

# **REPORT**

## **LABORATORY DATA QUALITY ASSURANCE REVIEW**

### **NORDALE FACILITY PFAS SOIL SAMPLING**

### **SAMPLING CONDUCTED FOR ALYESKA PIPELINE SERVICE COMPANY**

**January 2019**

**Prepared by:** Jennifer McLean  
**Reviewed by:** Scott Rose

SLR International Corporation  
2700 Gambell Street, Suite 200  
Anchorage, AK 99503

## ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska
BS	blank spike
°C	degrees Celsius
CCV	continuing calibration verification
COC	chain of custody
DL	detection limit
DoD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
FL	Florida
ID	isotope dilution
LCL	lower control limit
LOD	limit of detection
LOQ	limit of quantitation
MS	matrix spike
MSD	matrix spike duplicate
ND	not detected
NFG	National Functional Guidelines for Superfund Organic Methods Data Review
PARCCS	precision, accuracy, representativeness, comparability, completeness, and sensitivity
PFAS	per- and polyfluoroalkyl substances
QA	quality assurance
QAR	quality assurance review
QC	quality control
QSM	Quality Services Manual
RPD	relative percent difference
SDG	sample delivery group
SLR	SLR International Corporation
SGS	SGS North America, Inc.
USEPA	United States Environmental Protection Agency

## Introduction

This report summarizes a review of analytical data for water samples collected on January 10, 2019 at the [REDACTED] drinking water well, located approximately 1200 feet east of the Nordale Facility, Alaska. Samples were collected by SLR International Corporation (SLR) and submitted to SGS North America, Inc. (SGS) in Anchorage, Alaska. Samples were then transferred by SGS, Anchorage to SGS Orlando, Florida for all analysis. SGS Orlando maintains a current Alaska Department of Environmental Conservation (ADEC) Contaminated Sites approval, number UST-088, and is DoD (Department of Defense) Environmental Laboratory Accreditation Program (ELAP) Quality Services Manual (QSM) 5.1 accredited for the analytical methods of interest as applicable (Certificate #L2229). Table 1 provides a summary of the work order, sample receipt, analytical methods, and analytes.

**Table 1 Sample Receipt, Method, and Analyte Summary**

SDG	Date Collected	Date Received by Laboratory	Temperature Blank	Matrix	Analytical Method	Analyte
Anchorage 1190203 Orlando FA60804	1/10/2019	SGS, Anchorage, AK – 1/14/2019 SGS Orlando, FL – 1/15/2019	-0.3°C  3.4°C	Water	USEPA 537Mod	PFAS

**Acronyms:**

°C – degrees Celsius

AK - Alaska

SDG – sample delivery group

USEPA – United States Environmental Protection Agency

PFAS - per- and polyfluoroalkyl substances

The laboratory final report was provided as a Level II deliverable and included documentation of the delivery group chain of custody (COC) and sample receipt condition. The PDF laboratory report is provided electronically as Attachment 2.

## Quality Assurance Program

A quality assurance (QA) program was followed for this project that addressed project administration, sampling, quality control (QC), and data review. SLR adhered to required and established sampling and COC protocols. The select laboratory maintains an internal QA program and standard operating procedures.

The analytical data was reviewed for consistency with any project specific requirements, ADEC Technical Memorandum, *Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling* (ADEC, 2017) requirements, USEPA *National Functional Guidelines for Superfund Organic Methods Data Review* (NFG) [USEPA, 2014], analytical method criteria, and laboratory criteria. An ADEC Laboratory Data Review Checklist was completed for the SDG and was included as Attachment 1 to this Quality Assurance Review (QAR). A review for any anomalies to the project requirements for precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS) are noted in this QAR, and any data qualifications discussed.

The data review included the following, as applicable:

- Reviewing COC records for completeness, signatures, and dates;
- Identifying any sample receipt or preservation anomalies that could impact data quality;
- Verifying that QC blanks (e.g., field blanks, equipment blanks, trip blanks, method blanks, etc.) were properly prepared, identified, and analyzed;
- Evaluating whether laboratory reporting limits met project goals;
- Reviewing the case narrative for any discussion of any Continuing Calibration Verification (CCV) recoveries or other calibration related criteria as being outside applicable acceptance limits;
- Verifying that internal standard recoveries were within recovery acceptance limits;
- Verifying that surrogate analyses were within recovery acceptance limits;
- Verifying that Blank Spike (BS), Matrix Spike (MS), and Matrix Spike Duplicate (MSD) recoveries were within acceptance limits;
- Evaluating the result relative percent difference (RPD) between primary and duplicate field samples, MS/MSD, and laboratory duplicates; and
- Providing an overall assessment of laboratory data quality and qualifying sample results as necessary.

## Data Qualifications

As part of the quality assurance review, qualifiers (i.e. data flags) were applied to data as determined necessary based on specified criteria, or professional judgement. In all cases, the basis for qualification and the applied data flag are discussed in this QAR. Table 2 provides a list of potential qualifiers (i.e., flags). These data flags were appended to the data as appropriate.

**Table 2 Data Qualifiers**

Lab Qualifier (Flag)	NFG Qualifier (Flag)	Equivalent Project Qualifier (Flag) <sup>1,2,3</sup>	Definition
U	U	<b>ND</b>	The analyte was analyzed for but was not detected above the detection limit (DL).
J	NJ	J	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample between the limit of quantitation (LOQ) and the DL. This qualifier is appended by the laboratory.
--	J	Q	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample, due to one or more laboratory quality control criteria (e.g., LCS recovery, surrogate spike recovery) failed or matrix effect. Where applicable, a “+” or “-“ was appended to indicate a high bias, or a low bias respectively.
--	UJ	<b>UJ</b>	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
--	R	R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
--	--	B	Blank contamination: The analyte was positively identified in the blank (e.g., trip blank and/or method blank) associated with the sample and the concentration reported for the sample was less than five times that of the blank (ten times for metals and common laboratory contaminants methylene chloride and acetone). Where applicable, “U” was appended prior to the “B” to indicate a detected result with an associated blank detection greater than the sample detection; likely a false positive result. The greater of the sample detection or limit of detection (LOD) was reported in [ ].

