



FLEIS & VANDENBRINK

DESIGN. BUILD. OPERATE.

December 20, 2017

Village of Sparta
C/O Randy Carter
156 E. Division
Sparta, MI 49345
r.carter@spartami.org

RE: Residential Well Water Sampling Results - PFCs

Dear Randy:

Attached is the laboratory report from a sample we recently collected from your potable well. The sample was analyzed by Pace in Minneapolis, Minnesota for a limited number of perflourinated compounds including perflourinated Perfluorooctane sulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA).

The sample was un-treated groundwater collected from an aerator-free spigot in the well house. The laboratory report is summarized below. For reference, the table includes the Lifetime Health Advisories (LHA) developed in 2016 by the Environmental Protection Agency (EPA). LHAs are non-enforceable and non-regulatory and are intended to provide state agencies and other public health officials with general guidance on contaminants that can cause human health effects. Non-PFOs/PFOA compounds do not currently have LHAs.

Summary of Laboratory Results				Non-PFOS/PFOA detected
Sample	PFOS/PFOA Detected	Total PFOS/PFOA Detected (ppt)	Above or Below EPA PFOS/PFOA Lifetime Advisory (70 ppt, or ng/l)	
Potable Well #2	No	None	Below	2.2
Field Blank	No	None	Below	None
Potable Well #5	No	None	Below	None
Potable Well #4	No	None	Below	None

Pace expects to have the results of your additional testing available soon, and we will send a separate letter with those results. Thank you for using the services of F&V. If you need additional information, please contact me.

Sincerely,
FLEIS & VANDENBRINK

Brian L. Rice, P.E.
Manager, Environmental Services Group

att: Laboratory Report and Chain of Custody
cc: Mark Worrall, MDEQ
Karen Vorce, MDEQ

2960 Lucerne Drive SE, Suite 100
Grand Rapids, MI 49546
P: 616.977.1000
F: 616.977.1005
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www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

Report Prepared for:

Will Cole
Pace Analytical Grand Rapids
5560 Corporate Exchange Court
Grand Rapids MI 49512

**REPORT OF
LABORATORY
ANALYSIS
FOR PFAAs**

Report Information:

Pace Project #: 10413823
Sample Receipt Date: 12/08/2017
Client Project #: 465624 Fleis & Vandenbrink
Client Sub PO #: N/A
State Cert #: 9909

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PFAA Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed by:

December 18, 2017

Megan McCabe, Project Manager
612-607-6429
(612) 607-6444 (fax)
megan.mccabe@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

Report Prepared Date:

December 18, 2017

DISCUSSION

This report presents the results from the analyses performed on four of six samples submitted by a representative of Pace Analytical-Grand Rapids. The samples were analyzed for the presence or absence of twenty-one perfluorinated compounds using a modified version of USEPA Method 537. Reporting limits were set to the quantitation limits. The field blank results for samples City Sparta - PW#5 and City Sparta - PW#4 were not reported since the samples were free of the target analytes to the reporting limits.

The recoveries of the isotopically-labeled surrogate standards in the sample extracts ranged from 79-103%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in the method.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to be free of the target perfluorinated compounds at the reporting limits. This indicates that the sample processing procedures did not significantly contribute to the analyte content determined for the sample material.

Laboratory spike samples were also prepared with the sample batch using clean reference matrix that had been fortified with native standards. The results show that the spiked native compounds in the laboratory spikes were recovered at 81-124%, with relative percent differences of 1-13%. These values were within method limits.

It should be noted that Pace Analytical has not yet completed the certification process for this method.



Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP)	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL)	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

10413823

Chain of Custody



Workorder: 455624 Workorder Name: FV City Sparta

Owner Received Date: 12/7/2017 Results Requested By: 12/18/2017

Will Cole
 Pace Analytical Services
 5560 Corporate Exchange Ct. SE
 Grand Rapids, MI 49512
 USA
 Phone (616)975-4500

Pace Analytical Minnesota
 1700 Elm Street
 Suite 200
 Minneapolis, MN 55414
 Phone (612)607-1700

Item #	Sample ID	Sample Type	Collection Date/Time	Spill ID	Preserved Containers		LAB USE ONLY
					Water	Other	
1	City Sparta - PW#2	PS	12/7/2017 10:50	465624001	X		001
2	FB-10:55	PS	12/7/2017 10:55	465624002	X		002
3	City Sparta - PW#5	PS	12/7/2017 11:15	465624003	X		003
4	City Sparta - PW#4	PS	12/7/2017 11:30	465624004	X		004
5	FB-11:20	PS	12/7/2017 11:20	465624005	X		005
6	FB-11:35	PS	12/7/2017 11:35	465624006	X		006

Transfers	Released By	Date/Time	Received By	Date/Time
1	<i>[Signature]</i>	12-7-17 10:50	<i>[Signature]</i>	12-8-17 1745
2				
3				

Cooler Temperature on Receipt 0.4 °C Custody Seal Y or N Received on Ice or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
 This chain of custody is considered complete as is since this information is available in the owner laboratory.



Document Name:
Sample Condition Upon Receipt Form
 Document No.:
 F-MN-L-213-rev.21

Document Revised: 30Aug2017
 Page 1 of 2
 Issuing Authority:
 Pace Minnesota Quality Office

Sample Condition
 Upon Receipt

Client Name: Pace Corporate Exchange Project #: WO# : 10413823

WO# : 10413823



Courier: Fed Ex UPS USPS Client
 Commercial Pace Speedee Other: _____
 Tracking Number: 4175-9742-9952

Custody Seal on Cooler/Box Present? Yes No Seals Intact? Yes No
 Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags None Other: _____ Temp Blank? Yes No

Thermometer 151401163 Type of Ice: Wet Blue None Samples on Ice, cooling process has begun
 Used: G87A9155100842

Cooler Temp Read (°C): 0.3 Cooler Temp Corrected (°C): 0.4 Biological Tissue Frozen? Yes No N/A
 Temp should be above freezing to 6°C Correction Factor: +0.1 Date and Initials of Person Examining Contents: 12-8-17 JDD

USDA Regulated Soil (N/A, water sample)
 Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? Yes No
 Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
 If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes Date/Time/ID/Analysis Matrix: <u>WT</u>		
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <input type="checkbox"/> HNO ₃ <input type="checkbox"/> H ₂ SO ₄ <input type="checkbox"/> NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Sample #
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/BO15 (water) and Dioxin.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Initial when completed: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 12/11/17

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- * = See Discussion

REPORT OF LABORATORY ANALYSIS

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Appendix B

Sample Analysis Summary



PFAA Sample Analysis Summary

Client's Sample ID	City Sparta - PW#2	Date Extracted	12/13/2017
Lab Sample ID	465624001	Total Amount Extracted	252 mL
Filename	10LCMS02_171214A_038	ICAL ID	171031A02
Matrix	Drinking_Water	Starting CCal	10LCMS02_171214A_031
Collected	12/07/2017	Ending CCal	10LCMS02_171214A_050
Received	12/08/2017	Method Blank Filename	10LCMS02_171214A_033

