



**SUSTAINABLE ENVIRONMENT, ENERGY,
HEALTH & SAFETY PROFESSIONAL SERVICES**

NORTECH, Inc.

April 22, 2019

♦
Accounting Office:
2400 College Rd
Fairbanks, AK 99709
907.452.5688
907.452.5694 Fax

██████████
██████████████████
████████████████████

██████████████████
██████████████████

RE: Spring 2019 - PFAS Groundwater Results

♦
3105 Lakeshore Drive
Suite A106
Anchorage, AK 99517
907.222.2445
907.222.0915 Fax

██████████████████

Thank you very much for participating in **NORTECH's** well search and initial groundwater assessment. Enclosed is the laboratory report for your well. The laboratory results of your groundwater sample are non-detect for the two compounds of concern. There is no action you need to take at this time.

♦
5438 Shaune Drive
Suite B
Juneau, AK 99801
907.586.6813
907.586.6819 Fax

Please reference Section 4 - "Report of Analysis" found on Page 13 for the results of your groundwater analysis of per- and poly-fluoroalkyl substances (PFAS). PFAS compounds Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic Acid (PFOA) were not detected in your water well sample.

♦
www.nortechengr.com

The Environmental Protection Agency (EPA) and Alaska Department of Environmental Conservation (ADEC) have set a Lifetime Health Advisory (LHA) level of 0.070 micrograms per liter (µg/L). The LHA of 0.070 µg/L is for the sum of PFAS compounds PFOS and PFOA in drinking water..

As required by ADEC, we will be notifying ADEC of your laboratory test results. If you have any additional questions regarding the results of this report, please feel free to contact me or Julie Keener, at the **NORTECH** office, 907-452-5688, Monday through Friday, 8 am to 5 pm.

Again, thank you for participating in this groundwater assessment and we hope that you have a good summer.

Sincerely,
NORTECH

Scott Hummel
Chemist

Attached: SGS Work Order Laboratory Report: 1199075

Laboratory Report of Analysis

To: Nortech
2450 College Road
Fairbanks, AK 99709
(907)452-5688

Report Number: **1199075**

Client Project: **PFC Well Search NAPA-Van Horn**

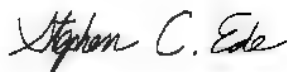
Dear Scott Hummel,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.



Alaska Division Technical Director

Stephen Ede

2019.03.19

13:54:59 -08'00'

Jennifer Dawkins
Project Manager
Jennifer.Dawkins@sgs.com

Date

Case Narrative

SGS Client: **Nortech**

SGS Project: **1199075**

Project Name/Site: **PFC Well Search NAPA-Van Horn**

Project Contact: **Scott Hummel**

Refer to sample receipt form for information on sample condition.

2119 Standard-01 (1199075001) PS

EPA 537- QSM 5.1 24 Compound List was analyzed by SGS of Orlando, FL.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 03/19/2019 11:55:30AM

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
[REDACTED]-01	1199075001	02/25/2019	03/01/2019	Water (Surface, Eff., Ground)

Method

Method Description

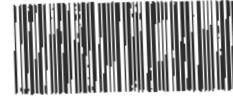
Print Date: 03/19/2019 11:55:32AM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518
 t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

CLIENT: NORTECH					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page 1 of 1								
Section 1	CONTACT: Scott Hummel				PHONE NO: 907-452-5688				Section 3		Preservative												
	PROJECT NAME: PFC well search NAPA-Van Horn				PROJECT/ PWSID/ PERMIT#: 17-1001				#	C O N T A I N E R S	Type C = COMP G = GRAB MI = Multi Incremental Soils	None											
	REPORTS TO: Scott Hummel				E-MAIL: scott.hummel@nortechengr.com																		
	INVOICE TO: NORTECH				QUOTE #: P.O. #: 17-1001																		
Section 2	RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	#	C O N T A I N E R S	Type C = COMP G = GRAB MI = Multi Incremental Soils	PFCs by EPA 537											REMARKS/ LOC ID			
	04-B		02/25/19	1136	WATER					2	G	X											
Section 5	Relinquished By: (1)		Date	Time	Received By:		2-28-19 1930		Section 4		DOD Project? Yes No		Data Deliverable Requirements:										
	Relinquished By: (2)		Date	Time	Received By:				Cooler ID:														
	Relinquished By: (3)		Date	Time	Received By:				Requested Turnaround Time and/or Special Instructions:														
	Relinquished By: (4)		Date	Time	Received For Laboratory By:				Temp Blank °C: 2.30C or Ambient []		Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT												





e-Sample Receipt Form

SGS Workorder #:

1199075



1 1 9 9 0 7 5

Review Criteria		Condition (Yes, No, N/A)	Exceptions Noted below	
Chain of Custody / Temperature Requirements			N/A	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location		Yes	1-F, 1-B	
COC accompanied samples?		Yes		
N/A		**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID:	1	@ 3.6 °C Therm. ID: D56
		Cooler ID:		@ °C Therm. ID:
		Cooler ID:		@ °C Therm. ID:
		Cooler ID:		@ °C Therm. ID:
		Cooler ID:		@ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?		N/A		
If <0°C, were sample containers ice free?		N/A		
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".				
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.				
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.		
Were samples received within holding time?		Yes		
Do samples match COC ** (i.e., sample IDs, dates/times collected)?		Yes		
**Note: If times differ <1hr, record details & login per COC.				
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)		Yes		
		N/A	***Exemption permitted for metals (e.g., 200.8/6020A).	
Were proper containers (type/mass/volume/preservative***) used?		Yes		
Volatile / LL-Hg Requirements				
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?		N/A		
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?		N/A		
Were all soil VOAs field extracted with MeOH+BFB?		N/A		
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.				
Additional notes (if applicable):				



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1199075001-A	No Preservative Required	OK			
1199075001-B	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

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

e-Hardcopy 2.0
Automated Report

Technical Report for

SGS North America, Inc

1199075

SGS Job Number: FA62038

Sampling Date: 02/25/19

Report to:

andrea.colby@sgs.com

Total number of pages in report: **24**



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

This report shall not be reproduced, except in its entirety, without the written approval of SGS.

Test results relate only to samples analyzed.

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-1-

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SGS North America Inc.

Sample Summary

SGS North America, Inc
1199075

Job No: FA62038

Sample Number	Collected Date	Time By	Received	Matrix Code Type	Client Sample ID
FA62038-1	02/25/19	11:36 JS	03/05/19	AQ Water	

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: SGS North America, Inc

Job No FA62038

Site: 1199075

Report Date 3/13/2019 11:38:01

1 Sample was collected on 02/25/2019 and received at SGS North America Inc - Orlando on 03/05/2019 properly preserved, at 3.6 Deg. C and intact. This sample received an SGS Orlando job number of FA62038. 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: OP74054

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA62023-2MS, FA62024-1DUP were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Blank Spike Recovery(s) for Perfluorodecanesulfonic acid are outside control limits.

OP74054-BS for Perfluorodecanesulfonic acid: Sporadic marginal failure.

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

RPD(s) for Duplicate for Perfluoropentanesulfonic acid are outside control limits for sample OP74054-DUP. Probable cause is due to sample non-homogeneity.

FA62038-1 for Perfluorodecanesulfonic acid: Associated BS recovery outside control limits.

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: FA62038
Account: SGS North America, Inc
Project: 1199075
Collected: 02/25/19



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

FA62038-1 [REDACTED] 01

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Page 1 of 2

Client Sample ID:		
Lab Sample ID:	FA62038-1	Date Sampled: 02/25/19
Matrix:	AQ - Water	Date Received: 03/05/19
Method:	EPA 537M BY ID EPA 537 MOD	Percent Solids: n/a
Project:	1199075	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q1672.D	1	03/07/19 20:02	NAF	03/06/19 09:00	OP74054	S3Q46
Run #2							

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

PFAS List

CAS No.	Compound	Result	RL	Units	Q
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PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	ND	0.0080	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

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

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA	ND	0.0040	ug/l	
----------	-------	----	--------	------	--

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	ND	0.020	ug/l	
2991-50-6	EtFOSAA	ND	0.020	ug/l	

FLUOROTELOMER SULFONATES

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

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	██████████	Date Sampled:	02/25/19
Lab Sample ID:	FA62038-1	Date Received:	03/05/19
Matrix:	AQ - Water	Percent Solids:	n/a
Method:	EPA 537M BY ID EPA 537 MOD		
Project:	1199075		

