



Stormwater Monitoring Results

April 28, 2020

Introductions

- Airport representatives
- WDNR representatives
- Contractor representatives

Purpose of this meeting

- Facilitate WDNR's understanding of the February storm water PFAS sampling results
- Highlight key observations and conclusions
- Discuss next steps

Background

- BRRTS #02-13-584472 established requirements for site investigations, and immediate, interim and remedial actions (10/11/2019)
- Draft Site Investigation Work Plan Submitted to WDNR (12/6/2019)
- Meeting with WDNR on Site Investigation Work Plan (1/21/2020)
- Storm Water Sampling (2/10/2020 – 2/12/2020)
- Final Site Investigation Work Plan Submitted to WDNR (2/17/2020)

February 2020 storm water sampling

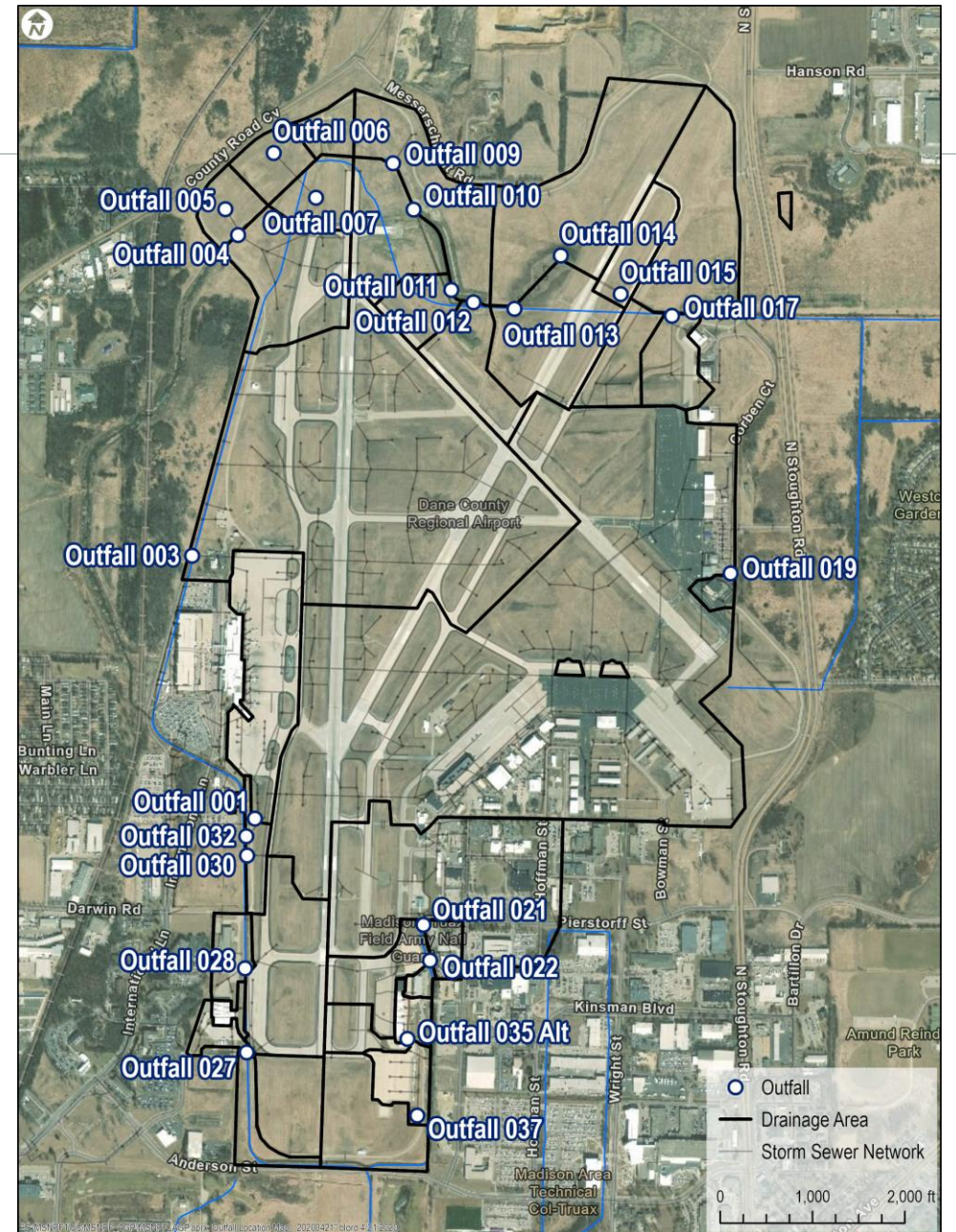
Objectives:

- Measure PFAS contributions within drainage basins and sub-basins of the Airport's storm sewer system.
- Identify priority sub-basins for action to reduce PFAS in storm water discharges.
- Establish a basis of knowledge to drive further investigations and remediation activities.

Sampling Design

Locations (Final)

- 23 Drainage basin outfalls
- 18 Junctions within drainage basin network



Sampling Design

Analytical parameters

- Method 537 (Modified)
- Field blanks & duplicates
- Data Validation

Analyte Name	CAS#	Analyte	RL (ng/l)
Perfluorobutanoic acid	375-22-4	PFBA	6.9
Perfluoropentanoic acid	2706-90-3	PFPeA	3.4
Perfluorobutanesulfonic acid	375-73-5	PFBS	3.4
Perfluorohexanoic acid	307-24-4	PFHxA	3.4
Perfluoroheptanoic acid	375-85-9	PFHpA	3.4
Perfluorohexanesulfonic acid	355-46-4	PFHxS	3.4
6:2 Fluorotelomer sulfonic acid	27619-97-2	6:2-FTS	6.9
Perfluorooctanoic acid	335-67-1	PFOA	3.4
Perfluoroheptanesulfonic acid	375-92-8	PFHpS	3.4
Perfluorooctanesulfonic acid	1763-23-1	PFOS	3.4
Perfluorononanoic acid	375-95-1	PFNA	3.4
Perfluorodecanoic acid	335-76-2	PFDA	3.4
8:2 Fluorotelomer sulfonic acid	39108-34-4	8:2-FTS	6.9
Perfluorooctane sulfonamide	754-91-6	PFOSA	3.4
Perfluorodecanesulfonic acid	335-77-3	PFDS	3.4
Perfluoroundecanoic acid	2058-94-8	PFUnA/PFUdA	3.4
Perfluorododecanoic acid	307-55-1	PFDoA	3.4
Perfluorotridecanoic acid	72629-94-8	PFTrDA	3.4
Perfluorotetradecanoic acid	376-06-7	PFTeDA	3.4
N-ethyl perfluorooctanesulfonamidoacetic acid	2991-50-6	EtFOSAA	17.0
N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9	MeFOSAA	17.0
4:2 Fluorotelomer sulfonic acid	757124-72-4	4:2-FTS	6.9
Perfluoropentane sulfonic acid	2706-91-4	PFPeS	3.4
Perfluorononane sulfonic acid	68259-12-1	PFNS	3.4

Sampling Design

Dry weather conditions

Date	Air Temperature (°F)			Precipitation (in.)		Snow Depth (in.)
	Max	Min	Avg	Snow	Water Equivalence	
2/7/20	34	12	23	0	0	5
2/8/20	30	17	24	Trace	Trace	5
2/9/20	32	16	24	6.0	0.37	6
2/10/20	31	4	18	0	0	10
2/11/20	30	17	24	0	0	9
2/12/20	35	10	23	1.3	0.08	9

Sampling Results

PFOA+PFAS

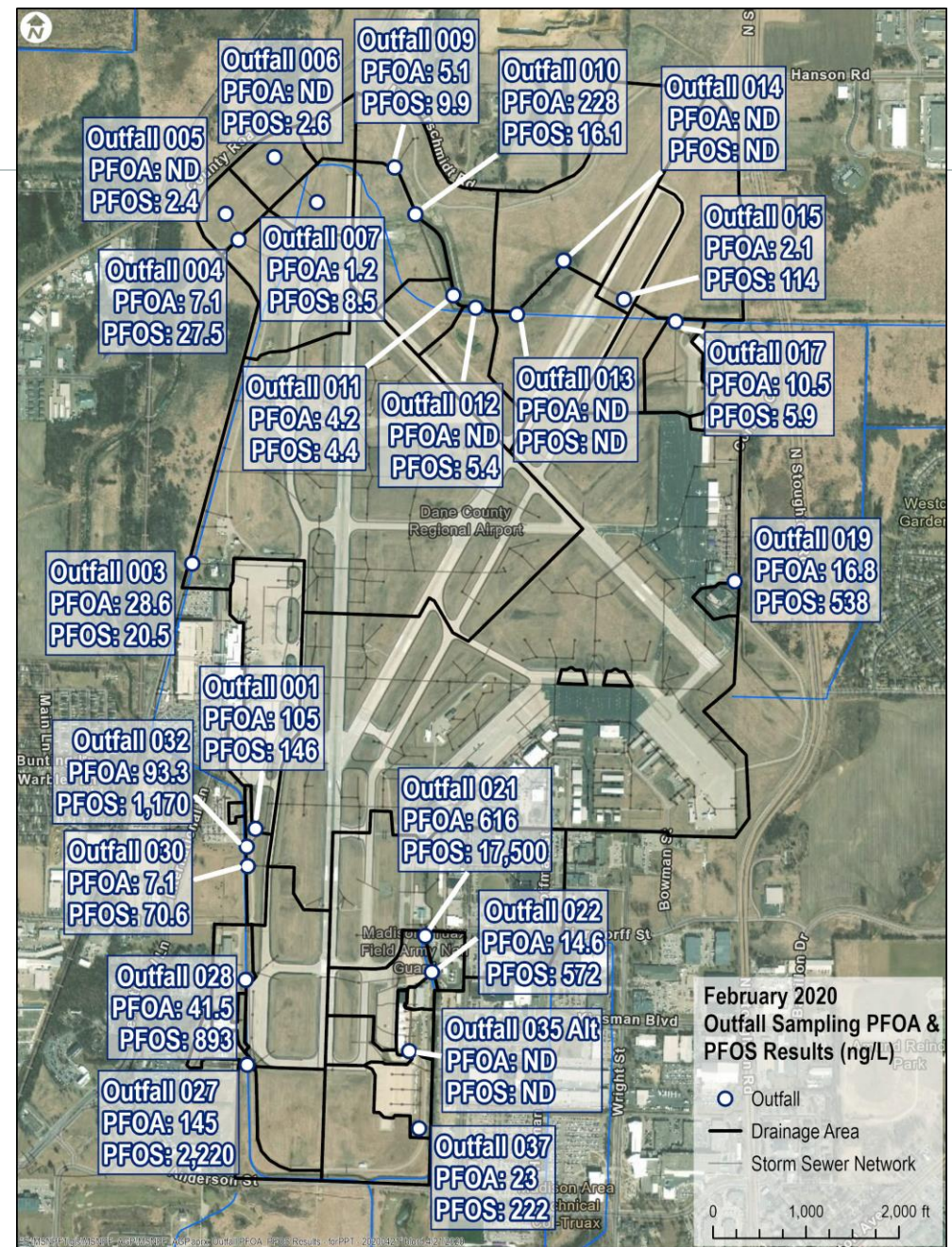
- 0 - 70 ppt at 12 outfalls
- > 70 ppt at 11 outfalls
- Highest concentrations at Outfalls 021, 027 and 032

Sample Location	PFOA (ng/l)	PFOS (ng/l)	PFOA + PFOS (ng/l)
Outfall 001	105.0	146.0	251.0
Outfall 003	28.6	20.5	49.1
Outfall 004	7.1	27.5	34.6
Outfall 005	0.0	2.4	2.4
Outfall 006	0.0	2.6	2.6
Outfall 007	1.2	8.5	9.7
Outfall 009	5.1	9.9	15.0
Outfall 010	228.0	16.1	244.1
Outfall 011	4.2	4.4	8.6
Outfall 012	0.0	5.4	5.4
Outfall 013	0.0	0.0	0.0
Outfall 014	0.0	0.0	0.0
Outfall 015	2.1	114.0	116.1
Outfall 017	10.5	5.9	16.4
Outfall 019	16.8	538.0	554.8
Outfall 021	616.0	17,500.0	18,116.0
Outfall 022	14.6	572.0	586.6
Outfall 027	145.0	2,220.0	2,365.0
Outfall 028	41.5	893.0	934.5
Outfall 030	7.1	70.6	77.7
Outfall 032	93.3	1,170.0	1,263.3
Outfall 035 Alt.	0.0	0.0	0.0
Outfall 037	23.0	222.0	245.0

Sampling Results

Key PFAS Observations:

- Found in sub-basins associated with WI ANG
- Also found in unexpected locations
- Low flow conditions may have influence on results



Sampling Results

Mass loading reflects PFAS contributions (under low flow)

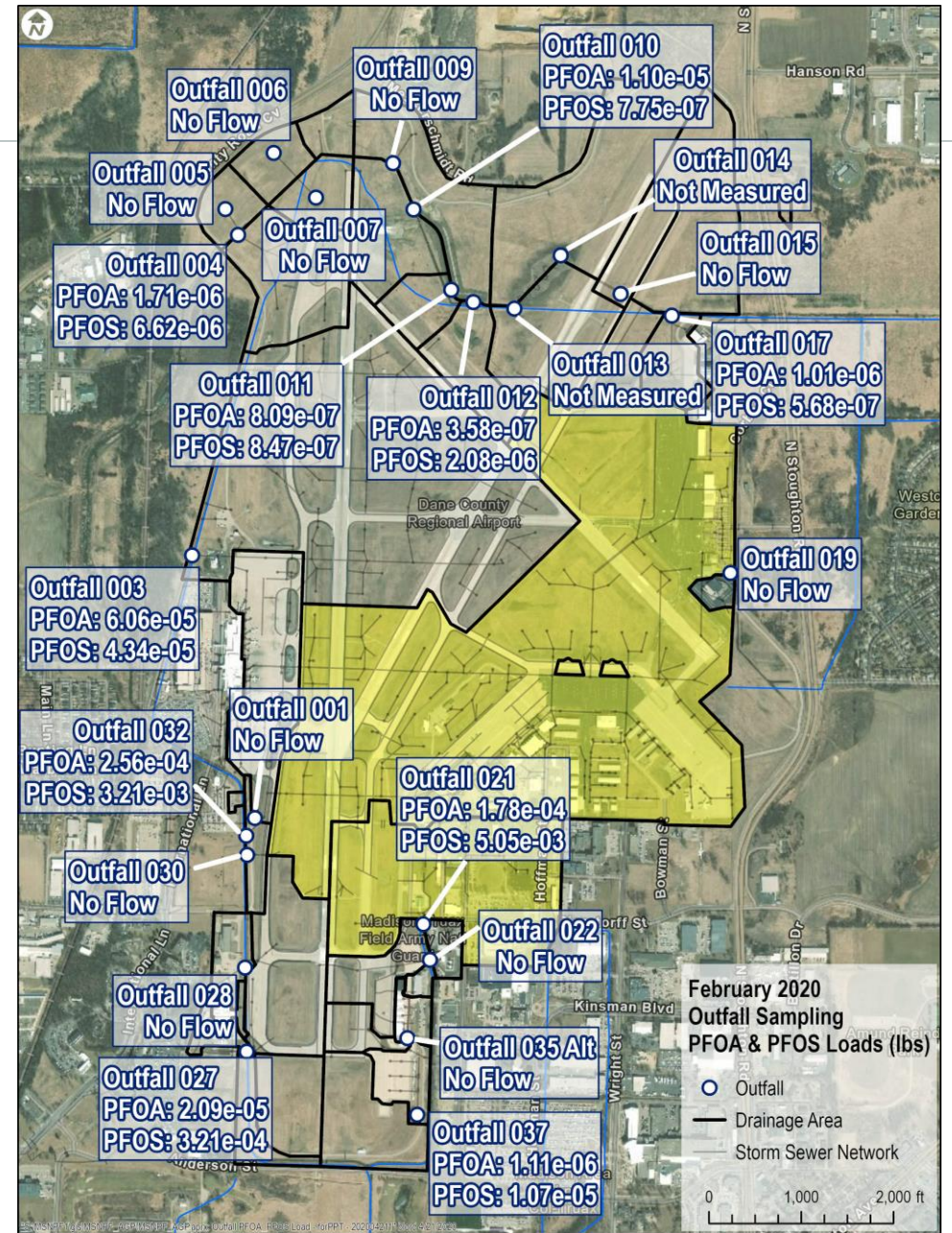
- Mass loading = (Concentration) x (flow)
- Calculated 94% of PFOS + PFOA load is from Outfalls 021 and 032

Sample Location	Flow (cfs)	PFOA Conc. (ng/L)	PFOS Conc. (ng/L)	PFOA + PFOS Load (mg/day)
Outfall 01	0.023	105	146	14.4
Outfall 03	0.44	28.6	20.5	253.9
Outfall 04	0.05	7.1	27.5	23.4
Outfall 05	0	ND	2.4(J)	0.0
Outfall 06	0	ND	2.6(J)	0.0
Outfall 07	0	1.2(J)	8.5	0.0
Outfall 09	0	5.1	9.9	0.0
Outfall 10	0.01	228	16.1	18.8
Outfall 11	0.04	4.2	4.4	2.9
Outfall 12	0.08	ND	5.4	2.9
Outfall 13	0	ND	ND	0.0
Outfall 14	0	ND	ND	0.0
Outfall 15	0	2.1(J)	114	0.0
Outfall 17	0.02	10.5	5.9	6.3
Outfall 19	0	16.8	538	0.0
Outfall 21	0.06	616	17,500	4,843.0
Outfall 22	0	14.6	572	0.0
Outfall 27	0.03	145	2,220	441.9
Outfall 28	0.01	41.5	893	62.7
Outfall 30	0	7.1	70.6	0.0
Outfall 32	0.57	93.3	1,170	3,109.0
Outfall 35 ALT	0.01	ND	ND	0.3
Outfall 37	0.01	23	222	29.4

Sampling Results

Outfalls 032 and 021

- Include WI ANG drainage
- 032 network locations show a lot of variability in loading
- 021 network locations suggest source close to the outfall



Preliminary Conclusions

- Results point to priority “hot spots” for action
 - Outfall 021 drainage
 - Outfall 032 drainage
- Many unknowns remain regarding sources, fate, and transport
 - Will require additional investigation to better locate PFAS sources and determine mitigation strategies

Next Steps

- Further investigations to address unknowns regarding sources, fate and transport, including:
 - Wet weather sampling
 - Additional dry weather and other sampling
 - Past practices on-airport
- Initiate mitigation in priority sub-basins to reduce PFAS discharges to the environment
 - “BAM” booms treatment technology at Outfall 021 as a pilot study
 - Investigate storm sewers in priority source areas
 - Televisive survey to identify locations of infiltration and sediment deposits
 - Test identified sediment deposits for PFAS
 - Remove/dispose of PFAS impacted sediments
 - As appropriate/feasible, line damaged/leaking storm sewers to stop infiltration of PFAS-impacted groundwater
- Airport hiring PFAS remediation contractor to lead site response

Questions?

Executive Summary

DCRA Storm Water Monitoring Results to Incorporate Mitigation and Investigation Planning

The objectives of the storm water sampling efforts documented in this report are to (1) measure per- or poly-fluorinated alkyl substances (PFAS) contributions within drainage basins and sub-basins of the Airport's storm sewer system; (2) identify priority sub-basins for action to reduce PFAS in storm water discharges; and (3) establish a basis of knowledge to drive further investigations and remediation activities.

Consistent with the storm water sampling work plan that had been reviewed and approved by the Wisconsin Department of Natural Resources (WDNR), water samples were collected from twenty-three (23) drainage basin outfalls and eighteen (18) junctions within the major drainage basin network. The sample locations are shown in the **Stormwater Sampling Summary for Dane County Regional Airport BRR # 02-13-584472** (May 2020).

The water samples were analyzed using United States Environmental Protection Agency (US EPA) Method 537 (Modified) for 24 PFAS compounds. Field blanks and duplicates were also collected and analyzed to support data validation. These samples were collected on February 10 – 12, 2020 under dry weather winter conditions.

The sample results and laboratory reports are provided in the May 2020 Stormwater Sampling Summary. Key observations for perfluorooctanoic acid (PFOA) and perfluorooctanoic sulfonate (PFOS), the two PFAS compounds of concern are as follows:

- Combined PFOA+PFOS concentrations were detected between 0 and 70 part per trillion (ppt), US EPA's current Lifetime Health Advisory level for drinking water, at twenty-three (23) locations. Eleven (11) locations had combined concentrations exceeding 70 ppt. The highest concentrations were detected at Outfalls 021, 027, and 032.
- PFAS was found in sub-basins associated with Wisconsin Air National Guard (WANG) Base operations and in some unexpected outfalls/locations. The sources of some of these observed concentrations are not clear.
- The results may reflect the influence of factors at each location at the time of sampling such as low or no flow, sediments, foam, and backwater effects from the receiving waters.
- Two outfalls stand out relative to elevated PFAS concentrations:
 - Outfall 021 and associated drainage junction sampling locations includes WANG base. Sampling results from Outfall 021 network locations suggest a PFAS source close to the outfall.

- Outfall 032 and associated drainage junction sample locations include parts of the WANG base. Sampling results from Outfall 032 network locations show a lot of variability in PFAS concentrations.

Estimated mass loads at each outfall were calculated using the combined PFOS and PFOA concentrations multiplied by the flow rate. The resulting loads reflect the mass of PFOS+PFOA discharged at each outfall during dry weather flow conditions. Ninety-four percent (94%) of the total PFOS and PFOA load discharged from the airport outfalls during the sampling event was from Outfalls 021 and 032.

Preliminary conclusions point to priority “hot spots” for action in the Outfall 021 and Outfall 032 drainage basins to address the largest sources of PFAS discharges. Many unknowns remain regarding PFAS sources, fate, and transport in other drainage basins, and additional investigation will be required to locate PFAS sources and determine mitigation strategies in those basins.

Based on these results, the Airport is currently planning to pursue the following next steps:

- Further investigations to address unknowns regarding sources as well as fate and transport which may include but are not limited to:
 - Wet weather sampling
 - Additional dry weather and other sampling
 - Evaluating past practices on-airport that may be sources of PFAS
- Mitigation efforts will be initiated in the priority sub-basins to reduce PFAS discharges to the environment:
 - 1) “BAM” booms surface water treatment technology will be installed at Outfall 021 as a pilot study. Monitoring will be conducted to evaluate the performance of the technology.
 - 2) Targeted pipe segments within the Outfall 021 and Outfall 032 storm sewer networks will be televised to identify locations of groundwater infiltration and/or sediment deposits. The effectiveness of slip-lining of leaking and damaged storm sewers in reducing PFAS infiltration into storm sewers will be evaluated. Identified sediment deposits will need to be tested for PFAS before removal and disposal prior to slip-lining. As appropriate/feasible, sections of storm sewer will then be slip-lined to stop infiltration of PFAS-impacted groundwater.
- The Airport, following a Request for Proposals (RFP) from the County, will be hiring a PFAS remediation contractor to lead the site response. Mead & Hunt will continue to lead the site work until a final decision is made, including leading further investigation and mitigation efforts.

Proposed Storm Water Investigation Timeline

The following timeline of activities is proposed, with the understanding that adjustments may be required to adapt to external factors affecting the ability to conduct the work, as well as findings that may require modifying the approach to achieving the overall program objectives.

- **Activities in May 2020**
 - Airport contracts with Orin to conduct pilot study of “BAM” boom surface water treatment technology (“BAM” Boom).
 - Installation of “BAM” Boom at Outfall 021.
 - Initiate weekly monitoring of BAM Boom at Outfall 021.
 - Identify targeted pipe segments for televising within Outfall 021 and Outfall 032.
 - Select contractor for televising targeted pipe segments within Outfall 021 basin and Outfall 032 basin.
 - Initiate wet weather stormwater sampling.
 - Evaluate past PFAS practices for on-airport sites that may be sources of observed PFAS.
- **Activities in June 2020**
 - Weekly monitoring of “BAM” Boom at Outfall 021 continues.
 - Implement televising of targeted pipe segments
 - Conduct field investigations at former fire training areas.
 - Compare wet weather & dry weather sampling results.
- **Activities in July 2020**
 - Weekly monitoring of “BAM” Boom at Outfall 021 concludes.
 - Evaluate pilot study (BAM) results after all lab results received and develop conclusions on effectiveness of “BAM” Boom.
 - Evaluate results of the televising targeted pipe segments.
 - Evaluate location/quantity of observed sediment deposits within targeted pipe segments from televised data and accessibility for testing.
 - Initiate removal, testing, and disposal of PFAS-impacted sediments where identified in the pipe segments.
 - Identify and initiate appropriate mitigation/remediation planning and actions for stormwater.
 - Evaluate results from former fire training areas.
- **Other Activities (Late Summer / Fall 2020)**
 - Completion of mitigation/remediation actions at targeted pipe segments, as needed.
 - Conduct dry weather sampling at outfalls or junctions not accessible during February 2020 dry weather sampling event.
 - Conduct dry weather sampling after remediation options implemented at targeted pipe segments.
 - Conduct potential soil & groundwater investigations at other identified source areas (as a result of the evaluation of past on-airport PFAS practices).

Stormwater Sampling Summary

For

Dane County Regional Airport

BRRT # 02-13-584472

Prepared by Mead & Hunt, Inc./LimnoTech

May 2020

This document provides a summary of stormwater sampling information collected at the Dane County Regional Airport (DCRA) during a February 10-12, 2020 event. Sampling was conducted in response to BRRTS # 02-13-584472, to provide initial information on per- and polyfluorinated alkyl substance (PFAS) constituents in stormwater at the airport. Sampling procedures and locations were described in the Initial Site Investigation Work Plan (February 4, 2020 (revised)) that was submitted to the WDNR on February 18, 2020.

Climatologic Conditions

The National Weather Service (NWS) reported 6 inches of snow at DCRA on February 6, adding to an existing snowpack of approximately 5 inches. The average temperature during the sampling period was 32 degrees and NWS reported that the snow depth decreased from 10 inches to 9 inches during the sampling period. Low runoff rates were observed during the sampling period. **Table 1** contains a summary of climatologic information reported by NWS immediately prior to and during the sampling period.

Table 1. DCRA February 7-12 Climatologic Summary.

Date	Air Temperature (°F)			Precipitation (in.)		Snow Depth (in.)
	Max	Min	Avg	Snow	Water Equivalence	
2/7/20	34	12	23	0	0	5
2/8/20	30	17	24	Trace	Trace	5
2/9/20	32	16	24	6.0	0.37	6
2/10/20	31	4	18	0	0	10
2/11/20	30	17	24	0	0	9
2/12/20	35	10	23	1.3	0.08	9

Monitoring Locations

Grab samples and flow measurements were collected at a total of 23 outfall locations and 18 storm sewer network locations. Storm network sampling effort was conducted in drainage areas 001, 021, and 032. **Table 2** contains a summary of the locations sampled.

Table 2. DCRA Outfall and Storm Network Sample Collection Locations February 10-12, 2020.

Sample Location	Sample I.D.
Outfall 1	001
Outfall 3	Outfall 03
Outfall 4	Outfall 04
Outfall 5	Outfall 05
Outfall 6	Outfall 06
Outfall 7	Outfall 07
Outfall 9	Outfall 09
Outfall 10	Outfall 10
Outfall 11	Outfall 11
Outfall 12	Outfall 12
Outfall 13	Outfall 13
Outfall 14	Outfall 14
Outfall 15	Outfall 15
Outfall 17	Outfall 17
Outfall 19	Outfall 19
Outfall 21	Outfall 21

Sample Location	Sample I.D.
Outfall 22	Outfall 22
Outfall 27	Outfall 27
Outfall 28	Outfall 28
Outfall 30	Outfall 30
Outfall 32	Outfall 32
Outfall 35	Outfall 35 ALT
Outfall 37	Outfall 37
Drainage Area 1, Location 1	DA001-01
Drainage Area 1, Location 3	DA001-03
Drainage Area 21, Location 3 Alternate	DA021-03 ALT
Drainage Area 21, Location 4 Alternate	DA021-04 ALT
Drainage Area 21, Location 6 Alternate	DA021-06 ALT
Drainage Area 32, Location 3A	DA032-03 A
Drainage Area 32, Location 3B	DA032-03 B
Drainage Area 32, Location 5	DA032-05
Drainage Area 32, Location 8	DA032-08
Drainage Area 32, Location 9A	DA032-09A
Drainage Area 32, Location 9	DA032-09
Drainage Area 32, Location 10 Alternate	DA032-10 ALT
Drainage Area 32, Location 12A	DA032-12A
Drainage Area 32, Location 12B	DA032-12B
Drainage Area 32, Location 13	DA032-13
Drainage Area 32, Location 14	DA032-14
Drainage Area 32, Location 15	DA032-15
Drainage Area 32, Location x	DA032-x

Samples were not collected at the following locations, for the reasons stated:

- Samples were not collected at outfalls 20, 24, 25, 26, 33, 34 or locations DA021-02, 05, 06 because there was no water present at these locations.
- Samples were not collected at outfall 16, outfall 38, or locations DA001-04, DA021-01, 02, 03, 04, 05, 06, DA032-01, 04, and 10 because they could not be accessed (DA001-04, lid bolted down); could not be found/were under snow or sediment (outfall 16, outfall 38, DA021-01, 05, 06, DA032-01, and 10); did not have enough water to sample (DA021-02 and DA032-04); or were not accessible from the surface (DA021-03 and 04).
- Outfalls 8, 18, 29, 36, 39, and A could not be sampled because they were frozen.

Alternate sampling locations were identified and sampled for Outfall 35, DA021-03, 04, 06, and DA032-10. Sampling locations and reported PFOA and PFOS results are shown in Figures 1 through 4.

In addition to the storm sewer and outfall samples, five field and equipment blanks were collected to evaluate sampling and equipment decontamination procedures.

Initial Summary of Reported Results

Samples were submitted to SGS North America in Orlando, FL for PFAS analysis using method 537M. Laboratory reports are included as **Attachment 1**. The reported PFOA and PFOS concentrations for samples collected are shown in **Table 3**.

Table 3. PFOA and PFOS Results.

Sample I.D.	PFOA (ng/L)	PFOS (ng/L)
001	105	146
Outfall 03	28.6	20.5
Outfall 04	7.1	27.5
Outfall 05	ND	2.4(J)
Outfall 06	ND	2.6(J)
Outfall 07	1.2(J)	8.5
Outfall 09	5.1	9.9
Outfall 10	228	16.1
Outfall 11	4.2	4.4
Outfall 12	ND	5.4
Outfall 13	ND	ND
Outfall 14	ND	ND
Outfall 15	2.1(J)	114
Outfall 17	10.5	5.9
Outfall 19	16.8	538
Outfall 21	616	17,500
Outfall 22	14.6	572
Outfall 27	145	2,220
Outfall 28	41.5	893
Outfall 30	7.1	70.6
Outfall 32	93.3	1,170
Outfall 35 ALT	ND	ND
Outfall 37	23	222
DA001-01	95.9	227
DA001-03	417	13.1
DA021-03 ALT	ND	46.3
DA021-04 ALT	ND	61.3
DA021-06 ALT	ND	21.9
DA032-03 A	685	3,080
DA032-03 B	432	5,380
DA032-05	292	4,090
DA032-08	48.2	692
DA032-09A	41.7	500
DA032-09	83	1,020
DA032-10 ALT	31.3	61.9
DA032-12A	8.4	96.9
DA032-12B	90.6	206
DA032-13	54.8	2,570
DA032-14	31.6	263
DA032-15	47.1	565

Sample I.D.	PFOA (ng/L)	PFOS (ng/L)
DA032-x	64.7	1,490
Field Blank A	ND	ND
Field Blank B	ND	ND
Field Blank C	ND	ND
Equipment Blank A	ND	ND
Equipment Blank B	ND	ND
(J)=Estimated value		

The following pages present figures of sample results. **Figure 1** shows reported PFOA results for the outfall locations sampled while **Figure 2** shows reported PFOS results for the outfall locations sampled. **Figure 3** shows reported PFOA results for the 001, 021, and 032 storm sewer network locations sampled while **Figure 4** shows reported PFOS results for the 001, 021, and 032 storm sewer network locations sampled. **Table 4** contains a summary of reported sampling results for all analyzed PFAS compounds.