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBS	2.2	2	0.32	1	12/14/2017 21:49	375-73-5	
PFHxA	ND	2	0.38	1	12/14/2017 21:49	307-24-4	
PFHpA	ND	2	0.64	1	12/14/2017 21:49	375-85-9	
PFHxS	ND	2	0.62	1	12/14/2017 21:49	355-46-4	
PFOA	ND	2	0.43	1	12/14/2017 21:49	335-67-1	
PFNA	ND	2	0.68	1	12/14/2017 21:49	375-95-1	
PFOS	ND	2	0.45	1	12/14/2017 21:49	1763-23-1	
PFDA	ND	2	0.39	1	12/14/2017 21:49	335-76-2	
PFUdA	ND	2	0.55	1	12/14/2017 21:49	2058-94-8	
N-MeFOSAA	ND	4	0.98	1	12/14/2017 21:49	2355-31-9	
N-EtFOSAA	ND	4	1.3	1	12/14/2017 21:49	2991-50-6	
PFDoA	ND	2	0.47	1	12/14/2017 21:49	307-55-1	
PFTrDA	ND	2	0.45	1	12/14/2017 21:49	72629-94-8	
PFTeDA	ND	2	0.37	1	12/14/2017 21:49	376-06-7	
PFPrOPrA	ND	4	1.4	1	12/14/2017 21:49	62037-80-3	
PFBA	ND	2	0.61	1	12/14/2017 21:49	375-22-4	
PFPeA	ND	2	0.36	1	12/14/2017 21:49	2706-90-3	
PFDS	ND	2	0.46	1	12/14/2017 21:49	335-77-3	
NaDONA	ND	4	1.5	1	12/14/2017 21:49	958445-44-8	
PFHxDA	ND	2	0.51	1	12/14/2017 21:49	67905-19-5	
PFODA	ND	2	0.60	1	12/14/2017 21:49	16517-11-6	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.7	85	70 - 130	Pass
13C2_PFDA	2.0	2.0	98	70 - 130	Pass
d5-EtFOSAA	8.0	7.0	88	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C3_PFPPrOPrA	385980	299325 - 897974	314087 - 628174	Pass
13C2_PFOA	256365	122449 - 367348	157977 - 315953	Pass
13C4_PFOS	381578	209883 - 629649	229128 - 458256	Pass
d3-MeFOSAA	155354	95616 - 286847	92247 - 184493	Pass

50-150% of Ical area

70-140% of the preceding CCV area



PFAA Sample Analysis Summary

Client's Sample ID	FB-10:55	Date Extracted	12/13/2017
Lab Sample ID	465624002	Total Amount Extracted	253 mL
Filename	10LCMS02_171214A_039	ICAL ID	171031A02
Matrix	Water	Starting CCal	10LCMS02_171214A_031
Collected	12/07/2017	Ending CCal	10LCMS02_171214A_050
Received	12/08/2017	Method Blank Filename	10LCMS02_171214A_033

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBS	ND	2	0.32	1	12/14/2017 22:01	375-73-5	
PFHxA	ND	2	0.38	1	12/14/2017 22:01	307-24-4	
PFHpA	ND	2	0.64	1	12/14/2017 22:01	375-85-9	
PFHxS	ND	2	0.61	1	12/14/2017 22:01	355-46-4	
PFOA	ND	2	0.42	1	12/14/2017 22:01	335-67-1	
PFNA	ND	2	0.68	1	12/14/2017 22:01	375-95-1	
PFOS	ND	2	0.44	1	12/14/2017 22:01	1763-23-1	
PFDA	ND	2	0.39	1	12/14/2017 22:01	335-76-2	
PFUdA	ND	2	0.55	1	12/14/2017 22:01	2058-94-8	
N-MeFOSAA	ND	4	0.98	1	12/14/2017 22:01	2355-31-9	
N-EtFOSAA	ND	4	1.3	1	12/14/2017 22:01	2991-50-6	
PFDoA	ND	2	0.47	1	12/14/2017 22:01	307-55-1	
PFTriDA	ND	2	0.45	1	12/14/2017 22:01	72629-94-8	
PFTeDA	ND	2	0.37	1	12/14/2017 22:01	376-06-7	
PFPrOPrA	ND	4	1.4	1	12/14/2017 22:01	62037-80-3	
PFBA	ND	2	0.61	1	12/14/2017 22:01	375-22-4	
PFPeA	ND	2	0.36	1	12/14/2017 22:01	2706-90-3	
PFDS	ND	2	0.46	1	12/14/2017 22:01	335-77-3	
NaDONA	ND	4	1.5	1	12/14/2017 22:01	958445-44-8	
PFHxDA	ND	2	0.51	1	12/14/2017 22:01	67905-19-5	
PFODA	ND	2	0.59	1	12/14/2017 22:01	16517-11-6	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.7	87	70 - 130	Pass
13C2_PFDA	2.0	2.0	100	70 - 130	Pass
d5-EtFOSAA	8.0	6.8	84	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C3_PFPPrA	419717	299325 - 897974	314087 - 628174	Pass
13C2_PFOA	250260	122449 - 367348	157977 - 315953	Pass
13C4_PFOS	374604	209883 - 629649	229128 - 458256	Pass
d3-MeFOSAA	155637	95616 - 286847	92247 - 184493	Pass