PFAS List

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

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	83%		30-140%
	13C5-PFPeA	88%		40-140%
	13C5-PFHxA	96%		50-150%
	13C4-PFHpA	99%		50-150%
	13C8-PFOA	113%		50-150%
	13C9-PFNA	110%		50-150%
	13C6-PFDA	89%		50-150%
	13C7-PFUnDA	82%		50-150%
	13C2-PFDoDA	73%		50-150%
	13C2-PFTeDA	78%		40-150%
	13C3-PFBS	87%		50-150%
	13C3-PFHxS	85%		50-150%
	13C8-PFOS	69%		50-150%
	13C8-FOSA	83%		30-140%
	d3-MeFOSAA	86%		50-150%
	13C2-4:2FTS	97%		50-150%
	13C2-6:2FTS	121%		50-150%
	13C2-8:2FTS	98%		50-150%

(a) Associated BS recovery outside control limits.

ND = Not detected
 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:

- Chain of Custody



SGS North America Inc.
CHAIN OF CUSTODY RECORD



1 1 9 9 0 7 5

FA62038

Locations Nationwide

Alaska Florida
New Jersey Colorado
Texas North Carolina
Virginia Louisiana
www.us.sgs.com

CLIENT: SGS North America Inc. - Alaska Division				SGS Reference: SGS, FL				Page 1 of 1			
CONTACT: Julie Shumway PHONE NO: (907) 562-2343				Additional Comments: All soils report out in dry weight unless otherwise requested.							
PROJECT NAME: 1199075		PWSID#:		NPD#:							
REPORTS TO:		E-MAIL: julia.shumway@sgs.com									
INVOICE TO: SGS - Alaska		QUOTE #:		P.O. #: 1199075							
RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/ MATRIX	2	G =	X	MS	MSD	SGS lab #	Location ID
1		2/25/2019	11:36	Water						1199075001	
Relinquished By: (1) <i>[Signature]</i> Date 3/4/2019 Time 1115 Received By: <i>VPS</i>											
Relinquished By: (2) <i>VPS</i> Date Date Time Time Received By:											
Relinquished By: (3) Date Date Time Time Received By:											
Relinquished By: (4) Date Date Time Time Received For Laboratory By: <i>3/5/19</i> <i>1315</i>											
DOD Project? NO Report to DL (J Flags)? NO Cooler ID:						Data Deliverable Requirements: Level 2 Report +DV EDD					
Requested Turnaround Time and/or Special Instructions: Report all analyses for Soils/Waters in mg/L or mg/Kg, where possible											
Temp Blank °C: <i>3.6</i> or Ambient []						Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT					

[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

1199075_PFC_03.04.19.xls

FA62038: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA62038

Client: SGS ALASKA

Project: 1199075

Date / Time Received: 3/5/2019 1:15:00 PM

Delivery Method: UPS

Airbill #s: 1za8619w0166092034

Therm ID: IR 1;

Therm CF: -0.2;

of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.8);

Cooler Temps (Corrected) °C: Cooler 1: (3.6);

Cooler Information

Y or N

1. Custody Seals Present
2. Custody Seals Intact
3. Temp criteria achieved
4. Cooler temp verification
5. Cooler media

☒ ☐
☒ ☐
☒ ☐
IR Gun
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
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?

☒ ☐
☒ ☐
☒ ☐
Intact
☒ ☐
☒ ☐
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Misc. Information

Number of Encores: 25-Gram 5-Gram

Number of 5035 Field Kits:

Number of Lab Filtered Metals:

Test Strip Lot #s: pH 0-3 230315

pH 10-12 219813A

Other: (Specify)

Residual Chlorine Test Strip Lot #:

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH

Date: 3/5/2019 1:15:00 PM

Reviewer:

Date:

FA62038: Chain of Custody

Page 2 of 2

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

Page 1 of 2

Job Number: FA62038
Account: SGSAKA SGS North America, Inc
Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74054-MB	3Q1656.D	1	03/07/19	NAF	03/06/19	OP74054	S3Q46

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA62038-1

CAS No.	Compound	Result	RL	Units	Q
375-22-4	Perfluorobutanoic acid	0.00451	0.0077	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0038	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0038	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0038	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0038	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0038	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0038	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0038	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0038	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0038	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0038	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0038	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0038	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0038	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0038	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0038	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0038	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0038	ug/l	
754-91-6	PFOSA	ND	0.0038	ug/l	
2355-31-9	MeFOSAA	ND	0.019	ug/l	
2991-50-6	EtFOSAA	ND	0.019	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0077	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0077	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0077	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	92% 30-140%
	13C5-PFPeA	95% 40-140%
	13C5-PFHxA	103% 50-150%
	13C4-PFHpA	106% 50-150%
	13C8-PFOA	120% 50-150%
	13C9-PFNA	116% 50-150%
	13C6-PFDA	92% 50-150%
	13C7-PFUnDA	78% 50-150%