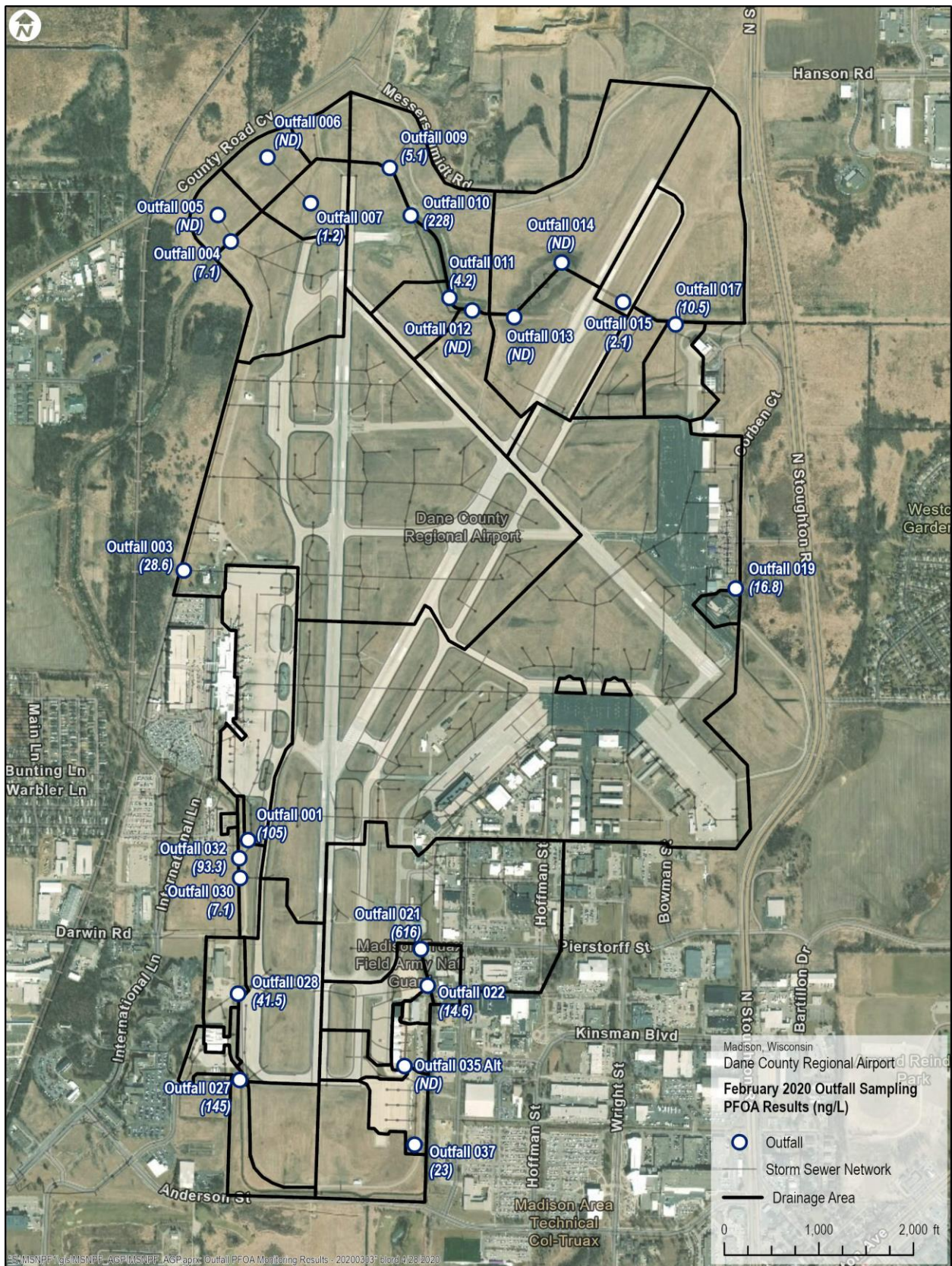


Figure 1. February 10-12 PFOA Results at DCRA Outfall Samples

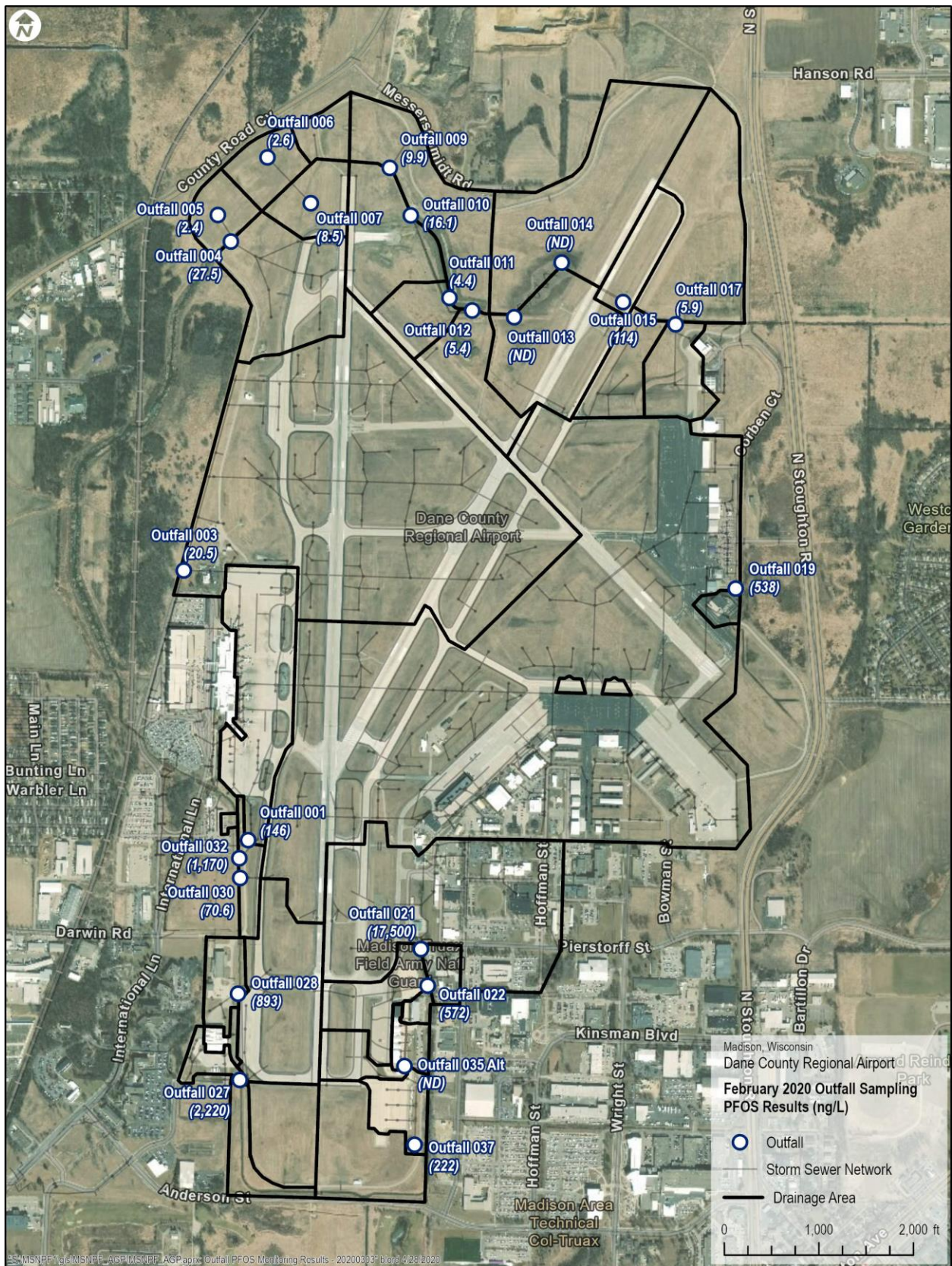


Figure 2. February 10-12 PFOS Results at DCRA Outfall Samples

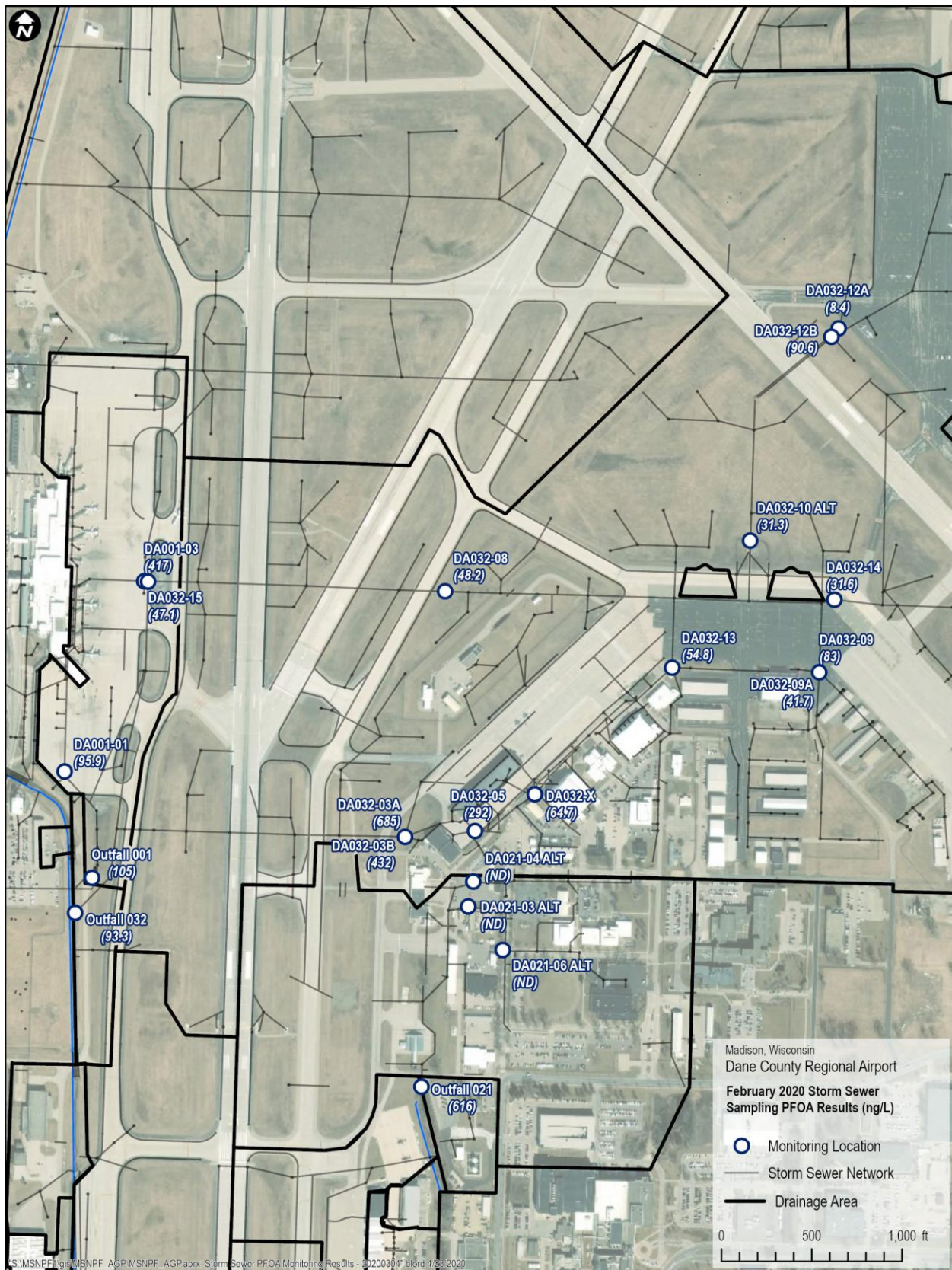


Figure 3. February 10-12 PFOA Results for Storm Sewer Network Samples

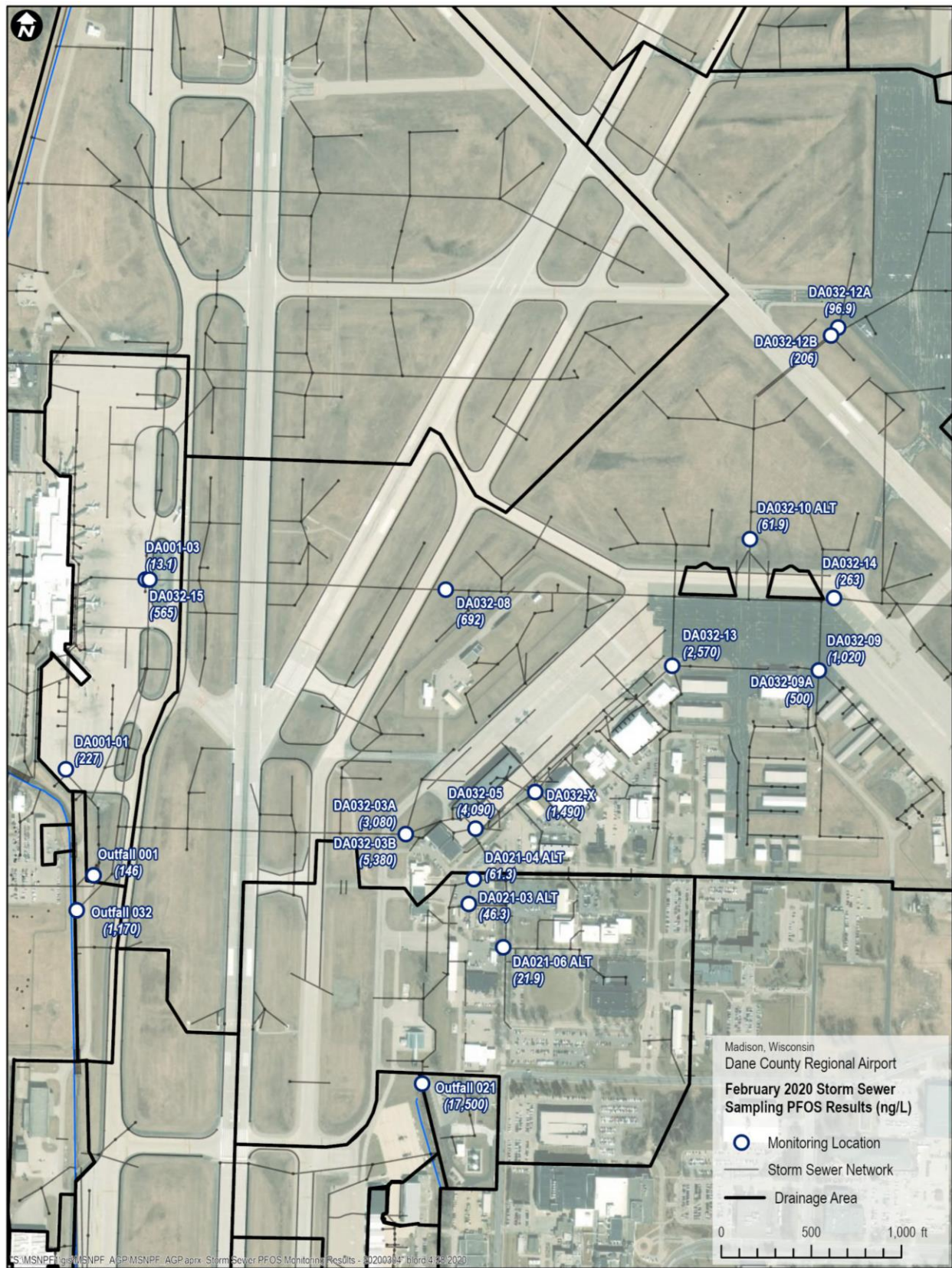


Figure 4. February 10-12 PFOS Results for Storm Sewer Network Samples

Table 4. February 10-12, 2020 Storm Sampling PFAS Results (ng/L).

	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnA	PFDoA	PFTriA	PFTeA	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFNS	PFDS	PFOSA	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS
001	55.9	127	159	57	105	8	14.8	ND (<1.0)	5.8	ND (<1.0)	1.4 (J)	42.1	23.3	119	8.3	146	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<4.0)	ND (<4.0)	ND (<2.0)	46.2	3.5 (J)
OUTFALL 03	23.4	36.6	37	16.4	28.6	1.9 (J)	1.7 (J)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	6.3	7.8	49.2	1.3 (J)	20.5	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 04	14.2	17.5	22.1	9	7.1	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	7.4	7.7	70.6	ND (<0.93)	27.5	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	3.8 (J)	ND (<1.9)
OUTFALL 05	4.8 (J)	1.7 (J)	1.3 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	1.2 (J)	0.98 (J)	6	ND (<0.93)	2.4 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 06	10.7	5	3.8	1.1 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	4.9	4	10.1	ND (<0.93)	2.6 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 07	6.3 (J)	5.8	4.7	1.4 (J)	1.2 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	5.8	4.1	12.5	ND (<0.93)	8.5	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 09	11.3	11.9	13.3	5.5	5.1	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	6.4	8.6	58	1.1 (J)	9.9	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	9.6	ND (<1.9)
OUTFALL 10	14.2	13.4	40.9	12.6	228	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	14.8	16.2	392	2.7 (J)	16.1	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 11	8.8	2.4 (J)	1.9 (J)	1.0 (J)	4.2	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	1.4 (J)	ND (<0.93)	4.9	ND (<0.93)	4.4	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 12	6.4 (J)	ND (<1.4)	1.2 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	1.7 (J)	ND (<0.93)	3.9	ND (<0.93)	5.4	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 13	5.5 (J)	ND (<1.4)	0.99 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	1.4 (J)	ND (<0.93)	2.4 (J)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 14	5.8 (J)	ND (<1.4)	0.99 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	1.4 (J)	ND (<0.93)	2.7 (J)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 15	14.6	18.4	8.8	2.4 (J)	2.1 (J)	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	3.4 (J)	2.6 (J)	14	1.2 (J)	114	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 17	16.4	17.5	18	4	10.5	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	9.2	5.8	39.4	ND (<0.93)	5.9	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	ND (<1.9)	ND (<1.9)
OUTFALL 19	27.9	45.7	37.9	18.9	16.8	1.4 (J)	ND (<0.93)	ND (<0.93)	ND (<1.4)	ND (<0.93)	ND (<0.93)	22.1	21	103	13.8	538	ND (<0.93)	ND (<0.93)	ND (<0.93)	ND (<3.7)	ND (<3.7)	ND (<1.9)	17.6	5.6 (J)
OUTFALL 21	320	962	1130	340	616	49.2	ND (<8.9)	ND (<8.9)	ND (<13)	ND (<8.9)	ND (<8.9)	858	1110	6130	402	17500	69.2	ND (<8.9)	21.2 (J)	ND (<36)	ND (<36)	21.8 (J)	2450	294
OUTFALL 22	29.3	32.9	24	15.6	14.6	10.2	ND (<0.89)	ND (<0.89)	ND (<1.3)	ND (<0.89)	ND (<0.89)	9.3	8.3	95.4	8	572	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<3.6)	ND (<3.6)	ND (<1.8)	2.6 (J)	ND (<1.8)
OUTFALL 27	113	271	336	94.2	145	12 (J)	ND (<9.3)	ND (<9.3)	ND (<14)	ND (<9.3)	ND (<9.3)	228	290	1810	105	2220	ND (<9.3)	ND (<9.3)	ND (<9.3)	ND (<37)	ND (<37)	ND (<19)	244	21.5 (J)
OUTFALL 28	54.5	86.8	200	48.7	41.5	2.5 (J)	ND (<1.0)	ND (<1.0)	ND (<1.5)	ND (<1.0)	ND (<1.0)	137	161	815	26.1	893	ND (<1.0)	ND (<1.0)	1.5 (J)	ND (<4.0)	ND (<4.0)	ND (<2.0)	36.5	3.1 (J)
OUTFALL 30	14.1	18.1	18.2	7.5	7.1	ND (<1.0)	1.7 (J)	ND (<1.0)	ND (<1.5)	ND (<1.0)	ND (<1.0)	14.3	14.9	76.7	2.3 (J)	70.6	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<4.0)	ND (<4.0)	ND (<2.0)	ND (<2.0)	ND (<2.0)
OUTFALL 32	36.2	67.1	73.6	39.5	93.3	5.6 (J)	2.2 (J)	ND (<1.8)	ND (<2.7)	ND (<1.8)	ND (<1.8)	40	48.5	365	21.2	1170	7.7	ND (<1.8)	27.4	ND (<7.1)	ND (<7.1)	ND (<3.6)	98.3	85.2
OUTFALL 35 ALT	9.3	ND (<1.3)	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<1.3)	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<1.3)	ND (<0.89)	1.8 (J)	ND (<0.89)	ND (<3.6)	ND (<3.6)	ND (<1.8)	ND (<1.8)	ND (<1.8)
OUTFALL 37	38.4	89.7	103	30.1	23	1.1 (J)	ND (<1.0)	ND (<1.0)	ND (<1.5)	ND (<1.0)	ND (<1.0)	81.9	111	450	13.2	222	ND (<1.0)	ND (<1.0)	ND (<1.0)	ND (<4.0)	ND (<4.0)	ND (<2.0)	12.9	ND (<2.0)
DA001-01	58.4	134	167	58.4	95.9	6.7	12.3	ND (<1.1)	6.4	ND (<1.1)	ND (<1.1)	70.1	28.6	158	11.4	227	ND (<1.1)	ND (<1.1)	ND (<1.1)	ND (<4.3)	ND (<4.3)	ND (<2.2)	58.6	4.8 (J)
DA001-03	287	650	901	280	417	13.4	16.1	ND (<11)	ND (<17)	ND (<1.1)	1.9 (J)	ND (<1.1)	ND (<1.1)	21.5	ND (<1.1)	13.1	ND (<1.1)	ND (<1.1)	ND (<1.1)	ND (<4.6)	ND (<4.6)	ND (<2.3)	11.8	ND (<2.3)
DA021-03 ALT	41.5	10 (J)	18.4 (J)	5.5 (J)	ND (<4.8)	ND (<4.8)	ND (<4.8)	ND (<4.8)	ND (<7.2)	ND (<4.8)	ND (<4.8)	11.3 (J)	6.2 (J)	20.9	ND (<4.8)	46.3	ND (<4.8)	ND (<4.8)	ND (<4.8)	ND (<19)	ND (<19)	ND (<9.6)	45	ND (<9.6)
DA021-04 ALT	50.8	16.7 (J)	21.8	4.9 (J)	ND (<4.5)	ND (<4.5)	ND (<4.5)	ND (<4.5)	ND (<6.7)	ND (<8.9)	ND (<8.9)	14 (J)	25.3	24.6	ND (<4.5)	61.3	ND (<4.5)	ND (<4.5)	ND (<8.9)	ND (<18)	ND (<18)	ND (<8.9)	152	ND (<8.9)
DA021-06 ALT	53.9	13.6 (J)	11.5 (J)	5.5 (J)	ND (<4.8)	ND (<4.8)	ND (<4.8)	ND (<4.8)	ND (<7.2)	ND (<4.8)	ND (<4.8)	8.2 (J)	26.7	11 (J)	ND (<4.8)	21.9	ND (<4.8)	ND (<4.8)	ND (<9.6)	ND (<19)	ND (<19)	ND (<9.6)	39.7	ND (<9.6)
DA032-03A	337	1240	1320	572	685	27.3 (J)	ND (<10)	ND (<10)	ND (<160)	ND (<100)	ND (<100)	889	3220	12000	122	3080	ND (<10)	ND (<10)	64.7	ND (<42)	ND (<42)	ND (<21)	1080	87.7
DA032-03B	141	352	419	154 (J)	432	ND (<89)	ND (<89)	ND (<89)	ND (<130)	ND (<89)	ND (<89)	222	214	2080	173	5380	31.1 (J)	ND (<8.9)	273	ND (<36)	ND (<36)	ND (<18)	630	472
DA032-05	99.4	233	278	153	292	33.3 (J)	ND (<10)	ND (<10)	ND (<26)	ND (<10)	ND (<10)	170	160	1500	101	4090	35 (J)	ND (<10)	291	ND (<42)	ND (<42)	ND (<21)	447	397
DA032-08	30.4	51.3	53.5	31.4	48.2	3.7	ND (<0.89)	ND (<0.89)	ND (<1.3)	ND (<0.89)	ND (<0.89)	25.1	27.2	250	16.2	692	ND (<0.89)	ND (<0.89)	1.8 (J)	ND (<3.6)	ND (<3.6)	ND (<1.8)	70.3	19.1
DA032-09	34.4	68.6	72.5	50.2	83	9.3	3 (J)	ND (<2.1)	ND (<3.1)	ND (<2.1)	ND (<2.1)	18.4	25.4	297	25.2	1020	ND (<2.1)	ND (<2.1)	ND (<2.1)	ND (<8.3)	ND (<8.3)	ND (<4.2)	141	25.2
DA032-09A	18	31.1	33	23.4	41.7	4.8	1.5 (J)	ND (<1.1)	ND (<1.6)	ND (<1.1)	ND (<1.1)	8.6	11.9	142	10.9	500	ND (<1.1)	ND (<1.1)	ND (<1.1)	ND (<4.4)	ND (<4.4)	ND (<2.2)	56.8	10.9
DA032-10 ALT	17.2	19.6	22.7	9.6	31.3	1.1 (J)	ND (<0.86)	ND (<0.86)	ND (<1.3)	ND (<0.86)	ND (<0.86)	9.5	10.9	88.8	2.9 (J)	61.9	ND (<0.86)	ND (<0.86)	ND (<0.86)	ND (<3.4)	ND (<3.4)	ND (<1.7)	6.7 (J)	1.7 (J)
DA032-12A	17.5	9.7	9.7	3.8	8.4	ND (<0.89)	4.3	3.6	ND (<1.3)	ND (<0.89)	ND (<0.89)	3.7	3.4 (J)	29.1	ND (<0.89)	96.9	ND (<0.89)	ND (<0.89)	9	ND (<3.6)	ND (<3.6)	ND (<1.8)	ND (<1.8)	4
DA032-12B	31.7	53	61.3	26.6	90.6	2.9 (J)	1.1 (J)	ND (<0.89)	ND (<1.3)	ND (<0.89)	ND (<0.89)	27.7	34.4	258	10.3	206	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<3.6)	ND (<3.6)	ND (<1.8)	24.3	3.6 (J)
DA032-13	44.4	104	117	52.2	54.8	6.8 (J)	ND (<4.3)	ND (<4.3)	ND (<6.5)	ND (<4.3)	ND (<4.3)	71.6	90.6	524	51.3	2570	ND (<4.3)	ND (<4.3)	ND (<4.3)	ND (<17)	ND (<17)	ND (<8.6)	140	70.8
DA032-14	20.8	27.1	30.1	15.2	31.6	3.6	ND (<0.83)	ND (<0.83)	ND (<1.2)	ND (<0.83)	ND (<0.83)	18.4	21.8	185	9.5	263	ND (<0.83)	ND (<0.83)	2.4 (J)	ND (<3.3)	ND (<3.3)	ND (<1.7)	23.6	21.9
DA032-15	30.8	50.5	52.7	30.5	47.1	3.5 (J)	ND (<0.89)	ND (<0.89)	ND (<1.3)	ND (<8.9)	ND (<8.9)	23.8	26.2	241	15.3	565	ND (<0.89)	ND (<0.89)	ND (<0.89)	ND (<3.6)	ND (<3.6)	ND (<1.8)	69.3	15.4
DA032-X	72.3	89.6																						

Flow measurements were also collected at storm sewer network locations DA001-01, 03, DA032-03A, 03B, 08, 09A, 09, 10ALT, 12A, 12B, 13, 14, and 15. Standing water was observed at locations DA021-03ALT, 04ALT, 06ALT, and DA032-x.

The mass loading of PFOA + PFOS was calculated for each outfall sampled. The mass loading is calculated by multiplying the combined PFOA + PFOS concentration by the flow rate. The mass loading calculated at each outfall is shown in **Table 5**. On the following page, **Figure 5** shows the calculated PFOA + PFOS mass load for the outfall locations sampled.

Table 5. PFOA + PFOS Mass Loading.

Sample I.D.	Flow (cfs)	PFOA (ng/L)	PFOS (ng/L)	PFOA + PFOS Load (mg/day)
Outfall 01	0.023	105	146	14.4
Outfall 03	0.44	28.6	20.5	253.9
Outfall 04	0.05	7.1	27.5	23.4
Outfall 05	0.0	ND	2.4(J)	0
Outfall 06	0.0	ND	2.6(J)	0
Outfall 07	0.0	1.2(J)	8.5	0
Outfall 09	0.0	5.1	9.9	0
Outfall 10	0.01	228	16.1	18.8
Outfall 11	0.04	4.2	4.4	2.9
Outfall 12	0.08	ND	5.4	2.9
Outfall 13	0	ND	ND	0
Outfall 14	0	ND	ND	0
Outfall 15	0	2.1(J)	114	0
Outfall 17	0.02	10.5	5.9	6.3
Outfall 19	0	16.8	538	0
Outfall 21	0.06	616	17,500	4,843
Outfall 22	0	14.6	572	0
Outfall 27	0.03	145	2,220	441.9
Outfall 28	0.01	41.5	893	62.7
Outfall 30	0	7.1	70.6	0
Outfall 32	0.57	93.3	1,170	3,109
Outfall 35 ALT	0.01	ND	ND	0.3
Outfall 37	0.01	23	222	29.4
	(J)=Estimated value			

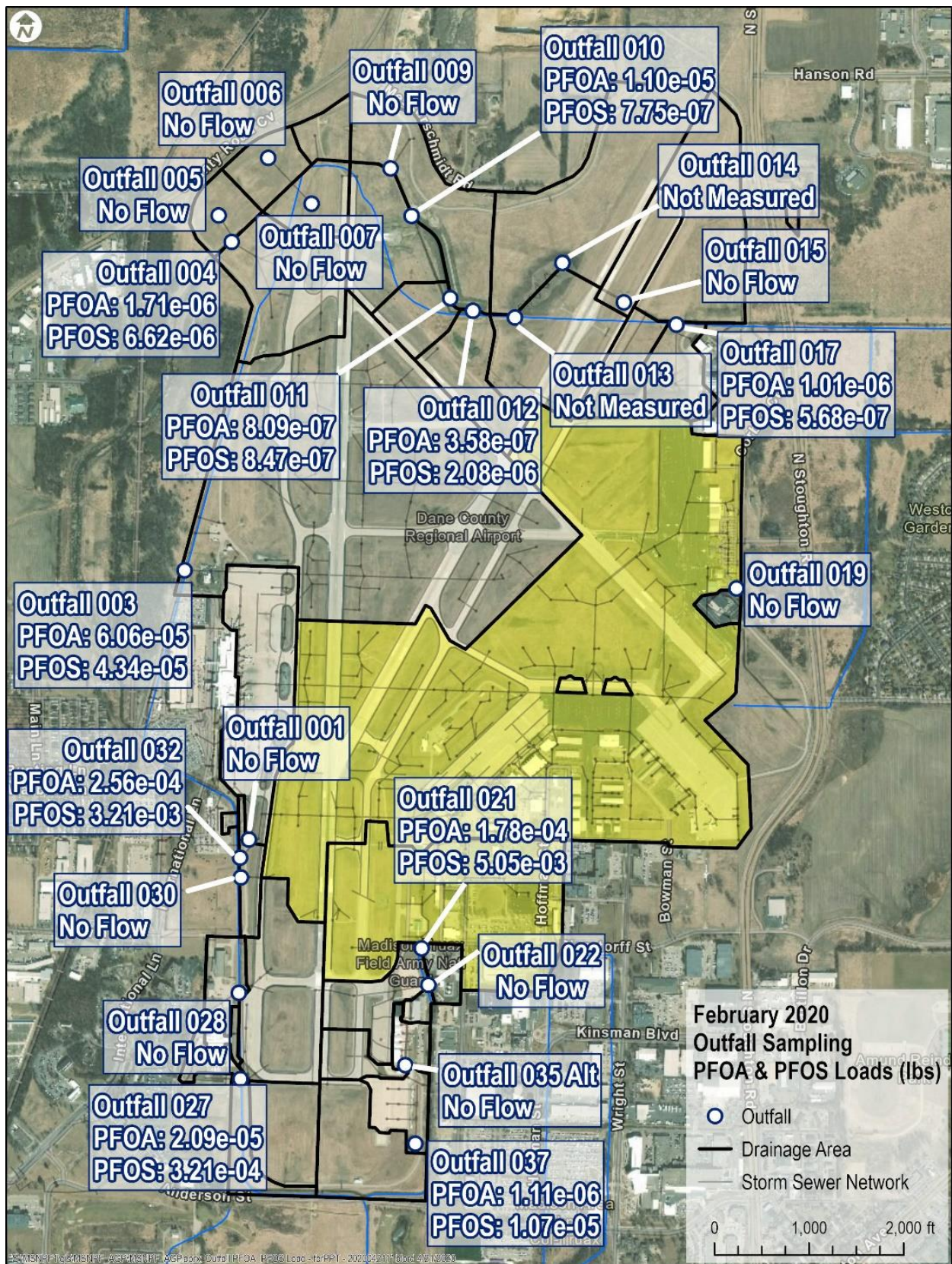


Figure 5. Calculated PFOA + PFOS Mass Loads for Outfall Locations Sampled

Attachment 1
Laboratory Reports



Orlando, FL

03/06/20

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

e-Hardcopy 2.0
Automated Report

Technical Report for

LimnoTech

MSNPF

SGS Job Number: FA72479

Sampling Date: 02/10/20



Report to:

andrea.colby@sgs.com

Total number of pages in report: 64



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.

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General Manager

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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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Test results relate only to samples analyzed.



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SGS North America Inc.

Sample Summary

LimnoTech

Job No: FA72479

MSNPF

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

FA72479-1	02/10/20	08:30	CB	02/12/20	AQ	Water	001
FA72479-2	02/10/20	09:00	CB	02/12/20	AQ	Water	DA001-01
FA72479-3	02/10/20	10:00	CB	02/12/20	AQ	Water	DA001-03
FA72479-4	02/10/20	10:15	CB	02/12/20	AQ	Water	DA032-15
FA72479-5	02/10/20	11:35	CB	02/12/20	AQ	Water	OUTFALL 32
FA72479-6	02/10/20	12:50	CB	02/12/20	AQ	Water	DA032-08
FA72479-7	02/10/20	13:35	CB	02/12/20	AQ	Water	DA032-10 ALT
FA72479-8	02/10/20	14:30	CB	02/12/20	AQ	Water	DA032-03A
FA72479-9	02/10/20	14:35	CB	02/12/20	AQ	Water	DA032-03B
FA72479-10	02/10/20	15:40	CB	02/12/20	AQ	Water	DA032-05
FA72479-11	02/10/20	16:30	CB	02/12/20	AQ	Water	DA032-X
FA72479-12	02/10/20	17:15	CB	02/12/20	AQ	Water	FIELD BLANK A



SGS North America Inc.

Sample Summary (continued)

LimnoTech

Job No: FA72479

MSNPF

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FA72479-13	02/10/20	00:00	CB	02/12/20	AQ Water	DUPLICATE A

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: LimnoTech

Job No: FA72479

Site: MSNPF

Report Date: 2/26/2020 6:51:21 PM

13 Samples were collected on 02/10/2020 and were received at SGS North America Inc - Orlando on 02/12/2020 properly preserved, at 1.6 Deg. C and intact. These Samples received an SGS Orlando job number of FA72479. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

MS Semi-volatiles By Method EPA 537M BY ID

Matrix: AQ

Batch ID: OP79002

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA72479-11MS, FA72479-12DUP, FA72479-11MS were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Matrix Spike Recovery(s) for 6:2 Fluorotelomer sulfonate, Perfluorohexanoic acid, Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Sample(s) FA72479-10, FA72479-11, FA72479-13, FA72479-3, FA72479-4, FA72479-6, FA72479-7, FA72479-8, FA72479-9 have surrogates outside control limits.

OP79002-MS for 13C2-PFTeDA: Outside control limits due to matrix interference.

OP79002-MS for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA72479-3 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA72479-3 for 13C5-PFHxA: Outside control limits due to matrix interference.

FA72479-3 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA72479-4 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA72479-4 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA72479-4 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by reanalysis.

FA72479-6 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA72479-6 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA72479-6 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA72479-6 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA72479-6 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA72479-6 for 13C7-PFUnDA: Outside control limits due to matrix interference.

FA72479-6 for Perfluorododecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

FA72479-6 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

FA72479-6 for Perfluorotridecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

FA72479-6 for Perfluoroundecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

FA72479-7 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA72479-7: Confirmation run.

FA72479-8 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA72479-8: Dilution required due to matrix interference.

FA72479-9 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA72479-9: Dilution required due to matrix interference (ID recovery standard failure).

FA72479-10 for 13C2-PFDoDA: Outside control limits due to matrix interference.

FA72479-10: Dilution required due to matrix interference.

MS Semi-volatiles By Method EPA 537M BY ID**Matrix:** AQ**Batch ID:** OP79002

FA72479-11 for 13C2-PFDoDA: Outside control limits due to matrix interference.
 FA72479-11 for 13C2-PFTeDA: Outside control limits due to matrix interference. Confirmed by MS/MSD.
 FA72479-11 for 13C2-PFTeDA: Outside control limits due to matrix interference.
 FA72479-11 for 13C7-PFUnDA: Outside control limits due to matrix interference.
 FA72479-11 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits, Confirmed by batch QC.
 FA72479-11 for Perfluorotridecanoic acid: Associated ID Standard outside control limits, Confirmed by batch QC.
 FA72479-13 for 13C2-PFTeDA: Outside control limits due to matrix interference.
 FA72479-13: Confirmation run.