50-150% of Ical area

70-140% of the preceding CCV area



PFAA Sample Analysis Summary

Client's Sample ID	City Sparta - PW#5	Date Extracted	12/13/2017
Lab Sample ID	465624003	Total Amount Extracted	244 mL
Filename	10LCMS02_171214A_040	ICAL ID	171031A02
Matrix	Drinking_Water	Starting CCal	10LCMS02_171214A_031
Collected	12/07/2017	Ending CCal	10LCMS02_171214A_050
Received	12/08/2017	Method Blank Filename	10LCMS02_171214A_033

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBS	ND	2	0.33	1	12/14/2017 22:13	375-73-5	
PFHxA	ND	2	0.40	1	12/14/2017 22:13	307-24-4	
PFHpA	ND	2	0.66	1	12/14/2017 22:13	375-85-9	
PFHxS	ND	2	0.64	1	12/14/2017 22:13	355-46-4	
PFOA	ND	2	0.44	1	12/14/2017 22:13	335-67-1	
PFNA	ND	2	0.71	1	12/14/2017 22:13	375-95-1	
PFOS	ND	2	0.46	1	12/14/2017 22:13	1763-23-1	
PFDA	ND	2	0.40	1	12/14/2017 22:13	335-76-2	
PFUdA	ND	2	0.57	1	12/14/2017 22:13	2058-94-8	
N-MeFOSAA	ND	4	1.0	1	12/14/2017 22:13	2355-31-9	
N-EtFOSAA	ND	4	1.4	1	12/14/2017 22:13	2991-50-6	
PFDaA	ND	2	0.48	1	12/14/2017 22:13	307-55-1	
PFTrDA	ND	2	0.47	1	12/14/2017 22:13	72629-94-8	
PFTeDA	ND	2	0.38	1	12/14/2017 22:13	376-06-7	
PFPrOPrA	ND	4	1.4	1	12/14/2017 22:13	62037-80-3	
PFBA	ND	2	0.63	1	12/14/2017 22:13	375-22-4	
PFPeA	ND	2	0.38	1	12/14/2017 22:13	2706-90-3	
PFDS	ND	2	0.48	1	12/14/2017 22:13	335-77-3	
NaDONA	ND	4	1.5	1	12/14/2017 22:13	958445-44-8	
PFHxDA	ND	2	0.53	1	12/14/2017 22:13	67905-19-5	
PFOA	ND	2	0.62	1	12/14/2017 22:13	16517-11-6	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	88	70 - 130	Pass
13C2_PFDA	2.0	2.1	103	70 - 130	Pass
d5-EtFOSAA	8.0	6.5	81	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C3_PFPPrOPrA	414921	299325 - 897974	314087 - 628174	Pass
13C2_PFOA	255138	122449 - 367348	157977 - 315953	Pass
13C4_PFOS	397740	209883 - 629649	229128 - 458256	Pass
d3-MeFOSAA	158071	95616 - 286847	92247 - 184493	Pass

50-150% of Ical area

70-140% of the preceding CCV area



PFAA Sample Analysis Summary

Client's Sample ID	City Sparta - PW#4	Date Extracted	12/13/2017
Lab Sample ID	465624004	Total Amount Extracted	249 mL
Filename	10LCMS02_171214A_041	ICAL ID	171031A02
Matrix	Drinking_Water	Starting CCal	10LCMS02_171214A_031
Collected	12/07/2017	Ending CCal	10LCMS02_171214A_050
Received	12/08/2017	Method Blank Filename	10LCMS02_171214A_033

