



ANALYTICAL REPORT

Job Number: 320-35042-1

Job Description: TT: PFAS, Brunswick, Discharge

For:

Tetra Tech, Inc. Foster Plaza VII 661 Anderson Drive Foster Plaza 7 Pittsburgh, PA 15220

Attention: Jeff Orient

Approved for release David R Alltucker Project Manager I 1/22/2018 3:49 PM

David R Alltucker, Project Manager I 880 Riverside Parkway, West Sacramento, CA, 95605 (916)374-4383 david.alltucker@testamericainc.com 01/22/2018



Table of Contents

Cover Title Page	1
Data Summaries	4
Definitions	4
Case Narrative	5
Detection Summary	6
Client Sample Results	8
Default Detection Limits	12
Isotope Dilution Summary	13
QC Sample Results	14
QC Association	17
Chronicle	18
Certification Summary	19
Method Summary	20
Sample Summary	21
Manual Integration Summary	22
Reagent Traceability	26
COAs	66
Organic Sample Data	351
LCMS	351
Method PFC DOD	351
Method PFC DOD QC Summary	352
Method PFC DOD Sample Data	357
Standards Data	410
Method PFC DOD ICAL Data	410
Method PFC DOD CCAL Data	484
Raw QC Data	552

Table of Contents

Method PFC DOD Blank Data	552
Method PFC DOD LCS/LCSD Data	562
Method PFC DOD Run Logs	584
Method PFC DOD Prep Data	588
Shipping and Receiving Documents	603
Client Chain of Custody	604
Sample Receipt Checklist	606

Definitions/Glossary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.
M	Manual integrated compound.
D	The reported value is from a dilution.
D	

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job Narrative 320-35042-1

Receipt

The samples were received on 1/12/2018 1:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.2° C.

Receipt Exceptions

The Chain-of-Custody (COC) was not reliquished. A revised CoC was received from the client and both will be included in the report.

LCMS

Method(s) 537 (modified): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) and Perfluorohexanesulfonic acid (PFHxS) within the calibration range: TP-PFC-025-TPI (320-35042-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-204105.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Tetra Tech, Inc.

Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-35042-1

Client Sample ID: TP-PFC-025-TPI

Lab Sample ID: 320-35042-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	73		2.0	0.34	ng/L		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	190		2.0	0.48	ng/L	1	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	340		3.9	0.57	ng/L	1	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	67		2.0	0.24	ng/L	1	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1300	ME	3.9	0.83	ng/L	1	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	2.4		2.0	0.26	ng/L	1	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.89	J	2.0	0.30	ng/L	1	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	51		2.0	0.29	ng/L	1	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	360	E	2.0	0.29	ng/L	1	537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	7.1		2.0	0.29	ng/L	1	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	340		3.9	0.53	ng/L	1	537 (modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	74	D	20	3.4	ng/L	10	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	200	D	20	4.8	ng/L	10	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	350	D	39	5.7	ng/L	10	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	75	D	20	2.4	ng/L	10	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1800	DM	39	8.3	ng/L	10	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	41	D	20	2.9	ng/L	10	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	410	D	20	2.9	ng/L	10	537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	8.7	JD	20	2.9	ng/L	10	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	340	D	39	5.3	ng/L	10	537 (modified)	Total/NA

Client Sample ID: TP-PFC-025-MID-CARBON

Lab Sample ID: 320-35042-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		2.0	0.34	ng/L		_	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	170		2.0	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	72		3.9	0.57	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3	M	2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	13	М	3.9	0.84	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.0	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-025-TPE

Lab Sample ID: 320-35042-3

Lab Sample ID: 320-35042-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.9	0.34	ng/L	1	_	537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	110		1.9	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	25		3.9	0.56	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.43	JM	1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.1	J M	3.9	0.83	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.38	J	1.9	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.38	J	1.9	0.29	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-025-TPE-D

Analyte	Result Qualifier	LOQ	DL Unit	Dil Fac D Method	Prep Type
Perfluorobutanoic acid (PFBA)	130	2.0	0.35 ng/L	1 537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Tetra Tech, Inc.

Project/Site: TT: PFAS, Brunswick, Discharge

Client Sample ID: TP-PFC-025-TPE-D (Continued)

Lab Sample ID: 320-35042-4

TestAmerica Job ID: 320-35042-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	110		2.0	0.48	ng/L		_	537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	25		4.0	0.57	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.43	JM	2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.1	J M	4.0	0.84	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.45	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.32	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Client Sample ID: TP-PFC-025-TPI Lab Sample ID: 320-35042-1

Date Collected: 01/11/18 09:00 Matrix: Water Date Received: 01/12/18 13:20

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	73		2.0	0.34	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluoropentanoic acid (PFPeA)	190		2.0	0.48	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorohexanoic acid (PFHxA)	340		3.9	0.57	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluoroheptanoic acid (PFHpA)	67		2.0	0.24	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorooctanoic acid (PFOA)	1300	ME	3.9	0.83	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorononanoic acid (PFNA)	2.4		2.0	0.26	ng/L		01/16/18 09:18	01/18/18 18:01	•
Perfluorodecanoic acid (PFDA)	0.89	J	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	1.1	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	0.54	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	1.3	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.28	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorobutanesulfonic acid (PFBS)	51		2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorohexanesulfonic acid (PFHxS)	360	E	2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluoroheptanesulfonic Acid (PFHpS)	7.1		2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorooctanesulfonic acid (PFOS)	340		3.9	0.53	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.31	ng/L		01/16/18 09:18	01/18/18 18:01	
Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.34	ng/L		01/16/18 09:18	01/18/18 18:01	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	112		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C4 PFBA	114		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C2 PFHxA	118		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C4 PFOA	103		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C5 PFNA	124		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C2 PFDA	125		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C2 PFUnA	128		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C2 PFDoA	109		25 - 150				01/16/18 09:18	01/18/18 18:01	
1802 PFHxS	122		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C4 PFOS	124		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C2-PFTeDA	108		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C4-PFHpA	121		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C5 PFPeA	141		25 - 150				01/16/18 09:18	01/18/18 18:01	
13C3-PFBS	123		25 - 150				01/16/18 09:18	01/18/18 18:01	
Method: 537 (modified) - Fluo				D.	l lm:4		Droporod	Analyzad	Dil Fa
Analyte		Qualifier	LOQ		Unit	D	Prepared	Analyzed	Dil Fa
Perfluorobutanoic acid (PFBA)	74	_	20	3.4	5			01/19/18 16:58	10
Perfluoropentanoic acid (PFPeA)	200	1)	20	48	ng/L		01/16/18 09:18	01/19/18 16:58	10