**Notes:**

1 - Flags were appended to the data where applicable. The table presents laboratory, NFG and project equivalent qualifiers.

2 - Only flags in **bold** were applicable and appended to data for this project.

3 – For historical purposes, ND was used in place of “U.”

A discussion of the project data quality relative to PARCCS goals and summary of any anomalies or failures requiring data qualifiers follows.

## Data Validation

### Data Packages

The data package was checked for transcription errors, omissions, or other anomalies. No issues were noted with regards to the data package.

### Sample Receipt

The sample receipt documentation was checked for anomalies. No issues were noted with regards to the receipt of the samples.

### Preservation (Chemical and Temperature)

Samples were appropriately preserved and were submitted to SGS, Fairbanks then transferred to SGS, Anchorage. From there all samples were subcontracted to SGS Orlando, Florida. The only issue with regards to temperature is noted below.

- The temperature blank was received at SGS, Anchorage at -0.3 °C, with no ice in the container. However, the field blank was noted as having “a small amount of ice upon receipt.” It is considered highly unlikely that the field blank was impacted by minimal ice present. Also, neither the primary sample nor field duplicate had ice present, and all samples had results of non-detectable for all analytes. Data was considered not impacted.

### Holding Times

Analytical holding times were satisfied for all samples.

### Laboratory Method Blanks

Laboratory method blanks were analyzed at the appropriate frequencies. Analytes were not detected (ND) in any method blanks at or above the limit of detection (LOD) or DL.

### Field Blanks

One field blank accompanied both project samples in the field and cooler and was analyzed for PFAS by EPA Method 537Mod. Analytes were not detected in the field blank at or above the LOD or DL.

### Reporting Limits

For non-detect results, LODs were compared to applicable cleanup levels for the site. LODs were compared with 18 AAC 75.345 Table C, *Groundwater Cleanup Levels* (ADEC, 2018b) and ADEC Technical Memorandum, *Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water* (ADEC, 2018a). All analytes with results of non-detect had LODs at or below applicable action levels.

### Continuous Calibration Verifications (CCVs)

CCV data were included only in the case narrative. No CCVs were noted in the case narrative as outside of acceptance limits. CCV performance criteria were considered met.

### Internal Standards

Isotope dilution (ID) standard recoveries (also referred to as extracted internal standards) are discussed in the ID Standard Recovery section.

### ID Standard Recovery Results

ID standard (aka. extracted internal standards) analysis was performed at the required frequencies. All ID standard recoveries were within analytical method and SGS percent recovery acceptance limits.

### Blank Spike and Blank Spike Duplicate Samples

Blank Spikes (BS) were analyzed at the appropriate frequency. All BS recoveries were within acceptable limits, except as noted below. No blank spike duplicate samples (BSDSs) were analyzed for this work order. Precision was established via an MS/MSD pair.

- For Method 537M, perfluorodecanesulfonic acid recovered at 64% in the LCS, slightly below the lower control limit (LCL) of 70%. Samples DW-1, DW-91, and the field blank were associated with this BS. Perfluorodecanesulfonic acid was not detected in any associated samples. Results for this analyte were qualified "UJ" and should be considered non-detect with an estimated reporting limit that may be inaccurate or imprecise. Because the recovery was only slightly below the acceptable LCL, data was considered minimally impacted. No cleanup levels currently exist for this analyte. All data is considered usable as qualified.

### Matrix Spike and Matrix Spike Duplicate Samples

MS/MSD pairs were analyzed at the appropriate frequencies. All MS/MSD RPDs were within acceptable limits. All MS/MSD recoveries were within acceptable limits, except as noted below.

- For Method 537M, perfluorodecanesulfonic acid recovered at 69%, slightly below the LCL of 70% in the MSD associated with samples DW-1, DW-91, and the field blank. Perfluorodecanesulfonic acid results of non-detectable were qualified "UJ" as was noted in the BS and BSD section of this QAR. No cleanup levels currently exist for this analyte. All data is considered usable as qualified.

### Field Duplicates

The field duplicate sample frequency is presented in Table 3. Parent sample and field duplicate pairs are presented in Table 4. The frequency satisfied the requirement of one per 10 samples or less per matrix and analyte. Field duplicates were submitted blind to the laboratory.

All parent sample and field duplicate RPDs were within the ADEC recommended limit of 30% for waters. Parent sample/field duplicate pairs with both results below the LOQ were considered acceptable without qualification.

**Table 3 Field Duplicate Frequency, Methods, and Analytes**

Matrix	Analytical Method	Analyte	Number of Primary Samples	Number of Field Duplicates
Water	USEPA 537M	PFAS	1	1

**Table 4 Field Duplicate Identification**

Parent Sample Identification	Duplicate Sample Identification	All RPDs acceptable (Y/N)
DW-1	DW-91	Y

### Laboratory Duplicate Samples

No laboratory duplicates were analyzed in association with these samples.

## Overall Assessment

### Precision, Accuracy, Representativeness, Comparability, Completeness, and Sensitivity Summary

- Precision: Overall project precision goals were met.
- Accuracy: Overall project accuracy goals were met, except as noted in the LCS/LCSD and MS/MSD sections.
- Representativeness: Representativeness goals were met. The samples were collected from planned locations in accordance with guidance documents.
- Comparability: Comparability goals were met. All samples were analyzed at SGS in Orlando, Florida.
- Completeness: Completeness goals were met. The data were 100 percent complete with respect to analysis.
- Sensitivity: Sensitivity goals were considered met.

This data were considered of good quality and acceptable for use with the noted qualifications. No data were rejected.

## References

- Alaska Department of Environmental Conservation (ADEC), 2017. *Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling*. Technical Memorandum. March.
- ADEC, 2018a. Technical Memorandum, *Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water*. August 20.
- ADEC, 2018b. 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control*. October 27.
- United States Environmental Protection Agency (USEPA), 2014. *National Functional Guidelines for Superfund Organic Methods Data Review*. August.

