	ND	ND	nc		30
1763-23-1	Perfluorooctanesulfonic acid	ND	ND	nc		30
68259-12-1	Perfluorononanesulfonic acid	ND	ND	nc		30
335-77-3	Perfluorodecanesulfonic acid	ND	ND	nc		30
754-91-6	PFOSA	ND	ND	nc		30
2355-31-9	MeFOSAA	ND	ND	nc		30
2991-50-6	EiFOSAA	ND	ND	nc		30
757124-72-44:2	Fluorotelomer sulfonate	ND	ND	nc		30
27619-97-2	6:2 Fluorotelomer sulfonate	ND	ND	nc		30
39108-34-4	8:2 Fluorotelomer sulfonate	ND	ND	nc		30
13252-13-6	HFPO-DA (GenX)	ND	ND	nc		30
919005-14-4	ADONA	ND	ND	nc		30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	ND	nc		30
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	ND	nc		30

CAS No.	ID Standard Recoveries	DUP	DA32709-2	Limits
	13C5-PFHxA	79%	79%	50-150%
	13C4-PFHpA	85%	84%	50-150%
	13C8-PFOA	77%	75%	50-150%
	13C9-PFNA	84%	80%	50-150%

\* = Outside of Control Limits.

5.5.3  
5

## Duplicate Summary

Job Number: FA83814  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP84565-DUP	2Q64857.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942
DA32709-2	2Q64856.D	1	03/21/21	NAF	03/19/21	OP84565	S2Q942

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA83814-10, FA83814-11, FA83814-12

CAS No.	ID Standard Recoveries	DUP	DA32709-2	Limits
	13C6-PFDA	87%	84%	50-150%
	13C7-PFUnDA	89%	87%	40-140%
	13C2-PFDoDA	84%	84%	40-140%
	13C2-PFTeDA	81%	78%	30-130%
	13C3-PFBS	84%	85%	50-150%
	13C3-PFHxS	79%	81%	50-150%
	13C8-PFOS	77%	77%	50-150%
	d3-MeFOSAA	73%	72%	40-140%
	d5-EtFOSAA	74%	75%	40-140%

\* = Outside of Control Limits.

5.5.3  
5

The results set forth herein are provided by SGS North America Inc.

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*Automated Report*

## Technical Report for

**Arcadis**

**Racer Lansing PFAS Delineation; Lansing, MI**

**30075941.03700**

**SGS Job Number: FA85846**

**Sampling Date: 05/24/21**



**Report to:**

**Arcadis**  
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**ATTN: Tiffany Linder**

**Total number of pages in report: 57**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

**Norm Farmer**  
**Technical Director**

**Client Service contact: Andrea Colby 407-425-6700**

Certifications: FL(E83510), LA(03051), KS(E-10327), NC(573), NJ(FL002), NY(12022), SC(96038001)  
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AL, AK, AR, CT, IA, KY, MA, MI, MS, ND, NH, NV, OK, OR, UT, VT, WA, WV

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Test results relate only to samples analyzed.

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## Sample Summary

**Arcadis**

**Job No: FA85846**

**Racer Lansing PFAS Delineation; Lansing, MI**  
**Project No: 30075941.03700**

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
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**This report contains results reported as ND = Not detected. The following applies:**  
**Organics ND = Not detected above the MDL**

FA85846-1	05/24/21	09:15	AMAH05/25/21	AQ	Water	MICH AVE-MH-3_052421
FA85846-1D	05/24/21	09:15	AMAH05/25/21	AQ	Water Dup/MSD	MICH AVE-MH-3_052421
FA85846-1S	05/24/21	09:15	AMAH05/25/21	AQ	Water Matrix Spike	MICH AVE-MH-3_052421
FA85846-2	05/24/21	09:35	AMAH05/25/21	AQ	Water	MICH AVE-MH-4_052421
FA85846-3	05/24/21	09:55	AMAH05/25/21	AQ	Water	VERLINDEN-MH-5_052421
FA85846-4	05/24/21	10:10	AMAH05/25/21	AQ	Water	VERLINDEN-MH-4_052421
FA85846-5	05/24/21	10:25	AMAH05/25/21	AQ	Water	VERLINDEN-MH-3_052421
FA85846-6	05/24/21	00:00	AMAH05/25/21	AQ	Water	DUP-01_052421
FA85846-7	05/24/21	10:45	AMAH05/25/21	AQ	Water	VERLINDEN-MH-2_052421
FA85846-8	05/24/21	11:05	AMAH05/25/21	AQ	Water	VERLINDEN-MH-1_052421
FA85846-9	05/24/21	11:20	AMAH05/25/21	AQ	Water	OSBORN-MH-1_052421
FA85846-10	05/24/21	11:40	AMAH05/25/21	AQ	Water	OSBORN-CB-2_052421



## Sample Summary (continued)

**Arcadis**

**Job No: FA85846**

**Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30075941.03700**

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FA85846-11	05/24/21	14:15	AMAH05/25/21	AQ	Water	P3-MH-284_052421
FA85846-12	05/24/21	14:35	AMAH05/25/21	AQ	Water	P2-MH-30_052421
FA85846-13	05/24/21	14:50	AMAH05/25/21	AQ	Water	P2-MH-2_052421
FA85846-14	05/24/21	15:40	AMAH05/25/21	AQ	Water	P2-MH-W_052421
FA85846-15	05/24/21	16:00	AMAH05/25/21	AQ	Field Blank Water	FB-01_052421
FA85846-16	05/24/21	16:05	AMAH05/25/21	AQ	Equipment Blank	EB-01_052421

## Summary of Hits

**Job Number:** FA85846  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 05/24/21

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Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**FA85846-1 MICH AVE-MH-3\_052421**

Perfluorobutanoic acid	0.0085	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0049	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0030	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0027	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0055	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0076	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0043	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0038	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA85846-2 MICH AVE-MH-4\_052421**

Perfluorobutanoic acid	0.0125	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0118	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0084	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0096	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0178	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0022	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid	0.00096 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0045	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0018	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0169	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA85846-3 VERLINDEN-MH-5\_052421**

Perfluorobutanoic acid	0.0131	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0275	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0225	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0194	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0361	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0032	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0038	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.0010 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0101	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA85846-4 VERLINDEN-MH-4\_052421**

Perfluorobutanoic acid	0.0291	0.0043	0.0021	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0803	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0421	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.0227	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0223	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0025	0.0021	0.0011	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA85846  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 05/24/21

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorodecanoic acid		0.0018 J	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0057	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0027	0.0021	0.0011	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0167	0.0021	0.0011	ug/l	EPA 537M BY ID
PFOSA		0.0037 J	0.0043	0.0021	ug/l	EPA 537M BY ID