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	74	D	20	3.4	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluoropentanoic acid (PFPeA)	200	D	20	4.8	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorohexanoic acid (PFHxA)	350	D	39	5.7	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluoroheptanoic acid (PFHpA)	75	D	20	2.4	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorooctanoic acid (PFOA)	1800	D M	39	8.3	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorononanoic acid (PFNA)	9.8	U	20	2.6	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorodecanoic acid (PFDA)	9.8	U	20	3.0	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluoroundecanoic acid (PFUnA)	29	U	39	11	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorododecanoic acid (PFDoA)	20	U	39	5.4	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorotridecanoic Acid (PFTriA)	29	U	39	13	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorotetradecanoic acid (PFTeA)	9.8	U	20	2.8	ng/L		01/16/18 09:18	01/19/18 16:58	10

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Client Sample ID: TP-PFC-025-TPI Lab Sample ID: 320-35042-1

Date Collected: 01/11/18 09:00 Matrix: Water Date Received: 01/12/18 13:20

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid	41	D	20	2.9	ng/L		01/16/18 09:18	01/19/18 16:58	10
(PFBS) Perfluorohexanesulfonic acid	410		20	20	ng/L		01/16/18 00:18	01/19/18 16:58	10
(PFHxS)	410	U	20	2.9	rig/L		01/10/10 09.10	01/19/10 10:50	10
Perfluoroheptanesulfonic Acid (PFHpS)	8.7	J D	20	2.9	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorooctanesulfonic acid (PFOS)	340	D	39	5.3	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorodecanesulfonic acid (PFDS)	9.8	U	20	3.1	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorooctane Sulfonamide (FOSA)	9.8	U	20	3.4	ng/L		01/16/18 09:18	01/19/18 16:58	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	95		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C4 PFBA	101		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C2 PFHxA	101		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C4 PFOA	103		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C5 PFNA	100		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C2 PFDA	102		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C2 PFUnA	106		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C2 PFDoA	94		25 - 150				01/16/18 09:18	01/19/18 16:58	10
1802 PFHxS	99		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C4 PFOS	101		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C2-PFTeDA	95		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C4-PFHpA	96		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C5 PFPeA	104		25 - 150				01/16/18 09:18	01/19/18 16:58	10
13C3-PFBS	118		25 - 150				01/16/18 09:18	01/19/18 16:58	10

Client Sample ID: TP-PFC-025-MID-CARBON Lab Sample ID: 320-35042-2

Date Collected: 01/11/18 09:05 Matrix: Water Date Received: 01/12/18 13:20

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	130		2.0	0.34	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluoropentanoic acid (PFPeA)	170		2.0	0.48	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorohexanoic acid (PFHxA)	72		3.9	0.57	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluoroheptanoic acid (PFHpA)	2.3	M	2.0	0.25	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorooctanoic acid (PFOA)	13	M	3.9	0.84	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.27	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorodecanoic acid (PFDA)	0.98	U	2.0	0.31	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	3.9	1.1	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	0.54	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	3.9	1.3	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	J	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.98	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	0.53	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.32	ng/L		01/16/18 09:18	01/18/18 18:08	1

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Client Sample ID: TP-PFC-025-MID-CARBON

Date Collected: 01/11/18 09:05 Matrix: Water

Date Received: 01/12/18 13:20

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.34	ng/L		01/16/18 09:18	01/18/18 18:08	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	92		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C4 PFBA	104		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C2 PFHxA	98		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C4 PFOA	102		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C5 PFNA	104		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C2 PFDA	97		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C2 PFUnA	100		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C2 PFDoA	90		25 - 150				01/16/18 09:18	01/18/18 18:08	1
1802 PFHxS	99		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C4 PFOS	100		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C2-PFTeDA	94		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C4-PFHpA	100		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C5 PFPeA	102		25 - 150				01/16/18 09:18	01/18/18 18:08	1
13C3-PFBS	98		25 - 150				01/16/18 09:18	01/18/18 18:08	1

Client Sample ID: TP-PFC-025-TPE Lab Sample ID: 320-35042-3

Date Collected: 01/11/18 09:10 Matrix: Water Date Received: 01/12/18 13:20

Method: 537 (modified) - Fluorinated Alkyl Substances Result Qualifier LOQ **Analyte DL** Unit Prepared Analyzed Dil Fac 1.9 0.34 ng/L 01/16/18 09:18 01/18/18 18:16 Perfluorobutanoic acid (PFBA) 130 Perfluoropentanoic acid (PFPeA) 110 1.9 0.48 ng/L 1 3.9 0.56 ng/L 01/16/18 09:18 01/18/18 18:16 Perfluorohexanoic acid (PFHxA) 25 1 Perfluoroheptanoic acid (PFHpA) 0.43 J M 1.9 0.24 ng/L 01/16/18 09:18 01/18/18 18:16 1 Perfluorooctanoic acid (PFOA) 1.1 J M 3.9 0.83 ng/L 01/16/18 09:18 01/18/18 18:16 1 Perfluorononanoic acid (PFNA) 0.97 U 1 19 0.26 ng/L Perfluorodecanoic acid (PFDA) 0.97 U 1.9 0.30 ng/L 01/16/18 09:18 01/18/18 18:16 Perfluoroundecanoic acid (PFUnA) 2.9 U 3.9 1.1 ng/L 1 Perfluorododecanoic acid (PFDoA) 1.9 U 3.9 0.54 ng/L 01/16/18 09:18 01/18/18 18:16 1 Perfluorotridecanoic Acid (PFTriA) 2.9 U 3.9 01/16/18 09:18 01/18/18 18:16 1.3 ng/L Perfluorotetradecanoic acid (PFTeA) 0.97 U 1.9 0.28 ng/L 01/16/18 09:18 01/18/18 18:16 1 Perfluorobutanesulfonic acid 0.38 J 1.9 0.29 ng/L 01/16/18 09:18 01/18/18 18:16 1 Perfluorohexanesulfonic acid 0.38 J 1.9 0.29 ng/L 01/16/18 09:18 01/18/18 18:16 (PFHxS) Perfluoroheptanesulfonic Acid 0.97 U 1.9 0.29 ng/L 1 Perfluorooctanesulfonic acid (PFOS) 1.9 U 3.9 0.53 ng/L 1 Perfluorodecanesulfonic acid (PFDS) 0.97 U 1.9 0.31 ng/L 01/16/18 09:18 01/18/18 18:16 1 Perfluorooctane Sulfonamide (FOSA) 0.97 U 1.9 0.34 ng/L 01/16/18 09:18 01/18/18 18:16 1 Isotope Dilution %Recovery Qualifier I imits Prepared Dil Fac Analyzed 13C8 FOSA 87 25 - 150 01/16/18 09:18 01/18/18 18:16 13C4 PFBA 105 25 - 150 01/16/18 09:18 01/18/18 18:16 1 13C2 PFHxA 101 25 - 150 107 1 13C4 PFOA 25 - 150 01/16/18 09:18 01/18/18 18:16 25 - 150 13C5 PFNA 106 01/16/18 09:18 01/18/18 18:16 1 13C2 PFDA 89 25 - 150 01/16/18 09:18 01/18/18 18:16