## **Attachments**

Attachment 1 – ADEC Laboratory Data Review Checklist  
Attachment 2 – Laboratory Deliverable

## **Attachment 1**

ADEC Laboratory Data Review Checklist

## Laboratory Data Review Checklist

Completed by:

Jennifer McLean

Title:

Associate Scientist

Date:

January 23, 2019

CS Report Name:

Nordale Facility PFAS Soil Sampling

Report Date:

January 21, 2019

Consultant Firm:

SLR International Corporation

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1190203/FA60804

ADEC File Number:

N/A

Hazard Identification Number:

N/A

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

Yes  No                      Comments:

Samples were received at SGS, Anchorage, then transferred to SGS, Orlando for all analysis. SGS, Orlando maintains a current ADEC Contaminated Sites approval number UST-088 for the applicable analytical method and analytes.

b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

Yes  No                      Comments:

All analyses were conducted at SGS in Orlando, Florida.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

Yes  No                      Comments:

b. Correct analyses requested?

Yes  No                      Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes  No                      Comments:

The temperature blank was received at SGS, Anchorage at -0.3 °C, with no ice in the container. However, the field blank was noted as having “a small amount of ice upon receipt.” It is considered highly unlikely that the field blank was impacted by minimal ice present. Also, neither the primary sample nor field duplicate had ice present, and all samples had results of non-detectable for all analytes. Data was considered not impacted

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes  No                      Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes  No                      Comments:

Small amount of ice in field blank was noted.

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes  No                      Comments:

Temperature below 0 degree Celsius was noted.

- e. Data quality or usability affected?

Comments:

No impact.

#### 4. Case Narrative

- a. Present and understandable?

Yes  No                      Comments:

- b. Discrepancies, errors or QC failures identified by the lab?

Yes  No                      Comments:

- c. Were all corrective actions documented?

Yes  No                      Comments:

No corrective actions were necessary.

- d. What is the effect on data quality/usability according to the case narrative?

Comments:

No impact.

#### 5. Samples Results

- a. Correct analyses performed/reported as requested on COC?

Yes  No                      Comments:

- b. All applicable holding times met?

Yes  No                      Comments:

- c. All soils reported on a dry weight basis?

Yes  No                      Comments:

Not applicable. Only water samples were analyzed.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes  No

Comments:

For non-detect results, LODs were compared to applicable cleanup levels. LODs were compared with 18 AAC 75.345 Table C, *Groundwater Cleanup Levels* (October 27, 2018) and ADEC Technical Memorandum, *Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water* (August 20, 2018).

All analytes with results of non-detect had LODs at or below applicable action levels

e. Data quality or usability affected?

Comments:

No impact.

## 6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes  No

Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

Yes  No

Comments:

iii. If above LOQ, what samples are affected?

Comments:

Not applicable.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes  No

Comments:

Not applicable.

v. Data quality or usability affected?

Comments:

No impact.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes  No

Comments:

An LCS (aka blank spike [BS]) and an MS/MSD were analyzed.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes  No                      Comments:

Not applicable. No inorganics were analyzed.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes  No                      Comments:

Perfluorodecanesulfonic acid recovered at 64% in the LCS, slightly below the lower control limit (LCL) of 70%.

Perfluorodecanesulfonic acid recovered at 69%, slightly below the LCL of 70% in the MSD.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes  No                      Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Samples DW-1, DW-91, and the field blank were associated with this BS and MSD, thus were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes  No                      Comments:

Perfluorodecanesulfonic acid was not detected in any associated samples. Results for this analyte for samples DW-1, DW-91, and the field blank were qualified “UJ” and should be considered non-detect with an estimated reporting limit that may be inaccurate or imprecise.

vii. Data quality or usability affected?

Comments:

Because the recovery was only slightly below the acceptable LCL, data was considered minimally impacted. No cleanup levels currently exist for this analyte. All data is considered usable as qualified.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

Yes  No                      Comments:

ID standard (aka. extracted internal standards) analysis was performed at the required frequencies.

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes  No Comments:

All ID standard recoveries were within analytical method and SGS percent recovery acceptance limits.

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes  No Comments:

Not applicable.

- iv. Data quality or usability affected?

Comments:

No impact.

- d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

- i. One trip blank reported per matrix, analysis and cooler?

Yes  No Comments:

One field blank was submitted for PFAS by USEPA Method 537 Mod.

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes  No Comments:

The field blank was noted as having “a small amount of ice upon receipt.” It is considered highly unlikely that the field blank was impacted by minimal ice present.

- iii. All results less than LOQ?

Yes  No Comments:

Yes.

- iv. If above LOQ, what samples are affected?

Comments:

Not applicable.

- v. Data quality or usability affected?

Comments:

No impact.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes  No Comments:

ii. Submitted blind to lab?

Yes  No Comments:

Parent sample DW-1 corresponds to duplicate sample DW-91.

iii. Precision – All relative percent differences (RPD) less than specified DQOs?  
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2) / 2)} \times 100$$

Where  $R_1$  = Sample Concentration  
 $R_2$  = Field Duplicate Concentration

Yes  No Comments:

iv. Data quality or usability affected?

Comments:

Not applicable.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below.)

Yes  No  Not Applicable

Dedicated or disposable equipment was used for the collection of all samples.

i. All results less than LOQ?

Yes  No Comments:

Not applicable.

ii. If above LOQ, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected?

Comments:

No impact.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes  No

Comments:

**Attachment 2**  
**Laboratory Deliverable**

(Data Package)

## Laboratory Report of Analysis

To: Alyeska Pipeline Srv Co.  
4601 Business Park Blvd K42  
Anchorage, AK 99503  
(907)222-1112

Report Number: **1190203**

Client Project: **105.01288.19001 Nordale Yard**

Dear Scott Rose,

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 Justin 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.



SGS North America Inc.  
Environmental Services – Alaska Division  
Project Manager

**Justin Nelson**

**2019.01.21**

**16:09:35 -09'00'**

Justin Nelson  
Project Manager  
Justin.Nelson@sgs.com

Date

## Case Narrative

SGS Client: **Alyeska Pipeline Srv Co.**  
SGS Project: **1190203**  
Project Name/Site: **105.01288.19001 Nordale Yard**  
Project Contact: **Scott Rose**

Refer to sample receipt form for information on sample condition.