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Job Number: FA62038

Account: SGSAKA SGS North America, Inc

Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74054-MB	3Q1656.D	1	03/07/19	NAF	03/06/19	OP74054	S3Q46

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA62038-1

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	67% 50-150%
	13C2-PFTeDA	67% 40-150%
	13C3-PFBS	95% 50-150%
	13C3-PFHxS	92% 50-150%
	13C8-PFOS	64% 50-150%
	13C8-FOSA	87% 30-140%
	d3-MeFOSAA	91% 50-150%
	13C2-4:2FTS	102% 50-150%
	13C2-6:2FTS	126% 50-150%
	13C2-8:2FTS	102% 50-150%

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Job Number: FA62038

Account: SGSAKA SGS North America, Inc

Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q46-IBLK	3Q1641.D	1	03/07/19	NAF	n/a	n/a	S3Q46

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.1 B-15

FA62038-1

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

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	96% 50-150%
	13C5-PFPeA	96% 50-150%
	13C5-PFHxA	104% 50-150%
	13C4-PFHpA	107% 50-150%
	13C8-PFOA	112% 50-150%
	13C9-PFNA	112% 50-150%
	13C6-PFDA	114% 50-150%
	13C7-PFUnDA	115% 50-150%

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Job Number: FA62038

Account: SGSAKA SGS North America, Inc

Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q46-IBLK	3Q1641.D	1	03/07/19	NAF	n/a	n/a	S3Q46

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.1 B-15

FA62038-1

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	113% 50-150%
	13C2-PFTeDA	100% 50-150%
	13C3-PFBS	99% 50-150%
	13C3-PFHxS	102% 50-150%
	13C8-PFOS	105% 50-150%
	13C8-FOSA	107% 50-150%
	d3-MeFOSAA	115% 50-150%
	13C2-4:2FTS	102% 50-150%
	13C2-6:2FTS	111% 50-150%
	13C2-8:2FTS	114% 50-150%

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Job Number: FA62038

Account: SGSAKA SGS North America, Inc

Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q47-IBLK	3Q1710.D	1	03/08/19	NAF	n/a	n/a	S3Q47

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.1 B-15

OP74054-DUP, OP74054-MS

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

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	96% 50-150%
	13C5-PFPeA	96% 50-150%
	13C5-PFHxA	97% 50-150%
	13C4-PFHpA	98% 50-150%
	13C8-PFOA	99% 50-150%
	13C9-PFNA	99% 50-150%
	13C6-PFDA	104% 50-150%
	13C7-PFUnDA	100% 50-150%

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Job Number: FA62038

Account: SGSAKA SGS North America, Inc

Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S3Q47-IBLK	3Q1710.D	1	03/08/19	NAF	n/a	n/a	S3Q47

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.1 B-15

OP74054-DUP, OP74054-MS

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	97% 50-150%
	13C2-PFTeDA	81% 50-150%
	13C3-PFBS	97% 50-150%
	13C3-PFHxS	97% 50-150%
	13C8-PFOS	97% 50-150%
	13C8-FOSA	99% 50-150%
	d3-MeFOSAA	97% 50-150%
	13C2-4:2FTS	90% 50-150%
	13C2-6:2FTS	92% 50-150%
	13C2-8:2FTS	93% 50-150%

Blank Spike Summary

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Job Number: FA62038

Account: SGSAKA SGS North America, Inc

Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74054-BS	3Q1655.D	1	03/07/19	NAF	03/06/19	OP74054	S3Q46