Matrix: AQ**Batch ID:** OP79088

All samples were extracted within the recommended method holding time.
 All samples were analyzed within the recommended method holding time.
 Sample(s) FA72756-1MS, FA72756-2DUP, FA72756-1MS were used as the QC samples indicated.
 All method blanks for this batch meet method specific criteria.
 Matrix Spike Recovery(s) for Perfluorodecanesulfonic acid are outside control limits. Probable cause is due to matrix interference.
 Sample(s) FA72479-13, FA72479-6, FA72479-7 have surrogates outside control limits.
 FA72479-6 for 13C2-PFDoDA: Outside control limits due to matrix interference.
 FA72479-6: Confirmation run.
 FA72479-7 for 13C2-PFTeDA: Outside control limits due to matrix interference.
 FA72479-7 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
 FA72479-7 for Perfluorotridecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
 FA72479-13 for Perfluorotridecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
 FA72479-13 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
 FA72479-13 for 13C2-PFTeDA: Outside control limits due to matrix interference.
 FA72479-13 for 13C2-PFTeDA: Outside control limits due to matrix interference.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

 Jenna Kravitz, Client Services (*Signature on File*)

Summary of Hits

Job Number: FA72479
Account: LimnoTech
Project: MSNPF
Collected: 02/10/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA72479-1	001					
Perfluorobutanoic acid		55.9	8.0	2.0	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		127	4.0	1.5	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		159	4.0	1.0	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		57.0	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		105	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorononanoic acid		8.0	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorodecanoic acid		14.8	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorododecanoic acid		5.8	4.0	1.5	ng/l	EPA 537M BY ID
Perfluorotetradecanoic acid		1.4 J	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		42.1	4.0	1.0	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		23.3	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		119	4.0	1.0	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		8.3	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		146	4.0	1.5	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		46.2	8.0	2.0	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		3.5 J	8.0	2.0	ng/l	EPA 537M BY ID
FA72479-2	DA001-01					
Perfluorobutanoic acid		58.4	8.7	2.2	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		134	4.3	1.6	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		167	4.3	1.1	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		58.4	4.3	1.1	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		95.9	4.3	1.1	ng/l	EPA 537M BY ID
Perfluorononanoic acid		6.7	4.3	1.1	ng/l	EPA 537M BY ID
Perfluorodecanoic acid		12.3	4.3	1.1	ng/l	EPA 537M BY ID
Perfluorododecanoic acid		6.4	4.3	1.6	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		70.1	4.3	1.1	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		28.6	4.3	1.1	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		158	4.3	1.1	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		11.4	4.3	1.1	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		227	4.3	1.6	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		58.6	8.7	2.2	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		4.8 J	8.7	2.2	ng/l	EPA 537M BY ID
FA72479-3	DA001-03					
Perfluorobutanoic acid		287	9.1	2.3	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		650	46	17	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		901	46	11	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		280	4.6	1.1	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		417	4.6	1.1	ng/l	EPA 537M BY ID
Perfluorononanoic acid		13.4	4.6	1.1	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72479
Account: LimnoTech
Project: MSNPF
Collected: 02/10/20

Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
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Perfluorodecanoic acid		16.1	4.6	1.1	ng/l	EPA 537M BY ID
Perfluorotetradecanoic acid		1.9 J	4.6	1.1	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		21.5	4.6	1.1	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		13.1	4.6	1.7	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		11.8	9.1	2.3	ng/l	EPA 537M BY ID

FA72479-4 DA032-15

Perfluorobutanoic acid		30.8	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		50.5	3.6	1.3	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		52.7	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		30.5	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		47.1	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorononanoic acid		3.5 J	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		23.8	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		26.2	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		241	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		15.3	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		565	36	13	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		69.3	7.1	1.8	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		15.4	7.1	1.8	ng/l	EPA 537M BY ID

FA72479-5 OUTFALL 32

Perfluorobutanoic acid		36.2	14	3.6	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		67.1	7.1	2.7	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		73.6	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		39.5	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		93.3	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorononanoic acid		5.6 J	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorodecanoic acid		2.2 J	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		40.0	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		48.5	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		365	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		21.2	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		1170	36	13	ng/l	EPA 537M BY ID
Perfluorononanesulfonic acid		7.7	7.1	1.8	ng/l	EPA 537M BY ID
PFOSA		27.4	7.1	1.8	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		98.3	14	3.6	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		85.2	14	3.6	ng/l	EPA 537M BY ID

FA72479-6 DA032-08

Perfluorobutanoic acid		30.4	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		51.3	3.6	1.3	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72479
Account: LimnoTech
Project: MSNPF
Collected: 02/10/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorohexanoic acid		53.5	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		31.4	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		48.2	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorononanoic acid		3.7	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		25.1	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		27.2	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		250	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		16.2	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		692	36	13	ng/l	EPA 537M BY ID
PFOSA		1.8 J	3.6	0.89	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		70.3	7.1	1.8	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		19.1	7.1	1.8	ng/l	EPA 537M BY ID

FA72479-7 DA032-10 ALT

Perfluorobutanoic acid		17.2	6.9	1.7	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		19.6	3.4	1.3	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		22.7	3.4	0.86	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		9.6	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		31.3	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorononanoic acid		1.1 J	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		9.5	3.4	0.86	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		10.9	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		88.8	3.4	0.86	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		2.9 J	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		61.9	3.4	1.3	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		6.7 J	6.9	1.7	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		1.7 J	6.9	1.7	ng/l	EPA 537M BY ID

FA72479-8 DA032-03A

Perfluorobutanoic acid ^a		337	83	21	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^a		1240	42	16	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^a		1320	42	10	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid ^a		572	42	10	ng/l	EPA 537M BY ID
Perfluorooctanoic acid ^a		685	42	10	ng/l	EPA 537M BY ID
Perfluorononanoic acid ^a		27.3 J	42	10	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a		889	42	10	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^a		3220	42	10	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		12000	420	100	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid ^a		122	42	10	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		3080	42	16	ng/l	EPA 537M BY ID
PFOSA ^a		64.7	42	10	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		1080	830	210	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate ^a		87.7	83	21	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72479
Account: LimnoTech
Project: MSNPF
Collected: 02/10/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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FA72479-9 DA032-03B

Perfluorobutanoic acid ^b	141	71	18	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^b	352	36	13	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^b	419	36	8.9	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid	154 J	360	89	ng/l	EPA 537M BY ID
Perfluorooctanoic acid ^b	432	36	8.9	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^b	222	36	8.9	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^b	214	36	8.9	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid ^b	2080	36	8.9	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid ^b	173	36	8.9	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	5380	360	130	ng/l	EPA 537M BY ID
Perfluorononanesulfonic acid ^b	31.1 J	36	8.9	ng/l	EPA 537M BY ID
PFOSA ^b	273	36	8.9	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate ^b	630	71	18	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate ^b	472	71	18	ng/l	EPA 537M BY ID

FA72479-10 DA032-05

Perfluorobutanoic acid ^a	99.4	83	21	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^a	233	42	16	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^a	278	42	10	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid ^a	153	42	10	ng/l	EPA 537M BY ID
Perfluorooctanoic acid ^a	292	42	10	ng/l	EPA 537M BY ID
Perfluorononanoic acid ^a	33.3 J	42	10	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a	170	42	10	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^a	160	42	10	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a	1500	42	10	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid ^a	101	42	10	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	4090	69	26	ng/l	EPA 537M BY ID
Perfluorononanesulfonic acid ^a	35.0 J	42	10	ng/l	EPA 537M BY ID
PFOSA ^a	291	42	10	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate ^a	447	83	21	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate ^a	397	83	21	ng/l	EPA 537M BY ID

FA72479-11 DA032-X

Perfluorobutanoic acid	72.3	14	3.6	ng/l	EPA 537M BY ID
Perfluoropentanoic acid	89.6	7.1	2.7	ng/l	EPA 537M BY ID
Perfluorohexanoic acid	125	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid	51.0	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorooctanoic acid	64.7	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorononanoic acid	5.6 J	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	101	7.1	1.8	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72479
Account: LimnoTech
Project: MSNPF
Collected: 02/10/20



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoropentanesulfonic acid		92.8	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		554	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		44.0	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		1490	36	13	ng/l	EPA 537M BY ID
PFOSA		18.8	7.1	1.8	ng/l	EPA 537M BY ID
4:2 Fluorotelomer sulfonate		3.6 J	14	3.6	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		84.1	14	3.6	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		39.9	14	3.6	ng/l	EPA 537M BY ID

FA72479-12 FIELD BLANK A

No hits reported in this sample.

FA72479-13 DUPLICATE A

Perfluorobutanoic acid		19.5	6.9	1.7	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		35.2	3.4	1.3	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		37.1	3.4	0.86	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		20.2	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		29.4	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorononanoic acid		2.4 J	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		15.8	3.4	0.86	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		21.0	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		151	3.4	0.86	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		10.5	3.4	0.86	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		361	34	13	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		48.5	6.9	1.7	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		11.4	6.9	1.7	ng/l	EPA 537M BY ID

- (a) Dilution required due to matrix interference.
- (b) Dilution required due to matrix interference (ID recovery standard failure).



Orlando, FL

Section 4



Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID: 001	Date Sampled: 02/10/20
Lab Sample ID: FA72479-1	Date Received: 02/12/20
Matrix: AQ - Water	Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD	
Project: MSNPF	

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q17263.D	1.12	02/21/20 17:57	NG	02/18/20 15:45	OP79002	S3Q271
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	55.9	8.0	2.0	ng/l	
2706-90-3	Perfluoropentanoic acid	127	4.0	1.5	ng/l	
307-24-4	Perfluorohexanoic acid	159	4.0	1.0	ng/l	
375-85-9	Perfluoroheptanoic acid	57.0	4.0	1.0	ng/l	
335-67-1	Perfluorooctanoic acid	105	4.0	1.0	ng/l	
375-95-1	Perfluorononanoic acid	8.0	4.0	1.0	ng/l	
335-76-2	Perfluorodecanoic acid	14.8	4.0	1.0	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	4.0	1.0	ng/l	
307-55-1	Perfluorododecanoic acid	5.8	4.0	1.5	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	4.0	1.0	ng/l	
376-06-7	Perfluorotetradecanoic acid	1.4	4.0	1.0	ng/l	J
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	42.1	4.0	1.0	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	23.3	4.0	1.0	ng/l	
355-46-4	Perfluorohexanesulfonic acid	119	4.0	1.0	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	8.3	4.0	1.0	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	146	4.0	1.5	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	4.0	1.0	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	4.0	1.0	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	4.0	1.0	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	8.0	4.0	ng/l	
2991-50-6	EtFOSAA	ND	8.0	4.0	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	8.0	2.0	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	46.2	8.0	2.0	ng/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

4.1
4

SGS North America Inc.

Report of Analysis

Client Sample ID: 001		
Lab Sample ID: FA72479-1		Date Sampled: 02/10/20
Matrix: AQ - Water		Date Received: 02/12/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	3.5	8.0	2.0	ng/l	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%		30-140%
	13C5-PFPeA	76%		40-140%
	13C5-PFHxA	75%		50-150%
	13C4-PFHpA	75%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	92%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	54%		50-150%
	13C2-PFDoDA	59%		50-150%
	13C2-PFTeDA	72%		40-150%
	13C3-PFBS	85%		50-150%
	13C3-PFHxS	86%		50-150%
	13C8-PFOS	89%		50-150%
	13C8-FOSA	79%		30-140%
	d3-MeFOSAA	100%		50-150%
	13C2-4:2FTS	91%		50-150%
	13C2-6:2FTS	112%		50-150%
	13C2-8:2FTS	113%		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

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Report of Analysis

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Client Sample ID: DA001-01		Date Sampled: 02/10/20
Lab Sample ID: FA72479-2		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q17264.D	1	02/21/20 18:12	NG	02/18/20 15:45	OP79002	S3Q271
Run #2							

Run #	Initial Volume	Final Volume
Run #1	230 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	58.4	8.7	2.2	ng/l	
2706-90-3	Perfluoropentanoic acid	134	4.3	1.6	ng/l	
307-24-4	Perfluorohexanoic acid	167	4.3	1.1	ng/l	
375-85-9	Perfluoroheptanoic acid	58.4	4.3	1.1	ng/l	
335-67-1	Perfluorooctanoic acid	95.9	4.3	1.1	ng/l	
375-95-1	Perfluorononanoic acid	6.7	4.3	1.1	ng/l	
335-76-2	Perfluorodecanoic acid	12.3	4.3	1.1	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	4.3	1.1	ng/l	
307-55-1	Perfluorododecanoic acid	6.4	4.3	1.6	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	4.3	1.1	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	4.3	1.1	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	70.1	4.3	1.1	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	28.6	4.3	1.1	ng/l	
355-46-4	Perfluorohexanesulfonic acid	158	4.3	1.1	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	11.4	4.3	1.1	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	227	4.3	1.6	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	4.3	1.1	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	4.3	1.1	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	4.3	1.1	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	8.7	4.3	ng/l	
2991-50-6	EtFOSAA	ND	8.7	4.3	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	8.7	2.2	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	58.6	8.7	2.2	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA001-01	Date Sampled: 02/10/20
Lab Sample ID: FA72479-2	Date Received: 02/12/20
Matrix: AQ - Water	Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD	
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	4.8	8.7	2.2	ng/l	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	60%		30-140%
	13C5-PFPeA	67%		40-140%
	13C5-PFHxA	67%		50-150%
	13C4-PFHpA	65%		50-150%
	13C8-PFOA	75%		50-150%
	13C9-PFNA	77%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	50%		50-150%
	13C2-PFDoDA	69%		50-150%
	13C2-PFTeDA	69%		40-150%
	13C3-PFBS	76%		50-150%
	13C3-PFHxS	73%		50-150%
	13C8-PFOS	76%		50-150%
	13C8-FOSA	75%		30-140%
	d3-MeFOSAA	87%		50-150%
	13C2-4:2FTS	79%		50-150%
	13C2-6:2FTS	91%		50-150%
	13C2-8:2FTS	97%		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

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Report of Analysis

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Client Sample ID: DA001-03		Date Sampled: 02/10/20
Lab Sample ID: FA72479-3		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q17265.D	1.14	02/21/20 18:26	NG	02/18/20 15:45	OP79002	S3Q271
Run #2	3Q17218.D	11.4	02/21/20 06:59	NG	02/18/20 15:45	OP79002	S3Q271

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	287	9.1	2.3	ng/l	
2706-90-3	Perfluoropentanoic acid	650 ^a	46	17	ng/l	
307-24-4	Perfluorohexanoic acid	901 ^a	46	11	ng/l	
375-85-9	Perfluoroheptanoic acid	280	4.6	1.1	ng/l	
335-67-1	Perfluorooctanoic acid	417	4.6	1.1	ng/l	
375-95-1	Perfluorononanoic acid	13.4	4.6	1.1	ng/l	
335-76-2	Perfluorodecanoic acid	16.1	4.6	1.1	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND ^a	46	11	ng/l	
307-55-1	Perfluorododecanoic acid	ND ^a	46	17	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	4.6	1.1	ng/l	
376-06-7	Perfluorotetradecanoic acid	1.9	4.6	1.1	ng/l	J
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	4.6	1.1	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	4.6	1.1	ng/l	
355-46-4	Perfluorohexanesulfonic acid	21.5	4.6	1.1	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	4.6	1.1	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	13.1	4.6	1.7	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	4.6	1.1	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	4.6	1.1	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	4.6	1.1	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	9.1	4.6	ng/l	
2991-50-6	EtFOSAA	ND	9.1	4.6	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	9.1	2.3	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	11.8	9.1	2.3	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA001-03		Date Sampled: 02/10/20
Lab Sample ID: FA72479-3		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	9.1	2.3	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	50%	63%	30-140%
	13C5-PFPeA	72%	85%	40-140%
	13C5-PFHxA	33% ^b	84%	50-150%
	13C4-PFHpA	70%	86%	50-150%
	13C8-PFOA	84%	97%	50-150%
	13C9-PFNA	87%	96%	50-150%
	13C6-PFDA	83%	90%	50-150%
	13C7-PFUnDA	15% ^b	63%	50-150%
	13C2-PFDoDA	40% ^b	62%	50-150%
	13C2-PFTeDA	51%	48%	40-150%
	13C3-PFBS	82%	93%	50-150%
	13C3-PFHxS	83%	97%	50-150%
	13C8-PFOS	82%	93%	50-150%
	13C8-FOSA	76%	87%	30-140%
	d3-MeFOSAA	121%	117%	50-150%
	13C2-4:2FTS	74%	94%	50-150%
	13C2-6:2FTS	100%	101%	50-150%
	13C2-8:2FTS	111%	102%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits due to matrix interference.

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

SGS North America Inc.

Report of Analysis

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Client Sample ID: DA032-15		Date Sampled: 02/10/20
Lab Sample ID: FA72479-4		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q17266.D	1	02/21/20 18:41	NG	02/18/20 15:45	OP79002	S3Q271
Run #2	3Q17219.D	10	02/21/20 07:14	NG	02/18/20 15:45	OP79002	S3Q271

	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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	30.8	7.1	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	50.5	3.6	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	52.7	3.6	0.89	ng/l	
375-85-9	Perfluoroheptanoic acid	30.5	3.6	0.89	ng/l	
335-67-1	Perfluorooctanoic acid	47.1	3.6	0.89	ng/l	
375-95-1	Perfluorononanoic acid	3.5	3.6	0.89	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	3.6	0.89	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.6	0.89	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.6	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND ^a	36	8.9	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND ^a	36	8.9	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	23.8	3.6	0.89	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	26.2	3.6	0.89	ng/l	
355-46-4	Perfluorohexanesulfonic acid	241	3.6	0.89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	15.3	3.6	0.89	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	565 ^a	36	13	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.6	0.89	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.6	0.89	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.6	0.89	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.1	3.6	ng/l	
2991-50-6	EtFOSAA	ND	7.1	3.6	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	69.3	7.1	1.8	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-15		Date Sampled: 02/10/20
Lab Sample ID: FA72479-4		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	15.4	7.1	1.8	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	56%	75%	30-140%
	13C5-PFPeA	67%	77%	40-140%
	13C5-PFHxA	67%	77%	50-150%
	13C4-PFHpA	62%	73%	50-150%
	13C8-PFOA	67%	77%	50-150%
	13C9-PFNA	65%	70%	50-150%
	13C6-PFDA	68%	63%	50-150%
	13C7-PFUnDA	63%	51%	50-150%
	13C2-PFDoDA	58%	40% ^b	50-150%
	13C2-PFTeDA	24% ^c	33% ^c	40-150%
	13C3-PFBS	75%	83%	50-150%
	13C3-PFHxS	68%	80%	50-150%
	13C8-PFOS	64%	69%	50-150%
	13C8-FOSA	52%	47%	30-140%
	d3-MeFOSAA	86%	59%	50-150%
	13C2-4:2FTS	76%	81%	50-150%
	13C2-6:2FTS	84%	86%	50-150%
	13C2-8:2FTS	81%	67%	50-150%

- (a) Result is from Run# 2
- (b) Outside control limits due to matrix interference.
- (c) Outside control limits due to matrix interference. Confirmed by reanalysis.

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

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SGS North America Inc.

Report of Analysis

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Client Sample ID:	OUTFALL 32	Date Sampled:	02/10/20
Lab Sample ID:	FA72479-5	Date Received:	02/12/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q17267.D	2	02/21/20 18:56	NG	02/18/20 15:45	OP79002	S3Q271
Run #2	3Q17220.D	10	02/21/20 07:28	NG	02/18/20 15:45	OP79002	S3Q271

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	36.2	14	3.6	ng/l	
2706-90-3	Perfluoropentanoic acid	67.1	7.1	2.7	ng/l	
307-24-4	Perfluorohexanoic acid	73.6	7.1	1.8	ng/l	
375-85-9	Perfluoroheptanoic acid	39.5	7.1	1.8	ng/l	
335-67-1	Perfluorooctanoic acid	93.3	7.1	1.8	ng/l	
375-95-1	Perfluorononanoic acid	5.6	7.1	1.8	ng/l	J
335-76-2	Perfluorodecanoic acid	2.2	7.1	1.8	ng/l	J
2058-94-8	Perfluoroundecanoic acid	ND	7.1	1.8	ng/l	
307-55-1	Perfluorododecanoic acid	ND	7.1	2.7	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	7.1	1.8	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	7.1	1.8	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	40.0	7.1	1.8	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	48.5	7.1	1.8	ng/l	
355-46-4	Perfluorohexanesulfonic acid	365	7.1	1.8	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	21.2	7.1	1.8	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	1170 ^a	36	13	ng/l	
68259-12-1	Perfluorononanesulfonic acid	7.7	7.1	1.8	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	7.1	1.8	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	27.4	7.1	1.8	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	14	7.1	ng/l	
2991-50-6	EtFOSAA	ND	14	7.1	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	14	3.6	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	98.3	14	3.6	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 32		Date Sampled: 02/10/20
Lab Sample ID: FA72479-5		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	85.2	14	3.6	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	67%	79%	30-140%
	13C5-PFPeA	75%	81%	40-140%
	13C5-PFHxA	77%	81%	50-150%
	13C4-PFHpA	72%	79%	50-150%
	13C8-PFOA	78%	84%	50-150%
	13C9-PFNA	73%	79%	50-150%
	13C6-PFDA	75%	76%	50-150%
	13C7-PFUnDA	72%	67%	50-150%
	13C2-PFDoDA	68%	56%	50-150%
	13C2-PFTeDA	63%	42%	40-150%
	13C3-PFBS	85%	88%	50-150%
	13C3-PFHxS	77%	85%	50-150%
	13C8-PFOS	72%	79%	50-150%
	13C8-FOSA	58%	59%	30-140%
	d3-MeFOSAA	86%	78%	50-150%
	13C2-4:2FTS	86%	85%	50-150%
	13C2-6:2FTS	95%	94%	50-150%
	13C2-8:2FTS	88%	82%	50-150%

(a) Result is from Run# 2

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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-08		Date Sampled: 02/10/20
Lab Sample ID: FA72479-6		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q17268.D	1	02/21/20 19:10	NG	02/18/20 15:45	OP79002	S3Q271
Run #2	3Q17221.D	10	02/21/20 07:43	NG	02/18/20 15:45	OP79002	S3Q271
Run #3 ^a	2Q44505.D	1	02/26/20 08:16	NAF	02/24/20 12:15	OP79088	S2Q672

Run #	Initial Volume	Final Volume
Run #1	280 ml	1.0 ml
Run #2	280 ml	1.0 ml
Run #3	290 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	30.4	7.1	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	51.3	3.6	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	53.5	3.6	0.89	ng/l	
375-85-9	Perfluoroheptanoic acid	31.4	3.6	0.89	ng/l	
335-67-1	Perfluorooctanoic acid	48.2	3.6	0.89	ng/l	
375-95-1	Perfluorononanoic acid	3.7	3.6	0.89	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.6	0.89	ng/l	
2058-94-8	Perfluoroundecanoic acid ^b	ND	3.6	0.89	ng/l	
307-55-1	Perfluorododecanoic acid ^b	ND	3.6	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid ^b	ND	3.6	0.89	ng/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND	3.6	0.89	ng/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	25.1	3.6	0.89	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	27.2	3.6	0.89	ng/l	
355-46-4	Perfluorohexanesulfonic acid	250	3.6	0.89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	16.2	3.6	0.89	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	692 ^c	36	13	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.6	0.89	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.6	0.89	ng/l	

PERFLUOROOCETANESULFONAMIDES

754-91-6	PFOSA	1.8	3.6	0.89	ng/l	J
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PERFLUOROOCETANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	7.1	3.6	ng/l	
2991-50-6	EtFOSAA	ND	7.1	3.6	ng/l	

FLUOROTELOMER SULFONATES

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

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Report of Analysis

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Client Sample ID:	DA032-08	Date Sampled:	02/10/20
Lab Sample ID:	FA72479-6	Date Received:	02/12/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	70.3	7.1	1.8	ng/l	
39108-34-4	8:2 Fluorotelomer sulfonate	19.1	7.1	1.8	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Run# 3	Limits
	13C4-PFBA	60%	82%	67%	30-140%
	13C5-PFPeA	71%	85%	72%	40-140%
	13C5-PFHxA	71%	86%	72%	50-150%
	13C4-PFHpA	67%	82%	71%	50-150%
	13C8-PFOA	71%	89%	70%	50-150%
	13C9-PFNA	66%	80%	69%	50-150%
	13C6-PFDA	57%	64%	51%	50-150%
	13C7-PFUnDA	41% ^d	42% ^d	40% ^d	50-150%
	13C2-PFDoDA	35% ^d	33% ^d	27% ^d	50-150%
	13C2-PFTeDA	36% ^d	29% ^d	9% ^d	40-150%
	13C3-PFBS	79%	93%	71%	50-150%
	13C3-PFHxS	72%	89%	66%	50-150%
	13C8-PFOS	54%	65%	46% ^d	50-150%
	13C8-FOSA	56%	71%	36%	30-140%
	d3-MeFOSAA	60%	54%	48% ^d	50-150%
	13C2-4:2FTS	81%	93%	79%	50-150%
	13C2-6:2FTS	89%	98%	84%	50-150%
	13C2-8:2FTS	70%	68%	54%	50-150%

- (a) Confirmation run.
 (b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
 (c) Result is from Run# 2
 (d) Outside control limits due to matrix interference.

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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-10 ALT		
Lab Sample ID: FA72479-7		Date Sampled: 02/10/20
Matrix: AQ - Water		Date Received: 02/12/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44486.D	1	02/25/20 18:15	NAF	02/24/20 12:15	OP79088	S2Q671
Run #2 ^a	3Q17269.D	1	02/21/20 19:25	NG	02/18/20 15:45	OP79002	S3Q271

Run #	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	17.2	6.9	1.7	ng/l	
2706-90-3	Perfluoropentanoic acid	19.6	3.4	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	22.7	3.4	0.86	ng/l	
375-85-9	Perfluoroheptanoic acid	9.6	3.4	0.86	ng/l	
335-67-1	Perfluorooctanoic acid	31.3	3.4	0.86	ng/l	
375-95-1	Perfluorononanoic acid	1.1	3.4	0.86	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	3.4	0.86	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.4	0.86	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.4	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid ^b	ND	3.4	0.86	ng/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND	3.4	0.86	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	9.5	3.4	0.86	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	10.9	3.4	0.86	ng/l	
355-46-4	Perfluorohexanesulfonic acid	88.8	3.4	0.86	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	2.9	3.4	0.86	ng/l	J
1763-23-1	Perfluorooctanesulfonic acid	61.9	3.4	1.3	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.4	0.86	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.4	0.86	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.4	0.86	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	6.9	3.4	ng/l	
2991-50-6	EtFOSAA	ND	6.9	3.4	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	6.9	1.7	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	6.7	6.9	1.7	ng/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

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Client Sample ID:	DA032-10 ALT	Date Sampled:	02/10/20
Lab Sample ID:	FA72479-7	Date Received:	02/12/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	1.7	6.9	1.7	ng/l	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%	53%	30-140%
	13C5-PFPeA	70%	64%	40-140%
	13C5-PFHxA	69%	64%	50-150%
	13C4-PFHpA	69%	61%	50-150%
	13C8-PFOA	71%	66%	50-150%
	13C9-PFNA	75%	62%	50-150%
	13C6-PFDA	75%	57%	50-150%
	13C7-PFUnDA	71%	35% ^c	50-150%
	13C2-PFDoDA	51%	13% ^c	50-150%
	13C2-PFTeDA	24% ^c	1% ^c	40-150%
	13C3-PFBS	69%	74%	50-150%
	13C3-PFHxS	66%	69%	50-150%
	13C8-PFOS	66%	56%	50-150%
	13C8-FOSA	50%	13% ^d	30-140%
	d3-MeFOSAA	76%	61%	50-150%
	13C2-4:2FTS	75%	74%	50-150%
	13C2-6:2FTS	81%	84%	50-150%
	13C2-8:2FTS	78%	72%	50-150%

(a) Confirmation run.

(b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

(c) Outside control limits due to matrix interference.

(d) 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

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Report of Analysis

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Client Sample ID: DA032-03A		Date Sampled: 02/10/20
Lab Sample ID: FA72479-8		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q17223.D	10	02/21/20 08:12	NG	02/18/20 15:45	OP79002	S3Q271
Run #2	3Q17270.D	100	02/21/20 19:39	NG	02/18/20 15:45	OP79002	S3Q271

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	337	83	21	ng/l	
2706-90-3	Perfluoropentanoic acid	1240	42	16	ng/l	
307-24-4	Perfluorohexanoic acid	1320	42	10	ng/l	
375-85-9	Perfluoroheptanoic acid	572	42	10	ng/l	
335-67-1	Perfluorooctanoic acid	685	42	10	ng/l	
375-95-1	Perfluorononanoic acid	27.3	42	10	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	42	10	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	42	10	ng/l	
307-55-1	Perfluorododecanoic acid	ND ^b	420	160	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND ^b	420	100	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND ^b	420	100	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	889	42	10	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	3220	42	10	ng/l	
355-46-4	Perfluorohexanesulfonic acid	12000 ^b	420	100	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	122	42	10	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	3080	42	16	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	42	10	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	42	10	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	64.7	42	10	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	83	42	ng/l	
2991-50-6	EtFOSAA	ND	83	42	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	83	21	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	1080 ^b	830	210	ng/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

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Report of Analysis

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Client Sample ID:	DA032-03A	Date Sampled:	02/10/20
Lab Sample ID:	FA72479-8	Date Received:	02/12/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	87.7	83	21	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	79%	88%	30-140%
	13C5-PFPeA	79%	91%	40-140%
	13C5-PFHxA	82%	95%	50-150%
	13C4-PFHpA	75%	90%	50-150%
	13C8-PFOA	84%	100%	50-150%
	13C9-PFNA	82%	95%	50-150%
	13C6-PFDA	78%	96%	50-150%
	13C7-PFUnDA	60%	97%	50-150%
	13C2-PFDoDA	39% ^c	96%	50-150%
	13C2-PFTeDA	24% ^c	95%	40-150%
	13C3-PFBS	90%	100%	50-150%
	13C3-PFHxS	82%	100%	50-150%
	13C8-PFOS	85%	100%	50-150%
	13C8-FOSA	52%	101%	30-140%
	d3-MeFOSAA	74%	109%	50-150%
	13C2-4:2FTS	85%	96%	50-150%
	13C2-6:2FTS	160% ^c	102%	50-150%
	13C2-8:2FTS	85%	96%	50-150%

- (a) Dilution required due to matrix interference.
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

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

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Report of Analysis

Client Sample ID: DA032-03B		Date Sampled: 02/10/20
Lab Sample ID: FA72479-9		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q17226.D	10	02/21/20 08:56	NG	02/18/20 15:45	OP79002	S3Q271
Run #2	3Q17273.D	100	02/21/20 20:23	NG	02/18/20 15:45	OP79002	S3Q271

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	141	71	18	ng/l	
2706-90-3	Perfluoropentanoic acid	352	36	13	ng/l	
307-24-4	Perfluorohexanoic acid	419	36	8.9	ng/l	
375-85-9	Perfluoroheptanoic acid	154 ^b	360	89	ng/l	J
335-67-1	Perfluorooctanoic acid	432	36	8.9	ng/l	
375-95-1	Perfluorononanoic acid	ND ^b	360	89	ng/l	
335-76-2	Perfluorodecanoic acid	ND ^b	360	89	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND ^b	360	89	ng/l	
307-55-1	Perfluorododecanoic acid	ND ^b	360	130	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND ^b	360	89	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND ^b	360	89	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	222	36	8.9	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	214	36	8.9	ng/l	
355-46-4	Perfluorohexanesulfonic acid	2080	36	8.9	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	173	36	8.9	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	5380 ^b	360	130	ng/l	
68259-12-1	Perfluorononanesulfonic acid	31.1	36	8.9	ng/l	J
335-77-3	Perfluorodecanesulfonic acid	ND	36	8.9	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	273	36	8.9	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	71	36	ng/l	
2991-50-6	EtFOSAA	ND	71	36	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	71	18	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	630	71	18	ng/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

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Report of Analysis

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Client Sample ID:	DA032-03B	Date Sampled:	02/10/20
Lab Sample ID:	FA72479-9	Date Received:	02/12/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	472	71	18	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	49%	95%	30-140%
	13C5-PFPeA	51%	97%	40-140%
	13C5-PFHxA	52%	100%	50-150%
	13C4-PFHpA	48% ^c	97%	50-150%
	13C8-PFOA	52%	106%	50-150%
	13C9-PFNA	48% ^c	101%	50-150%
	13C6-PFDA	49% ^c	101%	50-150%
	13C7-PFUnDA	46% ^c	102%	50-150%
	13C2-PFDoDA	40% ^c	100%	50-150%
	13C2-PFTeDA	34% ^c	101%	40-150%
	13C3-PFBS	57%	104%	50-150%
	13C3-PFHxS	54%	107%	50-150%
	13C8-PFOS	49% ^c	103%	50-150%
	13C8-FOSA	37%	106%	30-140%
	d3-MeFOSAA	54%	114%	50-150%
	13C2-4:2FTS	55%	102%	50-150%
	13C2-6:2FTS	98%	107%	50-150%
	13C2-8:2FTS	77%	100%	50-150%

(a) Dilution required due to matrix interference (ID recovery standard failure).

(b) Result is from Run# 2

(c) Outside control limits due to matrix interference.

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

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Report of Analysis

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Client Sample ID: DA032-05		Date Sampled: 02/10/20
Lab Sample ID: FA72479-10		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q17227.D	12.1	02/21/20 09:11	NG	02/18/20 15:45	OP79002	S3Q271
Run #2	3Q17274.D	20	02/21/20 20:38	NG	02/18/20 15:45	OP79002	S3Q271

Run #	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	290 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	99.4	83	21	ng/l	
2706-90-3	Perfluoropentanoic acid	233	42	16	ng/l	
307-24-4	Perfluorohexanoic acid	278	42	10	ng/l	
375-85-9	Perfluoroheptanoic acid	153	42	10	ng/l	
335-67-1	Perfluorooctanoic acid	292	42	10	ng/l	
375-95-1	Perfluorononanoic acid	33.3	42	10	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	42	10	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	42	10	ng/l	
307-55-1	Perfluorododecanoic acid	ND ^b	69	26	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	42	10	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	42	10	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	170	42	10	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	160	42	10	ng/l	
355-46-4	Perfluorohexanesulfonic acid	1500	42	10	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	101	42	10	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	4090 ^b	69	26	ng/l	
68259-12-1	Perfluorononanesulfonic acid	35.0	42	10	ng/l	J
335-77-3	Perfluorodecanesulfonic acid	ND	42	10	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	291	42	10	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	83	42	ng/l	
2991-50-6	EtFOSAA	ND	83	42	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	83	21	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	447	83	21	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-05		Date Sampled: 02/10/20
Lab Sample ID: FA72479-10		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

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CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	397	83	21	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	86%	97%	30-140%
	13C5-PFPeA	88%	101%	40-140%
	13C5-PFHxA	89%	104%	50-150%
	13C4-PFHpA	81%	98%	50-150%
	13C8-PFOA	82%	107%	50-150%
	13C9-PFNA	64%	102%	50-150%
	13C6-PFDA	54%	104%	50-150%
	13C7-PFUnDA	53%	105%	50-150%
	13C2-PFDoDA	48% ^c	104%	50-150%
	13C2-PFTeDA	48%	104%	40-150%
	13C3-PFBS	96%	108%	50-150%
	13C3-PFHxS	88%	107%	50-150%
	13C8-PFOS	59%	105%	50-150%
	13C8-FOSA	36%	105%	30-140%
	d3-MeFOSAA	66%	126%	50-150%
	13C2-4:2FTS	99%	109%	50-150%
	13C2-6:2FTS	129%	116%	50-150%
	13C2-8:2FTS	86%	109%	50-150%

- (a) Dilution required due to matrix interference.
- (b) Result is from Run# 2
- (c) Outside control limits due to matrix interference.