**DW-1 (1190203001) PS**

EPA 537 - Full List + PFPeA were analyzed by SGS of Orlando, FL.

**DW-91 (1190203004) PS**

EPA 537 - Full List + PFPeA were analyzed by SGS of Orlando, FL.

**DW-1 MS (1190203002) BMS**

EPA 537 - Full List + PFPeA and MS were analyzed by SGS of Orlando, FL.

**DW-1 MSD (1190203003) BMSD**

EPA 537 - Full List + PFPeA and MSD were 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: 01/21/2019 12:07:19PM

## Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
DW-1	1190203001	01/10/2019	01/14/2019	Water (Surface, Eff., Ground)
DW-1 MS	1190203002	01/10/2019	01/14/2019	Water (Surface, Eff., Ground)
DW-1 MSD	1190203003	01/10/2019	01/14/2019	Water (Surface, Eff., Ground)
DW-91	1190203004	01/10/2019	01/14/2019	Water (Surface, Eff., Ground)
Field Blank-1	1190203005	01/11/2019	01/14/2019	Water (Surface, Eff., Ground)

### Method

### Method Description

Print Date: 01/21/2019 12:07:21PM



SGS North America Inc.  
CHAIN OF CUSTODY RECORD

Locations Nationwide  
 Alaska Maryland  
 New Jersey New York  
 North Carolina Indiana  
 West Virginia Kentucky  
[www.us.sgs.com](http://www.us.sgs.com)

CLIENT: SLR/Alaska CONTACT: Scott Rose PROJECT NAME: Nordale Yard REPORTS TO: Scott Rose INVOICE TO: SLR/Alaska					PHONE NO: 907-222-1112 PROJECT/PWSID/PERMIT#: - E-MAIL: srose@slrconsulting.com QUOTE #: 105.01288.19001 P.O. #:					<b>Instructions: Sections 1 - 5 must be filled out.</b> <b>Omissions may delay the onset of analysis.</b>					Page 1 of 1				
RESERVED for lab use SAMPLE IDENTIFICATION DATE mm/dd/yy TIME HH:MM MATRIX/MATRIX CODE					Section 3					Preservative									
					# CONTAINERS Type C = COMP G = GRAB MI = Multi Incremental Soils 4°C PFAS by 537 (full list)					<b>1190203</b> 					REMARKS/ LOC ID MS/MSD				
Relinquished By: (1) <i>Ann Johnson</i> Relinquished By: (2) <i>[Signature]</i> Relinquished By: (3) Relinquished By: (4) <i>[Signature]</i>					Date 1/11/19 Date Date 1/14/19 Time 1230 Time Time 0905 Received By: <i>[Signature]</i> Received By: Received By: Received For Laboratory By: <i>[Signature]</i>					Section 4 DOD Project? Yes <input checked="" type="radio"/> No Cooler ID: Requested Turnaround Time and/or Special Instructions: Rush Temp Blank °C: ~0.3° #D53 or Ambient [ ] (See attached Sample Receipt Form)					Data Deliverable Requirements: L2 Chain of Custody Seal: (Circle) INTACT <input checked="" type="radio"/> BROKEN <input type="radio"/> <b>ABSENT</b> (See attached Sample Receipt Form)				



e-Sample Receipt Form

SGS Workorder #:

1190203



1 1 9 0 2 0 3

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below																				
<b>Chain of Custody / Temperature Requirements</b>	<b>Yes</b>	Exemption permitted if sampler hand carries/delivers.																				
Were Custody Seals intact? Note # & location	N/A																					
COC accompanied samples?	Yes																					
<input type="checkbox"/> **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required	Yes																					
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	<table border="1"> <tr> <td>Cooler ID: 1</td> <td>@</td> <td>-0.3 °C</td> <td>Therm. ID: D53</td> </tr> <tr> <td>Cooler ID:</td> <td>@</td> <td>°C</td> <td>Therm. ID:</td> </tr> </table>	Cooler ID: 1	@	-0.3 °C	Therm. ID: D53	Cooler ID:	@	°C	Therm. ID:	Cooler ID:	@	°C	Therm. ID:	Cooler ID:	@	°C	Therm. ID:	Cooler ID:	@	°C	Therm. ID:
Cooler ID: 1	@	-0.3 °C	Therm. ID: D53																			
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?	No	Sample "Field Blank-1" had a small amount of ice upon receipt.																				
If samples received without 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.																						
<b>Holding Time / Documentation / Sample Condition Requirements</b>		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																					
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g,200.8/6020A).																				
<b>Volatile / LL-Hg Requirements</b>																						
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																					
<b>Note to Client:</b> 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>
1190203001-A	No Preservative Required	OK			
1190203001-B	No Preservative Required	OK			
1190203002-A	No Preservative Required	OK			
1190203002-B	No Preservative Required	OK			
1190203003-A	No Preservative Required	OK			
1190203003-B	No Preservative Required	OK			
1190203004-A	No Preservative Required	OK			
1190203004-B	No Preservative Required	OK			
1190203005-A	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**

**1190203**

**SGS Job Number: FA60804**

**Sampling Date: 01/10/19**

### Report to:

SGS North America, Inc  
200 W Potter Dr  
Anchorage, AK 99518  
julie.shumway@sgs.com

**ATTN: Julie Shumway**

**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.

A handwritten signature in cursive script that reads "Caitlin Brice".

**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(FLO02), NY(12022), SC(96038001)  
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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## Sample Summary

SGS North America, Inc  
1190203

**Job No:** FA60804

<b>Sample Number</b>	<b>Collected Date</b>	<b>Time By</b>	<b>Received</b>	<b>Matrix Code</b>	<b>Type</b>	<b>Client Sample ID</b>
FA60804-1	01/10/19	13:25 JS	01/15/19	AQ	Water	DW-1
FA60804-1D	01/10/19	13:25 JS	01/15/19	AQ	Water Dup/MSD	DW-1
FA60804-1S	01/10/19	13:25 JS	01/15/19	AQ	Water Matrix Spike	DW-1
FA60804-2	01/10/19	18:00 JS	01/15/19	AQ	Water	DW-91
FA60804-3	01/10/19	12:00 JS	01/15/19	AQ	Field Blank Water	FIELD BLANK-1

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** SGS North America, Inc

**Job No** FA60804

**Site:** 1190203

**Report Date** 1/18/2019 3:37:29

2 Samples, 1 Field Blank were collected on 01/10/2019 and were received at SGS North America Inc - Orlando on 01/15/2019 properly preserved, at 3.4 Deg. C and intact. These samples received an SGS Orlando job number of FA60804. 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:** OP73402

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA60804-1MS, FA60804-1MSD 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.