TestAmerica Sacramento

Lab Sample ID: 320-35042-2

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Client Sample ID: TP-PFC-025-TPE Lab Sample ID: 320-35042-3

Date Collected: 01/11/18 09:10 Matrix: Water Date Received: 01/12/18 13:20

Isotope Dilution	%Recovery Q	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	99		25 - 150	01/16/18 09:18	01/18/18 18:16	1
13C2 PFDoA	93		25 - 150	01/16/18 09:18	01/18/18 18:16	1
1802 PFHxS	102		25 - 150	01/16/18 09:18	01/18/18 18:16	1
13C4 PFOS	100		25 - 150	01/16/18 09:18	01/18/18 18:16	1
13C2-PFTeDA	94		25 - 150	01/16/18 09:18	01/18/18 18:16	1
13C4-PFHpA	110		25 - 150	01/16/18 09:18	01/18/18 18:16	1
13C5 PFPeA	107		25 - 150	01/16/18 09:18	01/18/18 18:16	1
13C3-PFBS	99		25 - 150	01/16/18 09:18	01/18/18 18:16	1

Client Sample ID: TP-PFC-025-TPE-D Lab Sample ID: 320-35042-4

Date Collected: 01/11/18 00:00 Matrix: Water Date Received: 01/12/18 13:20

Analyte	Result	Qualifier	LOQ		Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	130		2.0		ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluoropentanoic acid (PFPeA)	110		2.0	0.48	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorohexanoic acid (PFHxA)	25		4.0	0.57	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluoroheptanoic acid (PFHpA)	0.43	JM	2.0	0.25	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorooctanoic acid (PFOA)	1.1	J M	4.0	0.84	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.27	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.31	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	1.1	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	0.54	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	1.3	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorotetradecanoic acid (PFTeA)	0.99	U	2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorobutanesulfonic acid (PFBS)	0.45	J	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorohexanesulfonic acid (PFHxS)	0.32	J	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.99	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	0.53	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.32	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorooctane Sulfonamide (FOSA)	0.99	U	2.0	0.35	ng/L		01/16/18 09:18	01/18/18 18:24	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	98		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C4 PFBA	105		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C2 PFHxA	108		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C4 PFOA	107		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C5 PFNA	107		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C2 PFDA	102		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C2 PFUnA	108		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C2 PFDoA	102		25 - 150				01/16/18 09:18	01/18/18 18:24	1
1802 PFHxS	103		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C4 PFOS	108		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C2-PFTeDA	99		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C4-PFHpA	108		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C5 PFPeA	109		25 - 150				01/16/18 09:18	01/18/18 18:24	1
13C3-PFBS	99		25 - 150				01/16/18 09:18	01/18/18 18:24	1

Default Detection Limits

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.0	0.30	ng/L	537 (modified)
Perfluorobutanoic acid (PFBA)	2.0	0.35	ng/L	537 (modified)
Perfluorodecanesulfonic acid (PFDS)	2.0	0.32	ng/L	537 (modified)
Perfluorodecanoic acid (PFDA)	2.0	0.31	ng/L	537 (modified)
Perfluorododecanoic acid (PFDoA)	4.0	0.55	ng/L	537 (modified)
Perfluoroheptanesulfonic Acid (PFHpS)	2.0	0.30	ng/L	537 (modified)
Perfluoroheptanoic acid (PFHpA)	2.0	0.25	ng/L	537 (modified)
Perfluorohexanesulfonic acid (PFHxS)	2.0	0.30	ng/L	537 (modified)
Perfluorohexanoic acid (PFHxA)	4.0	0.58	ng/L	537 (modified)
Perfluorononanoic acid (PFNA)	2.0	0.27	ng/L	537 (modified)
Perfluorooctane Sulfonamide (FOSA)	2.0	0.35	ng/L	537 (modified)
Perfluorooctanesulfonic acid (PFOS)	4.0	0.54	ng/L	537 (modified)
Perfluorooctanoic acid (PFOA)	4.0	0.85	ng/L	537 (modified)
Perfluoropentanoic acid (PFPeA)	2.0	0.49	ng/L	537 (modified)
Perfluorotetradecanoic acid (PFTeA)	2.0	0.29	ng/L	537 (modified)
Perfluorotridecanoic Acid (PFTriA)	4.0	1.3	ng/L	537 (modified)
Perfluoroundecanoic acid (PFUnA)	4.0	1.1	ng/L	537 (modified)

Isotope Dilution Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water Prep Type: Total/NA

			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		PFOSA	PFBA	PFHxA	PFOA	PFNA	PFDA	PFUnA	PFDoA
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
320-35042-1	TP-PFC-025-TPI	112	114	118	103	124	125	128	109
320-35042-1 - DL	TP-PFC-025-TPI	95	101	101	103	100	102	106	94
320-35042-2	TP-PFC-025-MID-CARBON	92	104	98	102	104	97	100	90
320-35042-3	TP-PFC-025-TPE	87	105	101	107	106	89	99	93
320-35042-4	TP-PFC-025-TPE-D	98	105	108	107	107	102	108	102
LCS 320-204105/2-A	Lab Control Sample	84	98	97	100	95	94	100	91
LCSD 320-204105/3-A	Lab Control Sample Dup	92	104	108	104	103	102	99	94
MB 320-204105/1-A	Method Blank	91	104	102	102	106	100	107	96
			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		PFHxS	PFOS	PFTDA	PFHpA	PFPeA	3C3-PFB		
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)		
320-35042-1	TP-PFC-025-TPI	122	124	108	121	141	123		
320-35042-1 - DL	TP-PFC-025-TPI	99	101	95	96	104	118		
320-35042-2	TP-PFC-025-MID-CARBON	99	100	94	100	102	98		
320-35042-3	TP-PFC-025-TPE	102	100	94	110	107	99		
320-35042-4	TP-PFC-025-TPE-D	103	108	99	108	109	99		
LCS 320-204105/2-A	Lab Control Sample	94	93	92	97	101	96		
LCSD 320-204105/3-A	Lab Control Sample Dup	100	101	99	104	106	105		
MB 320-204105/1-A	Method Blank	104	104	98	101	108	101		