**FA85846-5 VERLINDEN-MH-3\_052421**

Perfluorobutanoic acid		0.0296	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0852	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0470	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0279	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0285	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0024	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0050	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0029	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0113	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA85846-6 DUP-01\_052421**

Perfluorobutanoic acid		0.0292	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0856	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0474	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0275	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0272	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0022	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.00090 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0057	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0010 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0033	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0163	0.0018	0.00089	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0032 J	0.0071	0.0018	ug/l	EPA 537M BY ID

**FA85846-7 VERLINDEN-MH-2\_052421**

Perfluorobutanoic acid		0.0236	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0477	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0364	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0261	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0461	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0066	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0055	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0027	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0013 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0028	0.0018	0.00089	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA85846  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 05/24/21

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Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorooctanesulfonic acid		0.0353	0.0018	0.00089	ug/l	EPA 537M BY ID
EtFOSAA		0.0056	0.0036	0.0018	ug/l	EPA 537M BY ID

FA85846-8 VERLINDEN-MH-1\_052421

Perfluorobutanoic acid		0.0188	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0318	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0276	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0205	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0284	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0018	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0054	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0019	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0025	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0061	0.0018	0.00089	ug/l	EPA 537M BY ID

FA85846-9 OSBORN-MH-1\_052421

Perfluorobutanoic acid		0.0150	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0122	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0149	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0104	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0317	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0031	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0023	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0039	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0311	0.0018	0.00089	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		0.0891	0.0071	0.0018	ug/l	EPA 537M BY ID

FA85846-10 OSBORN-CB-2\_052421

Perfluorobutanoic acid		0.0181	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid		0.0228	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid		0.0259	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid		0.0152	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid		0.0473	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid		0.0060	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		0.0017 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		0.0341	0.0018	0.00089	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA85846  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 05/24/21

2

Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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**FA85846-11 P3-MH-284\_052421**

Perfluorobutanoic acid	0.0048	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0035	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0019	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.00092 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0014 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0021	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.00093 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0117	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA85846-12 P2-MH-30\_052421**

Perfluorobutanoic acid <sup>a</sup>	0.0095	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid <sup>a</sup>	0.0060	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid <sup>a</sup>	0.0051	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid <sup>a</sup>	0.0047	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid <sup>a</sup>	0.0097	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid <sup>a</sup>	0.0011 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid <sup>a</sup>	0.0619	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid <sup>a</sup>	0.0099	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid <sup>a</sup>	0.0055	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid <sup>a</sup>	0.0652	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA85846-13 P2-MH-2\_052421**

Perfluorobutanoic acid <sup>a</sup>	0.0100	0.0036	0.0018	ug/l	EPA 537M BY ID
Perfluoropentanoic acid <sup>a</sup>	0.0076	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanoic acid <sup>a</sup>	0.0070	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid <sup>a</sup>	0.0059	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanoic acid <sup>a</sup>	0.0128	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorononanoic acid <sup>a</sup>	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorodecanoic acid <sup>a</sup>	0.0015 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid <sup>a</sup>	0.0175	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid <sup>a</sup>	0.0027	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid <sup>a</sup>	0.0016 J	0.0018	0.00089	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid <sup>a</sup>	0.0190	0.0018	0.00089	ug/l	EPA 537M BY ID

**FA85846-14 P2-MH-W\_052421**

Perfluorobutanoic acid	0.0040	0.0037	0.0019	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.0042	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.0014 J	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0022	0.0019	0.00093	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.0014 J	0.0019	0.00093	ug/l	EPA 537M BY ID

## Summary of Hits

**Job Number:** FA85846  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 05/24/21

2

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		0.00097 J	0.0019	0.00093	ug/l	EPA 537M BY ID
		0.0024	0.0019	0.00093	ug/l	EPA 537M BY ID

FA85846-15      FB-01\_052421

No hits reported in this sample.

FA85846-16      EB-01\_052421

Perfluorohexanoic acid	0.0012 J	0.0018	0.00089	ug/l	EPA 537M BY ID
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(a) Dilution required due to matrix interference (ID recovery standard failure).

## Sample Results

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## Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> MICH AVE-MH-3_052421	
<b>Lab Sample ID:</b> FA85846-1	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39220.D	1	06/04/21 12:02	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0085	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0049	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0030	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0027	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0055	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0076	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0015	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0043	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.1  
3

Client Sample ID:	MICH AVE-MH-3_052421	Date Sampled:	05/24/21
Lab Sample ID:	FA85846-1	Date Received:	05/25/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	68%		35-135%
	13C5-PFPeA	65%		50-150%
	13C5-PFHxA	64%		50-150%
	13C4-PFHpA	66%		50-150%
	13C8-PFOA	71%		50-150%
	13C9-PFNA	72%		50-150%
	13C6-PFDA	70%		50-150%
	13C7-PFUnDA	66%		40-140%
	13C2-PFDoDA	56%		40-140%
	13C2-PFTeDA	59%		30-130%
	13C3-PFBS	66%		50-150%
	13C3-PFHxS	67%		50-150%
	13C8-PFOS	61%		50-150%
	13C8-FOSA	51%		30-130%
	d3-MeFOSAA	82%		40-140%
	d5-EtFOSAA	80%		40-140%
	13C2-4:2FTS	65%		50-150%
	13C2-6:2FTS	77%		50-150%
	13C2-8:2FTS	75%		50-150%
	13C3-HFPO-DA	56%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

32  
3

<b>Client Sample ID:</b> MICH AVE-MH-4_052421	
<b>Lab Sample ID:</b> FA85846-2	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39223.D	1	06/04/21 12:52	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0125	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0118	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0084	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0096	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0178	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0022	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.00096	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0045	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0018	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0169	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