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

OP73402-BS for Perfluorodecanesulfonic acid: Sporadic marginal failure.

FA60804-1 for Perfluorodecanesulfonic acid: Associated BS recovery outside control limits.

FA60804-2 for Perfluorodecanesulfonic acid: Associated BS recovery outside control limits.

FA60804-3 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:** FA60804  
**Account:** SGS North America, Inc  
**Project:** 1190203  
**Collected:** 01/10/19



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
---------------	------------------	-----------------	-----	-----	-------	--------

**FA60804-1**      **DW-1**

No hits reported in this sample.

**FA60804-2**      **DW-91**

No hits reported in this sample.

**FA60804-3**      **FIELD BLANK-1**

No hits reported in this sample.

Sample Results

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Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> DW-1		<b>Date Sampled:</b> 01/10/19
<b>Lab Sample ID:</b> FA60804-1		<b>Date Received:</b> 01/15/19
<b>Matrix:</b> AQ - Water		<b>Percent Solids:</b> n/a
<b>Method:</b> EPA 537M BY ID EPA 537 MOD		
<b>Project:</b> 1190203		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q26371.D	1	01/17/19 11:09	NAF	01/16/19 10:00	OP73402	S2Q410
Run #2							

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

**PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
<b>PERFLUOROALKYLCARBOXYLIC ACIDS</b>							
375-22-4	Perfluorobutanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0020 U	0.0040	0.0020	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	0.0020 U	0.0040	0.0020	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
<b>PERFLUOROALKYLSULFONATES</b>							
375-73-5	Perfluorobutanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0020 U	0.0040	0.0020	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid <sup>a</sup>	0.0020 U	0.0040	0.0020	0.0010	ug/l	
<b>PERFLUOROOCCTANESULFONAMIDES</b>							
754-91-6	PFOSA	0.0020 U	0.0040	0.0020	0.0010	ug/l	
<b>PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS</b>							
2355-31-9	MeFOSAA	0.0080 U	0.020	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	0.0080 U	0.020	0.0080	0.0040	ug/l	
<b>FLUOROTELOMER SULFONATES</b>							
757124-72-4	4:2 Fluorotelomer sulfonate	0.0040 U	0.0080	0.0040	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0040 U	0.0080	0.0040	0.0020	ug/l	

U = Not detected      LOD = Limit of Detection      J = Indicates an estimated value  
 LOQ = Limit of Quantitation      DL = Detection Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound



# Report of Analysis

<b>Client Sample ID:</b> DW-1	
<b>Lab Sample ID:</b> FA60804-1	<b>Date Sampled:</b> 01/10/19
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 01/15/19
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> 1190203	

**PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.0040 U	0.0080	0.0040	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	76%		30-140%
	13C5-PFPeA	88%		40-140%
	13C5-PFHxA	103%		50-150%
	13C4-PFHpA	111%		50-150%
	13C8-PFOA	119%		50-150%
	13C9-PFNA	120%		50-150%
	13C6-PFDA	109%		50-150%
	13C7-PFUnDA	117%		50-150%
	13C2-PFDoDA	107%		50-150%
	13C2-PFTeDA	74%		40-150%
	13C3-PFBS	83%		50-150%
	13C3-PFHxS	101%		50-150%
	13C8-PFOS	105%		50-150%
	13C8-FOSA	117%		30-140%
	d3-MeFOSAA	98%		50-150%
	13C2-4:2FTS	105%		50-150%
	13C2-6:2FTS	123%		50-150%
	13C2-8:2FTS	107%		50-150%

(a) Associated BS recovery outside control limits.

---

U = Not detected      LOD = Limit of Detection      J = Indicates an estimated value  
 LOQ = Limit of Quantitation      DL = Detection Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound



# Report of Analysis

<b>Client Sample ID:</b> DW-91		<b>Date Sampled:</b> 01/10/19
<b>Lab Sample ID:</b> FA60804-2		<b>Date Received:</b> 01/15/19
<b>Matrix:</b> AQ - Water		<b>Percent Solids:</b> n/a
<b>Method:</b> EPA 537M BY ID EPA 537 MOD		
<b>Project:</b> 1190203		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q26374.D	1	01/17/19 12:08	NAF	01/16/19 10:00	OP73402	S2Q410
Run #2							

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

**PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
<b>PERFLUOROALKYLCARBOXYLIC ACIDS</b>							
375-22-4	Perfluorobutanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0020 U	0.0040	0.0020	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	0.0020 U	0.0040	0.0020	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
<b>PERFLUOROALKYLSULFONATES</b>							
375-73-5	Perfluorobutanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0020 U	0.0040	0.0020	0.0015	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0020 U	0.0040	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid <sup>a</sup>	0.0020 U	0.0040	0.0020	0.0010	ug/l	
<b>PERFLUOROOCCTANESULFONAMIDES</b>							
754-91-6	PFOSA	0.0020 U	0.0040	0.0020	0.0010	ug/l	
<b>PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS</b>							
2355-31-9	MeFOSAA	0.0080 U	0.020	0.0080	0.0040	ug/l	
2991-50-6	EtFOSAA	0.0080 U	0.020	0.0080	0.0040	ug/l	
<b>FLUOROTELOMER SULFONATES</b>							
757124-72-4	4:2 Fluorotelomer sulfonate	0.0040 U	0.0080	0.0040	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0040 U	0.0080	0.0040	0.0020	ug/l	

U = Not detected      LOD = Limit of Detection      J = Indicates an estimated value  
 LOQ = Limit of Quantitation      DL = Detection Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.2  
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# Report of Analysis

<b>Client Sample ID:</b> DW-91	
<b>Lab Sample ID:</b> FA60804-2	<b>Date Sampled:</b> 01/10/19
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 01/15/19
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> 1190203	

**PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.0040 U	0.0080	0.0040	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	75%		30-140%
	13C5-PFPeA	87%		40-140%
	13C5-PFHxA	103%		50-150%
	13C4-PFHpA	110%		50-150%
	13C8-PFOA	120%		50-150%
	13C9-PFNA	122%		50-150%
	13C6-PFDA	114%		50-150%
	13C7-PFUnDA	113%		50-150%
	13C2-PFDoDA	105%		50-150%
	13C2-PFTeDA	76%		40-150%
	13C3-PFBS	81%		50-150%
	13C3-PFHxS	101%		50-150%
	13C8-PFOS	105%		50-150%
	13C8-FOSA	117%		30-140%
	d3-MeFOSAA	101%		50-150%
	13C2-4:2FTS	104%		50-150%
	13C2-6:2FTS	124%		50-150%
	13C2-8:2FTS	110%		50-150%

(a) Associated BS recovery outside control limits.

---

U = Not detected      LOD = Limit of Detection      J = Indicates an estimated value  
 LOQ = Limit of Quantitation      DL = Detection 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

# Report of Analysis

<b>Client Sample ID:</b> FIELD BLANK-1	
<b>Lab Sample ID:</b> FA60804-3	<b>Date Sampled:</b> 01/10/19
<b>Matrix:</b> AQ - Field Blank Water	<b>Date Received:</b> 01/15/19
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> 1190203	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q26370.D	1	01/17/19 10:53	NAF	01/16/19 10:00	OP73402	S2Q410
Run #2							

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

**PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
<b>PERFLUOROALKYLCARBOXYLIC ACIDS</b>							
375-22-4	Perfluorobutanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0019 U	0.0038	0.0019	0.0014	ug/l	
307-24-4	Perfluorohexanoic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
335-67-1	Perfluorooctanoic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
375-95-1	Perfluorononanoic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
335-76-2	Perfluorodecanoic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
307-55-1	Perfluorododecanoic acid	0.0019 U	0.0038	0.0019	0.0014	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
<b>PERFLUOROALKYLSULFONATES</b>							
375-73-5	Perfluorobutanesulfonic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0019 U	0.0038	0.0019	0.0014	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0019 U	0.0038	0.0019	0.00096	ug/l	
335-77-3	Perfluorodecanesulfonic acid <sup>a</sup>	0.0019 U	0.0038	0.0019	0.00096	ug/l	
<b>PERFLUOROOCCTANESULFONAMIDES</b>							
754-91-6	PFOSA	0.0019 U	0.0038	0.0019	0.00096	ug/l	
<b>PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS</b>							
2355-31-9	MeFOSAA	0.0077 U	0.019	0.0077	0.0038	ug/l	
2991-50-6	EtFOSAA	0.0077 U	0.019	0.0077	0.0038	ug/l	
<b>FLUOROTELOMER SULFONATES</b>							
757124-72-4	4:2 Fluorotelomer sulfonate	0.0038 U	0.0077	0.0038	0.0019	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0038 U	0.0077	0.0038	0.0019	ug/l	

U = Not detected      LOD = Limit of Detection      J = Indicates an estimated value  
 LOQ = Limit of Quantitation      DL = Detection Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.3  
4

# Report of Analysis

<b>Client Sample ID:</b>	FIELD BLANK-1	<b>Date Sampled:</b>	01/10/19
<b>Lab Sample ID:</b>	FA60804-3	<b>Date Received:</b>	01/15/19
<b>Matrix:</b>	AQ - Field Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537M BY ID EPA 537 MOD		
<b>Project:</b>	1190203		

**PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.0038 U	0.0077	0.0038	0.0019	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	119%		30-140%
	13C5-PFPeA	109%		40-140%
	13C5-PFHxA	108%		50-150%
	13C4-PFHpA	107%		50-150%
	13C8-PFOA	120%		50-150%
	13C9-PFNA	121%		50-150%
	13C6-PFDA	115%		50-150%
	13C7-PFUnDA	103%		50-150%
	13C2-PFDoDA	100%		50-150%
	13C2-PFTeDA	69%		40-150%
	13C3-PFBS	106%		50-150%
	13C3-PFHxS	98%		50-150%
	13C8-PFOS	114%		50-150%
	13C8-FOSA	129%		30-140%
	d3-MeFOSAA	99%		50-150%
	13C2-4:2FTS	101%		50-150%
	13C2-6:2FTS	112%		50-150%
	13C2-8:2FTS	112%		50-150%

(a) Associated BS recovery outside control limits.

U = Not detected      LOD = Limit of Detection      J = Indicates an estimated value  
 LOQ = Limit of Quantitation      DL = Detection Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.3  
 4

Misc. Forms

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Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



SGS North America Inc.  
CHAIN OF CUSTODY RECORD

FA60804



1 1 9 0 2 0 3

Locations Nationwide

- Alaska Florida
  - New Jersey Colorado
  - Texas North Carolina
  - Virginia Louisiana
- [www.us.sgs.com](http://www.us.sgs.com)

CLIENT: SGS North America Inc. - Alaska Division				SGS Reference: <b>SGS Orlando, Florida</b>				Additional Comments: All soils report out in dry weight unless otherwise requested.				Page 1 of 1			
CONTACT: Julie Shumway		PHONE NO: (907) 562-2343		PROJECT NAME: 1190203		PWSID#:		REPORTS TO:		E-MAIL: <a href="mailto:Julie.Shumway@sgs.com">Julie.Shumway@sgs.com</a>		INVOICE TO: SGS - Alaska		QUOTE #: 1190203	
RESERVED for lab use		SAMPLE IDENTIFICATION		DATE mm/dd/yy		TIME HHMM		MATRIX/MATRIX		#		Preservative Used:		MS MSD SGS lab # Location ID	
1		DW-1		1/10/2019		13:25		Water		2		G = X			
1		DW-1 MS		1/10/2019		13:25		Water		2		G = X		X	
1		DW-1 MSD		1/10/2019		13:25		Water		2		G = X		X	
2		DW-91		1/10/2019		18:00		Water		2		G = X			
3		Field Blank-1		1/10/2019		12:00		Water		1		G = X			
Relinquished By: (1)		Date		Time		Received By:		DOD Project?		NO		Report to DL (J Flags)?		YES	
<i>Julie Shumway</i>		1/14/19		1010		Fed Ex		Report as DL/LOD/LOQ?		YES		Data Deliverable Requirements:		Level 2 + SGS EDD	
Relinquished By: (2)		Date		Time		Received By:		Cooler ID:		Requested Turnaround Time and-or Special Instructions:		Rush Due 1/18		Chain of Custody Seal: (Circle)	
Fed Ex												Temp Blank °C: 3.4		INTACT [ ]	
Relinquished By: (3)		Date		Time		Received By:		Temp Blank °C:		or Ambient [ ]		Chain of Custody Seal: (Circle)		INTACT [ ]	
Relinquished By: (4)		Date		Time		Received For Laboratory By: 1000									