Surrogate Legend

PFOSA = 13C8 FOSA

PFBA = 13C4 PFBA

PFHxA = 13C2 PFHxA

PFOA = 13C4 PFOA

PFNA = 13C5 PFNA

PFDA = 13C2 PFDA

PFUnA = 13C2 PFUnA

PFDoA = 13C2 PFDoA

PFHxS = 18O2 PFHxS

PFOS = 13C4 PFOS

PFTDA = 13C2-PFTeDA

PFHpA = 13C4-PFHpA

PFPeA = 13C5 PFPeA

13C3-PFBS = 13C3-PFBS

QC Sample Results

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-204105/1-A

Matrix: Water

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 204105

watrix: water								Prep Type: 10	
Analysis Batch: 204556								Prep Batch:	204105
• • •		MB				_			5
Analyte		Qualifier	LOQ		Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.0	_	2.0		ng/L			01/18/18 17:37	1
Perfluoropentanoic acid (PFPeA)	1.0		2.0		ng/L			01/18/18 17:37	1
Perfluorohexanoic acid (PFHxA)	2.0		4.0		ng/L			01/18/18 17:37	1
Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	0.25	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorooctanoic acid (PFOA)	2.0	U	4.0	0.85	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorononanoic acid (PFNA)	1.0	U	2.0	0.27	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.31	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	1.1	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	0.55	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	1.3	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	0.29	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	0.54	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	0.32	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	0.35	ng/L		01/16/18 09:18	01/18/18 17:37	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	91		25 - 150				01/16/18 09:18	01/18/18 17:37	1
13C4 PFBA	104		25 - 150				01/16/18 09:18	01/18/18 17:37	1
13C2 PFHxA	102		25 - 150				01/16/18 09:18	01/18/18 17:37	1
13C4 PFOA	102		25 - 150				01/16/18 09:18	01/18/18 17:37	1
13C5 PFNA	106		25 - 150				01/16/18 09:18	01/18/18 17:37	1
13C2 PFDA	100		25 - 150				01/16/18 09:18	01/18/18 17:37	1
13C2 PFUnA	107		25 - 150				01/16/18 09:18	01/18/18 17:37	1
13C2 PFDoA	96		25 - 150					01/18/18 17:37	1
· · · · · · · · · · · · · · · · · · ·	•								

Lab Sample ID: LCS 320-204105/2-A

104

104

98

101

108

101

Matrix: Water

1802 PFHxS

13C4 PFOS

13C2-PFTeDA

13C4-PFHpA

13C5 PFPeA

13C3-PFBS

Analysis Batch: 204556

Client Sample ID: Lab Control Sample Prep Type: Total/NA

01/16/18 09:18 01/18/18 17:37

01/16/18 09:18 01/18/18 17:37

01/16/18 09:18 01/18/18 17:37

Prep Batch: 204105

1

1

1

/ manyone Datem 20 1000	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	40.0	39.2	-	ng/L		98	89 - 128
Perfluoropentanoic acid (PFPeA)	40.0	36.2		ng/L		90	66 - 136
Perfluorohexanoic acid (PFHxA)	40.0	36.9		ng/L		92	86 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	38.0		ng/L		95	89 - 127
Perfluorooctanoic acid (PFOA)	40.0	36.9		ng/L		92	80 - 120
Perfluorononanoic acid (PFNA)	40.0	38.8		ng/L		97	77 - 137
Perfluorodecanoic acid (PFDA)	40.0	40.0		ng/L		100	84 - 123
Perfluoroundecanoic acid (PFUnA)	40.0	34.4		ng/L		86	73 - 122

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

TestAmerica Sacramento

QC Sample Results

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-204105/2-A

Matrix: Water

Analysis Batch: 204556

Client Sample ID: Lab Control Sample Prep Type: Total/NA Prep Batch: 204105

Analysis Batch. 204000	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorododecanoic acid	 40.0	40.3		ng/L		101	82 - 122
(PFDoA)							
Perfluorotridecanoic Acid	40.0	39.4		ng/L		99	56 - 163
(PFTriA)							
Perfluorotetradecanoic acid	40.0	40.7		ng/L		102	66 - 120
(PFTeA)							
Perfluorobutanesulfonic acid	35.4	34.9		ng/L		99	88 - 130
(PFBS)				<u></u>			
Perfluorohexanesulfonic acid	36.4	34.8		ng/L		96	87 - 126
(PFHxS)	00.4	00.0				400	00 105
Perfluoroheptanesulfonic Acid	38.1	38.0		ng/L		100	92 - 135
(PFHpS)	37.1	36.0		na/I		97	83 - 126
Perfluorooctanesulfonic acid	37.1	30.0		ng/L		97	03 - 120
(PFOS)	38.6	40.0		ng/L		104	80 - 129
Perfluorodecanesulfonic acid (PFDS)	30.0	40.0		TIG/L		104	00 - 129
Perfluorooctane Sulfonamide	40.0	39.5		ng/L		99	91 - 133
(FOSA)	₹0.0	00.0		119,1		33	31-100
(1 00/1)							

LCS LCS

Isotope Dilution	%Recovery Qualifier	Limits
13C8 FOSA	84	25 - 150
13C4 PFBA	98	25 - 150
13C2 PFHxA	97	25 - 150
13C4 PFOA	100	25 - 150
13C5 PFNA	95	25 - 150
13C2 PFDA	94	25 - 150
13C2 PFUnA	100	25 - 150
13C2 PFDoA	91	25 - 150
1802 PFHxS	94	25 - 150
13C4 PFOS	93	25 - 150
13C2-PFTeDA	92	25 - 150
13C4-PFHpA	97	25 - 150
13C5 PFPeA	101	25 - 150
13C3-PFBS	96	25 - 150