32  
3

Client Sample ID:	MICH AVE-MH-4_052421	Date Sampled:	05/24/21
Lab Sample ID:	FA85846-2	Date Received:	05/25/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	76%		35-135%
	13C5-PFPeA	74%		50-150%
	13C5-PFHxA	71%		50-150%
	13C4-PFHpA	72%		50-150%
	13C8-PFOA	77%		50-150%
	13C9-PFNA	79%		50-150%
	13C6-PFDA	76%		50-150%
	13C7-PFUnDA	68%		40-140%
	13C2-PFDoDA	56%		40-140%
	13C2-PFTeDA	54%		30-130%
	13C3-PFBS	74%		50-150%
	13C3-PFHxS	72%		50-150%
	13C8-PFOS	66%		50-150%
	13C8-FOSA	48%		30-130%
	d3-MeFOSAA	93%		40-140%
	d5-EtFOSAA	83%		40-140%
	13C2-4:2FTS	73%		50-150%
	13C2-6:2FTS	84%		50-150%
	13C2-8:2FTS	81%		50-150%
	13C3-HFPO-DA	63%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-5_052421	
<b>Lab Sample ID:</b> FA85846-3	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39224.D	1	06/04/21 13:08	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0131	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0275	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0225	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0194	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0361	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0032	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0038	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0010	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0101	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-5_052421	
<b>Lab Sample ID:</b> FA85846-3	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	77%		50-150%
	13C5-PFHxA	75%		50-150%
	13C4-PFHpA	77%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	83%		50-150%
	13C6-PFDA	79%		50-150%
	13C7-PFUnDA	73%		40-140%
	13C2-PFDoDA	64%		40-140%
	13C2-PFTeDA	65%		30-130%
	13C3-PFBS	76%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	73%		50-150%
	13C8-FOSA	64%		30-130%
	d3-MeFOSAA	92%		40-140%
	d5-EtFOSAA	87%		40-140%
	13C2-4:2FTS	77%		50-150%
	13C2-6:2FTS	87%		50-150%
	13C2-8:2FTS	81%		50-150%
	13C3-HFPO-DA	66%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-4_052421	
<b>Lab Sample ID:</b> FA85846-4	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39225.D	1.2	06/04/21 13:25	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0291	0.0043	0.0021	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0803	0.0021	0.0011	ug/l	
307-24-4	Perfluorohexanoic acid	0.0421	0.0021	0.0011	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0227	0.0021	0.0011	ug/l	
335-67-1	Perfluorooctanoic acid	0.0223	0.0021	0.0011	ug/l	
375-95-1	Perfluorononanoic acid	0.0025	0.0021	0.0011	ug/l	
335-76-2	Perfluorodecanoic acid	0.0018	0.0021	0.0011	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0021	0.0011	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0021	0.0011	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0021	0.0011	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0021	0.0011	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0057	0.0021	0.0011	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0021	0.0011	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0027	0.0021	0.0011	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0021	0.0011	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0167	0.0021	0.0011	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0021	0.0011	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0021	0.0011	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	0.0037	0.0043	0.0021	ug/l	J
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0043	0.0021	ug/l	
2991-50-6	EtFOSAA	ND	0.0043	0.0021	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-4_052421	
<b>Lab Sample ID:</b> FA85846-4	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0086	0.0021	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0043	0.0021	ug/l	
919005-14-4	ADONA	ND	0.0086	0.0021	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0086	0.0021	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0086	0.0021	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	83%		35-135%
	13C5-PFPeA	81%		50-150%
	13C5-PFHxA	77%		50-150%
	13C4-PFHpA	78%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	76%		50-150%
	13C6-PFDA	67%		50-150%
	13C7-PFUnDA	56%		40-140%
	13C2-PFDoDA	54%		40-140%
	13C2-PFTeDA	48%		30-130%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	79%		50-150%
	13C8-PFOS	67%		50-150%
	13C8-FOSA	47%		30-130%
	d3-MeFOSAA	80%		40-140%
	d5-EtFOSAA	75%		40-140%
	13C2-4:2FTS	76%		50-150%
	13C2-6:2FTS	85%		50-150%
	13C2-8:2FTS	73%		50-150%
	13C3-HFPO-DA	69%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-3_052421 <b>Lab Sample ID:</b> FA85846-5 <b>Matrix:</b> AQ - Water <b>Method:</b> EPA 537M BY ID EPA 537 MOD <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	<b>Date Sampled:</b> 05/24/21 <b>Date Received:</b> 05/25/21 <b>Percent Solids:</b> n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39226.D	1	06/04/21 13:44	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0296	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0852	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0470	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0279	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0285	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0024	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0050	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0029	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0113	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

## Report of Analysis

3.5  
3

Client Sample ID:	VERLINDEN-MH-3_052421	Date Sampled:	05/24/21
Lab Sample ID:	FA85846-5	Date Received:	05/25/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	72%		35-135%
	13C5-PFPeA	70%		50-150%
	13C5-PFHxA	67%		50-150%
	13C4-PFHpA	69%		50-150%
	13C8-PFOA	72%		50-150%
	13C9-PFNA	72%		50-150%
	13C6-PFDA	67%		50-150%
	13C7-PFUnDA	60%		40-140%
	13C2-PFDoDA	52%		40-140%
	13C2-PFTeDA	53%		30-130%
	13C3-PFBS	70%		50-150%
	13C3-PFHxS	71%		50-150%
	13C8-PFOS	61%		50-150%
	13C8-FOSA	49%		30-130%
	d3-MeFOSAA	79%		40-140%
	d5-EtFOSAA	74%		40-140%
	13C2-4:2FTS	70%		50-150%
	13C2-6:2FTS	78%		50-150%
	13C2-8:2FTS	70%		50-150%
	13C3-HFPO-DA	60%		50-150%

ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> DUP-01_052421		
<b>Lab Sample ID:</b> FA85846-6		<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water		<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD		<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39227.D	1	06/04/21 14:00	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0292	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0856	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0474	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0275	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0272	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0022	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.00090	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0057	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0010	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0033	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0163	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0032	0.0071	0.0018	ug/l	J

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.6  
3

Client Sample ID: DUP-01_052421		Date Sampled: 05/24/21
Lab Sample ID: FA85846-6		Date Received: 05/25/21
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%		35-135%
	13C5-PFPeA	76%		50-150%
	13C5-PFHxA	73%		50-150%
	13C4-PFHpA	74%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	80%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	70%		40-140%
	13C2-PFDoDA	64%		40-140%
	13C2-PFTeDA	67%		30-130%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	46%		30-130%
	d3-MeFOSAA	98%		40-140%
	d5-EtFOSAA	94%		40-140%
	13C2-4:2FTS	76%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	85%		50-150%
	13C3-HFPO-DA	65%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-2_052421	
<b>Lab Sample ID:</b> FA85846-7	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39230.D	1	06/04/21 14:50	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0236	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0477	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0364	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0261	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0461	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0066	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0055	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0027	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0013	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0028	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0353	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EiFOSAA	0.0056	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

37  
3

Client Sample ID:	VERLINDEN-MH-2_052421	Date Sampled:	05/24/21
Lab Sample ID:	FA85846-7	Date Received:	05/25/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	80%		35-135%
	13C5-PFPeA	78%		50-150%
	13C5-PFHxA	74%		50-150%
	13C4-PFHpA	75%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	79%		50-150%
	13C6-PFDA	71%		50-150%
	13C7-PFUnDA	70%		40-140%
	13C2-PFDoDA	65%		40-140%
	13C2-PFTeDA	59%		30-130%
	13C3-PFBS	78%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	68%		50-150%
	13C8-FOSA	41%		30-130%
	d3-MeFOSAA	96%		40-140%
	d5-EtFOSAA	90%		40-140%
	13C2-4:2FTS	76%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	80%		50-150%
	13C3-HFPO-DA	66%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> VERLINDEN-MH-1_052421	
<b>Lab Sample ID:</b> FA85846-8	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39231.D	1	06/04/21 15:06	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0188	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0318	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0276	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0205	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0284	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0018	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0054	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0019	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0025	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0061	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound



## Report of Analysis



Client Sample ID:	VERLINDEN-MH-1_052421	Date Sampled:	05/24/21
Lab Sample ID:	FA85846-8	Date Received:	05/25/21
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	65%		35-135%
	13C5-PFPeA	63%		50-150%
	13C5-PFHxA	61%		50-150%
	13C4-PFHpA	63%		50-150%
	13C8-PFOA	69%		50-150%
	13C9-PFNA	70%		50-150%
	13C6-PFDA	72%		50-150%
	13C7-PFUnDA	64%		40-140%
	13C2-PFDoDA	51%		40-140%
	13C2-PFTeDA	51%		30-130%
	13C3-PFBS	64%		50-150%
	13C3-PFHxS	64%		50-150%
	13C8-PFOS	63%		50-150%
	13C8-FOSA	40%		30-130%
	d3-MeFOSAA	83%		40-140%
	d5-EtFOSAA	74%		40-140%
	13C2-4:2FTS	62%		50-150%
	13C2-6:2FTS	75%		50-150%
	13C2-8:2FTS	73%		50-150%
	13C3-HFPO-DA	53%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> OSBORN-MH-1_052421	
<b>Lab Sample ID:</b> FA85846-9	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39232.D	1	06/04/21 15:23	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0150	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0122	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0149	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0104	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0317	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0031	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0016	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0023	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0011	0.0018	0.00089	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0039	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0311	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0891	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> OSBORN-MH-1_052421	
<b>Lab Sample ID:</b> FA85846-9	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	76%		35-135%
	13C5-PFPeA	76%		50-150%
	13C5-PFHxA	73%		50-150%
	13C4-PFHpA	75%		50-150%
	13C8-PFOA	78%		50-150%
	13C9-PFNA	80%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	67%		40-140%
	13C2-PFDoDA	59%		40-140%
	13C2-PFTeDA	59%		30-130%
	13C3-PFBS	75%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	70%		50-150%
	13C8-FOSA	56%		30-130%
	d3-MeFOSAA	84%		40-140%
	d5-EtFOSAA	79%		40-140%
	13C2-4:2FTS	75%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	76%		50-150%
	13C3-HFPO-DA	64%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> OSBORN-CB-2_052421	
<b>Lab Sample ID:</b> FA85846-10	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39233.D	1	06/04/21 15:40	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0181	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0228	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0259	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0152	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0473	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0060	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	0.0017	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0018	0.00089	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0017	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0341	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> OSBORN-CB-2_052421	
<b>Lab Sample ID:</b> FA85846-10	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	83%		35-135%
	13C5-PFPeA	80%		50-150%
	13C5-PFHxA	79%		50-150%
	13C4-PFHpA	78%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	86%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	67%		40-140%
	13C2-PFDoDA	57%		40-140%
	13C2-PFTeDA	55%		30-130%
	13C3-PFBS	80%		50-150%
	13C3-PFHxS	81%		50-150%
	13C8-PFOS	73%		50-150%
	13C8-FOSA	58%		30-130%
	d3-MeFOSAA	89%		40-140%
	d5-EtFOSAA	79%		40-140%
	13C2-4:2FTS	80%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	84%		50-150%
	13C3-HFPO-DA	69%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P3-MH-284_052421	
<b>Lab Sample ID:</b> FA85846-11	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39234.D	1	06/04/21 15:56	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0048	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0035	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0019	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.00092	0.0018	0.00089	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0014	0.0018	0.00089	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0021	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.00093	0.0018	0.00089	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0117	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P3-MH-284_052421	
<b>Lab Sample ID:</b> FA85846-11	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	67%		35-135%
	13C5-PFPeA	65%		50-150%
	13C5-PFHxA	62%		50-150%
	13C4-PFHpA	61%		50-150%
	13C8-PFOA	65%		50-150%
	13C9-PFNA	63%		50-150%
	13C6-PFDA	58%		50-150%
	13C7-PFUnDA	48%		40-140%
	13C2-PFDoDA	41%		40-140%
	13C2-PFTeDA	36%		30-130%
	13C3-PFBS	67%		50-150%
	13C3-PFHxS	66%		50-150%
	13C8-PFOS	60%		50-150%
	13C8-FOSA	35%		30-130%
	d3-MeFOSAA	82%		40-140%
	d5-EtFOSAA	82%		40-140%
	13C2-4:2FTS	66%		50-150%
	13C2-6:2FTS	74%		50-150%
	13C2-8:2FTS	69%		50-150%
	13C3-HFPO-DA	52%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-30_052421	
<b>Lab Sample ID:</b> FA85846-12	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	3Q39235.D	1	06/04/21 16:13	NG	05/31/21 08:15	OP85641	S3Q574
Run #2	3Q39157.D	10	06/03/21 16:48	NG	05/31/21 08:15	OP85641	S3Q573

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0095	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0060	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0051	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0047	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0097	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0011	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0619	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0099	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0055	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0652	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>b</sup>	0.036	0.018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P2-MH-30_052421	
<b>Lab Sample ID:</b> FA85846-12	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND <sup>b</sup>	0.036	0.018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%	65%	35-135%
	13C5-PFPeA	58%	80%	50-150%
	13C5-PFHxA	52%	75%	50-150%
	13C4-PFHpA	54%	77%	50-150%
	13C8-PFOA	65%	79%	50-150%
	13C9-PFNA	68%	79%	50-150%
	13C6-PFDA	64%	73%	50-150%
	13C7-PFUnDA	57%	57%	40-140%
	13C2-PFDoDA	44%	44%	40-140%
	13C2-PFTeDA	31%	30%	30-130%
	13C3-PFBS	58%	80%	50-150%
	13C3-PFHxS	62%	78%	50-150%
	13C8-PFOS	60%	70%	50-150%
	13C8-FOSA	21% <sup>c</sup>	58%	30-130%
	d3-MeFOSAA	84%	71%	40-140%
	d5-EtFOSAA	77%	67%	40-140%
	13C2-4:2FTS	55%	77%	50-150%
	13C2-6:2FTS	72%	86%	50-150%
	13C2-8:2FTS	77%	72%	50-150%
	13C3-HFPO-DA	44% <sup>c</sup>	70%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-2_052421	
<b>Lab Sample ID:</b> FA85846-13	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	3Q39236.D	1	06/04/21 16:29	NG	05/31/21 08:15	OP85641	S3Q574
Run #2	3Q39158.D	10	06/03/21 17:04	NG	05/31/21 08:15	OP85641	S3Q573