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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-X		Date Sampled: 02/10/20
Lab Sample ID: FA72479-11		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q17275.D	2	02/21/20 20:52	NG	02/18/20 15:45	OP79002	S3Q271
Run #2	3Q17228.D	10	02/21/20 09:25	NG	02/18/20 15:45	OP79002	S3Q271

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	72.3	14	3.6	ng/l	
2706-90-3	Perfluoropentanoic acid	89.6	7.1	2.7	ng/l	
307-24-4	Perfluorohexanoic acid	125	7.1	1.8	ng/l	
375-85-9	Perfluoroheptanoic acid	51.0	7.1	1.8	ng/l	
335-67-1	Perfluorooctanoic acid	64.7	7.1	1.8	ng/l	
375-95-1	Perfluorononanoic acid	5.6	7.1	1.8	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	7.1	1.8	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	7.1	1.8	ng/l	
307-55-1	Perfluorododecanoic acid	ND	7.1	2.7	ng/l	
72629-94-8	Perfluorotridecanoic acid ^a	ND	7.1	1.8	ng/l	
376-06-7	Perfluorotetradecanoic acid ^a	ND	7.1	1.8	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	101	7.1	1.8	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	92.8	7.1	1.8	ng/l	
355-46-4	Perfluorohexanesulfonic acid	554	7.1	1.8	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	44.0	7.1	1.8	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	1490 ^b	36	13	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	7.1	1.8	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	7.1	1.8	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	18.8	7.1	1.8	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	14	7.1	ng/l	
2991-50-6	EtFOSAA	ND	14	7.1	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	3.6	14	3.6	ng/l	J
27619-97-2	6:2 Fluorotelomer sulfonate	84.1	14	3.6	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-X		Date Sampled: 02/10/20
Lab Sample ID: FA72479-11		Date Received: 02/12/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	39.9	14	3.6	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	71%	74%	30-140%
	13C5-PFPeA	77%	76%	40-140%
	13C5-PFHxA	75%	77%	50-150%
	13C4-PFHpA	69%	72%	50-150%
	13C8-PFOA	76%	77%	50-150%
	13C9-PFNA	70%	69%	50-150%
	13C6-PFDA	71%	55%	50-150%
	13C7-PFUnDA	67%	40% ^c	50-150%
	13C2-PFDoDA	60%	33% ^c	50-150%
	13C2-PFTeDA	35% ^d	38% ^c	40-150%
	13C3-PFBS	83%	85%	50-150%
	13C3-PFHxS	77%	83%	50-150%
	13C8-PFOS	68%	63%	50-150%
	13C8-FOSA	42%	37%	30-140%
	d3-MeFOSAA	100%	56%	50-150%
	13C2-4:2FTS	84%	83%	50-150%
	13C2-6:2FTS	97%	90%	50-150%
	13C2-8:2FTS	89%	61%	50-150%

- (a) Associated ID Standard outside control limits, Confirmed by batch QC.
- (b) Result is from Run# 2
- (c) Outside control limits due to matrix interference.
- (d) Outside control limits due to matrix interference. Confirmed by MS/MSD.

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

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SGS North America Inc.

Report of Analysis

Client Sample ID: FIELD BLANK A	Date Sampled: 02/10/20
Lab Sample ID: FA72479-12	Date Received: 02/12/20
Matrix: AQ - Water	Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD	
Project: MSNPF	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q17230.D	1	02/21/20 09:55	NG	02/18/20 15:45	OP79002	S3Q271
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	7.1	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	ND	3.6	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	ND	3.6	0.89	ng/l	
375-85-9	Perfluoroheptanoic acid	ND	3.6	0.89	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.6	0.89	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.6	0.89	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.6	0.89	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.6	0.89	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.6	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.6	0.89	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.6	0.89	ng/l	

PERFLUOROALKYL SULFONATES

375-73-5	Perfluorobutanesulfonic acid	ND	3.6	0.89	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	3.6	0.89	ng/l	
355-46-4	Perfluorohexanesulfonic acid	ND	3.6	0.89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.6	0.89	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	3.6	1.3	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.6	0.89	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.6	0.89	ng/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	3.6	0.89	ng/l	
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PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	7.1	3.6	ng/l	
2991-50-6	EtFOSAA	ND	7.1	3.6	ng/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/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

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SGS North America Inc.

Report of Analysis

Client Sample ID: FIELD BLANK A Lab Sample ID: FA72479-12 Matrix: AQ - Water Method: EPA 537M BY ID EPA 537 MOD Project: MSNPF	Date Sampled: 02/10/20 Date Received: 02/12/20 Percent Solids: n/a
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CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	80%		30-140%
	13C5-PFPeA	80%		40-140%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	79%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	78%		50-150%
	13C6-PFDA	69%		50-150%
	13C7-PFUnDA	65%		50-150%
	13C2-PFDoDA	61%		50-150%
	13C2-PFTeDA	45%		40-150%
	13C3-PFBS	86%		50-150%
	13C3-PFHxS	84%		50-150%
	13C8-PFOS	70%		50-150%
	13C8-FOSA	74%		30-140%
	d3-MeFOSAA	72%		50-150%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	68%		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

SGS North America Inc.

Report of Analysis

Page 1 of 2

Client Sample ID: DUPLICATE A		
Lab Sample ID: FA72479-13		Date Sampled: 02/10/20
Matrix: AQ - Water		Date Received: 02/12/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44487.D	1	02/25/20 18:31	NAF	02/24/20 12:15	OP79088	S2Q671
Run #2	2Q44488.D	10	02/25/20 18:46	NAF	02/24/20 12:15	OP79088	S2Q671
Run #3 ^a	3Q17277.D	1	02/21/20 21:22	NG	02/18/20 15:45	OP79002	S3Q271

Run #	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	290 ml	1.0 ml
Run #3	280 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	19.5	6.9	1.7	ng/l	
2706-90-3	Perfluoropentanoic acid	35.2	3.4	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	37.1	3.4	0.86	ng/l	
375-85-9	Perfluoroheptanoic acid	20.2	3.4	0.86	ng/l	
335-67-1	Perfluorooctanoic acid	29.4	3.4	0.86	ng/l	
375-95-1	Perfluorononanoic acid	2.4	3.4	0.86	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	3.4	0.86	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.4	0.86	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.4	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid ^b	ND	3.4	0.86	ng/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND	3.4	0.86	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	15.8	3.4	0.86	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	21.0	3.4	0.86	ng/l	
355-46-4	Perfluorohexanesulfonic acid	151	3.4	0.86	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	10.5	3.4	0.86	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	361 ^c	34	13	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.4	0.86	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.4	0.86	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.4	0.86	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	6.9	3.4	ng/l	
2991-50-6	EtFOSAA	ND	6.9	3.4	ng/l	
FLUOROTELOMER SULFONATES						

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

SGS North America Inc.

Report of Analysis

Client Sample ID: DUPLICATE A	Date Sampled: 02/10/20
Lab Sample ID: FA72479-13	Date Received: 02/12/20
Matrix: AQ - Water	Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD	
Project: MSNPF	

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CAS No.	Compound	Result	RL	MDL	Units	Q
757124-72-4	4:2 Fluorotelomer sulfonate	ND	6.9	1.7	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	48.5	6.9	1.7	ng/l	
39108-34-4	8:2 Fluorotelomer sulfonate	11.4	6.9	1.7	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Run# 3	Limits
	13C4-PFBA	74%	89%	62%	30-140%
	13C5-PFPeA	80%	92%	74%	40-140%
	13C5-PFHxA	79%	89%	73%	50-150%
	13C4-PFHpA	77%	88%	69%	50-150%
	13C8-PFOA	80%	89%	75%	50-150%
	13C9-PFNA	85%	88%	72%	50-150%
	13C6-PFDA	71%	72%	76%	50-150%
	13C7-PFUnDA	59%	62%	71%	50-150%
	13C2-PFDoDA	50%	50%	65%	50-150%
	13C2-PFTeDA	32% ^d	38% ^d	36% ^d	40-150%
	13C3-PFBS	78%	88%	83%	50-150%
	13C3-PFHxS	73%	87%	76%	50-150%
	13C8-PFOS	62%	72%	72%	50-150%
	13C8-FOSA	61%	73%	56%	30-140%
	d3-MeFOSAA	66%	90%	96%	50-150%
	13C2-4:2FTS	84%	89%	84%	50-150%
	13C2-6:2FTS	91%	102%	94%	50-150%
	13C2-8:2FTS	74%	72%	90%	50-150%

- (a) Confirmation run.
- (b) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
- (c) Result is from Run# 2
- (d) Outside control limits due to matrix interference.

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

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

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
EtFOSAA	2991-50-6	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



SGS North America Inc - Orlando
Chain of Custody

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FA72479
SGS - ORLANDO JOB #: PAGE 1 OF 2

Client / Reporting Information		Project Information		Analytical Information										Matrix Codes	
Company Name: LIMNOTECH		Project Name:												DW - Drinking Water	
Address: 501 AVIS DRIVE		Street:												GW - Ground Water	
City: ANN ARBOR State: MI Zip: 48106		City:												Water	
Project Contact: Chris CIEGEL Email: CCIEGEL@LIMNO.COM		Project # MSNPF1												WW - Water	
Phone #: 734 332 1200		Fax #:												SW - Surface Water	
Sampler(s) Name(s) (Printed)		Client Purchase Order #												SO - Soil	
Sampler 1: BEANKE Sampler 2:														SL - Sludge	
SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION		CONTAINER INFORMATION										LAB USE ONLY	
		DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	MINE	HCl	NaOH	HNO3	H2SO4	NaOH/Na2K		DI WATER
1	001	2/10/20	0830	LT1	WW	2		X							X
2	DA001-01	2/10/20	0900	LT1	WW	2		X							X
3	DA002-03	2/10/20	1000	LT1	WW	2		X							X
4	DA032-15	2/10/20	1015	LT1	WW	2		X							X
5	OUTFALL 32	2/10/20	1135	LT1	WW	2		X							X
6	DA032-08	2/10/20	1250	LT1	WW	2		X							X
7	DA032-10 ALT	2/10/20	1335	LT1	WW	2		X							X
8	DA032-03 A	2/10/20	1430	LT1	WW	2		X							X
9	DA032-03 B	2/10/20	1435	LT1	WW	2		X							X
10	DA032-05	2/10/20	1540	LT1	WW	2		X							X
11	DA032-X	2/10/20	1630	LT1	WW	2		X							X
12	FIELD BLANK A	2/10/20	1715	LT1	WW	2		X							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 type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC) <input type="checkbox"/> REDT1 (EPA LEVEL 3) <input type="checkbox"/> FULLT1 (EPA LEVEL 4) <input type="checkbox"/> EDD'S											
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 Chris CIEGEL / LIMNOTECH	Date Time: 2/11/20-1710	Received By/Affiliation [Signature]	Date Time: 2	Relinquished By/Affiliation [Signature]	Date Time: 3	Received By/Affiliation [Signature]	Date Time: 4	Relinquished By/Affiliation [Signature]	Date Time: 5	Received By/Affiliation [Signature]	Date Time: 6	Relinquished By/Affiliation [Signature]	Date Time: 7	Received By/Affiliation [Signature]	Date Time: 8
Lab Use Only: Cooler Temperature (s) Celsius (corrected):		http://www.sgs.com/en/terms-and-conditions													

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ORLD-SMT-0001-03-FORM-COC (1) Rev 031318





SGS North America Inc - Orlando
Chain of Custody

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SGS - ORLANDO JOB #:

FA72479

PAGE 2 OF 2

Client / Reporting Information		Project Information		Analytical Information		Matrix Codes																	
Company Name: LIMNOTECH		Project Name:				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: 501 AVIS DRIVE		Street:																					
City: ANN ARBOR State: MI Zip: 48108		City:		State:																			
Project Contact: Chris Ceciek Email: cceciek@limnotech.com		Project #:																					
Phone #: 734 332 1200		Fax #:																					
Sampler(s) Name(s) (Printed)		Client Purchase Order #:																					
Sampler 1: BEHNKE Sampler 2:																							
SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION		CONTAINER INFORMATION								LAB USE ONLY											
		DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	WINE	HCI	NOCH	INDS		HBSO4	NOCH-ZNR	SWATER	MECH							
13	DUPLICATE A	2/10/20		CTI	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 type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC) <input type="checkbox"/> REDT1 (EPA LEVEL 3) <input type="checkbox"/> FULLT1 (EPA LEVEL 4) <input type="checkbox"/> EDD'S																			
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		Date Time:		Received By/Affiliation		Relinquished By/Affiliation		Date Time:		Received By/Affiliation		Relinquished By/Affiliation		Date Time:		Received By/Affiliation		Relinquished By/Affiliation		Date Time:		Received By/Affiliation	
Chris Ceciek/LIMNOTECH		2/11/20 1710		FV		A		2/10/20 1710		JMY/M		A		2/10/20 1710		JMY/M		A		2/10/20 1710		JMY/M	
5				6		7				8													
Lab Use Only : Cooler Temperature (s) Celsius (corrected):																						http://www.sgs.com/en/terms-and-conditions	

ORLD-SMT-0001-03-FORM-COC (1) Rev 031318

FA72479: Chain of Custody

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SGS Sample Receipt Summary

Job Number: FA72479

Client: LIMNOTECH

Project: MSNPF1

Date / Time Received: 2/12/2020 9:00:00 AM

Delivery Method: FED EX

Airbill #'s: 0221138665960147

Therm ID: IR 1;

Therm CF: -0.8;

of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.4);

Cooler Temps (Corrected) °C: Cooler 1: (1.6);

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 _____
 Test Strip Lot #: pH 0-3 230315
 Residual Chlorine Test Strip Lot #: _____

Number of 5035 Field Kits: _____
 pH 10-12 219813A

Number of Lab Filtered Metals: _____
 Other: (Specify) _____

Comments

SM001
 Rev. Date 05/24/17

Technician: TRINITYM

Date: 2/12/2020 9:00:00 AM

Reviewer: _____

Date: _____

FA72479: Chain of Custody

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MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79002-MB	3Q17215.D	1	02/21/20	NG	02/18/20	OP79002	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.016	0.0040	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.0030	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0080	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0080	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0080	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0080	0.0030	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0020	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0080	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0080	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0080	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0080	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0080	0.0030	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0080	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0080	0.0020	ug/l	
754-91-6	PFOSA	ND	0.0080	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	ND	0.016	0.0080	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	70% 30-140%
	13C5-PFPeA	70% 40-140%
	13C5-PFHxA	72% 50-150%
	13C4-PFHpA	70% 50-150%
	13C8-PFOA	76% 50-150%
	13C9-PFNA	73% 50-150%
	13C6-PFDA	70% 50-150%
	13C7-PFUnDA	66% 50-150%

Method Blank Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79002-MB	3Q17215.D	1	02/21/20	NG	02/18/20	OP79002	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	62% 50-150%
	13C2-PFTeDA	56% 40-150%
	13C3-PFBS	76% 50-150%
	13C3-PFHxS	76% 50-150%
	13C8-PFOS	74% 50-150%
	13C8-FOSA	71% 30-140%
	d3-MeFOSAA	72% 50-150%
	13C2-4:2FTS	73% 50-150%
	13C2-6:2FTS	76% 50-150%
	13C2-8:2FTS	69% 50-150%

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Method Blank Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79088-MB	2Q44473.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-7, FA72479-13

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	0.0015	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	0.0015	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	0.0015	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	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	85% 30-140%
	13C5-PFPeA	86% 40-140%
	13C5-PFHxA	85% 50-150%
	13C4-PFHpA	86% 50-150%
	13C8-PFOA	85% 50-150%
	13C9-PFNA	84% 50-150%
	13C6-PFDA	80% 50-150%
	13C7-PFUnDA	77% 50-150%

Method Blank Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79088-MB	2Q44473.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-7, FA72479-13

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	68% 50-150%
	13C2-PFTeDA	61% 40-150%
	13C3-PFBS	83% 50-150%
	13C3-PFHxS	83% 50-150%
	13C8-PFOS	77% 50-150%
	13C8-FOSA	88% 30-140%
	d3-MeFOSAA	72% 50-150%
	13C2-4:2FTS	84% 50-150%
	13C2-6:2FTS	83% 50-150%
	13C2-8:2FTS	73% 50-150%

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6

Instrument Blank

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q271-IBLK	3Q17149.D	1	02/20/20	NG	n/a	n/a	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.016	0.0040	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.0030	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0080	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0080	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0080	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0080	0.0030	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0020	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0080	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0080	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0080	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0080	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0080	0.0030	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0080	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0080	0.0020	ug/l	
754-91-6	PFOSA	ND	0.0080	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.040	0.0080	ug/l	
2991-50-6	EtFOSAA	ND	0.040	0.0080	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.016	0.0040	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	96% 50-150%
	13C5-PFPeA	96% 50-150%
	13C5-PFHxA	98% 50-150%
	13C4-PFHpA	97% 50-150%
	13C8-PFOA	101% 50-150%
	13C9-PFNA	100% 50-150%
	13C6-PFDA	100% 50-150%
	13C7-PFUnDA	100% 50-150%

Instrument Blank

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q271-IBLK	3Q17149.D	1	02/20/20	NG	n/a	n/a	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	98% 50-150%
	13C2-PFTeDA	98% 50-150%
	13C3-PFBS	98% 50-150%
	13C3-PFHxS	100% 50-150%
	13C8-PFOS	101% 50-150%
	13C8-FOSA	105% 50-150%
	d3-MeFOSAA	100% 50-150%
	13C2-4:2FTS	94% 50-150%
	13C2-6:2FTS	96% 50-150%
	13C2-8:2FTS	95% 50-150%

Instrument Blank

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q671-IBLK	2Q44453.D	1	02/25/20	NAF	n/a	n/a	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72479-7, FA72479-13

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	0.0015	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	0.0015	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	0.0015	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	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	95% 50-150%
	13C5-PFPeA	97% 50-150%
	13C5-PFHxA	95% 50-150%
	13C4-PFHpA	94% 50-150%
	13C8-PFOA	94% 50-150%
	13C9-PFNA	93% 50-150%
	13C6-PFDA	93% 50-150%
	13C7-PFUnDA	99% 50-150%

Instrument Blank

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q671-IBLK	2Q44453.D	1	02/25/20	NAF	n/a	n/a	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72479-7, FA72479-13

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	95% 50-150%
	13C2-PFTeDA	89% 50-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	94% 50-150%
	13C8-PFOS	91% 50-150%
	13C8-FOSA	103% 50-150%
	d3-MeFOSAA	90% 50-150%
	13C2-4:2FTS	93% 50-150%
	13C2-6:2FTS	93% 50-150%
	13C2-8:2FTS	89% 50-150%
	13C3-HFPO-DA	102% 50-150%

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Blank Spike Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79002-BS	3Q17214.D	1	02/21/20	NG	02/18/20	OP79002	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.16	0.191	119	70-130
2706-90-3	Perfluoropentanoic acid	0.16	0.164	103	70-130
307-24-4	Perfluorohexanoic acid	0.16	0.169	106	70-130
375-85-9	Perfluoroheptanoic acid	0.16	0.176	110	71-130
335-67-1	Perfluorooctanoic acid	0.16	0.179	112	74-130
375-95-1	Perfluorononanoic acid	0.16	0.170	106	76-130
335-76-2	Perfluorodecanoic acid	0.16	0.172	108	70-130
2058-94-8	Perfluoroundecanoic acid	0.16	0.175	109	70-130
307-55-1	Perfluorododecanoic acid	0.16	0.175	109	70-130
72629-94-8	Perfluorotridecanoic acid	0.16	0.185	116	70-139
376-06-7	Perfluorotetradecanoic acid	0.16	0.163	102	70-130
375-73-5	Perfluorobutanesulfonic acid	0.16	0.173	108	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.16	0.163	102	70-130
355-46-4	Perfluorohexanesulfonic acid	0.16	0.179	112	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.16	0.183	114	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.16	0.170	106	70-130
68259-12-1	Perfluorononanesulfonic acid	0.16	0.157	98	70-130
335-77-3	Perfluorodecanesulfonic acid	0.16	0.168	105	70-130
754-91-6	PFOSA	0.16	0.175	109	70-131
2355-31-9	MeFOSAA	0.16	0.171	107	70-130
2991-50-6	EtFOSAA	0.16	0.168	105	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.16	0.173	108	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.16	0.172	108	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.16	0.169	106	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	77%	30-140%
	13C5-PFPeA	77%	40-140%
	13C5-PFHxA	79%	50-150%
	13C4-PFHpA	76%	50-150%
	13C8-PFOA	82%	50-150%
	13C9-PFNA	79%	50-150%
	13C6-PFDA	77%	50-150%
	13C7-PFUnDA	73%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79002-BS	3Q17214.D	1	02/21/20	NG	02/18/20	OP79002	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	69%	50-150%
	13C2-PFTeDA	63%	40-150%
	13C3-PFBS	84%	50-150%
	13C3-PFHxS	84%	50-150%
	13C8-PFOS	81%	50-150%
	13C8-FOSA	74%	30-140%
	d3-MeFOSAA	80%	50-150%
	13C2-4:2FTS	84%	50-150%
	13C2-6:2FTS	86%	50-150%
	13C2-8:2FTS	81%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79088-BS	2Q44472.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-7, FA72479-13

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0735	92	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0714	89	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0744	93	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0758	95	71-130
335-67-1	Perfluorooctanoic acid	0.08	0.0755	94	74-130
375-95-1	Perfluorononanoic acid	0.08	0.0770	96	76-130
335-76-2	Perfluorodecanoic acid	0.08	0.0746	93	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0720	90	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0750	94	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0775	97	70-139
376-06-7	Perfluorotetradecanoic acid	0.08	0.0732	92	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0753	94	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0782	98	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0753	94	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0769	96	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0762	95	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0762	95	70-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0742	93	70-130
754-91-6	PFOSA	0.08	0.0763	95	70-131
2355-31-9	MeFOSAA	0.08	0.0755	94	70-130
2991-50-6	EtFOSAA	0.08	0.0729	91	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0783	98	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0784	98	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0777	97	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	93%	30-140%
	13C5-PFPeA	95%	40-140%
	13C5-PFHxA	93%	50-150%
	13C4-PFHpA	94%	50-150%
	13C8-PFOA	92%	50-150%
	13C9-PFNA	91%	50-150%
	13C6-PFDA	89%	50-150%
	13C7-PFUnDA	92%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79088-BS	2Q44472.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-7, FA72479-13

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	84%	50-150%
	13C2-PFTeDA	76%	40-150%
	13C3-PFBS	92%	50-150%
	13C3-PFHxS	91%	50-150%
	13C8-PFOS	87%	50-150%
	13C8-FOSA	90%	30-140%
	d3-MeFOSAA	85%	50-150%
	13C2-4:2FTS	97%	50-150%
	13C2-6:2FTS	94%	50-150%
	13C2-8:2FTS	89%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79002-MS	3Q17229.D	10	02/21/20	NG	02/18/20	OP79002	S3Q271
FA72479-11	3Q17275.D	2	02/21/20	NG	02/18/20	OP79002	S3Q271
FA72479-11	3Q17228.D	10	02/21/20	NG	02/18/20	OP79002	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	Compound	FA72479-11 ug/l	Spike Q	MS ug/l	MS %	Limits	
375-22-4	Perfluorobutanoic acid	0.0723		0.0741	0.167	128	70-130
2706-90-3	Perfluoropentanoic acid	0.0896		0.0741	0.185	129	70-130
307-24-4	Perfluorohexanoic acid	0.125		0.0741	0.236	150*	70-130
375-85-9	Perfluoroheptanoic acid	0.0510		0.0741	0.140	120	71-130
335-67-1	Perfluorooctanoic acid	0.0647		0.0741	0.160	129	74-130
375-95-1	Perfluorononanoic acid	0.0056	J	0.0741	0.0884	112	76-130
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0798	108	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0792	107	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0785	106	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.0807	109	70-139
376-06-7	Perfluorotetradecanoic acid	ND		0.0741	0.0731	99	70-130
375-73-5	Perfluorobutanesulfonic acid	0.101		0.0741	0.192	123	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.0928		0.0741	0.178	115	70-130
355-46-4	Perfluorohexanesulfonic acid	0.554		0.0741	0.777	301* a	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.0440		0.0741	0.131	117	74-130
1763-23-1	Perfluorooctanesulfonic acid	1.49 ^b		0.0741	2.07	783* a	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0619	84	70-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0681	92	70-130
754-91-6	PFOSA	0.0188		0.0741	0.105	116	70-131
2355-31-9	MeFOSAA	ND		0.0741	0.0756	102	70-130
2991-50-6	EtFOSAA	ND		0.0741	0.0737	99	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.0036	J	0.0741	0.0815	105	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0841		0.0741	0.190	143*	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.0399		0.0741	0.133	126	70-130

CAS No.	ID Standard Recoveries	MS	FA72479-11	FA72479-11	Limits
	13C4-PFBA	70%	71%	74%	30-140%
	13C5-PFPeA	72%	77%	76%	40-140%
	13C5-PFHxA	72%	75%	77%	50-150%
	13C4-PFHpA	70%	69%	72%	50-150%
	13C8-PFOA	75%	76%	77%	50-150%
	13C9-PFNA	69%	70%	69%	50-150%
	13C6-PFDA	67%	71%	55%	50-150%
	13C7-PFUnDA	59%	67%	40%* c	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79002-MS	3Q17229.D	10	02/21/20	NG	02/18/20	OP79002	S3Q271
FA72479-11	3Q17275.D	2	02/21/20	NG	02/18/20	OP79002	S3Q271
FA72479-11	3Q17228.D	10	02/21/20	NG	02/18/20	OP79002	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	ID Standard Recoveries	MS	FA72479-11	FA72479-11	Limits
	13C2-PFDoDA	47% * c	60%	33% * c	50-150%
	13C2-PFTeDA	39% * c	35% * d	38% * c	40-150%
	13C3-PFBS	78%	83%	85%	50-150%
	13C3-PFHxS	75%	77%	83%	50-150%
	13C8-PFOS	70%	68%	63%	50-150%
	13C8-FOSA	52%	42%	37%	30-140%
	d3-MeFOSAA	73%	100%	56%	50-150%
	13C2-4:2FTS	82%	84%	83%	50-150%
	13C2-6:2FTS	89%	97%	90%	50-150%
	13C2-8:2FTS	81%	89%	61%	50-150%

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Result is from Run #2.

(c) Outside control limits due to matrix interference.

(d) Outside control limits due to matrix interference. Confirmed by MS/MSD.

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79088-MS	2Q44490.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671
FA72756-1	2Q44489.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-7, FA72479-13

CAS No.	Compound	FA72756-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0041	I	0.16	0.131	79	70-130
2706-90-3	Perfluoropentanoic acid	0.0067	I	0.16	0.130	77	70-130
307-24-4	Perfluorohexanoic acid	0.0062	I	0.16	0.134	80	70-130
375-85-9	Perfluoroheptanoic acid	0.0024	I	0.16	0.131	80	71-130
335-67-1	Perfluorooctanoic acid	0.0030	I	0.16	0.133	81	74-130
375-95-1	Perfluorononanoic acid	0.0080	U	0.16	0.131	82	76-130
335-76-2	Perfluorodecanoic acid	0.0080	U	0.16	0.130	81	70-130
2058-94-8	Perfluoroundecanoic acid	0.0080	U	0.16	0.122	76	70-130
307-55-1	Perfluorododecanoic acid	0.0080	U	0.16	0.129	81	70-130
72629-94-8	Perfluorotridecanoic acid	0.0080	U	0.16	0.200	125	70-139
376-06-7	Perfluorotetradecanoic acid	0.0080	U	0.16	0.131	82	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0080	U	0.16	0.134	84	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.0080	U	0.16	0.133	83	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0080	U	0.16	0.130	81	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.0080	U	0.16	0.144	90	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.0080	U	0.16	0.128	80	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0080	U	0.16	0.123	77	70-130
335-77-3	Perfluorodecanesulfonic acid	0.0080	U	0.16	0.107	67*	70-130
754-91-6	PFOSA	0.0080	U	0.16	0.131	82	70-131
2355-31-9	MeFOSAA	0.016	U	0.16	0.129	81	70-130
2991-50-6	EtFOSAA	0.016	U	0.16	0.119	74	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.016	U	0.16	0.136	85	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.016	U	0.16	0.138	86	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.016	U	0.16	0.136	85	70-130

CAS No.	ID Standard Recoveries	MS	FA72756-1	Limits
	13C4-PFBA	76%		30-140%
	13C5-PFPeA	82%		40-140%
	13C5-PFHxA	83%		50-150%
	13C4-PFHpA	83%	80%	50-150%
	13C8-PFOA	86%	83%	50-150%
	13C9-PFNA	90%	83%	50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	79%		50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79088-MS	2Q44490.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671
FA72756-1	2Q44489.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-7, FA72479-13

CAS No.	ID Standard Recoveries	MS	FA72756-1	Limits
	13C2-PFDoDA	63%		50-150%
	13C2-PFTeDA	31% * a		40-150%
	13C3-PFBS	80%	77%	50-150%
	13C3-PFHxS	79%	73%	50-150%
	13C8-PFOS	81%	70%	50-150%
	13C8-FOSA	63%		30-140%
	d3-MeFOSAA	75%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	93%		50-150%
	13C2-8:2FTS	82%		50-150%

(a) Outside control limits.

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79002-DUP	3Q17231.D	1	02/21/20	NG	02/18/20	OP79002	S3Q271
FA72479-12	3Q17230.D	1	02/21/20	NG	02/18/20	OP79002	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	Compound	FA72479-12 DUP		Q	RPD	Limits
		ug/l	Q ug/l			
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	EtFOSAA	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

CAS No.	ID Standard Recoveries	DUP	FA72479-12	Limits
	13C4-PFBA	78%	80%	30-140%
	13C5-PFPeA	78%	80%	40-140%
	13C5-PFHxA	80%	82%	50-150%
	13C4-PFHpA	76%	79%	50-150%
	13C8-PFOA	80%	85%	50-150%
	13C9-PFNA	75%	78%	50-150%
	13C6-PFDA	68%	69%	50-150%
	13C7-PFUnDA	65%	65%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79002-DUP	3Q17231.D	1	02/21/20	NG	02/18/20	OP79002	S3Q271
FA72479-12	3Q17230.D	1	02/21/20	NG	02/18/20	OP79002	S3Q271

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-1, FA72479-2, FA72479-3, FA72479-4, FA72479-5, FA72479-6, FA72479-8, FA72479-9, FA72479-10, FA72479-11, FA72479-12

CAS No.	ID Standard Recoveries	DUP	FA72479-12	Limits
	13C2-PFDoDA	59%	61%	50-150%
	13C2-PFTeDA	42%	45%	40-150%
	13C3-PFBS	84%	86%	50-150%
	13C3-PFHxS	78%	84%	50-150%
	13C8-PFOS	70%	70%	50-150%
	13C8-FOSA	72%	74%	30-140%
	d3-MeFOSAA	72%	72%	50-150%
	13C2-4:2FTS	82%	84%	50-150%
	13C2-6:2FTS	82%	86%	50-150%
	13C2-8:2FTS	68%	68%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79088-DUP	2Q44492.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671
FA72756-2	2Q44491.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-7, FA72479-13

CAS No.	Compound	FA72756-2		Q	RPD	Limits
		ug/l	DUP ug/l			
375-22-4	Perfluorobutanoic acid	0.0046	I 0.0041	J	11	30
2706-90-3	Perfluoropentanoic acid	0.0081	0.0078	J	4	30
307-24-4	Perfluorohexanoic acid	0.0089	0.0089		0	30
375-85-9	Perfluoroheptanoic acid	0.0063	I 0.0059	J	7	30
335-67-1	Perfluorooctanoic acid	0.0125	0.0114		9	30
375-95-1	Perfluorononanoic acid	0.0022	I 0.0022	J	0	30
335-76-2	Perfluorodecanoic acid	0.0080	U ND		nc	30
2058-94-8	Perfluoroundecanoic acid	0.0080	U ND		nc	30
307-55-1	Perfluorododecanoic acid	0.0080	U ND		nc	30
72629-94-8	Perfluorotridecanoic acid	0.0080	U ND		nc	30
376-06-7	Perfluorotetradecanoic acid	0.0080	U ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.0079	I 0.0059	J	29	30
2706-91-4	Perfluoropentanesulfonic acid	0.0028	I 0.0033	J	16	30
355-46-4	Perfluorohexanesulfonic acid	0.0264	0.0245		7	30
375-92-8	Perfluoroheptanesulfonic acid	0.0030	I 0.0027	J	11	30
1763-23-1	Perfluorooctanesulfonic acid	0.101	0.0933		8	30
68259-12-1	Perfluorononanesulfonic acid	0.0080	U ND		nc	30
335-77-3	Perfluorodecanesulfonic acid	0.0080	U ND		nc	30
754-91-6	PFOSA	0.0080	U ND		nc	30
2355-31-9	MeFOSAA	0.016	U ND		nc	30
2991-50-6	EtFOSAA	0.016	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

CAS No.	ID Standard Recoveries	DUP	FA72756-2	Limits
	13C4-PFBA	78%		30-140%
	13C5-PFPeA	85%		40-140%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	86%	75%	50-150%
	13C8-PFOA	90%	80%	50-150%
	13C9-PFNA	94%	83%	50-150%
	13C6-PFDA	84%		50-150%
	13C7-PFUnDA	78%		50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72479
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79088-DUP	2Q44492.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671
FA72756-2	2Q44491.D	1	02/25/20	NAF	02/24/20	OP79088	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72479-7, FA72479-13

CAS No.	ID Standard Recoveries	DUP	FA72756-2	Limits
	13C2-PFDoDA	56%		50-150%
	13C2-PFTeDA	15% * a		40-150%
	13C3-PFBS	82%	72%	50-150%
	13C3-PFHxS	81%	70%	50-150%
	13C8-PFOS	79%	72%	50-150%
	13C8-FOSA	56%		30-140%
	d3-MeFOSAA	78%		50-150%
	13C2-4:2FTS	90%		50-150%
	13C2-6:2FTS	95%		50-150%
	13C2-8:2FTS	82%		50-150%

(a) Outside control limits.

* = Outside of Control Limits.



Orlando, FL

03/06/20

e-Hardcopy 2.0
Automated Report

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

Technical Report for

LimnoTech

MSNPF

SGS Job Number: FA72530

Sampling Date: 02/11/20



Report to:

andrea.colby@sgs.com

Total number of pages in report: **61**



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.

Caitlin Brice, M.S.
General Manager

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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Test results relate only to samples analyzed.



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SGS North America Inc.

Sample Summary

LimnoTech

Job No: FA72530

MSNPF

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
---------------	----------------	---------	-----------------	-----------	------------------

This report contains results reported as ND = Not detected. The following applies:

Organics ND = Not detected above the MDL

FA72530-1	02/11/20	08:20	CB	02/13/20	AQ	Water	DA032-09A
FA72530-2	02/11/20	08:30	CB	02/13/20	AQ	Water	DA032-09
FA72530-3	02/11/20	08:50	CB	02/13/20	AQ	Water	DA032-14
FA72530-4	02/11/20	09:50	CB	02/13/20	AQ	Water	DA032-12A
FA72530-5	02/11/20	10:15	CB	02/13/20	AQ	Water	DA032-12B
FA72530-6	02/11/20	10:55	CB	02/13/20	AQ	Water	DA032-13
FA72530-7	02/11/20	11:15	CB	02/13/20	AQ	Water	DA021-03 ALT
FA72530-8	02/11/20	11:55	CB	02/13/20	AQ	Water	DA021-04 ALT
FA72530-9	02/11/20	14:00	CB	02/13/20	AQ	Water	OUTFALL 21
FA72530-10	02/11/20	15:00	CB	02/13/20	AQ	Water	DA021-06 ALT
FA72530-11	02/11/20	15:55	CB	02/13/20	AQ	Water	OUTFALL 22
FA72530-12	02/11/20	16:20	CB	02/13/20	AQ	Water	OUTFALL 35 ALT

SGS North America Inc.