Compound	Concentration (ng/L)	PQL (ng/L)	MDL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBS	ND	2	0.32	1	12/14/2017 22:26	375-73-5	
PFHxA	ND	2	0.39	1	12/14/2017 22:26	307-24-4	
PFHpA	ND	2	0.65	1	12/14/2017 22:26	375-85-9	
PFHxS	ND	2	0.62	1	12/14/2017 22:26	355-46-4	
PFOA	ND	2	0.43	1	12/14/2017 22:26	335-67-1	
PFNA	ND	2	0.69	1	12/14/2017 22:26	375-95-1	
PFOS	ND	2	0.45	1	12/14/2017 22:26	1763-23-1	
PFDA	ND	2	0.39	1	12/14/2017 22:26	335-76-2	
PFUdA	ND	2	0.56	1	12/14/2017 22:26	2058-94-8	
N-MeFOSAA	ND	4	1.00	1	12/14/2017 22:26	2355-31-9	
N-EtFOSAA	ND	4	1.3	1	12/14/2017 22:26	2991-50-6	
PFDoA	ND	2	0.47	1	12/14/2017 22:26	307-55-1	
PFTTrDA	ND	2	0.46	1	12/14/2017 22:26	72629-94-8	
PFTeDA	ND	2	0.38	1	12/14/2017 22:26	376-06-7	
PFPrOPrA	ND	4	1.4	1	12/14/2017 22:26	62037-80-3	
PFBA	ND	2	0.62	1	12/14/2017 22:26	375-22-4	
PFPeA	ND	2	0.37	1	12/14/2017 22:26	2706-90-3	
PFDS	ND	2	0.47	1	12/14/2017 22:26	335-77-3	
NaDONA	ND	4	1.5	1	12/14/2017 22:26	958445-44-8	
PFHxDA	ND	2	0.52	1	12/14/2017 22:26	67905-19-5	
PFODA	ND	2	0.61	1	12/14/2017 22:26	16517-11-6	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.7	86	70 - 130	Pass
13C2_PFDA	2.0	2.0	100	70 - 130	Pass
d5-EtFOSAA	8.0	6.3	79	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C3_PFPPrOPrA	388708	299325 - 897974	314087 - 628174	Pass
13C2_PFOA	251754	122449 - 367348	157977 - 315953	Pass
13C4_PFOS	380865	209883 - 629649	229128 - 458256	Pass
d3-MeFOSAA	159072	95616 - 286847	92247 - 184493	Pass

50-150% of Ical area

70-140% of the preceding CCV area



PFAA Blank Analysis Summary

Lab Sample ID	BLANK-59159	Total Amount Extracted	253 mL
Filename	10LCMS02_171214A_033	ICAL ID	171031A02
Matrix	Water	Starting CCal	10LCMS02_171214A_031
Date Extracted	12/13/2017	Ending CCal	10LCMS02_171214A_050

Compound	Concentration (ng/L)	PQL (ng/L)	Dilution	Analyzed	CAS No.	Qual.
PFBS	ND	2	1	12/14/2017 20:47	375-73-5	
PFHxA	ND	2	1	12/14/2017 20:47	307-24-4	
PFHpA	ND	2	1	12/14/2017 20:47	375-85-9	
PFHxS	ND	2	1	12/14/2017 20:47	355-46-4	
PFOA	ND	2	1	12/14/2017 20:47	335-67-1	
PFNA	ND	2	1	12/14/2017 20:47	375-95-1	
PFOS	ND	2	1	12/14/2017 20:47	1763-23-1	
PFDA	ND	2	1	12/14/2017 20:47	335-76-2	
PFUdA	ND	2	1	12/14/2017 20:47	2058-94-8	
N-MeFOSAA	ND	4	1	12/14/2017 20:47	2355-31-9	
N-EtFOSAA	ND	4	1	12/14/2017 20:47	2991-50-6	
PFDoA	ND	2	1	12/14/2017 20:47	307-55-1	
PFTTrDA	ND	2	1	12/14/2017 20:47	72629-94-8	
PFTeDA	ND	2	1	12/14/2017 20:47	376-06-7	
PFPPrOPrA	ND	4	1	12/14/2017 20:47	62037-80-3	
PFBA	ND	2	1	12/14/2017 20:47	375-22-4	
PFPeA	ND	2	1	12/14/2017 20:47	2706-90-3	
PFDS	ND	2	1	12/14/2017 20:47	335-77-3	
NaDONA	ND	4	1	12/14/2017 20:47	958445-44-8	
PFHxDA	ND	2	1	12/14/2017 20:47	67905-19-5	
PFODA	ND	2	1	12/14/2017 20:47	16517-11-6	