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0100	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0076	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0070	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0059	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	0.0128	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	0.0015	0.0018	0.00089	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0015	0.0018	0.00089	ug/l	J
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0175	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0027	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0016	0.0018	0.00089	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0190	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND <sup>b</sup>	0.036	0.018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P2-MH-2_052421	
<b>Lab Sample ID:</b> FA85846-13	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND <sup>b</sup>	0.036	0.018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	40%	43%	35-135%
	13C5-PFPeA	64%	73%	50-150%
	13C5-PFHxA	57%	73%	50-150%
	13C4-PFHpA	58%	71%	50-150%
	13C8-PFOA	66%	72%	50-150%
	13C9-PFNA	63%	67%	50-150%
	13C6-PFDA	55%	56%	50-150%
	13C7-PFUnDA	51%	48%	40-140%
	13C2-PFDoDA	43%	40%	40-140%
	13C2-PFTeDA	42%	36%	30-130%
	13C3-PFBS	63%	75%	50-150%
	13C3-PFHxS	63%	72%	50-150%
	13C8-PFOS	51%	58%	50-150%
	13C8-FOSA	27% <sup>c</sup>	62%	30-130%
	d3-MeFOSAA	74%	55%	40-140%
	d5-EtFOSAA	70%	57%	40-140%
	13C2-4:2FTS	59%	71%	50-150%
	13C2-6:2FTS	70%	70%	50-150%
	13C2-8:2FTS	63%	57%	50-150%
	13C3-HFPO-DA	49% <sup>c</sup>	67%	50-150%

- (a) Dilution required due to matrix interference (ID recovery standard failure).
- (b) Result is from Run# 2
- (c) Outside control limits.

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ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> P2-MH-W_052421	
<b>Lab Sample ID:</b> FA85846-14	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39237.D	1	06/04/21 16:46	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	270 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.0040	0.0037	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0042	0.0019	0.00093	ug/l	
307-24-4	Perfluorohexanoic acid	0.0014	0.0019	0.00093	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0019	0.00093	ug/l	
335-67-1	Perfluorooctanoic acid	0.0022	0.0019	0.00093	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0019	0.00093	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0019	0.00093	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0019	0.00093	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0019	0.00093	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0019	0.00093	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0019	0.00093	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.0014	0.0019	0.00093	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0019	0.00093	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.00097	0.0019	0.00093	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0019	0.00093	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0024	0.0019	0.00093	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0019	0.00093	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0019	0.00093	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0037	0.0019	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0037	0.0019	ug/l	
2991-50-6	EtFOSAA	ND	0.0037	0.0019	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> P2-MH-W_052421	
<b>Lab Sample ID:</b> FA85846-14	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0074	0.0019	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0037	0.0019	ug/l	
919005-14-4	ADONA	ND	0.0074	0.0019	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0074	0.0019	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0074	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	79%		35-135%
	13C5-PFPeA	78%		50-150%
	13C5-PFHxA	76%		50-150%
	13C4-PFHpA	78%		50-150%
	13C8-PFOA	88%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	81%		50-150%
	13C7-PFUnDA	67%		40-140%
	13C2-PFDoDA	59%		40-140%
	13C2-PFTeDA	67%		30-130%
	13C3-PFBS	77%		50-150%
	13C3-PFHxS	81%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	81%		30-130%
	d3-MeFOSAA	82%		40-140%
	d5-EtFOSAA	75%		40-140%
	13C2-4:2FTS	79%		50-150%
	13C2-6:2FTS	89%		50-150%
	13C2-8:2FTS	77%		50-150%
	13C3-HFPO-DA	66%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> FB-01_052421	
<b>Lab Sample ID:</b> FA85846-15	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Field Blank Water	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39238.D	1	06/04/21 17:02	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0018	0.00089	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

Client Sample ID: FB-01_052421		Date Sampled: 05/24/21
Lab Sample ID: FA85846-15		Date Received: 05/25/21
Matrix: AQ - Field Blank Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: Racer Lansing PFAS Delineation; Lansing, MI		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	86%		35-135%
	13C5-PFPeA	90%		50-150%
	13C5-PFHxA	89%		50-150%
	13C4-PFHpA	94%		50-150%
	13C8-PFOA	91%		50-150%
	13C9-PFNA	82%		50-150%
	13C6-PFDA	67%		50-150%
	13C7-PFUnDA	61%		40-140%
	13C2-PFDoDA	56%		40-140%
	13C2-PFTeDA	69%		30-130%
	13C3-PFBS	90%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	69%		50-150%
	13C8-FOSA	77%		30-130%
	d3-MeFOSAA	69%		40-140%
	d5-EtFOSAA	71%		40-140%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	77%		50-150%
	13C2-8:2FTS	65%		50-150%
	13C3-HFPO-DA	84%		50-150%

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ND = Not detected	MDL = Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

# Report of Analysis

<b>Client Sample ID:</b> EB-01_052421	
<b>Lab Sample ID:</b> FA85846-16	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Equipment Blank	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q39239.D	1	06/04/21 17:19	NG	05/31/21 08:15	OP85641	S3Q574
Run #2							

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
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**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	ND	0.0036	0.0018	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0018	0.00089	ug/l	
307-24-4	Perfluorohexanoic acid	0.0012	0.0018	0.00089	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0018	0.00089	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0018	0.00089	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0018	0.00089	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0018	0.00089	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0018	0.00089	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0018	0.00089	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0018	0.00089	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0018	0.00089	ug/l	

**PERFLUOROALKYL SULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	ND	0.0018	0.00089	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0018	0.00089	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0018	0.00089	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0018	0.00089	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0018	0.00089	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0018	0.00089	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0018	0.00089	ug/l	

**PERFLUORO OCTANESULFONAMIDES**

754-91-6	PFOSA	ND	0.0036	0.0018	ug/l	
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**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	ND	0.0036	0.0018	ug/l	
2991-50-6	EtFOSAA	ND	0.0036	0.0018	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b> EB-01_052421	
<b>Lab Sample ID:</b> FA85846-16	<b>Date Sampled:</b> 05/24/21
<b>Matrix:</b> AQ - Equipment Blank	<b>Date Received:</b> 05/25/21
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0071	0.0018	ug/l	