Lab Sample ID: LCSD 320-204105/3-A

Matrix: Water

Analysis Batch: 204556

Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

Prep Batch: 204105

	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorobutanoic acid (PFBA)	40.0	38.1		ng/L		95	89 - 128	3	30
Perfluoropentanoic acid (PFPeA)	40.0	35.9		ng/L		90	66 - 136	1	30
Perfluorohexanoic acid (PFHxA)	40.0	35.7		ng/L		89	86 - 126	3	30
Perfluoroheptanoic acid (PFHpA)	40.0	37.2		ng/L		93	89 - 127	2	30
Perfluorooctanoic acid (PFOA)	40.0	37.8		ng/L		94	80 - 120	2	30
Perfluorononanoic acid (PFNA)	40.0	37.5		ng/L		94	77 - 137	3	30
Perfluorodecanoic acid (PFDA)	40.0	37.9		ng/L		95	84 - 123	6	30
Perfluoroundecanoic acid (PFUnA)	40.0	37.2		ng/L		93	73 - 122	8	30
Perfluorododecanoic acid (PFDoA)	40.0	39.8		ng/L		100	82 - 122	1	30

QC Sample Results

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-204105/3-A

Matrix: Water

Analysis Batch: 204556

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA Prep Batch: 204105

•	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorotridecanoic Acid (PFTriA)	40.0	38.6		ng/L		97	56 - 163	2	30
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7		ng/L		102	66 - 120	0	30
Perfluorobutanesulfonic acid (PFBS)	35.4	33.8		ng/L		96	88 - 130	3	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.8		ng/L		93	87 - 126	3	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.5		ng/L		98	92 - 135	2	30
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3		ng/L		93	83 - 126	5	30
Perfluorodecanesulfonic acid (PFDS)	38.6	36.9		ng/L		96	80 - 129	8	30
Perfluorooctane Sulfonamide (FOSA)	40.0	36.6		ng/L		92	91 - 133	8	30

LCSD LCSD

Isotope Dilution	%Recovery Qualifie	r Limits
13C8 FOSA	92	25 - 150
13C4 PFBA	104	25 - 150
13C2 PFHxA	108	25 - 150
13C4 PFOA	104	25 - 150
13C5 PFNA	103	25 - 150
13C2 PFDA	102	25 - 150
13C2 PFUnA	99	25 - 150
13C2 PFDoA	94	25 - 150
1802 PFHxS	100	25 - 150
13C4 PFOS	101	25 - 150
13C2-PFTeDA	99	25 - 150
13C4-PFHpA	104	25 - 150
13C5 PFPeA	106	25 - 150
13C3-PFBS	105	25 - 150

QC Association Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

LCMS

Prep Batch: 204105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35042-1	TP-PFC-025-TPI	Total/NA	Water	3535	
320-35042-1 - DL	TP-PFC-025-TPI	Total/NA	Water	3535	
320-35042-2	TP-PFC-025-MID-CARBON	Total/NA	Water	3535	
320-35042-3	TP-PFC-025-TPE	Total/NA	Water	3535	
320-35042-4	TP-PFC-025-TPE-D	Total/NA	Water	3535	
MB 320-204105/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-204105/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-204105/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 204556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35042-1	TP-PFC-025-TPI	Total/NA	Water	537 (modified)	204105
320-35042-2	TP-PFC-025-MID-CARBON	Total/NA	Water	537 (modified)	204105
320-35042-3	TP-PFC-025-TPE	Total/NA	Water	537 (modified)	204105
320-35042-4	TP-PFC-025-TPE-D	Total/NA	Water	537 (modified)	204105
MB 320-204105/1-A	Method Blank	Total/NA	Water	537 (modified)	204105
LCS 320-204105/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	204105
LCSD 320-204105/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	204105

Analysis Batch: 204757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35042-1 - DL	TP-PFC-025-TPI	Total/NA	Water	537 (modified)	204105

Lab Chronicle

Client: Tetra Tech, Inc.

Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-35042-1

Client Sample ID: TP-PFC-025-TPI

Lab Sample ID: 320-35042-1 Date Collected: 01/11/18 09:00 **Matrix: Water**

Date Received: 01/12/18 13:20

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	204556	01/18/18 18:01	AAR	TAL SAC
Total/NA	Prep	3535	DL		204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)	DL	10	204757	01/19/18 16:58	AAR	TAL SAC

Client Sample ID: TP-PFC-025-MID-CARBON

Lab Sample ID: 320-35042-2 Date Collected: 01/11/18 09:05

Matrix: Water

Date Received: 01/12/18 13:20

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	204556	01/18/18 18:08	AAR	TAL SAC

Client Sample ID: TP-PFC-025-TPE

Lab Sample ID: 320-35042-3 Date Collected: 01/11/18 09:10

Matrix: Water Date Received: 01/12/18 13:20

Batch Batch Dilution Batch Prepared Method Type Factor Number or Analyzed Analyst **Prep Type** Run Lab Total/NA Prep 3535 204105 01/16/18 09:18 CCB TAL SAC Total/NA Analysis 537 (modified) 1 204556 01/18/18 18:16 AAR TAL SAC

Client Sample ID: TP-PFC-025-TPE-D

Lab Sample ID: 320-35042-4 Date Collected: 01/11/18 00:00 Matrix: Water

Date Received: 01/12/18 13:20

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	204556	01/18/18 18:24	AAR	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Laboratory: TestAmerica Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

uthority	Program		EPA Region	Identification Number	Expiration Date
regon	NELAP		10	4040	01-29-20
The following analyte:	s are included in this repo	rt, but accreditation	certification is not off	ered by the governing author	ority:
Analysis Method	Prep Method	Matrix	Analyt	te	
537 (modified)	3535	Water	Perflu	orobutanesulfonic acid (PFE	BS)
537 (modified)	3535	Water	Perflu	orobutanoic acid (PFBA)	
537 (modified)	3535	Water	Perflu	orodecanesulfonic acid (PFI	DS)
537 (modified)	3535	Water	Perflu	orodecanoic acid (PFDA)	
537 (modified)	3535	Water	Perflu	orododecanoic acid (PFDoA	۸)
537 (modified)	3535	Water	Perflu	oroheptanesulfonic Acid (PF	FHpS)
537 (modified)	3535	Water	Perflu	oroheptanoic acid (PFHpA)	
537 (modified)	3535	Water	Perflu	orohexanesulfonic acid (PFI	HxS)
537 (modified)	3535	Water	Perflu	orohexanoic acid (PFHxA)	
537 (modified)	3535	Water	Perflu	orononanoic acid (PFNA)	
537 (modified)	3535	Water	Perflu	orooctane Sulfonamide (FO	SA)
537 (modified)	3535	Water	Perflu	orooctanesulfonic acid (PFC	OS)
537 (modified)	3535	Water	Perflu	orooctanoic acid (PFOA)	
537 (modified)	3535	Water	Perflu	oropentanoic acid (PFPeA)	
537 (modified)	3535	Water	Perflu	orotetradecanoic acid (PFTe	eA)
537 (modified)	3535	Water	Perflu	orotridecanoic Acid (PFTriA)
537 (modified)	3535	Water	Perflu	oroundecanoic acid (PFUnA	۸)

Method Summary

Client: Tetra Tech, Inc.

Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-35042-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Tetra Tech, Inc.

Project/Site: TT: PFAS, Brunswick, Discharge

Lab Sample ID Client Sample ID Matrix Collected Received 320-35042-1 01/11/18 09:00 01/12/18 13:20 TP-PFC-025-TPI Water 320-35042-2 TP-PFC-025-MID-CARBON Water 01/11/18 09:05 01/12/18 13:20 320-35042-3 TP-PFC-025-TPE Water 01/11/18 09:10 01/12/18 13:20 Water 320-35042-4 TP-PFC-025-TPE-D 01/11/18 00:00 01/12/18 13:20

TestAmerica Job ID: 320-35042-1

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 204375

Lab Sample ID: IC 320-204375/2 Client Sample ID:

Date Analyzed: 01/17/18 14:19 Lab File ID: 2018.01.17CURVELLA 002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON ANALYST DATE			
Perfluorohexanoic acid (PFHxA)	1.94	Baseline	hannigana	01/17/18 16:49	

Lab Sample ID: IC 320-204375/3 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluoropentanoic acid (PFPeA)	1.66	Baseline	hannigana	01/17/18 16:50		
Perfluorohexanoic acid (PFHxA)	1.94	Baseline	hannigana	01/17/18 16:50		

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 204504

Lab Sample ID: CCVL 320-204504/1 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorohexanoic acid (PFHxA)	1.93	Baseline	roycea	01/18/18 12:26		
Perfluorooctanesulfonic acid (PFOS)	2.98	Isomers	roycea	01/18/18 12:25		

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 204556

Lab Sample ID: 320-35042-1 Client Sample ID: TP-PFC-025-TPI

Date Analyzed: 01/18/18 18:01 Lab File ID: 2018.01.18LLA 005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	DATE			
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/19/18 15:49		

Lab Sample ID: 320-35042-2 Client Sample ID: TP-PFC-025-MID-CARBON

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON ANALYST DATE				
Perfluoroheptanoic acid (PFHpA)	2.24	Baseline	roycea	01/19/18 15:44		
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/19/18 15:43		

Lab Sample ID: 320-35042-3 Client Sample ID: TP-PFC-025-TPE

COMPOUND NAME	RETENTION	MANUAL INTE		
	TIME	REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.25	Baseline	roycea	01/19/18 16:27
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/19/18 16:32

Lab Sample ID: 320-35042-4 Client Sample ID: TP-PFC-025-TPE-D

Date Analyzed: 01/18/18 18:24 Lab File ID: 2018.01.18LLA_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	roycea	01/19/18 16:28		
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/19/18 16:29		

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 204757

Lab Sample ID: 320-35042-1 DL

Client Sample ID: TP-PFC-025-TPI DL

Date Analyzed: 01/19/18 16:58 Lab File ID: 2018.01.19LLC 010.d

GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION		
	TIME	REASON ANALYST DATE			
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/22/18 09:45	

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

				Reagent	Parent Reagen	ıt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFC_ALL_SU_00031	06/28/18	12/28/17	Methanol, Lot Baker	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
			111003		LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS 00006		M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA 00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA 00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA 00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA 00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS 00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00013	200 uL	1802 PFHxS	0.0473 ug/mL
					LCMPFNA 00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS 00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00014	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA 00006	05/19/22		LINGTON, Lot d3NMeFOSAAC	517	(Purchased Reage	ent)	d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA 00006	11/08/22	WEI	LINGTON, Lot d5NEtFOSAA1	117	(Purchased Reage	ent)	d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS 00006	02/17/22	M	ELLINGTON, Lot M262FTS02	17	(Purchased Reage	ent)	M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS 00008	07/05/22		ELLINGTON, Lot M282FTS07		(Purchased Reage	ent)	M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA 00013	07/13/22	Wellingt	on Laboratories, Lot M2P	FHxDA0717	(Purchased Reage	ent)	13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA 00012	11/30/22	Wellingt	on Laboratories, Lot M2P	FTeDA1117	(Purchased Reage	ent)	13C2-PFTeDA	50 ug/mL
.LCM4PFHPA 00012	05/03/22	Wellingt	on Laboratories, Lot M4E	FHpA0517	(Purchased Reage	ent)	13C4-PFHpA	50 ug/mL
.LCM5PFPEA 00013	07/20/22	Wellingt	on Laboratories, Lot M5E	FPeA0717	(Purchased Reage	ent)	13C5 PFPeA	50 ug/mL
.LCM8FOSA 00016	10/11/22	Wellingt	on Laboratories, Lot M8E	OSA1017I	(Purchased Reage	ent)	13C8 FOSA	50 ug/mL
.LCMPFBA 00013	04/12/22	Welling	gton Laboratories, Lot ME	FBA0417	(Purchased Reage	ent)	13C4 PFBA	50 ug/mL
.LCMPFBS 00006	05/24/22	Welling	ton Laboratories, Lot M3	PFBS0815	(Purchased Reage	ent)	13C3-PFBS	46.5 ug/mL
.LCMPFDA 00018	07/13/22	Welling	gton Laboratories, Lot ME	FDA0717	(Purchased Reage	ent)	13C2 PFDA	50 ug/mL
.LCMPFDoA 00013	05/23/22		ton Laboratories, Lot MP		(Purchased Reage		13C2 PFDoA	50 ug/mL
.LCMPFHxA 00019	10/27/22	Welling	ton Laboratories, Lot MP	FHxA1017	(Purchased Reage	ent)	13C2 PFHxA	50 ug/mL
.LCMPFHxS_00013	02/17/22	Welling	ton Laboratories, Lot MP	FHxS0217	(Purchased Reage		1802 PFHxS	47.3 ug/mL
.LCMPFNA_00013	09/30/21		gton Laboratories, Lot ME		(Purchased Reage		13C5 PFNA	50 ug/mL
.LCMPFOA_00017	10/17/22		gton Laboratories, Lot ME		(Purchased Reage		13C4 PFOA	50 ug/mL
.LCMPFOS_00025	10/17/22		gton Laboratories, Lot ME		(Purchased Reage		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00014	11/22/21	Welling	ton Laboratories, Lot MP	FUdA1116	(Purchased Reage	ent)	13C2 PFUnA	50 ug/mL
LCPFC-IS 00020	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA 00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA 00008	02/12/21		ton Laboratories, Lot M2	PFOA0216	(Purchased Reage		13C2-PFOA	50 ug/mL
_			MeOH/H2O, Lot 090285		LCMPFC ALL SU 00029	500 uL		
LCPFC_CCVL_00002	00/23/18	01/1//18	MeOn/n2O, LOL 090285	ZOO IUT	LCMFFC_ALL_SU_UUU29	JUU UL	d5-NEtFOSAA	2.5 ng/mL 2.5 ng/mL
							M2-6:2FTS	
							M2-8:2FTS	2.375 ng/mL 2.395 ng/mL
							13C2-PFHxDA	
							13C2-PFHXDA 13C2-PFTeDA	2.5 ng/mL 2.5 ng/mL
		I	I	I	1	I	TOCZ_LLIGNY	2.5 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-35042-1