[ 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](http://www.sgs.com/terms_and_conditions.htm)

1190203\_PFA5\_01.14.2019.xls

FA60804: Chain of Custody

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## SGS Sample Receipt Summary

Job Number: FA60804

Client: SGS

Project: 1190203

Date / Time Received: 1/15/2019 10:00:00 AM

Delivery Method: FED EX

Airbill #'s: 1002239982110003281100813386201795

Therm ID: IR 1;

Therm CF: -0.2;

# of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.6);

Cooler Temps (Corrected) °C: Cooler 1: (3.4);

**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 #s: 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: SHAYLAP

Date: 1/15/2019 10:00:00 A

Reviewer: \_\_\_\_\_

Date: \_\_\_\_\_

**FA60804: Chain of Custody**

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MS Semi-volatiles

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QC Data Summaries

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Includes the following where applicable:

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

# Method Blank Summary

**Job Number:** FA60804  
**Account:** SGS/SAK/SGS North America, Inc  
**Project:** 1190203

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP73402-MB	2Q26369.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA60804-1, FA60804-2, FA60804-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	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	107%	30-140%
	13C5-PFPeA	97%	40-140%
	13C5-PFHxA	97%	50-150%
	13C4-PFHpA	96%	50-150%
	13C8-PFOA	98%	50-150%
	13C9-PFNA	104%	50-150%
	13C6-PFDA	93%	50-150%
	13C7-PFUnDA	97%	50-150%

## Method Blank Summary

**Job Number:** FA60804  
**Account:** SGS/SAK North America, Inc  
**Project:** 1190203

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP73402-MB	2Q26369.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA60804-1, FA60804-2, FA60804-3

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	89% 50-150%
	13C2-PFTeDA	72% 40-150%
	13C3-PFBS	96% 50-150%
	13C3-PFHxS	94% 50-150%
	13C8-PFOS	100% 50-150%
	13C8-FOSA	102% 30-140%
	d3-MeFOSAA	88% 50-150%
	13C2-4:2FTS	90% 50-150%
	13C2-6:2FTS	94% 50-150%
	13C2-8:2FTS	89% 50-150%

# Instrument Blank

**Job Number:** FA60804  
**Account:** SGS/SAK/SGS North America, Inc  
**Project:** 1190203

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q410-IBLK	2Q26365.D	1	01/17/19	NAF	n/a	n/a	S2Q410

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.1 B-15

FA60804-1, FA60804-2, FA60804-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	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	109%	50-150%
	13C5-PFPeA	102%	50-150%
	13C5-PFHxA	104%	50-150%
	13C4-PFHpA	108%	50-150%
	13C8-PFOA	101%	50-150%
	13C9-PFNA	105%	50-150%
	13C6-PFDA	109%	50-150%
	13C7-PFUnDA	100%	50-150%

# Instrument Blank

**Job Number:** FA60804  
**Account:** SGS/SAK North America, Inc  
**Project:** 1190203

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S2Q410-IBLK	2Q26365.D	1	01/17/19	NAF	n/a	n/a	S2Q410

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.1 B-15

FA60804-1, FA60804-2, FA60804-3

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	96% 50-150%
	13C2-PFTeDA	92% 50-150%
	13C3-PFBS	101% 50-150%
	13C3-PFHxS	102% 50-150%
	13C8-PFOS	101% 50-150%
	13C8-FOSA	106% 50-150%
	d3-MeFOSAA	95% 50-150%
	13C2-4:2FTS	91% 50-150%
	13C2-6:2FTS	92% 50-150%
	13C2-8:2FTS	89% 50-150%

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# Blank Spike Summary

**Job Number:** FA60804  
**Account:** SGS/KA SGS North America, Inc  
**Project:** 1190203

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP73402-BS	2Q26368.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA60804-1, FA60804-2, FA60804-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0700	88	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0781	98	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0681	85	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0779	97	71-130
335-67-1	Perfluorooctanoic acid	0.08	0.0737	92	74-130
375-95-1	Perfluorononanoic acid	0.08	0.0698	87	76-130
335-76-2	Perfluorodecanoic acid	0.08	0.0704	88	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0775	97	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0740	93	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0772	97	70-139
376-06-7	Perfluorotetradecanoic acid	0.08	0.0734	92	70-130
375-73-5	Perfluorobutanesulfonic acid	0.0708	0.0655	93	73-130
2706-91-4	Perfluoropentanesulfonic acid	0.0752	0.0755	100	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0728	0.0635	87	74-130
375-92-8	Perfluoroheptanesulfonic acid	0.076	0.0753	99	74-130
1763-23-1	Perfluorooctanesulfonic acid	0.074	0.0729	99	70-130
68259-12-1	Perfluorononanesulfonic acid	0.0768	0.0700	91	70-130
335-77-3	Perfluorodecanesulfonic acid	0.0772	0.0492	64* a	70-130
754-91-6	PFOSA	0.08	0.0765	96	70-131
2355-31-9	MeFOSAA	0.08	0.0733	92	70-130
2991-50-6	EtFOSAA	0.08	0.0720	90	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.0748	0.0741	99	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.076	0.0771	101	70-133
39108-34-4	8:2 Fluorotelomer sulfonate	0.0768	0.0717	93	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	96%	30-140%
	13C5-PFPeA	88%	40-140%
	13C5-PFHxA	88%	50-150%
	13C4-PFHpA	88%	50-150%
	13C8-PFOA	85%	50-150%
	13C9-PFNA	89%	50-150%
	13C6-PFDA	85%	50-150%
	13C7-PFUnDA	76%	50-150%

\* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** FA60804  
**Account:** SGSAKA SGS North America, Inc  
**Project:** 1190203

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP73402-BS	2Q26368.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA60804-1, FA60804-2, FA60804-3

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	83%	50-150%
	13C2-PFTeDA	68%	40-150%
	13C3-PFBS	90%	50-150%
	13C3-PFHxS	87%	50-150%
	13C8-PFOS	91%	50-150%
	13C8-FOSA	90%	30-140%
	d3-MeFOSAA	80%	50-150%
	13C2-4:2FTS	87%	50-150%
	13C2-6:2FTS	87%	50-150%
	13C2-8:2FTS	84%	50-150%

(a) Sporadic marginal failure.

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** FA60804  
**Account:** SGS/KA SGS North America, Inc  
**Project:** 1190203

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP73402-MS	2Q26372.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410
OP73402-MSD	2Q26373.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410
FA60804-1	2Q26371.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA60804-1, FA60804-2, FA60804-3

CAS No.	Compound	FA60804-1 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
375-22-4	Perfluorobutanoic acid	0.0080 U	0.08	0.0728	91	0.08	0.0691	86	5	70-130/30
2706-90-3	Perfluoropentanoic acid	0.0040 U	0.08	0.0795	99	0.08	0.0779	97	2	70-130/30
307-24-4	Perfluorohexanoic acid	0.0040 U	0.08	0.0675	84	0.08	0.0652	82	3	70-130/30
375-85-9	Perfluoroheptanoic acid	0.0040 U	0.08	0.0736	92	0.08	0.0735	92	0	71-130/30
335-67-1	Perfluorooctanoic acid	0.0040 U	0.08	0.0670	84	0.08	0.0702	88	5	74-130/30
375-95-1	Perfluorononanoic acid	0.0040 U	0.08	0.0685	86	0.08	0.0708	89	3	76-130/30
335-76-2	Perfluorodecanoic acid	0.0040 U	0.08	0.0764	96	0.08	0.0761	95	0	70-130/30
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.08	0.0759	95	0.08	0.0748	94	1	70-130/30
307-55-1	Perfluorododecanoic acid	0.0040 U	0.08	0.0757	95	0.08	0.0768	96	1	70-130/30
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.08	0.0785	98	0.08	0.0781	98	1	70-139/30
376-06-7	Perfluorotetradecanoic acid	0.0040 U	0.08	0.0695	87	0.08	0.0689	86	1	70-130/30
375-73-5	Perfluorobutanesulfonic acid	0.0040 U	0.0708	0.0639	90	0.0708	0.0631	89	1	73-130/30
2706-91-4	Perfluoropentanesulfonic acid	0.0040 U	0.0752	0.0856	114	0.0752	0.0829	110	3	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0040 U	0.0728	0.0618	85	0.0728	0.0619	85	0	74-130/30
375-92-8	Perfluoroheptanesulfonic acid	0.0040 U	0.076	0.0758	100	0.076	0.0761	100	0	74-130/30
1763-23-1	Perfluorooctanesulfonic acid	0.0040 U	0.074	0.0708	96	0.074	0.0714	96	1	70-130/30
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	0.0768	0.0703	92	0.0768	0.0709	92	1	70-130/30
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	0.0772	0.0537	70	0.0772	0.0529	69*	2	70-130/30
754-91-6	PFOSA	0.0040 U	0.08	0.0751	94	0.08	0.0735	92	2	70-131/30
2355-31-9	MeFOSAA	0.020 U	0.08	0.0738	92	0.08	0.0738	92	0	70-130/30
2991-50-6	EtFOSAA	0.020 U	0.08	0.0741	93	0.08	0.0719	90	3	70-130/30
757124-72-44:2	Fluorotelomer sulfonate	0.0080 U	0.0748	0.0720	96	0.0748	0.0705	94	2	70-130/30
27619-97-2	6:2 Fluorotelomer sulfonate	0.0080 U	0.076	0.0749	99	0.076	0.0740	97	1	70-133/30
39108-34-4	8:2 Fluorotelomer sulfonate	0.0080 U	0.0768	0.0682	89	0.0768	0.0707	92	4	70-130/30

CAS No.	ID Standard Recoveries	MS	MSD	FA60804-1	Limits
	13C4-PFBA	77%	74%	76%	30-140%
	13C5-PFPeA	90%	87%	88%	40-140%
	13C5-PFHxA	101%	98%	103%	50-150%
	13C4-PFHpA	109%	105%	111%	50-150%
	13C8-PFOA	113%	115%	119%	50-150%
	13C9-PFNA	121%	113%	120%	50-150%
	13C6-PFDA	109%	103%	109%	50-150%
	13C7-PFUnDA	111%	109%	117%	50-150%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** FA60804  
**Account:** SGSAKA SGS North America, Inc  
**Project:** 1190203

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP73402-MS	2Q26372.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410
OP73402-MSD	2Q26373.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410
FA60804-1	2Q26371.D	1	01/17/19	NAF	01/16/19	OP73402	S2Q410

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA60804-1, FA60804-2, FA60804-3

CAS No.	ID Standard Recoveries	MS	MSD	FA60804-1	Limits
	13C2-PFD <sub>o</sub> DA	108%	97%	107%	50-150%
	13C2-PFTeDA	85%	77%	74%	40-150%
	13C3-PFBS	85%	82%	83%	50-150%
	13C3-PFH <sub>x</sub> S	104%	98%	101%	50-150%
	13C8-PFOS	109%	101%	105%	50-150%
	13C8-FOSA	120%	112%	117%	30-140%
	d3-MeFOSAA	106%	98%	98%	50-150%
	13C2-4:2FTS	110%	107%	105%	50-150%
	13C2-6:2FTS	124%	121%	123%	50-150%
	13C2-8:2FTS	122%	112%	107%	50-150%

\* = Outside of Control Limits.