**NEXT GENERATION PFAS ANALYTES**

13252-13-6	HFPO-DA (GenX)	ND	0.0036	0.0018	ug/l	
919005-14-4	ADONA	ND	0.0071	0.0018	ug/l	
756426-58-1	9Cl-PF3ONS (F-53B Major)	ND	0.0071	0.0018	ug/l	
763051-92-9	11Cl-PF3OUdS (F-53B Minor)	ND	0.0071	0.0018	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	88%		35-135%
	13C5-PFPeA	88%		50-150%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	88%		50-150%
	13C8-PFOA	88%		50-150%
	13C9-PFNA	84%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	64%		40-140%
	13C2-PFDoDA	61%		40-140%
	13C2-PFTeDA	68%		30-130%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	73%		50-150%
	13C8-FOSA	75%		30-130%
	d3-MeFOSAA	69%		40-140%
	d5-EtFOSAA	65%		40-140%
	13C2-4:2FTS	85%		50-150%
	13C2-6:2FTS	84%		50-150%
	13C2-8:2FTS	68%		50-150%
	13C3-HFPO-DA	84%		50-150%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Misc. Forms

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### Custody Documents and Other Forms

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**Includes the following where applicable:**

- Certification Exceptions
- Chain of Custody

# Parameter Certification Exceptions

Job Number: FA85846  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.  
 The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
ADONA	919005-14-4	EPA 537M BY ID	AQ	Certified by SOP MS014
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	EPA 537M BY ID	AQ	Certified by SOP MS014
9Cl-PF3ONS (F-53B Major)	756426-58-1	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
HFPO-DA (GenX)	13252-13-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

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# SGS North America Inc - Orlando

## Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, FL 32811  
TEL: 407-425-6700 FAX: 407-425-0707  
www.sgs.com

# FA 85846

SGS - ORLANDO JOB # :

PAGE 1 OF 2

Client / Reporting Information		Project Information		Analytical Information										Matrix Codes				
Company Name: Arcadis		Project Name: RACER Lansing PFAS Delineation												DW - Drinking Water				
Address: 28550 Cabot Dr. Ste 500		Street												Water				
City: Novi State: MI Zip: 48377		City: Lansing State: MI												GW - Ground Water				
Project Contact: Marina Samp Marine.Samp@arcadis.com Email: 30075941.03600		Project #												WW - Water				
Phone #: 248-994-2318		Fax #												SW - Surface Water				
Sampler(s) Name(s) (Printed): Sampler 1: A. Mandich Sampler 2: A. Hartz		Client Purchase Order #: 30075941.03600												SO - Soil				
														SL - Sludge				
														OI - Oil				
														LIQ - Other Liquid				
														AIR - Air				
														SOL - Other Solid				
														LAB USE ONLY				
SGS Orlando Sample #		Field ID / Point of Collection		DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NH4OH/2M	DI WATER	MEQ	
1	Mich Ave - MH-3	052421	5/24/21	0915	AM	NW	6		X									
2	Mich Ave - MH-4	052421	5/24/21	0935	AM	NW	2		X									
3	Verlinden - MH-5	052421	5/24/21	0955	AM	NW	2		X									
4	Verlinden - MH-4	052421	5/24/21	1010	AM	NW	2		X									
5	Verlinden - MH-3	052421	5/24/21	1025	AM	NW	2		X									
6	DWP-01	052421	5/24/21	-	AM	NW	2		X									
7	Verlinden - MH-2	052421	5/24/21	1045	AM	NW	2		X									
8	Verlinden - MH-1	052421	5/24/21	1105	AM	NW	2		X									
9	Osborn - MH-1	052421	5/24/21	1120	AM	NW	2		X									
10	Osborn - CB-2	052421	5/24/21	1140	AM	NW	2		X									
Turnaround Time (Business days)		Data Deliverable Information		Comments / Remarks														
<del>10 Day (Business)</del>		Approved By: / Date:		<input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY)		Mich Ave - MH-3 is a MS/MSD												
7 Day				<input checked="" type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC)		Email results to Andrew Lorenz												
5 Day				<input type="checkbox"/> REDT1 (EPA LEVEL 3)		andrew.lorenz@arcadis.com												
3 Day RUSH				<input type="checkbox"/> FULLT1 (EPA LEVEL 4)		marina.samp@arcadis.com												
2 Day RUSH				<input checked="" type="checkbox"/> EDD'S		NW = waste water												
1 Day RUSH				INITIAL ASSESSMENT LABEL VERIFICATION														
Other																		
Rush T/A Data Available VIA Email or Lablink																		
Sample Custody must be documented below each time samples change possession, including courier delivery.																		
Relinquished by Sampler/Affiliation: A. Mandich/Arcadis		Date Time: 5/24/21 1635		Received By/Affiliation: FedEx		Relinquished By/Affiliation: H		Date Time: 5/25/21		Received By/Affiliation: H		Relinquished By/Affiliation:		Date Time: 900		Received By/Affiliation:		
5				6														
Lab Use Only: Cooler Temperature (s) Celsius (corrected): 11.8																		

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

http://www.sgs.com/en/terms-and-conditions

### FA85846: Chain of Custody

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## SGS Sample Receipt Summary

Job Number: FA85846

Client: ARCADIS

Project: RACER LANSING PFAS

Date / Time Received: 5/25/2021 9:00:00 AM

Delivery Method: FX

Airbill #'s: 5061 4507 5123

Therm ID: IR 1;

Therm CF: -1.8;

# of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.6);

Cooler Temps (Corrected) °C: Cooler 1: (1.8);

**Cooler Information**

Y or N

- |                             |                                     |                          |
|-----------------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present    | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Temp criteria achieved   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Cooler temp verification | <u>IR Gun</u>                       |                          |
| 5. Cooler media             | <u>Ice (Bag)</u>                    |                          |

**Trip Blank Information**

Y or N N/A

- |                                |                          |                          |                                     |
|--------------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC    | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|                                | <u>W or S</u>            |                          | <u>N/A</u>                          |
| 3. Type Of TB Received         | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Sample Information**

Y or N N/A

- |                                                     |                                     |                                     |                                     |
|-----------------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Sample labels present on bottles                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Samples preserved properly                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 3. Sufficient volume/containers recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Condition of sample                              | <u>Intact</u>                       |                                     |                                     |
| 5. Sample recvd within HT                           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 6. Dates/Times/IDs on COC match Sample Label        | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 7. VOCs have headspace                              | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8. Bottles received for unspecified tests           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 9. Compositing instructions clear                   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10. Voa Soil Kits/Jars received past 48hrs?         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11. % Solids Jar received?                          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12. Residual Chlorine Present?                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Misc. Information**

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_ Number of 5035 Field Kits: \_\_\_\_\_ Number of Lab Filtered Metals: \_\_\_\_\_  
 Test Strip Lot #'s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) \_\_\_\_\_  
 Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments

SM001 Rev. Date 05/24/17 Technician: PETERH Date: 5/25/2021 9:00:00 AM Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_

FA85846: Chain of Custody

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## MS Semi-volatiles

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### QC Data Summaries

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#### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Method Blank Summary