Sample Summary

(continued)

LimnoTech

Job No: FA72530

MSNPF

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
FA72530-13	02/11/20	00:00 CB	02/13/20	AQ	Water	DUPLICATE B
FA72530-14	02/11/20	18:50 CB	02/13/20	AQ	Field Blank Water	FIELD BLANK B
FA72530-15	02/11/20	19:00 CB	02/13/20	AQ	Equipment Blank	EQUIPMENT BLANK A

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: LimnoTech

Job No: FA72530

Site: MSNPF

Report Date 2/24/2020 6:21:16 PM

14 Samples and 1 Field Blank were collected on 02/11/2020 and were received at SGS North America Inc - Orlando on 02/13/2020 properly preserved, at 1.7 Deg. C and intact. These Samples received an SGS Orlando job number of FA72530. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

MS Semi-volatiles By Method EPA 537M BY ID

Matrix: AQ

Batch ID: OP79025

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA72530-4MS, FA72530-9DUP were used as the QC samples indicated.

RPD(s) for Duplicate for 4:2 Fluorotelomer sulfonate, Perfluorononanesulfonic acid, Perfluorononanoic acid, PFOSA are outside control limits for sample OP79025-DUP. Probable cause is due to sample non-homogeneity.

Sample(s) FA72530-1, FA72530-10, FA72530-13, FA72530-2, FA72530-5, FA72530-8, FA72530-9 have surrogates outside control limits.

FA72530-1 for 13C2-PFDoDA: Outside control limits.

FA72530-1 for 13C2-PFTeDA: Outside control limits.

FA72530-1 for 13C7-PFUnDA: Outside control limits.

FA72530-2 for 13C2-PFTeDA: Outside control limits.

FA72530-5 for 13C8-FOSA: Outside control limits due to matrix interference.

FA72530-5: Dilution required due to matrix interference.

FA72530-6: Dilution required due to matrix interference.

FA72530-7: Dilution required due to matrix interference.

FA72530-8 for 13C2-PFTeDA: Outside control limits due to matrix interference.

FA72530-8 for Perfluorotetradecanoic acid: Associated ID Standard outside control limits, Confirmed by re-analysis.

FA72530-8: Dilution required due to matrix interference.

FA72530-9 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA72530-9: Dilution required due to matrix interference.

FA72530-10 for 13C8-FOSA: Outside control limits due to matrix interference.

FA72530-10: Dilution required due to matrix interference.

FA72530-13 for 13C2-6:2FTS: Outside control limits due to matrix interference.

FA72530-13: Dilution required due to matrix interference.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Ariel Hartney, Client Services (*Signature on File*)

Summary of Hits

Job Number: FA72530
Account: LimnoTech
Project: MSNPF
Collected: 02/11/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA72530-1	DA032-09A					
Perfluorobutanoic acid		18.0	8.7	2.2	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		31.1	4.4	1.6	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		33.0	4.4	1.1	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		23.4	4.4	1.1	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		41.7	4.4	1.1	ng/l	EPA 537M BY ID
Perfluorononanoic acid		4.8	4.4	1.1	ng/l	EPA 537M BY ID
Perfluorodecanoic acid		1.5 J	4.4	1.1	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		8.6	4.4	1.1	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		11.9	4.4	1.1	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		142	4.4	1.1	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		10.9	4.4	1.1	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		500	44	16	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		56.8	8.7	2.2	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		10.9	8.7	2.2	ng/l	EPA 537M BY ID
FA72530-2	DA032-09					
Perfluorobutanoic acid		34.4	17	4.2	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		68.6	8.3	3.1	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		72.5	8.3	2.1	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		50.2	8.3	2.1	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		83.0	8.3	2.1	ng/l	EPA 537M BY ID
Perfluorononanoic acid		9.3	8.3	2.1	ng/l	EPA 537M BY ID
Perfluorodecanoic acid		3.0 J	8.3	2.1	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		18.4	8.3	2.1	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		25.4	8.3	2.1	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		297	8.3	2.1	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		25.2	8.3	2.1	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		1020	42	16	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		141	17	4.2	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		25.2	17	4.2	ng/l	EPA 537M BY ID
FA72530-3	DA032-14					
Perfluorobutanoic acid		20.8	6.7	1.7	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		27.1	3.3	1.2	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		30.1	3.3	0.83	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		15.2	3.3	0.83	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		31.6	3.3	0.83	ng/l	EPA 537M BY ID
Perfluorononanoic acid		3.6	3.3	0.83	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		18.4	3.3	0.83	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		21.8	3.3	0.83	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		185	3.3	0.83	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72530
Account: LimnoTech
Project: MSNPF
Collected: 02/11/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoroheptanesulfonic acid		9.5	3.3	0.83	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		263	3.3	1.2	ng/l	EPA 537M BY ID
PFOSA		2.4 J	3.3	0.83	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		23.6	6.7	1.7	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		21.9	6.7	1.7	ng/l	EPA 537M BY ID

FA72530-4 DA032-12A

Perfluorobutanoic acid		17.5	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		9.7	3.6	1.3	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		9.7	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		3.8	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		8.4	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorodecanoic acid		4.3	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroundecanoic acid		3.6	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		3.7	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		3.4 J	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		29.1	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		96.9	3.6	1.3	ng/l	EPA 537M BY ID
PFOSA		9.0	3.6	0.89	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		4.0 J	7.1	1.8	ng/l	EPA 537M BY ID

FA72530-5 DA032-12B

Perfluorobutanoic acid		31.7	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		53.0	3.6	1.3	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		61.3	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		26.6	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		90.6	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorononanoic acid		2.9 J	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorodecanoic acid		1.1 J	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		27.7	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		34.4	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		258	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		10.3	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		206	3.6	1.3	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		24.3	7.1	1.8	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		3.6 J	7.1	1.8	ng/l	EPA 537M BY ID

FA72530-6 DA032-13

Perfluorobutanoic acid ^a		44.4	34	8.6	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^a		104	17	6.5	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^a		117	17	4.3	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid ^a		52.2	17	4.3	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72530
Account: LimnoTech
Project: MSNPF
Collected: 02/11/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluorooctanoic acid ^a		54.8	17	4.3	ng/l	EPA 537M BY ID
Perfluorononanoic acid ^a		6.8 J	17	4.3	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a		71.6	17	4.3	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^a		90.6	17	4.3	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a		524	17	4.3	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid ^a		51.3	17	4.3	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		2570	34	13	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate ^a		140	34	8.6	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate ^a		70.8	34	8.6	ng/l	EPA 537M BY ID
FA72530-7 DA021-03 ALT						
Perfluorobutanoic acid ^a		41.5	38	9.6	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^a		10.0 J	19	7.2	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^a		18.4 J	19	4.8	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid ^a		5.5 J	19	4.8	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a		11.3 J	19	4.8	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^a		6.2 J	19	4.8	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a		20.9	19	4.8	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		46.3	19	7.2	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate ^a		45.0	38	9.6	ng/l	EPA 537M BY ID
FA72530-8 DA021-04 ALT						
Perfluorobutanoic acid ^a		50.8	36	8.9	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^a		16.7 J	18	6.7	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^a		21.8	18	4.5	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid ^a		4.9 J	18	4.5	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a		14.0 J	18	4.5	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^a		25.3	18	4.5	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a		24.6	18	4.5	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a		61.3	18	6.7	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate ^a		152	36	8.9	ng/l	EPA 537M BY ID
FA72530-9 OUTFALL 21						
Perfluorobutanoic acid ^a		320	71	18	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^a		962	36	13	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^a		1130	36	8.9	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid ^a		340	36	8.9	ng/l	EPA 537M BY ID
Perfluorooctanoic acid ^a		616	36	8.9	ng/l	EPA 537M BY ID
Perfluorononanoic acid ^a		49.2	36	8.9	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a		858	36	8.9	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^a		1110	36	8.9	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		6130	360	89	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72530
Account: LimnoTech
Project: MSNPF
Collected: 02/11/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoroheptanesulfonic acid ^a		402	36	8.9	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		17500	360	130	ng/l	EPA 537M BY ID
Perfluorononanesulfonic acid ^a		69.2	36	8.9	ng/l	EPA 537M BY ID
PFOSA ^a		21.2 J	36	8.9	ng/l	EPA 537M BY ID
4:2 Fluorotelomer sulfonate ^a		21.8 J	71	18	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		2450	710	180	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate ^a		294	71	18	ng/l	EPA 537M BY ID

FA72530-10 DA021-06 ALT

Perfluorobutanoic acid ^a	53.9	38	9.6	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^a	13.6 J	19	7.2	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^a	11.5 J	19	4.8	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid ^a	5.5 J	19	4.8	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a	8.2 J	19	4.8	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^a	26.7	19	4.8	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid ^a	11.0 J	19	4.8	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid ^a	21.9	19	7.2	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate ^a	39.7	38	9.6	ng/l	EPA 537M BY ID

FA72530-11 OUTFALL 22

Perfluorobutanoic acid	29.3	7.1	1.8	ng/l	EPA 537M BY ID
Perfluoropentanoic acid	32.9	3.6	1.3	ng/l	EPA 537M BY ID
Perfluorohexanoic acid	24.0	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid	15.6	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanoic acid	14.6	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorononanoic acid	10.2	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	9.3	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	8.3	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	95.4	3.6	0.89	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid	8.0	3.6	0.89	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	572	36	13	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate	2.6 J	7.1	1.8	ng/l	EPA 537M BY ID

FA72530-12 OUTFALL 35 ALT

Perfluorobutanoic acid	9.3	7.1	1.8	ng/l	EPA 537M BY ID
Perfluorodecanesulfonic acid	1.8 J	3.6	0.89	ng/l	EPA 537M BY ID

FA72530-13 DUPLICATE B

Perfluorobutanoic acid ^a	321	71	18	ng/l	EPA 537M BY ID
Perfluoropentanoic acid ^a	959	36	13	ng/l	EPA 537M BY ID
Perfluorohexanoic acid ^a	1130	36	8.9	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72530
Account: LimnoTech
Project: MSNPF
Collected: 02/11/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoroheptanoic acid ^a		339	36	8.9	ng/l	EPA 537M BY ID
Perfluorooctanoic acid ^a		610	36	8.9	ng/l	EPA 537M BY ID
Perfluorononanoic acid ^a		49.6	36	8.9	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid ^a		863	36	8.9	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid ^a		1100	36	8.9	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		5720	360	89	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid ^a		397	36	8.9	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		15800	360	130	ng/l	EPA 537M BY ID
Perfluorononanesulfonic acid ^a		59.7	36	8.9	ng/l	EPA 537M BY ID
PFOSA ^a		35.1 J	36	8.9	ng/l	EPA 537M BY ID
4:2 Fluorotelomer sulfonate ^a		21.2 J	71	18	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		2230	710	180	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate ^a		266	71	18	ng/l	EPA 537M BY ID

FA72530-14 FIELD BLANK B

No hits reported in this sample.

FA72530-15 EQUIPMENT BLANK A

No hits reported in this sample.

(a) Dilution required due to matrix interference.



Orlando, FL

Section 4

4

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Page 1 of 2

Client Sample ID: DA032-09A		Date Sampled: 02/11/20
Lab Sample ID: FA72530-1		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44224.D	1.09	02/21/20 11:30	NG	02/19/20 15:30	OP79025	S2Q668
Run #2	2Q44190.D	10.9	02/20/20 17:28	NG	02/19/20 15:30	OP79025	S2Q667

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	18.0	8.7	2.2	ng/l	
2706-90-3	Perfluoropentanoic acid	31.1	4.4	1.6	ng/l	
307-24-4	Perfluorohexanoic acid	33.0	4.4	1.1	ng/l	
375-85-9	Perfluoroheptanoic acid	23.4	4.4	1.1	ng/l	
335-67-1	Perfluorooctanoic acid	41.7	4.4	1.1	ng/l	
375-95-1	Perfluorononanoic acid	4.8	4.4	1.1	ng/l	
335-76-2	Perfluorodecanoic acid	1.5	4.4	1.1	ng/l	J
2058-94-8	Perfluoroundecanoic acid	ND	4.4	1.1	ng/l	
307-55-1	Perfluorododecanoic acid	ND	4.4	1.6	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	4.4	1.1	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	4.4	1.1	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	8.6	4.4	1.1	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	11.9	4.4	1.1	ng/l	
355-46-4	Perfluorohexanesulfonic acid	142	4.4	1.1	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	10.9	4.4	1.1	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	500 ^a	44	16	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	4.4	1.1	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	4.4	1.1	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	4.4	1.1	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	8.7	4.4	ng/l	
2991-50-6	EtFOSAA	ND	8.7	4.4	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	8.7	2.2	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	56.8	8.7	2.2	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-09A		Date Sampled: 02/11/20
Lab Sample ID: FA72530-1		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	10.9	8.7	2.2	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	90%	99%	30-140%
	13C5-PFPeA	93%	99%	40-140%
	13C5-PFHxA	91%	94%	50-150%
	13C4-PFHpA	87%	94%	50-150%
	13C8-PFOA	84%	87%	50-150%
	13C9-PFNA	80%	76%	50-150%
	13C6-PFDA	72%	63%	50-150%
	13C7-PFUnDA	68%	53%	50-150%
	13C2-PFDoDA	63%	48% ^b	50-150%
	13C2-PFTeDA	41%	39% ^b	40-150%
	13C3-PFBS	89%	98%	50-150%
	13C3-PFHxS	78%	86%	50-150%
	13C8-PFOS	66%	66%	50-150%
	13C8-FOSA	45%	45%	30-140%
	d3-MeFOSAA	90%	64%	50-150%
	13C2-4:2FTS	100%	98%	50-150%
	13C2-6:2FTS	102%	92%	50-150%
	13C2-8:2FTS	80%	62%	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

SGS North America Inc.

Report of Analysis

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Client Sample ID: DA032-09		Date Sampled: 02/11/20
Lab Sample ID: FA72530-2		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44225.D	2	02/21/20 11:45	NG	02/19/20 15:30	OP79025	S2Q668
Run #2	2Q44191.D	10	02/20/20 17:44	NG	02/19/20 15:30	OP79025	S2Q667

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	34.4	17	4.2	ng/l	
2706-90-3	Perfluoropentanoic acid	68.6	8.3	3.1	ng/l	
307-24-4	Perfluorohexanoic acid	72.5	8.3	2.1	ng/l	
375-85-9	Perfluoroheptanoic acid	50.2	8.3	2.1	ng/l	
335-67-1	Perfluorooctanoic acid	83.0	8.3	2.1	ng/l	
375-95-1	Perfluorononanoic acid	9.3	8.3	2.1	ng/l	
335-76-2	Perfluorodecanoic acid	3.0	8.3	2.1	ng/l	J
2058-94-8	Perfluoroundecanoic acid	ND	8.3	2.1	ng/l	
307-55-1	Perfluorododecanoic acid	ND	8.3	3.1	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	8.3	2.1	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	8.3	2.1	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	18.4	8.3	2.1	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	25.4	8.3	2.1	ng/l	
355-46-4	Perfluorohexanesulfonic acid	297	8.3	2.1	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	25.2	8.3	2.1	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	1020 ^a	42	16	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	8.3	2.1	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	8.3	2.1	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	8.3	2.1	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	17	8.3	ng/l	
2991-50-6	EtFOSAA	ND	17	8.3	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	17	4.2	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	141	17	4.2	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-09		Date Sampled: 02/11/20
Lab Sample ID: FA72530-2		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	25.2	17	4.2	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	98%	102%	30-140%
	13C5-PFPeA	100%	101%	40-140%
	13C5-PFHxA	99%	99%	50-150%
	13C4-PFHpA	96%	99%	50-150%
	13C8-PFOA	99%	99%	50-150%
	13C9-PFNA	102%	97%	50-150%
	13C6-PFDA	90%	85%	50-150%
	13C7-PFUnDA	88%	75%	50-150%
	13C2-PFDoDA	82%	61%	50-150%
	13C2-PFTeDA	69%	35% ^b	40-150%
	13C3-PFBS	93%	103%	50-150%
	13C3-PFHxS	91%	99%	50-150%
	13C8-PFOS	85%	88%	50-150%
	13C8-FOSA	86%	84%	30-140%
	d3-MeFOSAA	100%	89%	50-150%
	13C2-4:2FTS	105%	99%	50-150%
	13C2-6:2FTS	118%	108%	50-150%
	13C2-8:2FTS	90%	85%	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

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SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-14		Date Sampled: 02/11/20
Lab Sample ID: FA72530-3		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44226.D	1	02/21/20 12:00	NG	02/19/20 15:30	OP79025	S2Q668
Run #2							

Run #	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	20.8	6.7	1.7	ng/l	
2706-90-3	Perfluoropentanoic acid	27.1	3.3	1.2	ng/l	
307-24-4	Perfluorohexanoic acid	30.1	3.3	0.83	ng/l	
375-85-9	Perfluoroheptanoic acid	15.2	3.3	0.83	ng/l	
335-67-1	Perfluorooctanoic acid	31.6	3.3	0.83	ng/l	
375-95-1	Perfluorononanoic acid	3.6	3.3	0.83	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.3	0.83	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.3	0.83	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.3	1.2	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.3	0.83	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.3	0.83	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	18.4	3.3	0.83	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	21.8	3.3	0.83	ng/l	
355-46-4	Perfluorohexanesulfonic acid	185	3.3	0.83	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	9.5	3.3	0.83	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	263	3.3	1.2	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.3	0.83	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.3	0.83	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	2.4	3.3	0.83	ng/l	J
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	6.7	3.3	ng/l	
2991-50-6	EtFOSAA	ND	6.7	3.3	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	6.7	1.7	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	23.6	6.7	1.7	ng/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

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SGS North America Inc.

Report of Analysis

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Client Sample ID:	DA032-14	Date Sampled:	02/11/20
Lab Sample ID:	FA72530-3	Date Received:	02/13/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	21.9	6.7	1.7	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	82%		30-140%
	13C5-PFPeA	88%		40-140%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	86%		50-150%
	13C8-PFOA	91%		50-150%
	13C9-PFNA	97%		50-150%
	13C6-PFDA	91%		50-150%
	13C7-PFUnDA	87%		50-150%
	13C2-PFDoDA	81%		50-150%
	13C2-PFTeDA	79%		40-150%
	13C3-PFBS	85%		50-150%
	13C3-PFHxS	81%		50-150%
	13C8-PFOS	81%		50-150%
	13C8-FOSA	72%		30-140%
	d3-MeFOSAA	113%		50-150%
	13C2-4:2FTS	98%		50-150%
	13C2-6:2FTS	109%		50-150%
	13C2-8:2FTS	100%		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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-12A		Date Sampled: 02/11/20
Lab Sample ID: FA72530-4		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44227.D	1	02/21/20 12:16	NG	02/19/20 15:30	OP79025	S2Q668
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	17.5	7.1	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	9.7	3.6	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	9.7	3.6	0.89	ng/l	
375-85-9	Perfluoroheptanoic acid	3.8	3.6	0.89	ng/l	
335-67-1	Perfluorooctanoic acid	8.4	3.6	0.89	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.6	0.89	ng/l	
335-76-2	Perfluorodecanoic acid	4.3	3.6	0.89	ng/l	
2058-94-8	Perfluoroundecanoic acid	3.6	3.6	0.89	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.6	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.6	0.89	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.6	0.89	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	3.7	3.6	0.89	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	3.4	3.6	0.89	ng/l	J
355-46-4	Perfluorohexanesulfonic acid	29.1	3.6	0.89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.6	0.89	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	96.9	3.6	1.3	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.6	0.89	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.6	0.89	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	9.0	3.6	0.89	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.1	3.6	ng/l	
2991-50-6	EtFOSAA	ND	7.1	3.6	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/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

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SGS North America Inc.

Report of Analysis

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Client Sample ID:	DA032-12A	Date Sampled:	02/11/20
Lab Sample ID:	FA72530-4	Date Received:	02/13/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	4.0	7.1	1.8	ng/l	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	77%		30-140%
	13C5-PFPeA	84%		40-140%
	13C5-PFHxA	83%		50-150%
	13C4-PFHpA	83%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	90%		50-150%
	13C6-PFDA	91%		50-150%
	13C7-PFUnDA	90%		50-150%
	13C2-PFDoDA	83%		50-150%
	13C2-PFTeDA	70%		40-150%
	13C3-PFBS	82%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	55%		30-140%
	d3-MeFOSAA	116%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	103%		50-150%
	13C2-8:2FTS	101%		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

SGS North America Inc.

Report of Analysis

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Client Sample ID: DA032-12B		Date Sampled: 02/11/20
Lab Sample ID: FA72530-5		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44229.D	1	02/21/20 12:47	NG	02/19/20 15:30	OP79025	S2Q668
Run #2 ^a	2Q44195.D	10	02/20/20 18:45	NG	02/19/20 15:30	OP79025	S2Q667

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	31.7	7.1	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	53.0	3.6	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	61.3	3.6	0.89	ng/l	
375-85-9	Perfluoroheptanoic acid	26.6	3.6	0.89	ng/l	
335-67-1	Perfluorooctanoic acid	90.6	3.6	0.89	ng/l	
375-95-1	Perfluorononanoic acid	2.9	3.6	0.89	ng/l	J
335-76-2	Perfluorodecanoic acid	1.1	3.6	0.89	ng/l	J
2058-94-8	Perfluoroundecanoic acid	ND	3.6	0.89	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.6	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.6	0.89	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.6	0.89	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	27.7	3.6	0.89	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	34.4	3.6	0.89	ng/l	
355-46-4	Perfluorohexanesulfonic acid	258	3.6	0.89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	10.3	3.6	0.89	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	206	3.6	1.3	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.6	0.89	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.6	0.89	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND ^b	36	8.9	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.1	3.6	ng/l	
2991-50-6	EtFOSAA	ND	7.1	3.6	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	24.3	7.1	1.8	ng/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

SGS North America Inc.

Report of Analysis

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Client Sample ID:	DA032-12B	Date Sampled:	02/11/20
Lab Sample ID:	FA72530-5	Date Received:	02/13/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	3.6	7.1	1.8	ng/l	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	65%	95%	30-140%
	13C5-PFPeA	70%	94%	40-140%
	13C5-PFHxA	68%	91%	50-150%
	13C4-PFHpA	69%	89%	50-150%
	13C8-PFOA	74%	91%	50-150%
	13C9-PFNA	78%	93%	50-150%
	13C6-PFDA	77%	89%	50-150%
	13C7-PFUnDA	81%	83%	50-150%
	13C2-PFDoDA	72%	70%	50-150%
	13C2-PFTeDA	68%	48%	40-150%
	13C3-PFBS	71%	94%	50-150%
	13C3-PFHxS	70%	86%	50-150%
	13C8-PFOS	73%	87%	50-150%
	13C8-FOSA	25% ^c	72%	30-140%
	d3-MeFOSAA	120%	99%	50-150%
	13C2-4:2FTS	73%	97%	50-150%
	13C2-6:2FTS	91%	100%	50-150%
	13C2-8:2FTS	97%	91%	50-150%

- (a) Dilution required due to matrix interference.
(b) Result is from Run# 2
(c) Outside control limits due to matrix interference.

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

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Client Sample ID: DA032-13		Date Sampled: 02/11/20
Lab Sample ID: FA72530-6		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q44230.D	5	02/21/20 13:02	NG	02/19/20 15:30	OP79025	S2Q668
Run #2	2Q44196.D	10	02/20/20 19:01	NG	02/19/20 15:30	OP79025	S2Q667

Run #	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2	290 ml	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	44.4	34	8.6	ng/l	
2706-90-3	Perfluoropentanoic acid	104	17	6.5	ng/l	
307-24-4	Perfluorohexanoic acid	117	17	4.3	ng/l	
375-85-9	Perfluoroheptanoic acid	52.2	17	4.3	ng/l	
335-67-1	Perfluorooctanoic acid	54.8	17	4.3	ng/l	
375-95-1	Perfluorononanoic acid	6.8	17	4.3	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	17	4.3	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	17	4.3	ng/l	
307-55-1	Perfluorododecanoic acid	ND	17	6.5	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	17	4.3	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	17	4.3	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	71.6	17	4.3	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	90.6	17	4.3	ng/l	
355-46-4	Perfluorohexanesulfonic acid	524	17	4.3	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	51.3	17	4.3	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	2570 ^b	34	13	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	17	4.3	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	17	4.3	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	17	4.3	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	34	17	ng/l	
2991-50-6	EtFOSAA	ND	34	17	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	34	8.6	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	140	34	8.6	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA032-13		Date Sampled: 02/11/20
Lab Sample ID: FA72530-6		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	70.8	34	8.6	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	93%	93%	30-140%
	13C5-PFPeA	94%	93%	40-140%
	13C5-PFHxA	92%	91%	50-150%
	13C4-PFHpA	91%	90%	50-150%
	13C8-PFOA	92%	91%	50-150%
	13C9-PFNA	90%	90%	50-150%
	13C6-PFDA	86%	86%	50-150%
	13C7-PFUnDA	84%	79%	50-150%
	13C2-PFDoDA	74%	73%	50-150%
	13C2-PFTeDA	62%	56%	40-150%
	13C3-PFBS	91%	92%	50-150%
	13C3-PFHxS	86%	87%	50-150%
	13C8-PFOS	80%	82%	50-150%
	13C8-FOSA	78%	81%	30-140%
	d3-MeFOSAA	94%	93%	50-150%
	13C2-4:2FTS	95%	92%	50-150%
	13C2-6:2FTS	106%	101%	50-150%
	13C2-8:2FTS	85%	85%	50-150%

- (a) Dilution required due to matrix interference.
- (b) Result is from Run# 2

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

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Report of Analysis

Client Sample ID: DA021-03 ALT		Date Sampled: 02/11/20
Lab Sample ID: FA72530-7		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q44350.D	5	02/24/20 04:49	NAF	02/19/20 15:30	OP79025	S2Q669
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	41.5	38	9.6	ng/l	
2706-90-3	Perfluoropentanoic acid	10.0	19	7.2	ng/l	J
307-24-4	Perfluorohexanoic acid	18.4	19	4.8	ng/l	J
375-85-9	Perfluoroheptanoic acid	5.5	19	4.8	ng/l	J
335-67-1	Perfluorooctanoic acid	ND	19	4.8	ng/l	
375-95-1	Perfluorononanoic acid	ND	19	4.8	ng/l	
335-76-2	Perfluorodecanoic acid	ND	19	4.8	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	19	4.8	ng/l	
307-55-1	Perfluorododecanoic acid	ND	19	7.2	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	19	4.8	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	19	4.8	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	11.3	19	4.8	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	6.2	19	4.8	ng/l	J
355-46-4	Perfluorohexanesulfonic acid	20.9	19	4.8	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	19	4.8	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	46.3	19	7.2	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	19	4.8	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	19	4.8	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	19	4.8	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	38	19	ng/l	
2991-50-6	EtFOSAA	ND	38	19	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	38	9.6	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	45.0	38	9.6	ng/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

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Report of Analysis

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Client Sample ID:	DA021-03 ALT	Date Sampled:	02/11/20
Lab Sample ID:	FA72530-7	Date Received:	02/13/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	38	9.6	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	74%		30-140%
	13C5-PFPeA	86%		40-140%
	13C5-PFHxA	79%		50-150%
	13C4-PFHpA	77%		50-150%
	13C8-PFOA	77%		50-150%
	13C9-PFNA	78%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	85%		50-150%
	13C2-PFDoDA	82%		50-150%
	13C2-PFTeDA	57%		40-150%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	75%		50-150%
	13C8-FOSA	33%		30-140%
	d3-MeFOSAA	127%		50-150%
	13C2-4:2FTS	87%		50-150%
	13C2-6:2FTS	98%		50-150%
	13C2-8:2FTS	97%		50-150%

(a) Dilution required due to matrix interference.

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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA021-04 ALT		
Lab Sample ID: FA72530-8		Date Sampled: 02/11/20
Matrix: AQ - Water		Date Received: 02/13/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q44351.D	5	02/24/20 05:04	NAF	02/19/20 15:30	OP79025	S2Q669
Run #2 ^a	2Q44202.D	10	02/20/20 20:33	NG	02/19/20 15:30	OP79025	S2Q667

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	50.8	36	8.9	ng/l	
2706-90-3	Perfluoropentanoic acid	16.7	18	6.7	ng/l	J
307-24-4	Perfluorohexanoic acid	21.8	18	4.5	ng/l	
375-85-9	Perfluoroheptanoic acid	4.9	18	4.5	ng/l	J
335-67-1	Perfluorooctanoic acid	ND	18	4.5	ng/l	
375-95-1	Perfluorononanoic acid	ND	18	4.5	ng/l	
335-76-2	Perfluorodecanoic acid	ND	18	4.5	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	18	4.5	ng/l	
307-55-1	Perfluorododecanoic acid	ND	18	6.7	ng/l	
72629-94-8	Perfluorotridecanoic acid ^b	ND ^c	36	8.9	ng/l	
376-06-7	Perfluorotetradecanoic acid ^b	ND ^c	36	8.9	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	14.0	18	4.5	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	25.3	18	4.5	ng/l	
355-46-4	Perfluorohexanesulfonic acid	24.6	18	4.5	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	18	4.5	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	61.3	18	6.7	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	18	4.5	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	18	4.5	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND ^c	36	8.9	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	36	18	ng/l	
2991-50-6	EtFOSAA	ND	36	18	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	36	8.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	152	36	8.9	ng/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

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SGS North America Inc.

Report of Analysis

Client Sample ID: DA021-04 ALT	
Lab Sample ID: FA72530-8	Date Sampled: 02/11/20
Matrix: AQ - Water	Date Received: 02/13/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	36	8.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	62%	64%	30-140%
	13C5-PFPeA	81%	82%	40-140%
	13C5-PFHxA	72%	77%	50-150%
	13C4-PFHpA	70%	75%	50-150%
	13C8-PFOA	70%	75%	50-150%
	13C9-PFNA	71%	78%	50-150%
	13C6-PFDA	69%	77%	50-150%
	13C7-PFUnDA	76%	79%	50-150%
	13C2-PFDoDA	63%	67%	50-150%
	13C2-PFTeDA	33% ^d	38% ^d	40-150%
	13C3-PFBS	78%	81%	50-150%
	13C3-PFHxS	73%	79%	50-150%
	13C8-PFOS	69%	72%	50-150%
	13C8-FOSA	20% ^d	36%	30-140%
	d3-MeFOSAA	104%	120%	50-150%
	13C2-4:2FTS	79%	82%	50-150%
	13C2-6:2FTS	95%	100%	50-150%
	13C2-8:2FTS	91%	95%	50-150%

- (a) Dilution required due to matrix interference.
- (b) Associated ID Standard outside control limits, Confirmed by re-analysis.
- (c) Result is from Run# 2
- (d) Outside control limits due to matrix interference.

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

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SGS North America Inc.

Report of Analysis

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Client Sample ID:	OUTFALL 21		Date Sampled:	02/11/20
Lab Sample ID:	FA72530-9		Date Received:	02/13/20
Matrix:	AQ - Water		Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD			
Project:	MSNPF			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q44203.D	10	02/20/20 20:48	NG	02/19/20 15:30	OP79025	S2Q667
Run #2	2Q44235.D	100	02/21/20 14:24	NG	02/19/20 15:30	OP79025	S2Q668

	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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	320	71	18	ng/l	
2706-90-3	Perfluoropentanoic acid	962	36	13	ng/l	
307-24-4	Perfluorohexanoic acid	1130	36	8.9	ng/l	
375-85-9	Perfluoroheptanoic acid	340	36	8.9	ng/l	
335-67-1	Perfluorooctanoic acid	616	36	8.9	ng/l	
375-95-1	Perfluorononanoic acid	49.2	36	8.9	ng/l	
335-76-2	Perfluorodecanoic acid	ND	36	8.9	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	36	8.9	ng/l	
307-55-1	Perfluorododecanoic acid	ND	36	13	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	36	8.9	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	36	8.9	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	858	36	8.9	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	1110	36	8.9	ng/l	
355-46-4	Perfluorohexanesulfonic acid	6130 ^b	360	89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	402	36	8.9	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	17500 ^b	360	130	ng/l	
68259-12-1	Perfluorononanesulfonic acid	69.2	36	8.9	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	36	8.9	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	21.2	36	8.9	ng/l	J
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	71	36	ng/l	
2991-50-6	EtFOSAA	ND	71	36	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	21.8	71	18	ng/l	J
27619-97-2	6:2 Fluorotelomer sulfonate	2450 ^b	710	180	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 21		Date Sampled: 02/11/20
Lab Sample ID: FA72530-9		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	294	71	18	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	98%	108%	30-140%
	13C5-PFPeA	97%	110%	40-140%
	13C5-PFHxA	93%	107%	50-150%
	13C4-PFHpA	91%	105%	50-150%
	13C8-PFOA	92%	106%	50-150%
	13C9-PFNA	83%	104%	50-150%
	13C6-PFDA	89%	104%	50-150%
	13C7-PFUnDA	81%	104%	50-150%
	13C2-PFDoDA	77%	107%	50-150%
	13C2-PFTeDA	69%	102%	40-150%
	13C3-PFBS	97%	103%	50-150%
	13C3-PFHxS	89%	100%	50-150%
	13C8-PFOS	71%	97%	50-150%
	13C8-FOSA	80%	104%	30-140%
	d3-MeFOSAA	95%	119%	50-150%
	13C2-4:2FTS	95%	104%	50-150%
	13C2-6:2FTS	298% ^c	103%	50-150%
	13C2-8:2FTS	108%	98%	50-150%

- (a) Dilution required due to matrix interference.
- (b) Result is from Run# 2
- (c) Outside control limits due to matrix interference.

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

SGS North America Inc.

Report of Analysis

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Client Sample ID: DA021-06 ALT		Date Sampled: 02/11/20
Lab Sample ID: FA72530-10		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q44352.D	5	02/24/20 05:20	NAF	02/19/20 15:30	OP79025	S2Q669
Run #2 ^a	2Q44205.D	10	02/20/20 21:19	NG	02/19/20 15:30	OP79025	S2Q667

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	53.9	38	9.6	ng/l	
2706-90-3	Perfluoropentanoic acid	13.6	19	7.2	ng/l	J
307-24-4	Perfluorohexanoic acid	11.5	19	4.8	ng/l	J
375-85-9	Perfluoroheptanoic acid	5.5	19	4.8	ng/l	J
335-67-1	Perfluorooctanoic acid	ND	19	4.8	ng/l	
375-95-1	Perfluorononanoic acid	ND	19	4.8	ng/l	
335-76-2	Perfluorodecanoic acid	ND	19	4.8	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	19	4.8	ng/l	
307-55-1	Perfluorododecanoic acid	ND	19	7.2	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	19	4.8	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	19	4.8	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	8.2	19	4.8	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	26.7	19	4.8	ng/l	
355-46-4	Perfluorohexanesulfonic acid	11.0	19	4.8	ng/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	19	4.8	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	21.9	19	7.2	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	19	4.8	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	19	4.8	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND ^b	38	9.6	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	38	19	ng/l	
2991-50-6	EtFOSAA	ND	38	19	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	38	9.6	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	39.7	38	9.6	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DA021-06 ALT		Date Sampled: 02/11/20
Lab Sample ID: FA72530-10		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

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CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	38	9.6	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	66%	77%	30-140%
	13C5-PFPeA	83%	93%	40-140%
	13C5-PFHxA	75%	89%	50-150%
	13C4-PFHpA	73%	85%	50-150%
	13C8-PFOA	72%	85%	50-150%
	13C9-PFNA	73%	86%	50-150%
	13C6-PFDA	72%	81%	50-150%
	13C7-PFUnDA	79%	85%	50-150%
	13C2-PFDoDA	73%	68%	50-150%
	13C2-PFTeDA	40%	41%	40-150%
	13C3-PFBS	81%	93%	50-150%
	13C3-PFHxS	72%	85%	50-150%
	13C8-PFOS	69%	80%	50-150%
	13C8-FOSA	24% ^c	37%	30-140%
	d3-MeFOSAA	116%	126%	50-150%
	13C2-4:2FTS	82%	98%	50-150%
	13C2-6:2FTS	91%	107%	50-150%
	13C2-8:2FTS	93%	99%	50-150%

- (a) Dilution required due to matrix interference.
- (b) Result is from Run# 2
- (c) Outside control limits due to matrix interference.