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.7	86	70 - 130	Pass
13C2_PFDA	2.0	2.2	108	70 - 130	Pass
d5-EtFOSAA	8.0	6.6	82	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C3_PFPPrOPrA	456496	299325 - 897974	314087 - 628174	Pass
13C2_PFOA	268250	122449 - 367348	157977 - 315953	Pass
13C4_PFOS	380051	209883 - 629649	229128 - 458256	Pass
d3-MeFOSAA	147207	95616 - 286847	92247 - 184493	Pass

50-150% of Ical area

70-140% of the preceding CCV area



PFAA Laboratory Control Sample (LCS)

LCS Lab Sample ID	LCS-59160	Matrix	Water
LCS Filename	10LCMS02_171214A_034	Dilution	1
Total Amount Extracted	251mL	Extracted	12/13/2017
ICAL ID	171031A02	Analyzed	12/14/2017 21:00
Start CCal Filename	10LCMS02_171214A_031	Injected By	QL
End CCal Filename	10LCMS02_171214A_050		
Method Blank Filename	10LCMS02_171214A_033		

Compound	Spiked (ng/L)	Recovered (ng/L)	Recovery %	Limits
PFBA	2.0	1.7	83	50.0 - 150.0
PFPeA	2.0	1.6	82	50.0 - 150.0
PFBS	1.7	1.5	86	50.0 - 150.0
PFHxA	2.0	1.7	86	50.0 - 150.0
PFPPrA	4.0	4.4	110	50.0 - 150.0
PFHpA	2.0	1.6	83	50.0 - 150.0
NaDONA	4.0	4.6	115	50.0 - 150.0
PFHxS	1.9	1.8	97	50.0 - 150.0
PFOA	2.0	2.0	101	50.0 - 150.0
PFNA	2.0	2.0	98	50.0 - 150.0
PFOS	1.9	1.9	101	50.0 - 150.0
PFDA	2.0	1.8	92	50.0 - 150.0
PFUdA	2.0	2.1	106	50.0 - 150.0
N-MeFOSAA	4.0	3.4	85	50.0 - 150.0
N-EtFOSAA	4.0	3.3	82	50.0 - 150.0
PFDS	1.9	1.6	84	50.0 - 150.0
PFDaA	2.0	2.0	102	50.0 - 150.0
PFTrDA	2.0	2.2	112	50.0 - 150.0
PFTeDA	2.0	1.7	83	50.0 - 150.0
PFHxDA	2.0	1.7	85	50.0 - 150.0
PFODA	2.0	1.8	88	50.0 - 150.0

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.9	93	50 - 150	Pass
13C2_PFDA	2.0	2.1	105	50 - 150	Pass
d5-EtFOSAA	8.0	6.7	83	50 - 150	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C3_PFPPrA	435985	299325 - 897974	314087 - 628174	Pass
13C2_PFOA	244895	122449 - 367348	157977 - 315953	Pass
13C4_PFOS	361089	209883 - 629649	229128 - 458256	Pass
d3-MeFOSAA	149159	95616 - 286847	92247 - 184493	Pass

50-150% of Ical area

70-140% of the preceding CCV area



PFAA Laboratory Control Sample (LCS)

LCS Lab Sample ID	LCS-59161	Matrix	Water
LCS Filename	10LCMS02_171214A_035	Dilution	1
Total Amount Extracted	252mL	Extracted	12/13/2017
ICAL ID	171031A02	Analyzed	12/14/2017 21:12
Start CCal Filename	10LCMS02_171214A_031	Injected By	QL
End CCal Filename	10LCMS02_171214A_050		
Method Blank Filename	10LCMS02_171214A_033		