Job Number: FA85846  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85641-MB	3Q39141.D	1	06/03/21	NG	05/31/21	OP85641	S3Q573

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA85846-1, FA85846-2, FA85846-3, FA85846-4, FA85846-5, FA85846-6, FA85846-7, FA85846-8, FA85846-9, FA85846-10, FA85846-11, FA85846-12, FA85846-13, FA85846-14, FA85846-15, FA85846-16

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0040	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	84% 35-135%
	13C5-PFPeA	83% 50-150%
	13C5-PFHxA	83% 50-150%
	13C4-PFHpA	84% 50-150%

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5

## Method Blank Summary

Job Number: FA85846  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85641-MB	3Q39141.D	1	06/03/21	NG	05/31/21	OP85641	S3Q573

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA85846-1, FA85846-2, FA85846-3, FA85846-4, FA85846-5, FA85846-6, FA85846-7, FA85846-8, FA85846-9, FA85846-10, FA85846-11, FA85846-12, FA85846-13, FA85846-14, FA85846-15, FA85846-16

CAS No.	ID Standard Recoveries	Limits
	13C8-PFOA	83% 50-150%
	13C9-PFNA	78% 50-150%
	13C6-PFDA	71% 50-150%
	13C7-PFUnDA	66% 40-140%
	13C2-PFDoDA	62% 40-140%
	13C2-PFTeDA	66% 30-130%
	13C3-PFBS	83% 50-150%
	13C3-PFHxS	82% 50-150%
	13C8-PFOS	68% 50-150%
	13C8-FOSA	69% 30-130%
	d3-MeFOSA	50% 30-130%
	d3-MeFOSAA	70% 40-140%
	d5-EtFOSAA	67% 40-140%
	13C2-4:2FTS	80% 50-150%
	13C2-6:2FTS	79% 50-150%
	13C2-8:2FTS	69% 50-150%
	13C3-HFPO-DA	82% 50-150%

5.1.1  
5

# Instrument Blank

Job Number: FA85846  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q573-IBLK	3Q39137.D	1	06/03/21	NG	n/a	n/a	S3Q573

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA85846-12, FA85846-13

CAS No.	Compound	Result	RL	MDL	Units	Q
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C5-PFHxA	101% 50-150%
	13C4-PFHpA	101% 50-150%
	13C8-PFOA	104% 50-150%
	13C9-PFNA	103% 50-150%
	13C6-PFDA	105% 50-150%
	13C7-PFUnDA	103% 50-150%
	13C2-PFDoDA	104% 50-150%
	13C2-PFTeDA	101% 50-150%
	13C3-PFBS	101% 50-150%
	13C3-PFHxS	101% 50-150%
	13C8-PFOS	101% 50-150%
	d3-MeFOSAA	113% 50-150%
	d5-EtFOSAA	109% 50-150%

# Instrument Blank

Job Number: FA85846  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q574-IBLK	3Q39215.D	1	06/04/21	NG	n/a	n/a	S3Q574

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA85846-1, FA85846-2, FA85846-3, FA85846-4, FA85846-5, FA85846-6, FA85846-7, FA85846-8, FA85846-9, FA85846-10, FA85846-11, FA85846-12, FA85846-13, FA85846-14, FA85846-15, FA85846-16

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EiFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
13252-13-6	HFPO-DA (GenX)	ND	0.0080	0.0020	ug/l	
919005-14-4	ADONA	ND	0.0080	0.0020	ug/l	
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0080	0.0020	ug/l	
763051-92-91	Cl-PF3OUdS (F-53B Minor)	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits	
	13C5-PFHxA	103%	50-150%
	13C4-PFHpA	105%	50-150%
	13C8-PFOA	106%	50-150%
	13C9-PFNA	105%	50-150%

5.1.3  
5

# Instrument Blank

**Job Number:** FA85846  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q574-IBLK	3Q39215.D	1	06/04/21	NG	n/a	n/a	S3Q574

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA85846-1, FA85846-2, FA85846-3, FA85846-4, FA85846-5, FA85846-6, FA85846-7, FA85846-8, FA85846-9, FA85846-10, FA85846-11, FA85846-12, FA85846-13, FA85846-14, FA85846-15, FA85846-16

CAS No.	ID Standard Recoveries	Limits
	13C6-PFDA	107% 50-150%
	13C7-PFUnDA	108% 50-150%
	13C2-PFDoDA	107% 50-150%
	13C2-PFTeDA	103% 50-150%
	13C3-PFBS	102% 50-150%
	13C3-PFHxS	103% 50-150%
	13C8-PFOS	104% 50-150%
	d3-MeFOSAA	118% 50-150%
	d5-EtFOSAA	121% 50-150%

5.1.3  
5

# Blank Spike Summary

Job Number: FA85846  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85641-BS	3Q39140.D	1	06/03/21	NG	05/31/21	OP85641	S3Q573

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA85846-1, FA85846-2, FA85846-3, FA85846-4, FA85846-5, FA85846-6, FA85846-7, FA85846-8, FA85846-9, FA85846-10, FA85846-11, FA85846-12, FA85846-13, FA85846-14, FA85846-15, FA85846-16

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0780	98	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0797	100	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0804	101	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0791	99	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0785	98	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0784	98	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0768	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0784	98	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0785	98	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0748	94	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0828	104	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0775	97	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0763	95	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0776	97	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0919	115	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0787	98	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0735	92	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0802	100	60-130
754-91-6	PFOSA	0.08	0.0814	102	70-130
2355-31-9	MeFOSAA	0.08	0.0829	104	70-130
2991-50-6	EiFOSAA	0.08	0.0809	101	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0813	102	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0807	101	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0800	100	70-130
13252-13-6	HFPO-DA (GenX)	0.08	0.0807	101	70-130
919005-14-4	ADONA	0.08	0.0835	104	60-140
756426-58-19	Cl-PF3ONS (F-53B Major)	0.08	0.0765	96	60-140
763051-92-91	Cl-PF3OUdS (F-53B Minor)	0.08	0.0847	106	60-140

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	86%	35-135%
	13C5-PFPeA	85%	50-150%
	13C5-PFHxA	85%	50-150%
	13C4-PFHpA	84%	50-150%

\* = Outside of Control Limits.