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

SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 22		Date Sampled: 02/11/20
Lab Sample ID: FA72530-11		Date Received: 02/13/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44238.D	1	02/21/20 15:10	NG	02/19/20 15:30	OP79025	S2Q668
Run #2	2Q44206.D	10	02/20/20 21:34	NG	02/19/20 15:30	OP79025	S2Q667

	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	29.3	7.1	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	32.9	3.6	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	24.0	3.6	0.89	ng/l	
375-85-9	Perfluoroheptanoic acid	15.6	3.6	0.89	ng/l	
335-67-1	Perfluorooctanoic acid	14.6	3.6	0.89	ng/l	
375-95-1	Perfluorononanoic acid	10.2	3.6	0.89	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.6	0.89	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.6	0.89	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.6	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.6	0.89	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.6	0.89	ng/l	

PERFLUOROALKYL SULFONATES

375-73-5	Perfluorobutanesulfonic acid	9.3	3.6	0.89	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	8.3	3.6	0.89	ng/l	
355-46-4	Perfluorohexanesulfonic acid	95.4	3.6	0.89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	8.0	3.6	0.89	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	572 ^a	36	13	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.6	0.89	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.6	0.89	ng/l	

PERFLUORO OCTANESULFONAMIDES

754-91-6	PFOSA	ND	3.6	0.89	ng/l	
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PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	7.1	3.6	ng/l	
2991-50-6	EtFOSAA	ND	7.1	3.6	ng/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	2.6	7.1	1.8	ng/l	J

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

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Report of Analysis

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Client Sample ID: OUTFALL 22	
Lab Sample ID: FA72530-11	Date Sampled: 02/11/20
Matrix: AQ - Water	Date Received: 02/13/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	89%	97%	30-140%
	13C5-PFPeA	92%	95%	40-140%
	13C5-PFHxA	91%	92%	50-150%
	13C4-PFHpA	89%	92%	50-150%
	13C8-PFOA	93%	90%	50-150%
	13C9-PFNA	91%	89%	50-150%
	13C6-PFDA	89%	81%	50-150%
	13C7-PFUnDA	85%	67%	50-150%
	13C2-PFDoDA	70%	54%	50-150%
	13C2-PFTeDA	62%	40%	40-150%
	13C3-PFBS	88%	97%	50-150%
	13C3-PFHxA	84%	97%	50-150%
	13C8-PFOS	77%	82%	50-150%
	13C8-FOSA	69%	70%	30-140%
	d3-MeFOSAA	113%	84%	50-150%
	13C2-4:2FTS	99%	93%	50-150%
	13C2-6:2FTS	105%	92%	50-150%
	13C2-8:2FTS	98%	78%	50-150%

(a) Result is from Run# 2

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

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 35 ALT	Date Sampled: 02/11/20
Lab Sample ID: FA72530-12	Date Received: 02/13/20
Matrix: AQ - Water	Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD	
Project: MSNPF	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44239.D	1	02/21/20 15:26	NG	02/19/20 15:30	OP79025	S2Q668
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	9.3	7.1	1.8	ng/l	
2706-90-3	Perfluoropentanoic acid	ND	3.6	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	ND	3.6	0.89	ng/l	
375-85-9	Perfluoroheptanoic acid	ND	3.6	0.89	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.6	0.89	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.6	0.89	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.6	0.89	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.6	0.89	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.6	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.6	0.89	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.6	0.89	ng/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	3.6	0.89	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	3.6	0.89	ng/l	
355-46-4	Perfluorohexanesulfonic acid	ND	3.6	0.89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.6	0.89	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	3.6	1.3	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.6	0.89	ng/l	
335-77-3	Perfluorodecanesulfonic acid	1.8	3.6	0.89	ng/l	J
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.6	0.89	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.1	3.6	ng/l	
2991-50-6	EtFOSAA	ND	7.1	3.6	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/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

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Report of Analysis

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Client Sample ID:	OUTFALL 35 ALT		Date Sampled:	02/11/20
Lab Sample ID:	FA72530-12		Date Received:	02/13/20
Matrix:	AQ - Water		Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD			
Project:	MSNPF			

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.1	1.8	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	97%		30-140%
	13C5-PFPeA	98%		40-140%
	13C5-PFHxA	97%		50-150%
	13C4-PFHpA	97%		50-150%
	13C8-PFOA	98%		50-150%
	13C9-PFNA	100%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	83%		50-150%
	13C2-PFDoDA	78%		50-150%
	13C2-PFTeDA	70%		40-150%
	13C3-PFBS	94%		50-150%
	13C3-PFHxS	93%		50-150%
	13C8-PFOS	86%		50-150%
	13C8-FOSA	70%		30-140%
	d3-MeFOSAA	99%		50-150%
	13C2-4:2FTS	101%		50-150%
	13C2-6:2FTS	108%		50-150%
	13C2-8:2FTS	92%		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

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Report of Analysis

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Client Sample ID:	DUPLICATE B	Date Sampled:	02/11/20
Lab Sample ID:	FA72530-13	Date Received:	02/13/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	2Q44208.D	10	02/20/20 22:05	NG	02/19/20 15:30	OP79025	S2Q667
Run #2	2Q44240.D	100	02/21/20 15:41	NG	02/19/20 15:30	OP79025	S2Q668

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	321	71	18	ng/l	
2706-90-3	Perfluoropentanoic acid	959	36	13	ng/l	
307-24-4	Perfluorohexanoic acid	1130	36	8.9	ng/l	
375-85-9	Perfluoroheptanoic acid	339	36	8.9	ng/l	
335-67-1	Perfluorooctanoic acid	610	36	8.9	ng/l	
375-95-1	Perfluorononanoic acid	49.6	36	8.9	ng/l	
335-76-2	Perfluorodecanoic acid	ND	36	8.9	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	36	8.9	ng/l	
307-55-1	Perfluorododecanoic acid	ND	36	13	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	36	8.9	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	36	8.9	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	863	36	8.9	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	1100	36	8.9	ng/l	
355-46-4	Perfluorohexanesulfonic acid	5720 ^b	360	89	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	397	36	8.9	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	15800 ^b	360	130	ng/l	
68259-12-1	Perfluorononanesulfonic acid	59.7	36	8.9	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	36	8.9	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	35.1	36	8.9	ng/l	J
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	71	36	ng/l	
2991-50-6	EtFOSAA	ND	71	36	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	21.2	71	18	ng/l	J
27619-97-2	6:2 Fluorotelomer sulfonate	2230 ^b	710	180	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DUPLICATE B	
Lab Sample ID: FA72530-13	Date Sampled: 02/11/20
Matrix: AQ - Water	Date Received: 02/13/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

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CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	266	71	18	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	101%	111%	30-140%
	13C5-PFPeA	101%	114%	40-140%
	13C5-PFHxA	97%	112%	50-150%
	13C4-PFHpA	95%	110%	50-150%
	13C8-PFOA	95%	110%	50-150%
	13C9-PFNA	84%	107%	50-150%
	13C6-PFDA	89%	106%	50-150%
	13C7-PFUnDA	79%	114%	50-150%
	13C2-PFDoDA	68%	112%	50-150%
	13C2-PFTeDA	52%	104%	40-150%
	13C3-PFBS	102%	107%	50-150%
	13C3-PFHxS	93%	104%	50-150%
	13C8-PFOS	73%	101%	50-150%
	13C8-FOSA	82%	109%	30-140%
	d3-MeFOSAA	93%	118%	50-150%
	13C2-4:2FTS	101%	107%	50-150%
	13C2-6:2FTS	310% ^c	108%	50-150%
	13C2-8:2FTS	107%	100%	50-150%

- (a) Dilution required due to matrix interference.
- (b) Result is from Run# 2
- (c) Outside control limits due to matrix interference.

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

SGS North America Inc.

Report of Analysis

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Client Sample ID: FIELD BLANK B		Date Sampled: 02/11/20
Lab Sample ID: FA72530-14		Date Received: 02/13/20
Matrix: AQ - Field Blank Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44200.D	1	02/20/20 20:02	NG	02/19/20 15:30	OP79025	S2Q667
Run #2							

Run #	Initial Volume	Final Volume
Run #1	300 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	6.7	1.7	ng/l	
2706-90-3	Perfluoropentanoic acid	ND	3.3	1.2	ng/l	
307-24-4	Perfluorohexanoic acid	ND	3.3	0.83	ng/l	
375-85-9	Perfluoroheptanoic acid	ND	3.3	0.83	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.3	0.83	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.3	0.83	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.3	0.83	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.3	0.83	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.3	1.2	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.3	0.83	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.3	0.83	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	3.3	0.83	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	3.3	0.83	ng/l	
355-46-4	Perfluorohexanesulfonic acid	ND	3.3	0.83	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.3	0.83	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	3.3	1.2	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.3	0.83	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.3	0.83	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.3	0.83	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	6.7	3.3	ng/l	
2991-50-6	EtFOSAA	ND	6.7	3.3	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	6.7	1.7	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	6.7	1.7	ng/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

SGS North America Inc.

Report of Analysis

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Client Sample ID: FIELD BLANK B	
Lab Sample ID: FA72530-14	Date Sampled: 02/11/20
Matrix: AQ - Field Blank Water	Date Received: 02/13/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	6.7	1.7	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	98%		30-140%
	13C5-PFPeA	98%		40-140%
	13C5-PFHxA	96%		50-150%
	13C4-PFHpA	96%		50-150%
	13C8-PFOA	95%		50-150%
	13C9-PFNA	89%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	75%		50-150%
	13C2-PFDoDA	72%		50-150%
	13C2-PFTeDA	74%		40-150%
	13C3-PFBS	95%		50-150%
	13C3-PFHxS	90%		50-150%
	13C8-PFOS	74%		50-150%
	13C8-FOSA	77%		30-140%
	d3-MeFOSAA	84%		50-150%
	13C2-4:2FTS	94%		50-150%
	13C2-6:2FTS	92%		50-150%
	13C2-8:2FTS	73%		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

SGS North America Inc.

Report of Analysis

Client Sample ID: EQUIPMENT BLANK A	
Lab Sample ID: FA72530-15	Date Sampled: 02/11/20
Matrix: AQ - Equipment Blank	Date Received: 02/13/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44201.D	1	02/20/20 20:17	NG	02/19/20 15:30	OP79025	S2Q667
Run #2							

Run #	Initial Volume	Final Volume
Run #1	290 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	6.9	1.7	ng/l	
2706-90-3	Perfluoropentanoic acid	ND	3.4	1.3	ng/l	
307-24-4	Perfluorohexanoic acid	ND	3.4	0.86	ng/l	
375-85-9	Perfluoroheptanoic acid	ND	3.4	0.86	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.4	0.86	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.4	0.86	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.4	0.86	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.4	0.86	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.4	1.3	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.4	0.86	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.4	0.86	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	3.4	0.86	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	3.4	0.86	ng/l	
355-46-4	Perfluorohexanesulfonic acid	ND	3.4	0.86	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.4	0.86	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	3.4	1.3	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.4	0.86	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.4	0.86	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.4	0.86	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	6.9	3.4	ng/l	
2991-50-6	EtFOSAA	ND	6.9	3.4	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	6.9	1.7	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	6.9	1.7	ng/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

4.15
4

SGS North America Inc.

Report of Analysis

Client Sample ID: EQUIPMENT BLANK A	Date Sampled: 02/11/20
Lab Sample ID: FA72530-15	Date Received: 02/13/20
Matrix: AQ - Equipment Blank	Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD	
Project: MSNPF	

4.15
4

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	6.9	1.7	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	106%		30-140%
	13C5-PFPeA	105%		40-140%
	13C5-PFHxA	105%		50-150%
	13C4-PFHpA	103%		50-150%
	13C8-PFOA	103%		50-150%
	13C9-PFNA	103%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	87%		50-150%
	13C2-PFDoDA	87%		50-150%
	13C2-PFTeDA	80%		40-150%
	13C3-PFBS	103%		50-150%
	13C3-PFHxS	98%		50-150%
	13C8-PFOS	88%		50-150%
	13C8-FOSA	89%		30-140%
	d3-MeFOSAA	93%		50-150%
	13C2-4:2FTS	101%		50-150%
	13C2-6:2FTS	100%		50-150%
	13C2-8:2FTS	85%		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

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

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
EtFOSAA	2991-50-6	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



SGS North America Inc - Orlando
Chain of Custody

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FA72530
SGS - ORLANDO JOB #: PAGE 1 OF 2

Client / Reporting Information		Project Information				Analytical Information										Matrix Codes
Company Name: LIMNOTECH		Project Name:														DW - Drinking Water
Address: 501 AVIS DRIVE		Street:														GW - Ground Water
City: ANN ARBOR State: MI Zip: 48108		City: State:														WW - Water
Project Contact: Chris Cecicik Email: cecicik@limnotech.com		Project # MSNPF1														SW - Surface Water
Phone #: 734 332 1200		Fax #:														SO - Soil
Sampler(s) Name(s) (Printed):		Client Purchase Order #:														SL - Sludge
Sampler 1: BPH/MC Sampler 2:																LIQ - Other Liquid
SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION		CONTAINER INFORMATION												LAB USE ONLY
		DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	WINE	PCII	NSOH	PHOS	PHOS4	NAOH-ZINC	DIWATER	MICH	
1	DA032-09A	2/11/20	0820	LT1	WW	2		Y								X
2	DA032-09	2/11/20	0830					Y								X
3	DA032-14	2/11/20	0850					Y								X
4	DA032-12a	2/11/20	0950					Y								X
5	DA032-12B	2/11/20	1015					Y								X
6	DA032-13	2/11/20	1055					X								X
7	DA021-03 ALT	2/11/20	1115					Y								X
8	DA021-04 ALT	2/11/20	1155					X								X
9	OUTFALL 21	2/11/20	1400					Y								X
10	DA021-06 ALT	2/11/20	1500					Y								X
11	OUTFALL 22	2/11/20	1555					X								X
12	OUTFALL 35 ALT	2/11/20	1620					X								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 type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC) <input type="checkbox"/> REDT1 (EPA LEVEL 3) <input type="checkbox"/> FULLT1 (EPA LEVEL 4) <input type="checkbox"/> EDD'S												
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		
1 LIMNOTECH		2/12/20 1200		2 NY				3 NY				2/13/20 900		4 RALPH AM		
5				6				7				8				

5.2 5

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ORLD-SMT-0001-03-FORM-COC (1) Rev 031318





SGS North America Inc - Orlando
Chain of Custody

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SGS - ORLANDO JOB #: **FA72530** PAGE 2 OF 2

Client / Reporting Information			Project Information				Analytical Information											Matrix Codes					
Company Name: LIMNOTECH			Project Name:															DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge LIQ - Other Liquid AIR - Air SOL - Other Solid					
Address: 501 AYS DRIVE			Street:																				
City: ANN ARBOR State: MI Zip: 48108			City: State:																				
Project Contact: CHRIS CICIEK Email: cciciek@limnotech.com			Project # MSNPFI																				
Phone #: 734-332-1200			Fax #:															LAB USE ONLY					
Sampler(s) Name(s) (Printed)			Client Purchase Order #:																				
Sampler 1:			Sampler 2:																				
SGS Orlando	Sample #	Field ID / Point of Collection		DATE		TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	OTHER	PONE	PCU	NaOH	INCO	HPSCA	NaOH-ZNAC	SWATER	MECH	PFAS	X	X	X	
	13	DUPLICATE B		2/11/20			LT1	NW	2		X												
	14	FIELD BLANK B		2/11/20		1850	LT1	WW	2		X												
	15	EQUIPMENT BLANK A		2/11/20		1900	LT1	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 type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC) <input type="checkbox"/> REDT1 (EPA LEVEL 3) <input type="checkbox"/> FULLT1 (EPA LEVEL 4) <input type="checkbox"/> EDD'S																	
Rush T/A Data Available VIA Email or Lablink																							
Relinquished by Sampler/Affiliation		Date Time:		Received By/Affiliation		Sample Custody must be documented below each time samples change possession, including courier delivery.				Relinquished By/Affiliation		Date Time:		Received By/Affiliation									
CHRIS LIMNOTECH		2/11/20 1700		FVX						PK		2/13/20		RJM									
5		Date Time:		6		7				8		8											
Lab Use Only : Cooler Temperature (s) Celsius (corrected):																		http://www.sgs.com/en/terms-and-conditions					

1.57 ORLD-SMT-0001-03-FORM-COC (1) Rev 031318



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SGS Sample Receipt Summary

Job Number: FA72530

Client: LIMNOTECH

Project: MSNPF1

Date / Time Received: 2/13/2020 9:10:00 AM

Delivery Method: FED EX

Airbill #'s:

Therm ID: IR 1; Therm CF: -0.8; # of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.5);

Cooler Temps (Corrected) °C: Cooler 1: (1.7);

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 checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>

	W	or	S	N/A
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"/>	<input 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: TRINITYM Date: 2/13/2020 9:10:00 AM Reviewer: _____ Date: _____

5.2
5

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79025-MB	2Q44189.D	1	02/20/20	NG	02/19/20	OP79025	S2Q667

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-7, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-12, FA72530-13, FA72530-14, FA72530-15

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	0.0015	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	0.0015	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	0.0015	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	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	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	

CAS No.	ID Standard Recoveries	Limits	
	13C4-PFBA	102%	30-140%
	13C5-PFPeA	102%	40-140%
	13C5-PFHxA	102%	50-150%
	13C4-PFHpA	101%	50-150%
	13C8-PFOA	102%	50-150%
	13C9-PFNA	99%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	86%	50-150%

Method Blank Summary

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79025-MB	2Q44189.D	1	02/20/20	NG	02/19/20	OP79025	S2Q667

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-7, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-12, FA72530-13, FA72530-14, FA72530-15

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	85% 50-150%
	13C2-PFTeDA	75% 40-150%
	13C3-PFBS	99% 50-150%
	13C3-PFHxS	99% 50-150%
	13C8-PFOS	93% 50-150%
	13C8-FOSA	100% 30-140%
	d3-MeFOSAA	97% 50-150%
	13C2-4:2FTS	96% 50-150%
	13C2-6:2FTS	98% 50-150%
	13C2-8:2FTS	89% 50-150%

Instrument Blank

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q667-IBLK	2Q44180.D	1	02/20/20	NG	n/a	n/a	S2Q667

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72530-1, FA72530-2, FA72530-5, FA72530-6, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-13, FA72530-14, FA72530-15

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	0.0015	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	0.0015	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	0.0015	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	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	99% 50-150%
	13C5-PFPeA	100% 50-150%
	13C5-PFHxA	100% 50-150%
	13C4-PFHpA	99% 50-150%
	13C8-PFOA	100% 50-150%
	13C9-PFNA	100% 50-150%
	13C6-PFDA	98% 50-150%
	13C7-PFUnDA	101% 50-150%

Instrument Blank

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q667-IBLK	2Q44180.D	1	02/20/20	NG	n/a	n/a	S2Q667

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72530-1, FA72530-2, FA72530-5, FA72530-6, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-13, FA72530-14, FA72530-15

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	101% 50-150%
	13C2-PFTeDA	95% 50-150%
	13C3-PFBS	100% 50-150%
	13C3-PFHxS	98% 50-150%
	13C8-PFOS	97% 50-150%
	13C8-FOSA	106% 50-150%
	d3-MeFOSAA	108% 50-150%
	13C2-4:2FTS	95% 50-150%
	13C2-6:2FTS	97% 50-150%
	13C2-8:2FTS	93% 50-150%
	13C3-HFPO-DA	105% 50-150%

Instrument Blank

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q668-IBLK	2Q44221.D	1	02/21/20	NG	n/a	n/a	S2Q668

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-9, FA72530-11, FA72530-12, FA72530-13

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	0.0015	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	0.0015	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	0.0015	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	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	101% 50-150%
	13C5-PFPeA	103% 50-150%
	13C5-PFHxA	102% 50-150%
	13C4-PFHpA	101% 50-150%
	13C8-PFOA	102% 50-150%
	13C9-PFNA	101% 50-150%
	13C6-PFDA	100% 50-150%
	13C7-PFUnDA	105% 50-150%

Instrument Blank

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q668-IBLK	2Q44221.D	1	02/21/20	NG	n/a	n/a	S2Q668

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-9, FA72530-11, FA72530-12, FA72530-13

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	103% 50-150%
	13C2-PFTeDA	96% 50-150%
	13C3-PFBS	99% 50-150%
	13C3-PFHxS	98% 50-150%
	13C8-PFOS	97% 50-150%
	13C8-FOSA	104% 50-150%
	d3-MeFOSAA	113% 50-150%
	13C2-4:2FTS	98% 50-150%
	13C2-6:2FTS	97% 50-150%
	13C2-8:2FTS	93% 50-150%
	13C3-HFPO-DA	104% 50-150%

6.1.3

6

Instrument Blank

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q669-IBLK	2Q44284.D	1	02/23/20	NAF	n/a	n/a	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72530-7, FA72530-8, FA72530-10

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	0.0015	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	0.0015	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	0.0015	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	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	93% 50-150%
	13C5-PFPeA	93% 50-150%
	13C5-PFHxA	91% 50-150%
	13C4-PFHpA	92% 50-150%
	13C8-PFOA	90% 50-150%
	13C9-PFNA	89% 50-150%
	13C6-PFDA	94% 50-150%
	13C7-PFUnDA	97% 50-150%

Instrument Blank

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q669-IBLK	2Q44284.D	1	02/23/20	NAF	n/a	n/a	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72530-7, FA72530-8, FA72530-10

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	92% 50-150%
	13C2-PFTeDA	86% 50-150%
	13C3-PFBS	94% 50-150%
	13C3-PFHxS	92% 50-150%
	13C8-PFOS	93% 50-150%
	13C8-FOSA	91% 50-150%
	d3-MeFOSAA	98% 50-150%
	13C2-4:2FTS	88% 50-150%
	13C2-6:2FTS	86% 50-150%
	13C2-8:2FTS	86% 50-150%
	13C3-HFPO-DA	102% 50-150%

6.1.4
6

Blank Spike Summary

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79025-BS	2Q44188.D	1	02/20/20	NG	02/19/20	OP79025	S2Q667

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-7, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-12, FA72530-13, FA72530-14, FA72530-15

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0761	95	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0751	94	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0762	95	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0770	96	71-130
335-67-1	Perfluorooctanoic acid	0.08	0.0770	96	74-130
375-95-1	Perfluorononanoic acid	0.08	0.0779	97	76-130
335-76-2	Perfluorodecanoic acid	0.08	0.0768	96	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0740	93	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0761	95	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0751	94	70-139
376-06-7	Perfluorotetradecanoic acid	0.08	0.0738	92	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0779	97	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0766	96	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0749	94	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0783	98	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0737	92	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0737	92	70-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0708	89	70-130
754-91-6	PFOSA	0.08	0.0776	97	70-131
2355-31-9	MeFOSAA	0.08	0.0779	97	70-130
2991-50-6	EtFOSAA	0.08	0.0747	93	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0791	99	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0796	100	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0787	98	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	100%	30-140%
	13C5-PFPeA	100%	40-140%
	13C5-PFHxA	99%	50-150%
	13C4-PFHpA	98%	50-150%
	13C8-PFOA	98%	50-150%
	13C9-PFNA	98%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	91%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79025-BS	2Q44188.D	1	02/20/20	NG	02/19/20	OP79025	S2Q667

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-7, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-12, FA72530-13, FA72530-14, FA72530-15

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	90%	50-150%
	13C2-PFTeDA	81%	40-150%
	13C3-PFBS	97%	50-150%
	13C3-PFHxS	97%	50-150%
	13C8-PFOS	94%	50-150%
	13C8-FOSA	94%	30-140%
	d3-MeFOSAA	97%	50-150%
	13C2-4:2FTS	101%	50-150%
	13C2-6:2FTS	100%	50-150%
	13C2-8:2FTS	95%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79025-MS	2Q44228.D	1	02/21/20	NG	02/19/20	OP79025	S2Q668
FA72530-4	2Q44227.D	1	02/21/20	NG	02/19/20	OP79025	S2Q668

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-7, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-12, FA72530-13, FA72530-14, FA72530-15

CAS No.	Compound	FA72530-4 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0175		0.0714	0.0873	98	70-130
2706-90-3	Perfluoropentanoic acid	0.0097		0.0714	0.0747	91	70-130
307-24-4	Perfluorohexanoic acid	0.0097		0.0714	0.0777	95	70-130
375-85-9	Perfluoroheptanoic acid	0.0038		0.0714	0.0716	95	71-130
335-67-1	Perfluorooctanoic acid	0.0084		0.0714	0.0771	96	74-130
375-95-1	Perfluorononanoic acid	ND		0.0714	0.0686	96	76-130
335-76-2	Perfluorodecanoic acid	0.0043		0.0714	0.0710	93	70-130
2058-94-8	Perfluoroundecanoic acid	0.0036		0.0714	0.0698	93	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0714	0.0665	93	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0714	0.0708	99	70-139
376-06-7	Perfluorotetradecanoic acid	ND		0.0714	0.0645	90	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0037		0.0714	0.0704	93	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.0034	J	0.0714	0.0711	95	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0291		0.0714	0.0978	96	74-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.0714	0.0737	103	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.0969		0.0714	0.150	74	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0714	0.0661	93	70-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0714	0.0648	91	70-130
754-91-6	PFOSA	0.0090		0.0714	0.0775	96	70-131
2355-31-9	MeFOSAA	ND		0.0714	0.0683	96	70-130
2991-50-6	EtFOSAA	ND		0.0714	0.0671	94	70-130
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0714	0.0706	99	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0714	0.0720	101	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.0040	J	0.0714	0.0740	98	70-130

CAS No.	ID Standard Recoveries	MS	FA72530-4	Limits
	13C4-PFBA	75%	77%	30-140%
	13C5-PFPeA	82%	84%	40-140%
	13C5-PFHxA	82%	83%	50-150%
	13C4-PFHpA	82%	83%	50-150%
	13C8-PFOA	85%	85%	50-150%
	13C9-PFNA	90%	90%	50-150%
	13C6-PFDA	90%	91%	50-150%
	13C7-PFUnDA	91%	90%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79025-MS	2Q44228.D	1	02/21/20	NG	02/19/20	OP79025	S2Q668
FA72530-4	2Q44227.D	1	02/21/20	NG	02/19/20	OP79025	S2Q668

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-7, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-12, FA72530-13, FA72530-14, FA72530-15

CAS No.	ID Standard Recoveries	MS	FA72530-4	Limits
	13C2-PFDoDA	79%	83%	50-150%
	13C2-PFTeDA	62%	70%	40-150%
	13C3-PFBS	81%	82%	50-150%
	13C3-PFHxS	78%	80%	50-150%
	13C8-PFOS	81%	80%	50-150%
	13C8-FOSA	51%	55%	30-140%
	d3-MeFOSAA	113%	116%	50-150%
	13C2-4:2FTS	96%	92%	50-150%
	13C2-6:2FTS	105%	103%	50-150%
	13C2-8:2FTS	105%	101%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79025-DUP	2Q44236.D	100	02/21/20	NG	02/19/20	OP79025	S2Q668
FA72530-9 ^a	2Q44203.D	10	02/20/20	NG	02/19/20	OP79025	S2Q667
FA72530-9	2Q44235.D	100	02/21/20	NG	02/19/20	OP79025	S2Q668

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-7, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-12, FA72530-13, FA72530-14, FA72530-15

CAS No.	Compound	FA72530-9 ug/l	DUP Q	ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.320		0.314	J	2	30
2706-90-3	Perfluoropentanoic acid	0.962		0.873		10	30
307-24-4	Perfluorohexanoic acid	1.13		1.06		6	30
375-85-9	Perfluoroheptanoic acid	0.340		0.309	J	10	30
335-67-1	Perfluorooctanoic acid	0.616		0.563		9	30
375-95-1	Perfluorononanoic acid	0.0492		ND		200*	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	0.858		0.848		1	30
2706-91-4	Perfluoropentanesulfonic acid	1.11		1.11		0	30
355-46-4	Perfluorohexanesulfonic acid	6.13 ^b		6.97		13	30
375-92-8	Perfluoroheptanesulfonic acid	0.402		0.367		9	30
1763-23-1	Perfluorooctanesulfonic acid	17.5 ^b		19.1		9	30
68259-12-1	Perfluorononanesulfonic acid	0.0692		ND		200*	30
335-77-3	Perfluorodecanesulfonic acid	ND		ND		nc	30
754-91-6	PFOSA	0.0212	J	ND		200*	30
2355-31-9	MeFOSAA	ND		ND		nc	30
2991-50-6	EtFOSAA	ND		ND		nc	30
757124-72-44:2	Fluorotelomer sulfonate	0.0218	J	ND		200*	30
27619-97-2	6:2 Fluorotelomer sulfonate	2.45 ^b		2.77		12	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.294		0.273	J	7	30

CAS No.	ID Standard Recoveries	DUP	FA72530-9	FA72530-9	Limits
	13C4-PFBA	101%	98%	108%	30-140%
	13C5-PFPeA	103%	97%	110%	40-140%
	13C5-PFHxA	100%	93%	107%	50-150%
	13C4-PFHpA	99%	91%	105%	50-150%
	13C8-PFOA	100%	92%	106%	50-150%
	13C9-PFNA	98%	83%	104%	50-150%
	13C6-PFDA	97%	89%	104%	50-150%
	13C7-PFUnDA	97%	81%	104%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72530
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79025-DUP	2Q44236.D	100	02/21/20	NG	02/19/20	OP79025	S2Q668
FA72530-9 ^a	2Q44203.D	10	02/20/20	NG	02/19/20	OP79025	S2Q667
FA72530-9	2Q44235.D	100	02/21/20	NG	02/19/20	OP79025	S2Q668

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72530-1, FA72530-2, FA72530-3, FA72530-4, FA72530-5, FA72530-6, FA72530-7, FA72530-8, FA72530-9, FA72530-10, FA72530-11, FA72530-12, FA72530-13, FA72530-14, FA72530-15

CAS No.	ID Standard Recoveries	DUP	FA72530-9	FA72530-9	Limits
	13C2-PFDoDA	100%	77%	107%	50-150%
	13C2-PFTeDA	94%	69%	102%	40-150%
	13C3-PFBS	97%	97%	103%	50-150%
	13C3-PFHxS	95%	89%	100%	50-150%
	13C8-PFOS	92%	71%	97%	50-150%
	13C8-FOSA	102%	80%	104%	30-140%
	d3-MeFOSAA	109%	95%	119%	50-150%
	13C2-4:2FTS	97%	95%	104%	50-150%
	13C2-6:2FTS	97%	298% * c	103%	50-150%
	13C2-8:2FTS	92%	108%	98%	50-150%

- (a) Dilution required due to matrix interference.
- (b) Result is from Run #2.
- (c) Outside control limits due to matrix interference.

* = Outside of Control Limits.



Orlando, FL

03/06/20

e-Hardcopy 2.0
Automated Report

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

Technical Report for

LimnoTech

MSNPF

SGS Job Number: FA72571

Sampling Date: 02/12/20



Report to:

andrea.colby@sgs.com

Total number of pages in report: 47



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.

Caitlin Brice, M.S.
General Manager

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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Test results relate only to samples analyzed.



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SGS North America Inc.