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA62038-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.0769	0.0753	98	70-130
2706-90-3	Perfluoropentanoic acid	0.0769	0.0717	93	70-130
307-24-4	Perfluorohexanoic acid	0.0769	0.0722	94	70-130
375-85-9	Perfluoroheptanoic acid	0.0769	0.0729	95	71-130
335-67-1	Perfluorooctanoic acid	0.0769	0.0743	97	74-130
375-95-1	Perfluorononanoic acid	0.0769	0.0723	94	76-130
335-76-2	Perfluorodecanoic acid	0.0769	0.0732	95	70-130
2058-94-8	Perfluoroundecanoic acid	0.0769	0.0706	92	70-130
307-55-1	Perfluorododecanoic acid	0.0769	0.0689	90	70-130
72629-94-8	Perfluorotridecanoic acid	0.0769	0.0675	88	70-139
376-06-7	Perfluorotetradecanoic acid	0.0769	0.0656	85	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0769	0.0727	95	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.0769	0.0713	93	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0769	0.0737	96	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.0769	0.0686	89	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.0769	0.0707	92	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0769	0.0548	71	70-130
335-77-3	Perfluorodecanesulfonic acid	0.0769	0.0402	52* a	70-130
754-91-6	PFOSA	0.0769	0.0753	98	70-131
2355-31-9	MeFOSAA	0.0769	0.0727	95	70-130
2991-50-6	EtFOSAA	0.0769	0.0586	76	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.0769	0.0750	98	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0769	0.0758	99	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.0769	0.0775	101	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	91%	30-140%
	13C5-PFPeA	94%	40-140%
	13C5-PFHxA	102%	50-150%
	13C4-PFHpA	105%	50-150%
	13C8-PFOA	117%	50-150%
	13C9-PFNA	115%	50-150%
	13C6-PFDA	94%	50-150%
	13C7-PFUnDA	81%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: FA62038

Account: SGSAKA SGS North America, Inc

Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74054-BS	3Q1655.D	1	03/07/19	NAF	03/06/19	OP74054	S3Q46

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA62038-1

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	72%	50-150%
	13C2-PFTeDA	75%	40-150%
	13C3-PFBS	94%	50-150%
	13C3-PFHxS	93%	50-150%
	13C8-PFOS	73%	50-150%
	13C8-FOSA	91%	30-140%
	d3-MeFOSAA	90%	50-150%
	13C2-4:2FTS	107%	50-150%
	13C2-6:2FTS	130%	50-150%
	13C2-8:2FTS	108%	50-150%

(a) Sporadic marginal failure.

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: FA62038
Account: SGSAKA SGS North America, Inc
Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74054-MS	3Q1731.D	1	03/08/19	NAF	03/06/19	OP74054	S3Q47
FA62023-2 ^a	3Q1730.D	1	03/08/19	NAF	03/06/19	OP74054	S3Q47

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA62038-1

CAS No.	Compound	FA62023-2 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	0.00822	B	0.08	0.0841	95	70-130
2706-90-3	Perfluoropentanoic acid	0.00909		0.08	0.0862	96	70-130
307-24-4	Perfluorohexanoic acid	0.0133		0.08	0.0900	96	70-130
375-85-9	Perfluoroheptanoic acid	0.00391		0.08	0.0812	97	71-130
335-67-1	Perfluorooctanoic acid	0.00969		0.08	0.0870	97	74-130
375-95-1	Perfluorononanoic acid	0.00132		0.08	0.0766	94	76-130
335-76-2	Perfluorodecanoic acid	ND		0.08	0.0760	95	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.08	0.0701	88	70-130
307-55-1	Perfluorododecanoic acid	ND		0.08	0.0643	80	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.08	0.0737	92	70-139
376-06-7	Perfluorotetradecanoic acid	ND		0.08	0.0619	77	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0319		0.08	0.109	96	73-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.08	0.0765	96	70-130
355-46-4	Perfluorohexanesulfonic acid	0.00142		0.08	0.0791	97	74-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.08	0.0759	95	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.00610		0.08	0.0789	91	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.08	0.0507	63*	70-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.08	0.0357	45*	70-130
754-91-6	PFOSA	ND		0.08	0.0781	98	70-131
2355-31-9	MeFOSAA	ND		0.08	0.0735	92	70-130
2991-50-6	EtFOSAA	ND		0.08	0.0613	77	70-130
757124-72-44:2	Fluorotelomer sulfonate	ND		0.08	0.0799	100	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.08	0.0791	99	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.08	0.0798	100	70-130

CAS No.	ID Standard Recoveries	MS	FA62023-2	Limits
	13C4-PFBA	71%	74%	30-140%
	13C5-PFPeA	87%	86%	40-140%
	13C5-PFHxA	92%	93%	50-150%
	13C4-PFHpA	94%	96%	50-150%
	13C8-PFOA	103%	108%	50-150%
	13C9-PFNA	100%	104%	50-150%
	13C6-PFDA	89%	104%	50-150%
	13C7-PFUnDA	75%	92%	50-150%

* = Outside of Control Limits.