5.2.1  
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# Blank Spike Summary

**Job Number:** FA85846  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85641-BS	3Q39140.D	1	06/03/21	NG	05/31/21	OP85641	S3Q573

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA85846-1, FA85846-2, FA85846-3, FA85846-4, FA85846-5, FA85846-6, FA85846-7, FA85846-8, FA85846-9,  
 FA85846-10, FA85846-11, FA85846-12, FA85846-13, FA85846-14, FA85846-15, FA85846-16

CAS No.	ID Standard Recoveries	BSP	Limits
	13C8-PFOA	81%	50-150%
	13C9-PFNA	75%	50-150%
	13C6-PFDA	65%	50-150%
	13C7-PFUnDA	59%	40-140%
	13C2-PFDoDA	57%	40-140%
	13C2-PFTeDA	64%	30-130%
	13C3-PFBS	86%	50-150%
	13C3-PFHxS	80%	50-150%
	13C8-PFOS	64%	50-150%
	13C8-FOSA	58%	30-130%
	d3-MeFOSA	40%	30-130%
	d3-MeFOSAA	58%	40-140%
	d5-EtFOSAA	57%	40-140%
	13C2-4:2FTS	86%	50-150%
	13C2-6:2FTS	83%	50-150%
	13C2-8:2FTS	69%	50-150%
	13C3-HFPO-DA	84%	50-150%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA85846  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85641-MS	3Q39221.D	1	06/04/21	NG	05/31/21	OP85641	S3Q574
OP85641-MSD	3Q39222.D	1	06/04/21	NG	05/31/21	OP85641	S3Q574
FA85846-1	3Q39220.D	1	06/04/21	NG	05/31/21	OP85641	S3Q574

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA85846-1, FA85846-2, FA85846-3, FA85846-4, FA85846-5, FA85846-6, FA85846-7, FA85846-8, FA85846-9, FA85846-10, FA85846-11, FA85846-12, FA85846-13, FA85846-14, FA85846-15, FA85846-16

CAS No.	Compound	FA85846-1 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0085	0.0714	0.0809	101	0.0714	0.0738	91	9	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0049	0.0714	0.0810	107	0.0714	0.0754	99	7	70-130/30
307-24-4	Perfluorohexanoic acid	0.0030	0.0714	0.0757	102	0.0714	0.0699	94	8	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0027	0.0714	0.0769	104	0.0714	0.0704	95	9	70-130/30
335-67-1	Perfluorooctanoic acid	0.0055	0.0714	0.0795	104	0.0714	0.0708	91	12	70-130/30
375-95-1	Perfluorononanoic acid	ND	0.0714	0.0716	100	0.0714	0.0667	93	7	70-130/30
335-76-2	Perfluorodecanoic acid	ND	0.0714	0.0714	100	0.0714	0.0664	93	7	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND	0.0714	0.0722	101	0.0714	0.0679	95	6	70-130/30
307-55-1	Perfluorododecanoic acid	ND	0.0714	0.0736	103	0.0714	0.0683	96	7	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND	0.0714	0.0716	100	0.0714	0.0665	93	7	60-140/30
376-06-7	Perfluorotetradecanoic acid	ND	0.0714	0.0734	103	0.0714	0.0696	97	5	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0076	0.0714	0.0804	102	0.0714	0.0743	93	8	70-130/30
2706-91-4	Perfluoropentanesulfonic acid	0.0015	J 0.0714	0.0751	103	0.0714	0.0703	96	7	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0043	0.0714	0.0781	103	0.0714	0.0717	94	9	70-130/30
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0714	0.0749	105	0.0714	0.0753	105	1	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0038	0.0714	0.0750	100	0.0714	0.0700	93	7	70-130/30
68259-12-1	Perfluorononanesulfonic acid	ND	0.0714	0.0693	97	0.0714	0.0622	87	11	65-130/30
335-77-3	Perfluorodecanesulfonic acid	ND	0.0714	0.0631	88	0.0714	0.0637	89	1	60-130/30
754-91-6	PFOSA	ND	0.0714	0.0780	109	0.0714	0.0718	101	8	70-130/30
2355-31-9	MeFOSAA	ND	0.0714	0.0778	109	0.0714	0.0699	98	11	70-130/30
2991-50-6	EtFOSAA	ND	0.0714	0.0768	108	0.0714	0.0723	101	6	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0714	0.0765	107	0.0714	0.0710	99	7	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0714	0.0765	107	0.0714	0.0712	100	7	70-130/30
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0714	0.0745	104	0.0714	0.0703	98	6	70-130/30
13252-13-6	HFPO-DA (GenX)	ND	0.0714	0.0856	120	0.0714	0.0799	112	7	70-130/30
919005-14-4	ADONA	ND	0.0714	0.0722	101	0.0714	0.0702	98	3	60-140/30
756426-58-19	Cl-PF3ONS (F-53B Major)	ND	0.0714	0.0658	92	0.0714	0.0630	88	4	60-140/30
763051-92-911	Cl-PF3OUdS (F-53B Minor)	ND	0.0714	0.0747	105	0.0714	0.0675	94	10	60-140/30

CAS No.	ID Standard Recoveries	MS	MSD	FA85846-1	Limits
	13C4-PFBA	69%	74%	68%	35-135%
	13C5-PFPeA	66%	73%	65%	50-150%
	13C5-PFHxA	64%	71%	64%	50-150%
	13C4-PFHpA	65%	72%	66%	50-150%

\* = Outside of Control Limits.

5.3.1  
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# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA85846  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85641-MS	3Q39221.D	1	06/04/21	NG	05/31/21	OP85641	S3Q574
OP85641-MSD	3Q39222.D	1	06/04/21	NG	05/31/21	OP85641	S3Q574
FA85846-1	3Q39220.D	1	06/04/21	NG	05/31/21	OP85641	S3Q574

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA85846-1, FA85846-2, FA85846-3, FA85846-4, FA85846-5, FA85846-6, FA85846-7, FA85846-8, FA85846-9, FA85846-10, FA85846-11, FA85846-12, FA85846-13, FA85846-14, FA85846-15, FA85846-16

CAS No.	ID Standard Recoveries	MS	MSD	FA85846-1	Limits
	13C8-PFOA	72%	78%	71%	50-150%
	13C9-PFNA	76%	80%	72%	50-150%
	13C6-PFDA	72%	75%	70%	50-150%
	13C7-PFUnDA	66%	66%	66%	40-140%
	13C2-PFDoDA	54%	58%	56%	40-140%
	13C2-PFTeDA	56%	60%	59%	30-130%
	13C3-PFBS	66%	73%	66%	50-150%
	13C3-PFHxS	68%	73%	67%	50-150%
	13C8-PFOS	69%	73%	61%	50-150%
	13C8-FOSA	46%	58%	51%	30-130%
	d3-MeFOSAA	84%	83%	82%	40-140%
	d5-EtFOSAA	77%	77%	80%	40-140%
	13C2-4:2FTS	70%	77%	65%	50-150%
	13C2-6:2FTS	82%	85%	77%	50-150%
	13C2-8:2FTS	76%	81%	75%	50-150%
	13C3-HFPO-DA	57%	63%	56%	50-150%

\* = Outside of Control Limits.

5.3.1  
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