				Reagent	Parent Reagent	:		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP 00129	100 uL	Perfluorobutanoic acid (PFBA)	0.05 ng/mL
					_		Perfluorobutanesulfonic acid	0.0442 ng/mL
							(PFBS)	
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid	0.05 ng/mL
							(PFDoA)	
							Perfluorodecanesulfonic acid	0.0482 ng/mL
							(PFDS)	0.05/
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid	0.0476 ng/mL
							(PFHpS)	0.04/0 119/1111
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexanesulfonic acid	0.0455 ng/mL
							(PFHxS)	J.
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05 ng/mL
							Perfluorooctanesulfonic acid	0.0464 ng/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	0.05 ng/mL
							(FOSA)	0.05 / 5
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluorotetradecanoic acid	0.05 ng/mL
							(PFTeA)	
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid	0.05 ng/mL
							(PFUnA)	0.00 119/1111
.LCMPFC_ALL_SU_00029	06/28/18	12/28/17	Methanol, Lot Baker 141039	10000 uL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	1 ug/mL
			111000		LCd5-NEtFOSAA 00006	200 uT.	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00006		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00008		M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA 00013		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00012		13C2-PFTeDA	1 ug/mL
1	1	1	T. Control of the con	1	=			- 5, [

Lab	Name:	TestAmerica	Sacrament	to Job No.: 320-35042-1

				Deagent	Parent Reag	rent		
		D	D'3 1 1	Reagent		77-7		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCM4PFHPA_00012		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00013		13C5 PFPeA	1 ug/mL
					LCM8FOSA 00016	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00013	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS 00006	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA 00018	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00013	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00019	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00013	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00013	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00017	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00025		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00014		13C2 PFUnA	1 ug/mL
LCd3-NMeFOSAA 00006	05/19/22	WET	LINGTON, Lot d3NMeFOSAA0	517	(Purchased Rea		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00006	11/08/22		LINGTON, Lot d5NEtFOSAA1		(Purchased Rea		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00006	02/17/22		ELLINGTON, Lot M262FTS02		(Purchased Rea		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00008	07/05/22		ELLINGTON, Lot M282FTS07		(Purchased Rea	<i></i>	M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA 00013			on Laboratories, Lot M2P1		(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00012	11/30/22		on Laboratories, Lot M2Pl		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22		on Laboratories, Lot M4P		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00013	07/20/22		on Laboratories, Lot M5P		(Purchased Rea		13C5 PFPeA	50 ug/mL
LCM8FOSA 00016	10/11/22		on Laboratories, Lot M8F		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22		ton Laboratories, Lot M31		(Purchased Rea		13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22		ton Laboratories, Lot MP1		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22		ton Laboratories, Lot MP1		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22		ton Laboratories, Lot MP1		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21		ton Laboratories, Lot MP		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21		ton Laboratories, Lot MPI		(Purchased Rea	, ,	13C2 PFUnA	50 ug/mL
.LCPFCSP 00129	06/23/18		Methanol, Lot 090285	10000 uL		1 mL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL
	00/23/10	12/23/17	nechanor, not 050205	10000 41	Lettest_ootz/	1 11111	Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	0.0004 dg/mb
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							(PFDoA)	J.1 ug/IIII
							Perfluorodecanesulfonic acid	0.0964 ug/mL
							(PFDS)	
							Perfluoroheptanoic acid	0.1 ug/mL
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							(PFHpS)	
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-35042-	1	

SDG No.: _____

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LCPFBA_00007		Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008		Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003		Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007		Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LCPFBA_00007	05/27/21		gton Laboratories, Lot P		(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21		ton Laboratories, Lot L		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22		gton Laboratories, Lot P		(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21	Welling	ton Laboratories, Lot L	PFDS0516	(Purchased Rea	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1	
	Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

				Reagent	Parent Reagen	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	- Analyte	Concentration
LCPFHpA_00008	12/02/21	Welling	gton Laboratories, Lot	PFHpA1216	(Purchased Reage	ent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22	_	ton Laboratories, Lot	-	(Purchased Reago	ent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA_00007	12/22/20	Welling	gton Laboratories, Lot	PFHxA1215	(Purchased Reage		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxS-br_00004	07/03/20	_	on Laboratories, Lot l		(Purchased Reag		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22		gton Laboratories, Lo		(Purchased Reage		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00009	09/27/22		gton Laboratories, Lo		(Purchased Reage		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFOS-br_00004	10/14/20		ton Laboratories, Lot		(Purchased Reage		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21		gton Laboratories, Lot		(Purchased Reage	•	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21		gton Laboratories, Lot		(Purchased Reage	•	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00006	12/09/20	_	ton Laboratories, Lot		(Purchased Reage		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00006	02/12/21	_	ton Laboratories, Lot		(Purchased Reage	•	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Welling	gton Laboratories, Lot	PFUdA1016	(Purchased Reage	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC LL1 00003	06/23/18	01/02/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC ALL SU 00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
					T. G. D. G.	1.0	13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023		13C2-PFOA	2.5 ng/mL
					LCPFCSP_00129	50 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.02335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0237 ng/mL

Lab Nai	ame: TestAmerica	Sacramento	Job No.: 320-35042-1
---------	------------------	------------	----------------------