Matrix Spike Summary

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Job Number: FA62038

Account: SGSAKA SGS North America, Inc

Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74054-MS	3Q1731.D	1	03/08/19	NAF	03/06/19	OP74054	S3Q47
FA62023-2 ^a	3Q1730.D	1	03/08/19	NAF	03/06/19	OP74054	S3Q47

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA62038-1

CAS No.	ID Standard Recoveries	MS	FA62023-2	Limits
	13C2-PFDoDA	59%	72%	50-150%
	13C2-PFTeDA	41%	50%	40-150%
	13C3-PFBS	88%	88%	50-150%
	13C3-PFHxS	90%	93%	50-150%
	13C8-PFOS	71%	84%	50-150%
	13C8-FOSA	67%	81%	30-140%
	d3-MeFOSAA	85%	95%	50-150%
	13C2-4:2FTS	102%	95%	50-150%
	13C2-6:2FTS	109%	108%	50-150%
	13C2-8:2FTS	113%	117%	50-150%

(a) Insufficient sample for re-extraction.

* = Outside of Control Limits.

Duplicate Summary

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Job Number: FA62038
Account: SGSAKA SGS North America, Inc
Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74054-DUP	3Q1737.D	2	03/08/19	NAF	03/06/19	OP74054	S3Q47
FA62024-1 ^a	3Q1736.D	2	03/08/19	NAF	03/06/19	OP74054	S3Q47

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA62038-1

CAS No.	Compound	FA62024-1 ug/l	DUP Q	ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	0.220	B	0.265		19	30
2706-90-3	Perfluoropentanoic acid	0.148		0.163		10	30
307-24-4	Perfluorohexanoic acid	0.382		0.424		10	30
375-85-9	Perfluoroheptanoic acid	0.0445		0.0494		10	30
335-67-1	Perfluorooctanoic acid	0.107		0.118		10	30
375-95-1	Perfluorononanoic acid	0.00237		0.00268	J	12	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	0.166		0.186		11	30
2706-91-4	Perfluoropentanesulfonic acid	0.00397		0.00548	J	32*	30
355-46-4	Perfluorohexanesulfonic acid	0.0218		0.0221		1	30
375-92-8	Perfluoroheptanesulfonic acid	ND		ND		nc	30
1763-23-1	Perfluorooctanesulfonic acid	0.0191		0.0188		2	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	0.0342		0.0341		0	30
39108-34-4	8:2 Fluorotelomer sulfonate	ND		ND		nc	30

CAS No.	ID Standard Recoveries	DUP	FA62024-1	Limits
	13C4-PFBA	8%* ^c	10%* ^b	30-140%
	13C5-PFPcA	79%	76%	40-140%
	13C5-PFHxA	88%	85%	50-150%
	13C4-PFHpA	90%	87%	50-150%
	13C8-PFOA	97%	94%	50-150%
	13C9-PFNA	89%	86%	50-150%
	13C6-PFDA	86%	84%	50-150%
	13C7-PFUnDA	73%	69%	50-150%

* = Outside of Control Limits.

Duplicate Summary

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Job Number: FA62038
Account: SGSAKA SGS North America, Inc
Project: 1199075

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74054-DUP	3Q1737.D	2	03/08/19	NAF	03/06/19	OP74054	S3Q47
FA62024-1 ^a	3Q1736.D	2	03/08/19	NAF	03/06/19	OP74054	S3Q47

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA62038-1

CAS No.	ID Standard Recoveries	DUP	FA62024-1	Limits
	13C2-PFDoDA	66%	61%	50-150%
	13C2-PFTeDA	63%	52%	40-150%
	13C3-PFBS	81%	79%	50-150%
	13C3-PFHxS	80%	79%	50-150%
	13C8-PFOS	71%	71%	50-150%
	13C8-FOSA	83%	69%	30-140%
	d3-MeFOSAA	74%	69%	50-150%
	13C2-4:2FTS	88%	85%	50-150%
	13C2-6:2FTS	108%	102%	50-150%
	13C2-8:2FTS	88%	86%	50-150%

- (a) Dilution required due to matrix interference.
(b) Outside control limits due to matrix interference. Confirmed by batch QC.
(c) Outside control limits.

* = Outside of Control Limits.