Compound	Spiked (ng/L)	Recovered (ng/L)	Recovery %	Limits
PFBA	20	18	89	70.0 - 130.0
PFPeA	20	16	81	70.0 - 130.0
PFBS	17	16	89	70.0 - 130.0
PFHxA	20	17	85	70.0 - 130.0
PFPrOPrA	40	45	113	70.0 - 130.0
PFHpA	20	16	81	70.0 - 130.0
NaDONA	40	48	120	70.0 - 130.0
PFHxS	19	17	92	70.0 - 130.0
PFOA	20	18	93	70.0 - 130.0
PFNA	20	18	91	70.0 - 130.0
PFOS	19	18	92	70.0 - 130.0
PFDA	20	20	99	70.0 - 130.0
PFUdA	20	23	114	70.0 - 130.0
N-MeFOSAA	40	34	85	70.0 - 130.0
N-EtFOSAA	40	32	80	70.0 - 130.0
PFDS	19	22	113	70.0 - 130.0
PFDoA	20	22	112	70.0 - 130.0
PFTrDA	20	25	124	70.0 - 130.0
PFTeDA	20	19	95	70.0 - 130.0
PFHxDA	20	19	94	70.0 - 130.0
PFODA	20	19	96	70.0 - 130.0

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.7	86	70 - 130	Pass
13C2_PFDA	2.0	2.1	106	70 - 130	Pass
d5-EtFOSAA	8.0	6.5	81	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C3_PFPrOPrA	433928	299325 - 897974	314087 - 628174	Pass
13C2_PFOA	252871	122449 - 367348	157977 - 315953	Pass
13C4_PFOS	367987	209883 - 629649	229128 - 458256	Pass
d3-MeFOSAA	144890	95616 - 286847	92247 - 184493	Pass

50-150% of Ical area

70-140% of the preceding CCV area



PFAA Laboratory Control Sample Duplicate (LCSD)

LCSD Lab Sample ID	LCSD-59175	LCS Filename	10LCMS02_171214A_035
LCSD Filename	10LCMS02_171214A_036	Matrix	Water
Total Amount Extracted	253mL	Dilution	1
ICAL ID	171031A02	Extracted	12/13/2017
Start CCal Filename	10LCMS02_171214A_031	Analyzed	12/14/2017 21:24
End CCal Filename	10LCMS02_171214A_050	Injected By	QL
Method Blank Filename	10LCMS02_171214A_033		

Compound	Spiked (ng/L)	Recovered (ng/L)	Recovery %	Recovery Limits	RPD %
PFBA	20	17	86	70.0 - 130.0	4
PFPeA	20	16	80	70.0 - 130.0	2
PFBS	17	15	84	70.0 - 130.0	6
PFHxA	20	16	80	70.0 - 130.0	7
PFPrOPrA	40	45	115	70.0 - 130.0	1
PFHpA	20	14	73	70.0 - 130.0	11
NaDONA	40	49	123	70.0 - 130.0	2
PFHxS	19	17	91	70.0 - 130.0	2
PFOA	20	18	89	70.0 - 130.0	5
PFNA	20	18	90	70.0 - 130.0	2
PFOS	19	17	88	70.0 - 130.0	5
PFDA	20	18	92	70.0 - 130.0	8
PFUdA	20	20	104	70.0 - 130.0	10
N-MeFOSAA	40	32	81	70.0 - 130.0	6
N-EtFOSAA	40	34	87	70.0 - 130.0	7
PFDS	19	19	100	70.0 - 130.0	13
PFDoA	20	21	106	70.0 - 130.0	6
PFTrDA	20	23	118	70.0 - 130.0	5
PFTeDA	20	18	91	70.0 - 130.0	4
PFHxDA	20	18	90	70.0 - 130.0	5
PFODA	20	19	98	70.0 - 130.0	1

Surrogate Standards

SS Compound	Spiked	Found	%Recovery	Limits	Pass/Fail
13C2_PFHxA	2.0	1.8	92	70 - 130	Pass
13C2_PFDA	2.0	2.1	104	70 - 130	Pass
d5-EtFOSAA	8.0	6.8	85	70 - 130	Pass

Internal Standards

IS Compound	Area	Ical Limits	CCV Limits	Pass/Fail
13C3_PFPPrOPrA	435672	299325 - 897974	314087 - 628174	Pass
13C2_PFOA	263656	122449 - 367348	157977 - 315953	Pass
13C4_PFOS	379950	209883 - 629649	229128 - 458256	Pass
d3-MeFOSAA	157532	95616 - 286847	92247 - 184493	Pass

50-150% of Ical area

70-140% of the preceding CCV area