Sample Summary

LimnoTech

Job No: FA72571

MSNPF

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

FA72571-1	02/12/20	09:00	CB	02/14/20	AQ	Water	OUTFALL 05
FA72571-2	02/12/20	10:10	CB	02/14/20	AQ	Water	OUTFALL 09
FA72571-3	02/12/20	09:45	CB	02/14/20	AQ	Water	OUTFALL 07
FA72571-4	02/12/20	11:20	CB	02/14/20	AQ	Water	OUTFALL 13
FA72571-5	02/12/20	08:40	CB	02/14/20	AQ	Water	OUTFALL 04
FA72571-6	02/12/20	11:05	CB	02/14/20	AQ	Water	OUTFALL 12
FA72571-7	02/12/20	12:05	CB	02/14/20	AQ	Water	OUTFALL 17
FA72571-8	02/12/20	13:45	CB	02/14/20	AQ	Water	OUTFALL 19
FA72571-9	02/12/20	14:40	CB	02/14/20	AQ	Water	OUTFALL 37
FA72571-10	02/12/20	15:15	CB	02/14/20	AQ	Water	OUTFALL 28
FA72571-11	02/12/20	11:40	CB	02/14/20	AQ	Water	OUTFALL 14

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: LimnoTech

Job No: FA72571

Site: MSNPF

Report Date 2/27/2020 1:26:32

11 Samples were collected on 02/12/2020 and were received at SGS North America Inc - Orlando on 02/14/2020 properly preserved, at 1.8 Deg. C and intact. These Samples received an SGS Orlando job number of FA72571. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

MS Semi-volatiles By Method EPA 537M BY ID

Matrix: AQ

Batch ID: OP79062

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA72567-5MS, FA72567-8DUP were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Ariel Hartney, Client Services (*Signature on file*)

Summary of Hits

Job Number: FA72571
Account: LimnoTech
Project: MSNPF
Collected: 02/12/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA72571-1		OUTFALL 05				
		4.8 J	7.4	1.9	ng/l	EPA 537M BY ID
		1.7 J	3.7	1.4	ng/l	EPA 537M BY ID
		1.3 J	3.7	0.93	ng/l	EPA 537M BY ID
		1.2 J	3.7	0.93	ng/l	EPA 537M BY ID
		0.98 J	3.7	0.93	ng/l	EPA 537M BY ID
		6.0	3.7	0.93	ng/l	EPA 537M BY ID
		2.4 J	3.7	1.4	ng/l	EPA 537M BY ID
FA72571-2		OUTFALL 09				
		11.3	7.4	1.9	ng/l	EPA 537M BY ID
		11.9	3.7	1.4	ng/l	EPA 537M BY ID
		13.3	3.7	0.93	ng/l	EPA 537M BY ID
		5.5	3.7	0.93	ng/l	EPA 537M BY ID
		5.1	3.7	0.93	ng/l	EPA 537M BY ID
		6.4	3.7	0.93	ng/l	EPA 537M BY ID
		8.6	3.7	0.93	ng/l	EPA 537M BY ID
		58.0	3.7	0.93	ng/l	EPA 537M BY ID
		1.1 J	3.7	0.93	ng/l	EPA 537M BY ID
		9.9	3.7	1.4	ng/l	EPA 537M BY ID
		9.6	7.4	1.9	ng/l	EPA 537M BY ID
FA72571-3		OUTFALL 07				
		6.3 J	7.4	1.9	ng/l	EPA 537M BY ID
		5.8	3.7	1.4	ng/l	EPA 537M BY ID
		4.7	3.7	0.93	ng/l	EPA 537M BY ID
		1.4 J	3.7	0.93	ng/l	EPA 537M BY ID
		1.2 J	3.7	0.93	ng/l	EPA 537M BY ID
		5.8	3.7	0.93	ng/l	EPA 537M BY ID
		4.1	3.7	0.93	ng/l	EPA 537M BY ID
		12.5	3.7	0.93	ng/l	EPA 537M BY ID
		8.5	3.7	1.4	ng/l	EPA 537M BY ID
FA72571-4		OUTFALL 13				
		5.5 J	7.4	1.9	ng/l	EPA 537M BY ID
		0.99 J	3.7	0.93	ng/l	EPA 537M BY ID
		1.4 J	3.7	0.93	ng/l	EPA 537M BY ID
		2.4 J	3.7	0.93	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72571
Account: LimnoTech
Project: MSNPF
Collected: 02/12/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA72571-5		OUTFALL 04				
	Perfluorobutanoic acid	14.2	7.4	1.9	ng/l	EPA 537M BY ID
	Perfluoropentanoic acid	17.5	3.7	1.4	ng/l	EPA 537M BY ID
	Perfluorohexanoic acid	22.1	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluoroheptanoic acid	9.0	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorooctanoic acid	7.1	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorobutanesulfonic acid	7.4	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluoropentanesulfonic acid	7.7	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorohexanesulfonic acid	70.6	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorooctanesulfonic acid	27.5	3.7	1.4	ng/l	EPA 537M BY ID
	6:2 Fluorotelomer sulfonate	3.8 J	7.4	1.9	ng/l	EPA 537M BY ID
FA72571-6		OUTFALL 12				
	Perfluorobutanoic acid	6.4 J	7.4	1.9	ng/l	EPA 537M BY ID
	Perfluorohexanoic acid	1.2 J	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorobutanesulfonic acid	1.7 J	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorohexanesulfonic acid	3.9	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorooctanesulfonic acid	5.4	3.7	1.4	ng/l	EPA 537M BY ID
FA72571-7		OUTFALL 17				
	Perfluorobutanoic acid	16.4	7.4	1.9	ng/l	EPA 537M BY ID
	Perfluoropentanoic acid	17.5	3.7	1.4	ng/l	EPA 537M BY ID
	Perfluorohexanoic acid	18.0	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluoroheptanoic acid	4.0	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorooctanoic acid	10.5	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorobutanesulfonic acid	9.2	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluoropentanesulfonic acid	5.8	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorohexanesulfonic acid	39.4	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorooctanesulfonic acid	5.9	3.7	1.4	ng/l	EPA 537M BY ID
FA72571-8		OUTFALL 19				
	Perfluorobutanoic acid	27.9	7.4	1.9	ng/l	EPA 537M BY ID
	Perfluoropentanoic acid	45.7	3.7	1.4	ng/l	EPA 537M BY ID
	Perfluorohexanoic acid	37.9	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluoroheptanoic acid	18.9	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorooctanoic acid	16.8	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorononanoic acid	1.4 J	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorobutanesulfonic acid	22.1	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluoropentanesulfonic acid	21.0	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluorohexanesulfonic acid	103	3.7	0.93	ng/l	EPA 537M BY ID
	Perfluoroheptanesulfonic acid	13.8	3.7	0.93	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72571
Account: LimnoTech
Project: MSNPF
Collected: 02/12/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Perfluorooctanesulfonic acid		538	37	14	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		17.6	7.4	1.9	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		5.6 J	7.4	1.9	ng/l	EPA 537M BY ID

FA72571-9 OUTFALL 37

Perfluorobutanoic acid		38.4	8.0	2.0	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		89.7	4.0	1.5	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		103	4.0	1.0	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		30.1	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		23.0	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorononanoic acid		1.1 J	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		81.9	4.0	1.0	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		111	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		450	40	10	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		13.2	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		222	4.0	1.5	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		12.9	8.0	2.0	ng/l	EPA 537M BY ID

FA72571-10 OUTFALL 28

Perfluorobutanoic acid		54.5	8.0	2.0	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		86.8	4.0	1.5	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		200	4.0	1.0	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		48.7	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		41.5	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorononanoic acid		2.5 J	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		137	4.0	1.0	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		161	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		815	40	10	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		26.1	4.0	1.0	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		893	40	15	ng/l	EPA 537M BY ID
PFOSA		1.5 J	4.0	1.0	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		36.5	8.0	2.0	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		3.1 J	8.0	2.0	ng/l	EPA 537M BY ID

FA72571-11 OUTFALL 14

Perfluorobutanoic acid		5.8 J	7.4	1.9	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		0.99 J	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		1.4 J	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		2.7 J	3.7	0.93	ng/l	EPA 537M BY ID



Orlando, FL

Section 4

4

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 05		
Lab Sample ID: FA72571-1		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44456.D	1	02/25/20 10:35	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	4.8	7.4	1.9	ng/l	J
2706-90-3	Perfluoropentanoic acid	1.7	3.7	1.4	ng/l	J
307-24-4	Perfluorohexanoic acid	1.3	3.7	0.93	ng/l	J
375-85-9	Perfluoroheptanoic acid	ND	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	1.2	3.7	0.93	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	0.98	3.7	0.93	ng/l	J
355-46-4	Perfluorohexanesulfonic acid	6.0	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	2.4	3.7	1.4	ng/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

4.1
4

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 05		Date Sampled: 02/12/20
Lab Sample ID: FA72571-1		Date Received: 02/14/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	88%		30-140%
	13C5-PFPeA	94%		40-140%
	13C5-PFHxA	95%		50-150%
	13C4-PFHpA	95%		50-150%
	13C8-PFOA	97%		50-150%
	13C9-PFNA	99%		50-150%
	13C6-PFDA	94%		50-150%
	13C7-PFUnDA	97%		50-150%
	13C2-PFDoDA	90%		50-150%
	13C2-PFTeDA	85%		40-150%
	13C3-PFBS	94%		50-150%
	13C3-PFHxS	93%		50-150%
	13C8-PFOS	91%		50-150%
	13C8-FOSA	93%		30-140%
	d3-MeFOSAA	88%		50-150%
	13C2-4:2FTS	99%		50-150%
	13C2-6:2FTS	101%		50-150%
	13C2-8:2FTS	92%		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

4.1
4

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 09		
Lab Sample ID: FA72571-2		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44457.D	1	02/25/20 10:50	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	11.3	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	11.9	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	13.3	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	5.5	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	5.1	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	6.4	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	8.6	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	58.0	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	1.1	3.7	0.93	ng/l	J
1763-23-1	Perfluorooctanesulfonic acid	9.9	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	9.6	7.4	1.9	ng/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

4.2
4

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 09		Date Sampled: 02/12/20
Lab Sample ID: FA72571-2		Date Received: 02/14/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	88%		30-140%
	13C5-PFPeA	91%		40-140%
	13C5-PFHxA	89%		50-150%
	13C4-PFHpA	89%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	91%		50-150%
	13C6-PFDA	85%		50-150%
	13C7-PFUnDA	86%		50-150%
	13C2-PFDoDA	80%		50-150%
	13C2-PFTeDA	74%		40-150%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	84%		50-150%
	13C8-PFOS	82%		50-150%
	13C8-FOSA	92%		30-140%
	d3-MeFOSAA	79%		50-150%
	13C2-4:2FTS	91%		50-150%
	13C2-6:2FTS	93%		50-150%
	13C2-8:2FTS	80%		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

4.2
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SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 07		
Lab Sample ID: FA72571-3		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44458.D	1	02/25/20 11:05	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	6.3	7.4	1.9	ng/l	J
2706-90-3	Perfluoropentanoic acid	5.8	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	4.7	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	1.4	3.7	0.93	ng/l	J
335-67-1	Perfluorooctanoic acid	1.2	3.7	0.93	ng/l	J
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	5.8	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	4.1	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	12.5	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	8.5	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

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SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 07	
Lab Sample ID: FA72571-3	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	83%		30-140%
	13C5-PFPeA	89%		40-140%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	88%		50-150%
	13C8-PFOA	91%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	84%		50-150%
	13C7-PFUnDA	87%		50-150%
	13C2-PFDoDA	82%		50-150%
	13C2-PFTeDA	73%		40-150%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	86%		50-150%
	13C8-PFOS	83%		50-150%
	13C8-FOSA	84%		30-140%
	d3-MeFOSAA	81%		50-150%
	13C2-4:2FTS	91%		50-150%
	13C2-6:2FTS	96%		50-150%
	13C2-8:2FTS	83%		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

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 13		
Lab Sample ID: FA72571-4		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44459.D	1	02/25/20 11:21	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	5.5	7.4	1.9	ng/l	J
2706-90-3	Perfluoropentanoic acid	ND	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	0.99	3.7	0.93	ng/l	J
375-85-9	Perfluoroheptanoic acid	ND	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	1.4	3.7	0.93	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	2.4	3.7	0.93	ng/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

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Report of Analysis

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Client Sample ID: OUTFALL 13	
Lab Sample ID: FA72571-4	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	80%		30-140%
	13C5-PFPeA	86%		40-140%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	84%		50-150%
	13C8-PFOA	87%		50-150%
	13C9-PFNA	89%		50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	86%		50-150%
	13C2-PFDoDA	80%		50-150%
	13C2-PFTeDA	72%		40-150%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	82%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	79%		30-140%
	d3-MeFOSAA	81%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	91%		50-150%
	13C2-8:2FTS	82%		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

SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 04		Date Sampled: 02/12/20
Lab Sample ID: FA72571-5		Date Received: 02/14/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44460.D	1	02/25/20 11:36	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	14.2	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	17.5	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	22.1	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	9.0	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	7.1	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	7.4	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	7.7	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	70.6	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	27.5	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	3.8	7.4	1.9	ng/l	J

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

SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 04	
Lab Sample ID: FA72571-5	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	81%		30-140%
	13C5-PFPeA	87%		40-140%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	81%		50-150%
	13C9-PFNA	81%		50-150%
	13C6-PFDA	75%		50-150%
	13C7-PFUnDA	76%		50-150%
	13C2-PFDoDA	68%		50-150%
	13C2-PFTeDA	67%		40-150%
	13C3-PFBS	84%		50-150%
	13C3-PFHxS	74%		50-150%
	13C8-PFOS	73%		50-150%
	13C8-FOSA	74%		30-140%
	d3-MeFOSAA	72%		50-150%
	13C2-4:2FTS	89%		50-150%
	13C2-6:2FTS	87%		50-150%
	13C2-8:2FTS	74%		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

SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 12		
Lab Sample ID: FA72571-6		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44461.D	1	02/25/20 11:51	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	6.4	7.4	1.9	ng/l	J
2706-90-3	Perfluoropentanoic acid	ND	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	1.2	3.7	0.93	ng/l	J
375-85-9	Perfluoroheptanoic acid	ND	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	1.7	3.7	0.93	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	3.9	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	5.4	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 12		Date Sampled: 02/12/20
Lab Sample ID: FA72571-6		Date Received: 02/14/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	81%		30-140%
	13C5-PFPeA	89%		40-140%
	13C5-PFHxA	88%		50-150%
	13C4-PFHpA	87%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	92%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	91%		50-150%
	13C2-PFDoDA	83%		50-150%
	13C2-PFTeDA	75%		40-150%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	85%		50-150%
	13C8-PFOS	82%		50-150%
	13C8-FOSA	83%		30-140%
	d3-MeFOSAA	85%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	95%		50-150%
	13C2-8:2FTS	85%		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

4.6
4

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 17		
Lab Sample ID: FA72571-7		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44462.D	1	02/25/20 12:07	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	16.4	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	17.5	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	18.0	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	4.0	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	10.5	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	9.2	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	5.8	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	39.4	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	5.9	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

4.7
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SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 17		Date Sampled: 02/12/20
Lab Sample ID: FA72571-7		Date Received: 02/14/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	71%		30-140%
	13C5-PFPeA	79%		40-140%
	13C5-PFHxA	79%		50-150%
	13C4-PFHpA	80%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	89%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	89%		50-150%
	13C2-PFDoDA	83%		50-150%
	13C2-PFTeDA	77%		40-150%
	13C3-PFBS	80%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	80%		50-150%
	13C8-FOSA	68%		30-140%
	d3-MeFOSAA	88%		50-150%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	93%		50-150%
	13C2-8:2FTS	88%		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

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Report of Analysis

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Client Sample ID:	OUTFALL 19		Date Sampled:	02/12/20
Lab Sample ID:	FA72571-8		Date Received:	02/14/20
Matrix:	AQ - Water		Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD			
Project:	MSNPF			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44463.D	1	02/25/20 12:22	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2	2Q44395.D	10	02/24/20 18:22	NAF	02/21/20 11:50	OP79062	S2Q670

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	27.9	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	45.7	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	37.9	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	18.9	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	16.8	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	1.4	3.7	0.93	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	22.1	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	21.0	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	103	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	13.8	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	538 ^a	37	14	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	17.6	7.4	1.9	ng/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

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N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

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Client Sample ID:	OUTFALL 19		Date Sampled:	02/12/20
Lab Sample ID:	FA72571-8		Date Received:	02/14/20
Matrix:	AQ - Water		Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD			
Project:	MSNPF			

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	5.6	7.4	1.9	ng/l	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	78%	95%	30-140%
	13C5-PFPeA	84%	95%	40-140%
	13C5-PFHxA	80%	93%	50-150%
	13C4-PFHpA	80%	92%	50-150%
	13C8-PFOA	81%	90%	50-150%
	13C9-PFNA	81%	86%	50-150%
	13C6-PFDA	82%	81%	50-150%
	13C7-PFUnDA	85%	83%	50-150%
	13C2-PFDoDA	80%	74%	50-150%
	13C2-PFTeDA	75%	67%	40-150%
	13C3-PFBS	83%	93%	50-150%
	13C3-PFHxS	76%	87%	50-150%
	13C8-PFOS	71%	82%	50-150%
	13C8-FOSA	54%	68%	30-140%
	d3-MeFOSAA	87%	86%	50-150%
	13C2-4:2FTS	84%	94%	50-150%
	13C2-6:2FTS	92%	92%	50-150%
	13C2-8:2FTS	86%	78%	50-150%

(a) Result is from Run# 2

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
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SGS North America Inc.

Report of Analysis

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Client Sample ID:	OUTFALL 37	Date Sampled:	02/12/20
Lab Sample ID:	FA72571-9	Date Received:	02/14/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44464.D	1	02/25/20 12:37	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2	2Q44396.D	10	02/24/20 18:37	NAF	02/21/20 11:50	OP79062	S2Q670

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	38.4	8.0	2.0	ng/l	
2706-90-3	Perfluoropentanoic acid	89.7	4.0	1.5	ng/l	
307-24-4	Perfluorohexanoic acid	103	4.0	1.0	ng/l	
375-85-9	Perfluoroheptanoic acid	30.1	4.0	1.0	ng/l	
335-67-1	Perfluorooctanoic acid	23.0	4.0	1.0	ng/l	
375-95-1	Perfluorononanoic acid	1.1	4.0	1.0	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	4.0	1.0	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	4.0	1.0	ng/l	
307-55-1	Perfluorododecanoic acid	ND	4.0	1.5	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	4.0	1.0	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	4.0	1.0	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	81.9	4.0	1.0	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	111	4.0	1.0	ng/l	
355-46-4	Perfluorohexanesulfonic acid	450 ^a	40	10	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	13.2	4.0	1.0	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	222	4.0	1.5	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	4.0	1.0	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	4.0	1.0	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	4.0	1.0	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	8.0	4.0	ng/l	
2991-50-6	EtFOSAA	ND	8.0	4.0	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	8.0	2.0	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	12.9	8.0	2.0	ng/l	

ND = Not detected MDL = Method Detection Limit

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SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 37	
Lab Sample ID: FA72571-9	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	8.0	2.0	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	59%	94%	30-140%
	13C5-PFPeA	65%	97%	40-140%
	13C5-PFHxA	63%	93%	50-150%
	13C4-PFHpA	66%	91%	50-150%
	13C8-PFOA	73%	91%	50-150%
	13C9-PFNA	82%	93%	50-150%
	13C6-PFDA	79%	86%	50-150%
	13C7-PFUnDA	85%	87%	50-150%
	13C2-PFDoDA	79%	78%	50-150%
	13C2-PFTeDA	71%	65%	40-150%
	13C3-PFBS	64%	96%	50-150%
	13C3-PFHxS	64%	89%	50-150%
	13C8-PFOS	70%	86%	50-150%
	13C8-FOSA	55%	69%	30-140%
	d3-MeFOSAA	81%	86%	50-150%
	13C2-4:2FTS	68%	95%	50-150%
	13C2-6:2FTS	83%	96%	50-150%
	13C2-8:2FTS	82%	83%	50-150%

(a) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
 RL = Reporting Limit
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J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
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SGS North America Inc.

Report of Analysis

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Client Sample ID:	OUTFALL 28	Date Sampled:	02/12/20
Lab Sample ID:	FA72571-10	Date Received:	02/14/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44465.D	1	02/25/20 12:53	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2	2Q44397.D	10	02/24/20 18:53	NAF	02/21/20 11:50	OP79062	S2Q670

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
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	54.5	8.0	2.0	ng/l	
2706-90-3	Perfluoropentanoic acid	86.8	4.0	1.5	ng/l	
307-24-4	Perfluorohexanoic acid	200	4.0	1.0	ng/l	
375-85-9	Perfluoroheptanoic acid	48.7	4.0	1.0	ng/l	
335-67-1	Perfluorooctanoic acid	41.5	4.0	1.0	ng/l	
375-95-1	Perfluorononanoic acid	2.5	4.0	1.0	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	4.0	1.0	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	4.0	1.0	ng/l	
307-55-1	Perfluorododecanoic acid	ND	4.0	1.5	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	4.0	1.0	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	4.0	1.0	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	137	4.0	1.0	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	161	4.0	1.0	ng/l	
355-46-4	Perfluorohexanesulfonic acid	815 ^a	40	10	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	26.1	4.0	1.0	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	893 ^a	40	15	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	4.0	1.0	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	4.0	1.0	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	1.5	4.0	1.0	ng/l	J
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	8.0	4.0	ng/l	
2991-50-6	EtFOSAA	ND	8.0	4.0	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	8.0	2.0	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	36.5	8.0	2.0	ng/l	

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N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

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Client Sample ID:	OUTFALL 28	Date Sampled:	02/12/20
Lab Sample ID:	FA72571-10	Date Received:	02/14/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	3.1	8.0	2.0	ng/l	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	64%	94%	30-140%
	13C5-PFPeA	73%	95%	40-140%
	13C5-PFHxA	71%	92%	50-150%
	13C4-PFHpA	72%	90%	50-150%
	13C8-PFOA	76%	92%	50-150%
	13C9-PFNA	76%	91%	50-150%
	13C6-PFDA	80%	86%	50-150%
	13C7-PFUnDA	86%	88%	50-150%
	13C2-PFDoDA	79%	79%	50-150%
	13C2-PFTeDA	70%	70%	40-150%
	13C3-PFBS	73%	95%	50-150%
	13C3-PFHxS	69%	89%	50-150%
	13C8-PFOS	66%	81%	50-150%
	13C8-FOSA	56%	85%	30-140%
	d3-MeFOSAA	86%	91%	50-150%
	13C2-4:2FTS	77%	95%	50-150%
	13C2-6:2FTS	89%	97%	50-150%
	13C2-8:2FTS	86%	83%	50-150%

(a) Result is from Run# 2

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SGS North America Inc.

Report of Analysis

Page 1 of 2

Client Sample ID:	OUTFALL 14	Date Sampled:	02/12/20
Lab Sample ID:	FA72571-11	Date Received:	02/14/20
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44468.D	1	02/25/20 13:39	NAF	02/21/20 11:50	OP79062	S2Q671
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	5.8	7.4	1.9	ng/l	J
2706-90-3	Perfluoropentanoic acid	ND	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	0.99	3.7	0.93	ng/l	J
375-85-9	Perfluoroheptanoic acid	ND	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	1.4	3.7	0.93	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	2.7	3.7	0.93	ng/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

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N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

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Client Sample ID:	OUTFALL 14		Date Sampled:	02/12/20
Lab Sample ID:	FA72571-11		Date Received:	02/14/20
Matrix:	AQ - Water		Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD			
Project:	MSNPF			

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	77%		30-140%
	13C5-PFPeA	84%		40-140%
	13C5-PFHxA	82%		50-150%
	13C4-PFHpA	81%		50-150%
	13C8-PFOA	83%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	83%		50-150%
	13C7-PFUnDA	86%		50-150%
	13C2-PFDoDA	79%		50-150%
	13C2-PFTeDA	74%		40-150%
	13C3-PFBS	81%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	79%		50-150%
	13C8-FOSA	74%		30-140%
	d3-MeFOSAA	80%		50-150%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	81%		50-150%

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

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Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

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
EtFOSAA	2991-50-6	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
Perfluoronanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoronanoic 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

SGS Sample Receipt Summary

Job Number: FA72571

Client: LIMNOTECH

Project: MSNPF1

Date / Time Received: 2/14/2020 9:10:00 AM

Delivery Method: FX

Airbill #'s: 1386 6596 0125

Therm ID: IR 1; Therm CF: -0.8; # of Coolers: N/A

Cooler Temps (Raw Measured) °C: Cooler 1: (2.6);

Cooler Temps (Corrected) °C: Cooler 1: (1.8);

<u>Cooler Information</u>	<u>Y</u>	<u>or</u>	<u>N</u>
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 type="checkbox"/>		<input type="checkbox"/>
4. Cooler temp verification	<u>N/A</u>		
5. Cooler media	<u>N/A</u>		

<u>Sample Information</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
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"/>

<u>Trip Blank Information</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
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</u>	<u>or</u>	<u>S</u>	<u>N/A</u>
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 RECEIVED EXTRA SAMPLE ID "OUTFALL 14" TIME "1140"

Technician: PETERH

Date: 2/14/2020 9:10:00 AM

Reviewer: _____

Date: _____

SM001
Rev. Date 05/24/17

FA72571: Chain of Custody

Page 2 of 3



5.2
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Response: Please analyze the extra sample received per Chris Behnke.

SM001
Rev. Date 05/24/17

FA72571: Chain of Custody
Page 3 of 3

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79062-MB	2Q44372.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

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	0.0015	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	0.0015	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	0.0015	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	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	105% 30-140%
	13C5-PFPeA	106% 40-140%
	13C5-PFHxA	104% 50-150%
	13C4-PFHpA	104% 50-150%
	13C8-PFOA	103% 50-150%
	13C9-PFNA	98% 50-150%
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	94% 50-150%

Method Blank Summary

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79062-MB	2Q44372.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	87% 50-150%
	13C2-PFTeDA	79% 40-150%
	13C3-PFBS	106% 50-150%
	13C3-PFHxS	102% 50-150%
	13C8-PFOS	91% 50-150%
	13C8-FOSA	70% 30-140%
	d3-MeFOSAA	93% 50-150%
	13C2-4:2FTS	104% 50-150%
	13C2-6:2FTS	102% 50-150%
	13C2-8:2FTS	86% 50-150%
	13C3-HFPO-DA	114% 50-150%

Instrument Blank

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q670-IBLK	2Q44357.D	1	02/24/20	NAF	n/a	n/a	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72571-8, FA72571-9, FA72571-10

CAS No.	Compound	Result	RL	MDL	Units	Q
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0015	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	95% 50-150%
	13C5-PFPeA	96% 50-150%
	13C5-PFHxA	94% 50-150%
	13C4-PFHpA	95% 50-150%
	13C8-PFOA	93% 50-150%
	13C9-PFNA	92% 50-150%
	13C6-PFDA	94% 50-150%
	13C7-PFUnDA	98% 50-150%
	13C2-PFD _o DA	94% 50-150%
	13C2-PFTeDA	86% 50-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	94% 50-150%
	13C8-PFOS	93% 50-150%
	13C8-FOSA	103% 50-150%
	d3-MeFOSAA	89% 50-150%
	13C2-4:2FTS	93% 50-150%
	13C2-6:2FTS	92% 50-150%
	13C2-8:2FTS	91% 50-150%
	13C3-HFPO-DA	106% 50-150%

Instrument Blank

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q671-IBLK	2Q44453.D	1	02/25/20	NAF	n/a	n/a	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

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	0.0015	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	0.0015	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	0.0015	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	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	95% 50-150%
	13C5-PFPeA	97% 50-150%
	13C5-PFHxA	95% 50-150%
	13C4-PFHpA	94% 50-150%
	13C8-PFOA	94% 50-150%
	13C9-PFNA	93% 50-150%
	13C6-PFDA	93% 50-150%
	13C7-PFUnDA	99% 50-150%

Instrument Blank

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q671-IBLK	2Q44453.D	1	02/25/20	NAF	n/a	n/a	S2Q671

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	95% 50-150%
	13C2-PFTeDA	89% 50-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	94% 50-150%
	13C8-PFOS	91% 50-150%
	13C8-FOSA	103% 50-150%
	d3-MeFOSAA	90% 50-150%
	13C2-4:2FTS	93% 50-150%
	13C2-6:2FTS	93% 50-150%
	13C2-8:2FTS	89% 50-150%
	13C3-HFPO-DA	102% 50-150%

6.1.3
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Blank Spike Summary

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79062-BS	2Q44371.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0727	91	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0733	92	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0764	96	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0763	95	71-130
335-67-1	Perfluorooctanoic acid	0.08	0.0753	94	74-130
375-95-1	Perfluorononanoic acid	0.08	0.0774	97	76-130
335-76-2	Perfluorodecanoic acid	0.08	0.0757	95	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0717	90	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0747	93	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0785	98	70-139
376-06-7	Perfluorotetradecanoic acid	0.08	0.0741	93	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0766	96	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0772	97	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0732	92	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0752	94	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0772	97	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0760	95	70-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0725	91	70-130
754-91-6	PFOSA	0.08	0.0770	96	70-131
2355-31-9	MeFOSAA	0.08	0.0752	94	70-130
2991-50-6	EtFOSAA	0.08	0.0744	93	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0790	99	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0784	98	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0788	99	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	89%	30-140%
	13C5-PFPeA	90%	40-140%
	13C5-PFHxA	88%	50-150%
	13C4-PFHpA	89%	50-150%
	13C8-PFOA	87%	50-150%
	13C9-PFNA	84%	50-150%
	13C6-PFDA	78%	50-150%
	13C7-PFUnDA	82%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79062-BS	2Q44371.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	76%	50-150%
	13C2-PFTeDA	70%	40-150%
	13C3-PFBS	90%	50-150%
	13C3-PFHxS	87%	50-150%
	13C8-PFOS	78%	50-150%
	13C8-FOSA	67%	30-140%
	d3-MeFOSAA	77%	50-150%
	13C2-4:2FTS	92%	50-150%
	13C2-6:2FTS	90%	50-150%
	13C2-8:2FTS	77%	50-150%
	13C3-HFPO-DA	97%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79062-MS	2Q44378.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670
FA72567-5	2Q44377.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

CAS No.	Compound	FA72567-5 ug/l	Spike Q	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	ND	0.0741	0.0662	89	70-130
2706-90-3	Perfluoropentanoic acid	ND	0.0741	0.0664	90	70-130
307-24-4	Perfluorohexanoic acid	ND	0.0741	0.0678	92	70-130
375-85-9	Perfluoroheptanoic acid	ND	0.0741	0.0690	93	71-130
335-67-1	Perfluorooctanoic acid	ND	0.0741	0.0683	92	74-130
375-95-1	Perfluorononanoic acid	ND	0.0741	0.0699	94	76-130
335-76-2	Perfluorodecanoic acid	ND	0.0741	0.0668	90	70-130
2058-94-8	Perfluoroundecanoic acid	ND	0.0741	0.0645	87	70-130
307-55-1	Perfluorododecanoic acid	ND	0.0741	0.0681	92	70-130
72629-94-8	Perfluorotridecanoic acid	ND	0.0741	0.0710	96	70-139
376-06-7	Perfluorotetradecanoic acid	ND	0.0741	0.0655	88	70-130
375-73-5	Perfluorobutanesulfonic acid	ND	0.0741	0.0688	93	73-130
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0741	0.0693	94	70-130
355-46-4	Perfluorohexanesulfonic acid	ND	0.0741	0.0662	89	74-130
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0741	0.0686	93	74-130
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0741	0.0677	91	70-130
68259-12-1	Perfluorononanesulfonic acid	ND	0.0741	0.0643	87	70-130
335-77-3	Perfluorodecanesulfonic acid	ND	0.0741	0.0600	81	70-130
754-91-6	PFOSA	ND	0.0741	0.0718	97	70-131
2355-31-9	MeFOSAA	ND	0.0741	0.0686	93	70-130
2991-50-6	EtFOSAA	ND	0.0741	0.0659	89	70-130
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0741	0.0715	97	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0741	0.0706	95	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0741	0.0715	97	70-130

CAS No.	ID Standard Recoveries	MS	FA72567-5	Limits
	13C4-PFBA	94%	100%	30-140%
	13C5-PFPeA	95%	101%	40-140%
	13C5-PFHxA	93%	98%	50-150%
	13C4-PFHpA	93%	98%	50-150%
	13C8-PFOA	91%	97%	50-150%
	13C9-PFNA	90%	97%	50-150%
	13C6-PFDA	84%	90%	50-150%
	13C7-PFUnDA	85%	92%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79062-MS	2Q44378.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670
FA72567-5	2Q44377.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

CAS No.	ID Standard Recoveries	MS	FA72567-5	Limits
	13C2-PFDoDA	76%	82%	50-150%
	13C2-PFTeDA	68%	69%	40-150%
	13C3-PFBS	93%	99%	50-150%
	13C3-PFHxS	93%	97%	50-150%
	13C8-PFOS	85%	90%	50-150%
	13C8-FOSA	68%	87%	30-140%
	d3-MeFOSAA	77%	85%	50-150%
	13C2-4:2FTS	93%	93%	50-150%
	13C2-6:2FTS	93%	95%	50-150%
	13C2-8:2FTS	83%	85%	50-150%
	13C3-HFPO-DA	103%	110%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79062-DUP	2Q44384.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670
FA72567-8	2Q44383.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

CAS No.	Compound	FA72567-8 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	EtFOSAA	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

CAS No.	ID Standard Recoveries	DUP	FA72567-8	Limits
	13C4-PFBA	107%	93%	30-140%
	13C5-PFPeA	107%	94%	40-140%
	13C5-PFHxA	106%	92%	50-150%
	13C4-PFHpA	105%	92%	50-150%
	13C8-PFOA	103%	92%	50-150%
	13C9-PFNA	103%	90%	50-150%
	13C6-PFDA	100%	83%	50-150%
	13C7-PFUnDA	105%	86%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72571
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79062-DUP	2Q44384.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670
FA72567-8	2Q44383.D	1	02/24/20	NAF	02/21/20	OP79062	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72571-1, FA72571-2, FA72571-3, FA72571-4, FA72571-5, FA72571-6, FA72571-7, FA72571-8, FA72571-9, FA72571-10, FA72571-11

CAS No.	ID Standard Recoveries	DUP	FA72567-8	Limits
	13C2-PFDoDA	89%	78%	50-150%
	13C2-PFTeDA	76%	71%	40-150%
	13C3-PFBS	105%	92%	50-150%
	13C3-PFHxS	102%	88%	50-150%
	13C8-PFOS	99%	82%	50-150%
	13C8-FOSA	92%	91%	30-140%
	d3-MeFOSAA	95%	80%	50-150%
	13C2-4:2FTS	103%	89%	50-150%
	13C2-6:2FTS	103%	89%	50-150%
	13C2-8:2FTS	94%	78%	50-150%
	13C3-HFPO-DA	113%	99%	50-150%

* = Outside of Control Limits.



Orlando, FL

03/06/20

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Automated Report

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

Technical Report for

LimnoTech

MSNPF

SGS Job Number: FA72576

Sampling Date: 02/12/20



Report to:

andrea.colby@sgs.com

Total number of pages in report: 45



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.

Caitlin Brice, M.S.
General Manager

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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Test results relate only to samples analyzed.



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SGS North America Inc.

Sample Summary

LimnoTech

Job No: FA72576

MSNPF

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
---------------	----------------	---------	-----------------	-----------	------------------

This report contains results reported as ND = Not detected. The following applies:

Organics ND = Not detected above the MDL

FA72576-1	02/12/20	13:20	CB	02/14/20	AQ Water	OUTFALL 15
FA72576-2	02/12/20	15:50	CB	02/14/20	AQ Water	OUTFALL 30
FA72576-3	02/12/20	00:00	CB	02/14/20	AQ Water	DUPLICATE C
FA72576-4	02/12/20	15:00	CB	02/14/20	AQ Water	OUTFALL 27
FA72576-5	02/12/20	16:40	CB	02/14/20	AQ Water	OUTFALL 03
FA72576-6	02/12/20	09:15	CB	02/14/20	AQ Water	OUTFALL 06
FA72576-7	02/12/20	10:55	CB	02/14/20	AQ Water	OUTFALL 11
FA72576-8	02/12/20	10:30	CB	02/14/20	AQ Water	OUTFALL 10
FA72576-9	02/12/20	17:40	CB	02/14/20	AQ Equipment Blank	EQUIPMENT BLANK B
FA72576-10	02/12/20	17:50	CB	02/14/20	AQ Field Blank Water	FIELD BLANK C

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: LimnoTech

Job No: FA72576

Site: MSNPF

Report Date 2/25/2020 4:28:09

9 Samples and 1 Field Blank were collected on 02/12/2020 and were received at SGS North America Inc - Orlando on 02/14/2020 properly preserved, at 2.1 Deg. C and intact. These Samples received an SGS Orlando job number of FA72576. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

MS Semi-volatiles By Method EPA 537M BY ID

Matrix: AQ

Batch ID: OP79063

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA72576-1MS, FA72576-3DUP were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Matrix Spike Recovery(s) for Perfluorooctanesulfonic acid are outside control limits. Probable cause is due to matrix interference.

RPD(s) for Duplicate for 6:2 Fluorotelomer sulfonate, Perfluorononanoic acid are outside control limits for sample OP79063-DUP. Probable cause is due to sample non-homogeneity.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Ariel Hartney, Client Services (*Signature on File*)

Summary of Hits

Job Number: FA72576
Account: LimnoTech
Project: MSNPF
Collected: 02/12/20

Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method	
FA72576-1		OUTFALL 15					
		Perfluorobutanoic acid	14.6	7.4	1.9	ng/l	EPA 537M BY ID
		Perfluoropentanoic acid	18.4	3.7	1.4	ng/l	EPA 537M BY ID
		Perfluorohexanoic acid	8.8	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluoroheptanoic acid	2.4 J	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorooctanoic acid	2.1 J	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	3.4 J	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluoropentanesulfonic acid	2.6 J	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	14.0	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluoroheptanesulfonic acid	1.2 J	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	114	3.7	1.4	ng/l	EPA 537M BY ID
FA72576-2		OUTFALL 30					
		Perfluorobutanoic acid	14.1	8.0	2.0	ng/l	EPA 537M BY ID
		Perfluoropentanoic acid	18.1	4.0	1.5	ng/l	EPA 537M BY ID
		Perfluorohexanoic acid	18.2	4.0	1.0	ng/l	EPA 537M BY ID
		Perfluoroheptanoic acid	7.5	4.0	1.0	ng/l	EPA 537M BY ID
		Perfluorooctanoic acid	7.1	4.0	1.0	ng/l	EPA 537M BY ID
		Perfluorodecanoic acid	1.7 J	4.0	1.0	ng/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	14.3	4.0	1.0	ng/l	EPA 537M BY ID
		Perfluoropentanesulfonic acid	14.9	4.0	1.0	ng/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	76.7	4.0	1.0	ng/l	EPA 537M BY ID
		Perfluoroheptanesulfonic acid	2.3 J	4.0	1.0	ng/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	70.6	4.0	1.5	ng/l	EPA 537M BY ID
FA72576-3		DUPLICATE C					
		Perfluorobutanoic acid	37.8	7.4	1.9	ng/l	EPA 537M BY ID
		Perfluoropentanoic acid	90.1	3.7	1.4	ng/l	EPA 537M BY ID
		Perfluorohexanoic acid	102	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluoroheptanoic acid	28.7	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorooctanoic acid	22.0	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorononanoic acid	1.1 J	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorobutanesulfonic acid	80.3	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluoropentanesulfonic acid	108	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorohexanesulfonic acid	447	37	9.3	ng/l	EPA 537M BY ID
		Perfluoroheptanesulfonic acid	11.9	3.7	0.93	ng/l	EPA 537M BY ID
		Perfluorooctanesulfonic acid	181	3.7	1.4	ng/l	EPA 537M BY ID
		6:2 Fluorotelomer sulfonate	12.1	7.4	1.9	ng/l	EPA 537M BY ID
FA72576-4		OUTFALL 27					
		Perfluorobutanoic acid	113	74	19	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72576
Account: LimnoTech
Project: MSNPF
Collected: 02/12/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Perfluoropentanoic acid		271	37	14	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		336	37	9.3	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		94.2	37	9.3	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		145	37	9.3	ng/l	EPA 537M BY ID
Perfluorononanoic acid		12.0 J	37	9.3	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		228	37	9.3	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		290	37	9.3	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		1810	37	9.3	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		105	37	9.3	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		2220	37	14	ng/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate		244	74	19	ng/l	EPA 537M BY ID
8:2 Fluorotelomer sulfonate		21.5 J	74	19	ng/l	EPA 537M BY ID

FA72576-5 OUTFALL 03

Perfluorobutanoic acid		23.4	7.4	1.9	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		36.6	3.7	1.4	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		37.0	3.7	0.93	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		16.4	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorooctanoic acid		28.6	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorononanoic acid		1.9 J	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorodecanoic acid		1.7 J	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		6.3	3.7	0.93	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		7.8	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		49.2	3.7	0.93	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid		1.3 J	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		20.5	3.7	1.4	ng/l	EPA 537M BY ID

FA72576-6 OUTFALL 06

Perfluorobutanoic acid		10.7	7.4	1.9	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		5.0	3.7	1.4	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		3.8	3.7	0.93	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		1.1 J	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid		4.9	3.7	0.93	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid		4.0	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid		10.1	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid		2.6 J	3.7	1.4	ng/l	EPA 537M BY ID

FA72576-7 OUTFALL 11

Perfluorobutanoic acid		8.8	7.4	1.9	ng/l	EPA 537M BY ID
Perfluoropentanoic acid		2.4 J	3.7	1.4	ng/l	EPA 537M BY ID
Perfluorohexanoic acid		1.9 J	3.7	0.93	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid		1.0 J	3.7	0.93	ng/l	EPA 537M BY ID

Summary of Hits

Job Number: FA72576
Account: LimnoTech
Project: MSNPF
Collected: 02/12/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		4.2	3.7	0.93	ng/l	EPA 537M BY ID
		1.4 J	3.7	0.93	ng/l	EPA 537M BY ID
		4.9	3.7	0.93	ng/l	EPA 537M BY ID
		4.4	3.7	1.4	ng/l	EPA 537M BY ID

FA72576-8 UTFALL 10

Perfluorobutanoic acid	14.2	7.4	1.9	ng/l	EPA 537M BY ID
Perfluoropentanoic acid	13.4	3.7	1.4	ng/l	EPA 537M BY ID
Perfluorohexanoic acid	40.9	3.7	0.93	ng/l	EPA 537M BY ID
Perfluoroheptanoic acid	12.6	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorooctanoic acid	228	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	14.8	3.7	0.93	ng/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	16.2	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	392	37	9.3	ng/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid	2.7 J	3.7	0.93	ng/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	16.1	3.7	1.4	ng/l	EPA 537M BY ID

FA72576-9 EQUIPMENT BLANK B

No hits reported in this sample.

FA72576-10 FIELD BLANK C

No hits reported in this sample.



Orlando, FL

Section 4

4

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 15		
Lab Sample ID: FA72576-1		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44361.D	1	02/24/20 09:24	NAF	02/21/20 15:10	OP79063	S2Q670
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	14.6	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	18.4	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	8.8	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	2.4	3.7	0.93	ng/l	J
335-67-1	Perfluorooctanoic acid	2.1	3.7	0.93	ng/l	J
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	3.4	3.7	0.93	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	2.6	3.7	0.93	ng/l	J
355-46-4	Perfluorohexanesulfonic acid	14.0	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	1.2	3.7	0.93	ng/l	J
1763-23-1	Perfluorooctanesulfonic acid	114	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

4.1
4

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 15		Date Sampled: 02/12/20
Lab Sample ID: FA72576-1		Date Received: 02/14/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	76%		30-140%
	13C5-PFPeA	82%		40-140%
	13C5-PFHxA	81%		50-150%
	13C4-PFHpA	82%		50-150%
	13C8-PFOA	85%		50-150%
	13C9-PFNA	87%		50-150%
	13C6-PFDA	81%		50-150%
	13C7-PFUnDA	78%		50-150%
	13C2-PFDoDA	74%		50-150%
	13C2-PFTeDA	68%		40-150%
	13C3-PFBS	80%		50-150%
	13C3-PFHxS	80%		50-150%
	13C8-PFOS	79%		50-150%
	13C8-FOSA	83%		30-140%
	d3-MeFOSAA	81%		50-150%
	13C2-4:2FTS	86%		50-150%
	13C2-6:2FTS	90%		50-150%
	13C2-8:2FTS	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

4.1
4

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 30	Date Sampled: 02/12/20
Lab Sample ID: FA72576-2	Date Received: 02/14/20
Matrix: AQ - Water	Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD	
Project: MSNPF	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44363.D	1	02/24/20 09:55	NAF	02/21/20 15:10	OP79063	S2Q670
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	14.1	8.0	2.0	ng/l	
2706-90-3	Perfluoropentanoic acid	18.1	4.0	1.5	ng/l	
307-24-4	Perfluorohexanoic acid	18.2	4.0	1.0	ng/l	
375-85-9	Perfluoroheptanoic acid	7.5	4.0	1.0	ng/l	
335-67-1	Perfluorooctanoic acid	7.1	4.0	1.0	ng/l	
375-95-1	Perfluorononanoic acid	ND	4.0	1.0	ng/l	
335-76-2	Perfluorodecanoic acid	1.7	4.0	1.0	ng/l	J
2058-94-8	Perfluoroundecanoic acid	ND	4.0	1.0	ng/l	
307-55-1	Perfluorododecanoic acid	ND	4.0	1.5	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	4.0	1.0	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	4.0	1.0	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	14.3	4.0	1.0	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	14.9	4.0	1.0	ng/l	
355-46-4	Perfluorohexanesulfonic acid	76.7	4.0	1.0	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	2.3	4.0	1.0	ng/l	J
1763-23-1	Perfluorooctanesulfonic acid	70.6	4.0	1.5	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	4.0	1.0	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	4.0	1.0	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	4.0	1.0	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	8.0	4.0	ng/l	
2991-50-6	EtFOSAA	ND	8.0	4.0	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	8.0	2.0	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	8.0	2.0	ng/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

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SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 30	
Lab Sample ID: FA72576-2	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	8.0	2.0	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	75%		30-140%
	13C5-PFPeA	79%		40-140%
	13C5-PFHxA	77%		50-150%
	13C4-PFHpA	76%		50-150%
	13C8-PFOA	79%		50-150%
	13C9-PFNA	83%		50-150%
	13C6-PFDA	78%		50-150%
	13C7-PFUnDA	76%		50-150%
	13C2-PFDoDA	68%		50-150%
	13C2-PFTeDA	60%		40-150%
	13C3-PFBS	79%		50-150%
	13C3-PFHxS	76%		50-150%
	13C8-PFOS	77%		50-150%
	13C8-FOSA	73%		30-140%
	d3-MeFOSAA	80%		50-150%
	13C2-4:2FTS	84%		50-150%
	13C2-6:2FTS	88%		50-150%
	13C2-8:2FTS	82%		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

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Report of Analysis

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Client Sample ID: DUPLICATE C		
Lab Sample ID: FA72576-3		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44364.D	1	02/24/20 10:10	NAF	02/21/20 15:10	OP79063	S2Q670
Run #2	2Q44299.D	10	02/23/20 15:46	NAF	02/21/20 15:10	OP79063	S2Q669

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	37.8	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	90.1	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	102	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	28.7	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	22.0	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	1.1	3.7	0.93	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	80.3	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	108	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	447 ^a	37	9.3	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	11.9	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	181	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	12.1	7.4	1.9	ng/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

SGS North America Inc.

Report of Analysis

Client Sample ID: DUPLICATE C	
Lab Sample ID: FA72576-3	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	57%	84%	30-140%
	13C5-PFPeA	63%	82%	40-140%
	13C5-PFHxA	61%	82%	50-150%
	13C4-PFHpA	65%	80%	50-150%
	13C8-PFOA	73%	79%	50-150%
	13C9-PFNA	81%	80%	50-150%
	13C6-PFDA	80%	77%	50-150%
	13C7-PFUnDA	82%	77%	50-150%
	13C2-PFDoDA	76%	69%	50-150%
	13C2-PFTeDA	63%	61%	40-150%
	13C3-PFBS	64%	83%	50-150%
	13C3-PFHxS	64%	79%	50-150%
	13C8-PFOS	74%	80%	50-150%
	13C8-FOSA	75%	82%	30-140%
	d3-MeFOSAA	78%	84%	50-150%
	13C2-4:2FTS	66%	84%	50-150%
	13C2-6:2FTS	81%	81%	50-150%
	13C2-8:2FTS	80%	71%	50-150%

(a) Result is from Run# 2

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

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SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 27		Date Sampled: 02/12/20
Lab Sample ID: FA72576-4		Date Received: 02/14/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44301.D	10	02/23/20 16:16	NAF	02/21/20 15:10	OP79063	S2Q669
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	113	74	19	ng/l	
2706-90-3	Perfluoropentanoic acid	271	37	14	ng/l	
307-24-4	Perfluorohexanoic acid	336	37	9.3	ng/l	
375-85-9	Perfluoroheptanoic acid	94.2	37	9.3	ng/l	
335-67-1	Perfluorooctanoic acid	145	37	9.3	ng/l	
375-95-1	Perfluorononanoic acid	12.0	37	9.3	ng/l	J
335-76-2	Perfluorodecanoic acid	ND	37	9.3	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	37	9.3	ng/l	
307-55-1	Perfluorododecanoic acid	ND	37	14	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	37	9.3	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	37	9.3	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	228	37	9.3	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	290	37	9.3	ng/l	
355-46-4	Perfluorohexanesulfonic acid	1810	37	9.3	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	105	37	9.3	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	2220	37	14	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	37	9.3	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	37	9.3	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	37	9.3	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	74	37	ng/l	
2991-50-6	EtFOSAA	ND	74	37	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	74	19	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	244	74	19	ng/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

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SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 27		
Lab Sample ID: FA72576-4		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	21.5	74	19	ng/l	J

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	85%		30-140%
	13C5-PFPeA	84%		40-140%
	13C5-PFHxA	81%		50-150%
	13C4-PFHpA	80%		50-150%
	13C8-PFOA	80%		50-150%
	13C9-PFNA	82%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	80%		50-150%
	13C2-PFDoDA	71%		50-150%
	13C2-PFTeDA	63%		40-150%
	13C3-PFBS	88%		50-150%
	13C3-PFHxS	77%		50-150%
	13C8-PFOS	79%		50-150%
	13C8-FOSA	67%		30-140%
	d3-MeFOSAA	93%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	105%		50-150%
	13C2-8:2FTS	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

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SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 03		
Lab Sample ID: FA72576-5		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44365.D	1	02/24/20 10:25	NAF	02/21/20 15:10	OP79063	S2Q670
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	23.4	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	36.6	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	37.0	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	16.4	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	28.6	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	1.9	3.7	0.93	ng/l	J
335-76-2	Perfluorodecanoic acid	1.7	3.7	0.93	ng/l	J
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	6.3	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	7.8	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	49.2	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	1.3	3.7	0.93	ng/l	J
1763-23-1	Perfluorooctanesulfonic acid	20.5	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 03	
Lab Sample ID: FA72576-5	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	80%		30-140%
	13C5-PFPeA	85%		40-140%
	13C5-PFHxA	85%		50-150%
	13C4-PFHpA	85%		50-150%
	13C8-PFOA	88%		50-150%
	13C9-PFNA	93%		50-150%
	13C6-PFDA	88%		50-150%
	13C7-PFUnDA	89%		50-150%
	13C2-PFDoDA	81%		50-150%
	13C2-PFTeDA	73%		40-150%
	13C3-PFBS	86%		50-150%
	13C3-PFHxS	82%		50-150%
	13C8-PFOS	84%		50-150%
	13C8-FOSA	64%		30-140%
	d3-MeFOSAA	87%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	97%		50-150%
	13C2-8:2FTS	88%		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

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 06		
Lab Sample ID: FA72576-6		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44366.D	1	02/24/20 10:41	NAF	02/21/20 15:10	OP79063	S2Q670
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	10.7	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	5.0	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	3.8	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	1.1	3.7	0.93	ng/l	J
335-67-1	Perfluorooctanoic acid	ND	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	4.9	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	4.0	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	10.1	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	2.6	3.7	1.4	ng/l	J
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

4.6
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SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 06		Date Sampled: 02/12/20
Lab Sample ID: FA72576-6		Date Received: 02/14/20
Matrix: AQ - Water		Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD		
Project: MSNPF		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	82%		30-140%
	13C5-PFPeA	89%		40-140%
	13C5-PFHxA	90%		50-150%
	13C4-PFHpA	90%		50-150%
	13C8-PFOA	93%		50-150%
	13C9-PFNA	94%		50-150%
	13C6-PFDA	86%		50-150%
	13C7-PFUnDA	84%		50-150%
	13C2-PFDoDA	78%		50-150%
	13C2-PFTeDA	72%		40-150%
	13C3-PFBS	89%		50-150%
	13C3-PFHxS	87%		50-150%
	13C8-PFOS	86%		50-150%
	13C8-FOSA	74%		30-140%
	d3-MeFOSAA	80%		50-150%
	13C2-4:2FTS	93%		50-150%
	13C2-6:2FTS	98%		50-150%
	13C2-8:2FTS	85%		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

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Report of Analysis

Client Sample ID: OUTFALL 11		
Lab Sample ID: FA72576-7		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44367.D	1	02/24/20 10:56	NAF	02/21/20 15:10	OP79063	S2Q670
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	8.8	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	2.4	3.7	1.4	ng/l	J
307-24-4	Perfluorohexanoic acid	1.9	3.7	0.93	ng/l	J
375-85-9	Perfluoroheptanoic acid	1.0	3.7	0.93	ng/l	J
335-67-1	Perfluorooctanoic acid	4.2	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	1.4	3.7	0.93	ng/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	4.9	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	4.4	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

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SGS North America Inc.

Report of Analysis

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Client Sample ID: OUTFALL 11	
Lab Sample ID: FA72576-7	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	77%		30-140%
	13C5-PFPeA	82%		40-140%
	13C5-PFHxA	81%		50-150%
	13C4-PFHpA	81%		50-150%
	13C8-PFOA	82%		50-150%
	13C9-PFNA	81%		50-150%
	13C6-PFDA	73%		50-150%
	13C7-PFUnDA	75%		50-150%
	13C2-PFDoDA	70%		50-150%
	13C2-PFTeDA	65%		40-150%
	13C3-PFBS	81%		50-150%
	13C3-PFHxS	78%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	73%		30-140%
	d3-MeFOSAA	72%		50-150%
	13C2-4:2FTS	85%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	71%		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

SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 10		
Lab Sample ID: FA72576-8		Date Sampled: 02/12/20
Matrix: AQ - Water		Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD		Percent Solids: n/a
Project: MSNPF		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44368.D	1	02/24/20 11:11	NAF	02/21/20 15:10	OP79063	S2Q670
Run #2	2Q44305.D	10	02/23/20 17:18	NAF	02/21/20 15:10	OP79063	S2Q669

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	14.2	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	13.4	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	40.9	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	12.6	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	228	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	14.8	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	16.2	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	392 ^a	37	9.3	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	2.7	3.7	0.93	ng/l	J
1763-23-1	Perfluorooctanesulfonic acid	16.1	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

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SGS North America Inc.

Report of Analysis

Client Sample ID: OUTFALL 10	
Lab Sample ID: FA72576-8	Date Sampled: 02/12/20
Matrix: AQ - Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	74%	88%	30-140%
	13C5-PFPeA	80%	86%	40-140%
	13C5-PFHxA	80%	86%	50-150%
	13C4-PFHpA	79%	85%	50-150%
	13C8-PFOA	81%	83%	50-150%
	13C9-PFNA	84%	79%	50-150%
	13C6-PFDA	77%	74%	50-150%
	13C7-PFUnDA	79%	74%	50-150%
	13C2-PFDoDA	74%	68%	50-150%
	13C2-PFTeDA	65%	62%	40-150%
	13C3-PFBS	81%	88%	50-150%
	13C3-PFHxS	75%	86%	50-150%
	13C8-PFOS	75%	73%	50-150%
	13C8-FOSA	73%	75%	30-140%
	d3-MeFOSAA	77%	78%	50-150%
	13C2-4:2FTS	85%	85%	50-150%
	13C2-6:2FTS	86%	81%	50-150%
	13C2-8:2FTS	75%	70%	50-150%

(a) Result is from Run# 2

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

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SGS North America Inc.

Report of Analysis

Client Sample ID: EQUIPMENT BLANK B	
Lab Sample ID: FA72576-9	Date Sampled: 02/12/20
Matrix: AQ - Equipment Blank	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44291.D	1	02/23/20 13:40	NAF	02/21/20 15:10	OP79063	S2Q669
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	ND	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	ND	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	ND	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	ND	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

ND = Not detected MDL = Method Detection Limit J = Indicates an estimated value
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 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

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SGS North America Inc.

Report of Analysis

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Client Sample ID: EQUIPMENT BLANK B	
Lab Sample ID: FA72576-9	Date Sampled: 02/12/20
Matrix: AQ - Equipment Blank	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	100%		30-140%
	13C5-PFPeA	101%		40-140%
	13C5-PFHxA	100%		50-150%
	13C4-PFHpA	101%		50-150%
	13C8-PFOA	98%		50-150%
	13C9-PFNA	96%		50-150%
	13C6-PFDA	92%		50-150%
	13C7-PFUnDA	92%		50-150%
	13C2-PFDoDA	83%		50-150%
	13C2-PFTeDA	80%		40-150%
	13C3-PFBS	101%		50-150%
	13C3-PFHxS	99%		50-150%
	13C8-PFOS	91%		50-150%
	13C8-FOSA	85%		30-140%
	d3-MeFOSAA	95%		50-150%
	13C2-4:2FTS	97%		50-150%
	13C2-6:2FTS	94%		50-150%
	13C2-8:2FTS	85%		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

SGS North America Inc.

Report of Analysis

Client Sample ID: FIELD BLANK C	Date Sampled: 02/12/20
Lab Sample ID: FA72576-10	Date Received: 02/14/20
Matrix: AQ - Field Blank Water	Percent Solids: n/a
Method: EPA 537M BY ID EPA 537 MOD	
Project: MSNPF	

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q44292.D	1	02/23/20 13:55	NAF	02/21/20 15:10	OP79063	S2Q669
Run #2							

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

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYL CARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	ND	7.4	1.9	ng/l	
2706-90-3	Perfluoropentanoic acid	ND	3.7	1.4	ng/l	
307-24-4	Perfluorohexanoic acid	ND	3.7	0.93	ng/l	
375-85-9	Perfluoroheptanoic acid	ND	3.7	0.93	ng/l	
335-67-1	Perfluorooctanoic acid	ND	3.7	0.93	ng/l	
375-95-1	Perfluorononanoic acid	ND	3.7	0.93	ng/l	
335-76-2	Perfluorodecanoic acid	ND	3.7	0.93	ng/l	
2058-94-8	Perfluoroundecanoic acid	ND	3.7	0.93	ng/l	
307-55-1	Perfluorododecanoic acid	ND	3.7	1.4	ng/l	
72629-94-8	Perfluorotridecanoic acid	ND	3.7	0.93	ng/l	
376-06-7	Perfluorotetradecanoic acid	ND	3.7	0.93	ng/l	
PERFLUOROALKYL SULFONATES						
375-73-5	Perfluorobutanesulfonic acid	ND	3.7	0.93	ng/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	3.7	0.93	ng/l	
355-46-4	Perfluorohexanesulfonic acid	ND	3.7	0.93	ng/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	3.7	0.93	ng/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	3.7	1.4	ng/l	
68259-12-1	Perfluorononanesulfonic acid	ND	3.7	0.93	ng/l	
335-77-3	Perfluorodecanesulfonic acid	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDES						
754-91-6	PFOSA	ND	3.7	0.93	ng/l	
PERFLUORO OCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	7.4	3.7	ng/l	
2991-50-6	EtFOSAA	ND	7.4	3.7	ng/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/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

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SGS North America Inc.

Report of Analysis

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Client Sample ID: FIELD BLANK C	
Lab Sample ID: FA72576-10	Date Sampled: 02/12/20
Matrix: AQ - Field Blank Water	Date Received: 02/14/20
Method: EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project: MSNPF	

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	7.4	1.9	ng/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	92%		30-140%
	13C5-PFPeA	92%		40-140%
	13C5-PFHxA	91%		50-150%
	13C4-PFHpA	91%		50-150%
	13C8-PFOA	90%		50-150%
	13C9-PFNA	88%		50-150%
	13C6-PFDA	84%		50-150%
	13C7-PFUnDA	82%		50-150%
	13C2-PFDoDA	74%		50-150%
	13C2-PFTeDA	71%		40-150%
	13C3-PFBS	92%		50-150%
	13C3-PFHxS	91%		50-150%
	13C8-PFOS	85%		50-150%
	13C8-FOSA	77%		30-140%
	d3-MeFOSAA	85%		50-150%
	13C2-4:2FTS	88%		50-150%
	13C2-6:2FTS	86%		50-150%
	13C2-8:2FTS	76%		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

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

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
EtFOSAA	2991-50-6	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

SGS Sample Receipt Summary

Job Number: FA72576

Client: LIMNOTECH

Project: MSNPF1

Date / Time Received: 2/14/2020 9:10:00 AM

Delivery Method: FX

Airbill #s: 1386 6596 0136

Therm ID: IR 1; Therm CF: -0.8; # of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.9);

Cooler Temps (Corrected) °C: Cooler 1: (2.1);

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"/>

	W	or	S	N/A
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: PETERH Date: 2/14/2020 9:10:00 AM Reviewer: _____ Date: _____

FA72576: Chain of Custody
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MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79063-MB	2Q44290.D	1	02/23/20	NAF	02/21/20	OP79063	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72576-1, FA72576-2, FA72576-3, FA72576-4, FA72576-5, FA72576-6, FA72576-7, FA72576-8, FA72576-9, FA72576-10

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	0.0015	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	0.0015	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	0.0015	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	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	97% 30-140%
	13C5-PFPeA	97% 40-140%
	13C5-PFHxA	95% 50-150%
	13C4-PFHpA	96% 50-150%
	13C8-PFOA	94% 50-150%
	13C9-PFNA	92% 50-150%
	13C6-PFDA	94% 50-150%
	13C7-PFUnDA	90% 50-150%

Method Blank Summary

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79063-MB	2Q44290.D	1	02/23/20	NAF	02/21/20	OP79063	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72576-1, FA72576-2, FA72576-3, FA72576-4, FA72576-5, FA72576-6, FA72576-7, FA72576-8, FA72576-9, FA72576-10

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	80% 50-150%
	13C2-PFTeDA	74% 40-150%
	13C3-PFBS	96% 50-150%
	13C3-PFHxS	95% 50-150%
	13C8-PFOS	93% 50-150%
	13C8-FOSA	90% 30-140%
	d3-MeFOSAA	99% 50-150%
	13C2-4:2FTS	92% 50-150%
	13C2-6:2FTS	89% 50-150%
	13C2-8:2FTS	85% 50-150%

Instrument Blank

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q669-IBLK	2Q44284.D	1	02/23/20	NAF	n/a	n/a	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72576-3, FA72576-4, FA72576-8, FA72576-9, FA72576-10

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	0.0015	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	0.0015	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	0.0015	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	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	93% 50-150%
	13C5-PFPeA	93% 50-150%
	13C5-PFHxA	91% 50-150%
	13C4-PFHpA	92% 50-150%
	13C8-PFOA	90% 50-150%
	13C9-PFNA	89% 50-150%
	13C6-PFDA	94% 50-150%
	13C7-PFUnDA	97% 50-150%

Instrument Blank

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q669-IBLK	2Q44284.D	1	02/23/20	NAF	n/a	n/a	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72576-3, FA72576-4, FA72576-8, FA72576-9, FA72576-10

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	92% 50-150%
	13C2-PFTeDA	86% 50-150%
	13C3-PFBS	94% 50-150%
	13C3-PFHxS	92% 50-150%
	13C8-PFOS	93% 50-150%
	13C8-FOSA	91% 50-150%
	d3-MeFOSAA	98% 50-150%
	13C2-4:2FTS	88% 50-150%
	13C2-6:2FTS	86% 50-150%
	13C2-8:2FTS	86% 50-150%
	13C3-HFPO-DA	102% 50-150%

Instrument Blank

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q670-IBLK	2Q44357.D	1	02/24/20	NAF	n/a	n/a	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72576-1, FA72576-2, FA72576-3, FA72576-5, FA72576-6, FA72576-7, FA72576-8

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	0.0015	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	0.0015	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	0.0015	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	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	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	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	95% 50-150%
	13C5-PFPeA	96% 50-150%
	13C5-PFHxA	94% 50-150%
	13C4-PFHpA	95% 50-150%
	13C8-PFOA	93% 50-150%
	13C9-PFNA	92% 50-150%
	13C6-PFDA	94% 50-150%
	13C7-PFUnDA	98% 50-150%

Instrument Blank

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q670-IBLK	2Q44357.D	1	02/24/20	NAF	n/a	n/a	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA72576-1, FA72576-2, FA72576-3, FA72576-5, FA72576-6, FA72576-7, FA72576-8

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	94% 50-150%
	13C2-PFTeDA	86% 50-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	94% 50-150%
	13C8-PFOS	93% 50-150%
	13C8-FOSA	103% 50-150%
	d3-MeFOSAA	89% 50-150%
	13C2-4:2FTS	93% 50-150%
	13C2-6:2FTS	92% 50-150%
	13C2-8:2FTS	91% 50-150%
	13C3-HFPO-DA	106% 50-150%

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Blank Spike Summary

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79063-BS	2Q44289.D	1	02/23/20	NAF	02/21/20	OP79063	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72576-1, FA72576-2, FA72576-3, FA72576-4, FA72576-5, FA72576-6, FA72576-7, FA72576-8, FA72576-9, FA72576-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0702	88	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0695	87	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0720	90	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0710	89	71-130
335-67-1	Perfluorooctanoic acid	0.08	0.0718	90	74-130
375-95-1	Perfluorononanoic acid	0.08	0.0724	91	76-130
335-76-2	Perfluorodecanoic acid	0.08	0.0703	88	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0669	84	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0701	88	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0743	93	70-139
376-06-7	Perfluorotetradecanoic acid	0.08	0.0705	88	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0709	89	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0728	91	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0701	88	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0727	91	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0719	90	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0685	86	70-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0624	78	70-130
754-91-6	PFOSA	0.08	0.0719	90	70-131
2355-31-9	MeFOSAA	0.08	0.0704	88	70-130
2991-50-6	EtFOSAA	0.08	0.0674	84	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0735	92	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0743	93	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0724	91	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	96%	30-140%
	13C5-PFPeA	97%	40-140%
	13C5-PFHxA	95%	50-150%
	13C4-PFHpA	96%	50-150%
	13C8-PFOA	92%	50-150%
	13C9-PFNA	92%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	94%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79063-BS	2Q44289.D	1	02/23/20	NAF	02/21/20	OP79063	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72576-1, FA72576-2, FA72576-3, FA72576-4, FA72576-5, FA72576-6, FA72576-7, FA72576-8, FA72576-9, FA72576-10

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	82%	50-150%
	13C2-PFTeDA	76%	40-150%
	13C3-PFBS	96%	50-150%
	13C3-PFHxS	95%	50-150%
	13C8-PFOS	93%	50-150%
	13C8-FOSA	84%	30-140%
	d3-MeFOSAA	97%	50-150%
	13C2-4:2FTS	97%	50-150%
	13C2-6:2FTS	92%	50-150%
	13C2-8:2FTS	91%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79063-MS	2Q44362.D	1	02/24/20	NAF	02/21/20	OP79063	S2Q670
FA72576-1	2Q44361.D	1	02/24/20	NAF	02/21/20	OP79063	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72576-1, FA72576-2, FA72576-3, FA72576-4, FA72576-5, FA72576-6, FA72576-7, FA72576-8, FA72576-9, FA72576-10

CAS No.	Compound	FA72576-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.0146		0.0741	0.0810	90	70-130
2706-90-3	Perfluoropentanoic acid	0.0184		0.0741	0.0859	91	70-130
307-24-4	Perfluorohexanoic acid	0.0088		0.0741	0.0779	93	70-130
375-85-9	Perfluoroheptanoic acid	0.0024	J	0.0741	0.0719	94	71-130
335-67-1	Perfluorooctanoic acid	0.0021	J	0.0741	0.0708	93	74-130
375-95-1	Perfluorononanoic acid	ND		0.0741	0.0711	96	76-130
335-76-2	Perfluorodecanoic acid	ND		0.0741	0.0684	92	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.0741	0.0661	89	70-130
307-55-1	Perfluorododecanoic acid	ND		0.0741	0.0681	92	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.0741	0.0684	92	70-139
376-06-7	Perfluorotetradecanoic acid	ND		0.0741	0.0659	89	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0034	J	0.0741	0.0715	92	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.0026	J	0.0741	0.0723	94	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0140		0.0741	0.0823	92	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.0012	J	0.0741	0.0749	99	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.114		0.0741	0.165	69*	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.0741	0.0666	90	70-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.0741	0.0636	86	70-130
754-91-6	PFOSA	ND		0.0741	0.0705	95	70-131
2355-31-9	MeFOSAA	ND		0.0741	0.0673	91	70-130
2991-50-6	EtFOSAA	ND		0.0741	0.0709	96	70-130
757124-72-44:2	Fluorotelomer sulfonate	ND		0.0741	0.0720	97	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.0741	0.0716	97	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.0741	0.0705	95	70-130

CAS No.	ID Standard Recoveries	MS	FA72576-1	Limits
	13C4-PFBA	77%	76%	30-140%
	13C5-PFPeA	83%	82%	40-140%
	13C5-PFHxA	83%	81%	50-150%
	13C4-PFHpA	84%	82%	50-150%
	13C8-PFOA	85%	85%	50-150%
	13C9-PFNA	88%	87%	50-150%
	13C6-PFDA	84%	81%	50-150%
	13C7-PFUnDA	82%	78%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79063-MS	2Q44362.D	1	02/24/20	NAF	02/21/20	OP79063	S2Q670
FA72576-1	2Q44361.D	1	02/24/20	NAF	02/21/20	OP79063	S2Q670

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72576-1, FA72576-2, FA72576-3, FA72576-4, FA72576-5, FA72576-6, FA72576-7, FA72576-8, FA72576-9, FA72576-10

CAS No.	ID Standard Recoveries	MS	FA72576-1	Limits
	13C2-PFDoDA	76%	74%	50-150%
	13C2-PFTeDA	73%	68%	40-150%
	13C3-PFBS	83%	80%	50-150%
	13C3-PFHxS	82%	80%	50-150%
	13C8-PFOS	82%	79%	50-150%
	13C8-FOSA	73%	83%	30-140%
	d3-MeFOSAA	83%	81%	50-150%
	13C2-4:2FTS	93%	86%	50-150%
	13C2-6:2FTS	96%	90%	50-150%
	13C2-8:2FTS	89%	81%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79063-DUP	2Q44300.D	10	02/23/20	NAF	02/21/20	OP79063	S2Q669
FA72576-3	2Q44364.D	1	02/24/20	NAF	02/21/20	OP79063	S2Q670
FA72576-3	2Q44299.D	10	02/23/20	NAF	02/21/20	OP79063	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72576-1, FA72576-2, FA72576-3, FA72576-4, FA72576-5, FA72576-6, FA72576-7, FA72576-8, FA72576-9, FA72576-10

CAS No.	Compound	FA72576-3 DUP		Q	RPD	Limits
		ug/l	Q ug/l			
375-22-4	Perfluorobutanoic acid	0.0378	0.0376	J	1	30
2706-90-3	Perfluoropentanoic acid	0.0901	0.0893		1	30
307-24-4	Perfluorohexanoic acid	0.102	0.0972		5	30
375-85-9	Perfluoroheptanoic acid	0.0287	0.0264	J	8	30
335-67-1	Perfluorooctanoic acid	0.0220	0.0215	J	2	30
375-95-1	Perfluorononanoic acid	0.0011	J ND		200*	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	0.0803	0.0794		1	30
2706-91-4	Perfluoropentanesulfonic acid	0.108	0.102		6	30
355-46-4	Perfluorohexanesulfonic acid	0.447 ^a	0.419		6	30
375-92-8	Perfluoroheptanesulfonic acid	0.0119	0.0104	J	13	30
1763-23-1	Perfluorooctanesulfonic acid	0.181	0.161		12	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	EtFOSAA	ND	ND		nc	30
757124-72-44:2	Fluorotelomer sulfonate	ND	ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	0.0121	ND		200*	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND	ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA72576-3	FA72576-3	Limits
	13C4-PFBA	87%	57%	84%	30-140%
	13C5-PFPeA	87%	63%	82%	40-140%
	13C5-PFHxA	85%	61%	82%	50-150%
	13C4-PFHpA	85%	65%	80%	50-150%
	13C8-PFOA	85%	73%	79%	50-150%
	13C9-PFNA	85%	81%	80%	50-150%
	13C6-PFDA	80%	80%	77%	50-150%
	13C7-PFUnDA	79%	82%	77%	50-150%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA72576
Account: LIMNMIAA LimnoTech
Project: MSNPF

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP79063-DUP	2Q44300.D	10	02/23/20	NAF	02/21/20	OP79063	S2Q669
FA72576-3	2Q44364.D	1	02/24/20	NAF	02/21/20	OP79063	S2Q670
FA72576-3	2Q44299.D	10	02/23/20	NAF	02/21/20	OP79063	S2Q669

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA72576-1, FA72576-2, FA72576-3, FA72576-4, FA72576-5, FA72576-6, FA72576-7, FA72576-8, FA72576-9, FA72576-10

CAS No.	ID Standard Recoveries	DUP	FA72576-3	FA72576-3	Limits
	13C2-PFDoDA	72%	76%	69%	50-150%
	13C2-PFTeDA	64%	63%	61%	40-150%
	13C3-PFBS	89%	64%	83%	50-150%
	13C3-PFHxS	85%	64%	79%	50-150%
	13C8-PFOS	83%	74%	80%	50-150%
	13C8-FOSA	77%	75%	82%	30-140%
	d3-MeFOSAA	91%	78%	84%	50-150%
	13C2-4:2FTS	88%	66%	84%	50-150%
	13C2-6:2FTS	84%	81%	81%	50-150%
	13C2-8:2FTS	75%	80%	71%	50-150%

(a) Result is from Run #2.

* = Outside of Control Limits.