			Prep Dilutant Date Used	Reagent Final Volume	Parent Reagen			
Reagent ID		-			Reagent ID	Volume Added		Concentration
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.02395 ng/ml
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/m
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/m
							Perfluorobutanoic acid (PFBA)	0.025 ng/ml
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/ml
							Perfluorodecanoic acid (PFDA)	0.025 ng/ml
							Perfluorododecanoic acid (PFDoA)	0.025 ng/ml
							Perfluorodecanesulfonic acid (PFDS)	0.0241 ng/ml
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/ml
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0238 ng/ml
							Perfluorohexanoic acid (PFHxA)	0.025 ng/ml
							Perfluorohexadecanoic acid	0.025 ng/ml
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/ml
							Perfluorononanoic acid (PFNA)	0.025 ng/ml
							Perfluorooctanoic acid (PFOA)	0.025 ng/ml
							Perfluorooctadecanoic acid	0.025 ng/ml
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/ml
							Perfluorooctane Sulfonamide (FOSA)	0.025 ng/ml
							Perfluoropentanoic acid (PFPeA)	0.025 ng/ml
							Perfluorotetradecanoic acid (PFTeA)	0.025 ng/ml
							Perfluorotridecanoic Acid (PFTriA)	0.025 ng/ml
							Perfluoroundecanoic acid (PFUnA)	0.025 ng/ml
PFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/ml
					LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/ml
					LCM2-6:FTS_00006		M2-6:2FTS	0.0475 ug/ml
					LCM2-8:2FTS_00008		M2-8:2FTS	0.0479 ug/ml
					LCM2PFHxDA_00013		13C2-PFHxDA	0.05 ug/ml
					LCM2PFTeDA_00012		13C2-PFTeDA	0.05 ug/ml
					LCM4PFHPA_00012		13C4-PFHpA	0.05 ug/ml
					LCM5PFPEA_00013		13C5 PFPeA	0.05 ug/ml
					LCM8FOSA_00016 LCMPFBA 00013		13C8 FOSA	0.05 ug/ml
							13C4 PFBA	0.05 ug/ml

Lab	Name:	TestAmerica	Sacrament	to Job No.: 320-35042-1

				Reagent	Parent Reag	gent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
Reagent 1D	Date	Date	usea	VOTUNE	=		=	
					LCMPFDA_00018		13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00013		13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025		13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014		13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA_00006	05/19/22		LINGTON, Lot d3NMeFOSAA0		(Purchased Rea	<i></i>	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA_00006	11/08/22		LINGTON, Lot d5NEtFOSAA1		(Purchased Rea		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS_00006	02/17/22		ELLINGTON, Lot M262FTS02		(Purchased Re		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS_00008	07/05/22		ELLINGTON, Lot M282FTS07		(Purchased Re		M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA_00013			on Laboratories, Lot M2P1		(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00012	11/30/22		on Laboratories, Lot M2P1		(Purchased Rea	<i></i>	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00012	05/03/22	Wellingt	on Laboratories, Lot M4F	FHpA0517	(Purchased Re		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00013	07/20/22		on Laboratories, Lot M5F		(Purchased Rea		13C5 PFPeA	50 ug/mL
LCM8FOSA_00016	10/11/22		on Laboratories, Lot M8F		(Purchased Re		13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22		gton Laboratories, Lot MP		(Purchased Re	agent)	13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22	Welling	ton Laboratories, Lot M3	PFBS0815	(Purchased Re	agent)	13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22	Welling	gton Laboratories, Lot MF	FDA0717	(Purchased Rea	agent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22	Welling	ton Laboratories, Lot MP1	FDoA0517	(Purchased Rea	agent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22	Welling	ton Laboratories, Lot MP	FHxA1017	(Purchased Rea	agent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22	Welling	ton Laboratories, Lot MP	FHxS0217	(Purchased Rea	agent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21	Welling	ton Laboratories, Lot MP	FNA0916	(Purchased Rea	agent)	13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22	Welling	ton Laboratories, Lot MP	FOS1017	(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21	Welling	ton Laboratories, Lot MP	FUdA1116	(Purchased Rea	agent)	13C2 PFUnA	50 ug/mL
.LCPFC-IS 00023			Methanol, Lot 090285	200 mI			13C2-PFOA	0.05 ug/mL
LCM2PFOA 00008	02/12/21		ton Laboratories, Lot M2		(Purchased Re		13C2-PFOA	50 ug/mL
.LCPFCSP 00129			Methanol, Lot 090285		LCPFCSP 00127	<i></i>	Sodium	0.0934 ug/mL
	33, 23, 23						1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	
							Sodium	0.0948 ug/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
							Sodium	0.0958 ug/mL
							1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	
							N-ethyl perfluorooctane	0.1 ug/mL
							sulfonamidoacetic acid	
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
		1					Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							(PFDoA)	

Lab	Name:	TestAmerica	Sacramento	O	320-35	JU4.	2-1	

			Dilutant Used	Reagent Final Volume	Parent Reage	ent		Concentration
Reagent ID	Exp Date	Prep Date			Reagent ID	Volume Added	Analyte	
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid	0.0928 ug/mL
							(PFOS)	
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007		Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00008		Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008		Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL

Lab	Name: TestAmerica	Sacramento	Job No.: 320-35042-1

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHxA 00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA 00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00009		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007		Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS121	. 6	(Purchased Read	gent)	Sodium 1H, 1H, 2H, 2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS061	. 6	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS081	. 6	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21	WI	ELLINGTON, Lot NETFOSAAO	916	(Purchased Rea	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21	W	ELLINGTON, Lot NMeFOSAA0	916	(Purchased Rea	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA_00007	05/27/21		gton Laboratories, Lot E		(Purchased Rea	J ,	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21		gton Laboratories, Lot L		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22	Wellin	gton Laboratories, Lot E	PFDA0517	(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22		gton Laboratories, Lot P		(Purchased Rea	_	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21		gton Laboratories, Lot L		(Purchased Rea		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21		gton Laboratories, Lot P	_	(Purchased Rea	-	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22	Welling	ton Laboratories, Lot LE	PFHpS0817	(Purchased Rea	gent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA_00007	12/22/20		gton Laboratories, Lot P		(Purchased Rea	gent)	Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00009	07/13/22		ton Laboratories, Lot PE		(Purchased Rea	,	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00004	07/03/20		on Laboratories, Lot br		(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22		gton Laboratories, Lot E		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00009	09/27/22	Wellin	gton Laboratories, Lot E	PFOA0917	(Purchased Rea	gent)	Perfluorooctanoic acid (PFOA)	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
SDG No.:	

				Reagent	Parent Reagen	ıt				
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration		
LCPFODA 00009	07/13/22	Welling	rton Laboratories, Lot Pl	FODA0717	(Purchased Reage	ent)	Perfluorooctadecanoic acid	50 ug/mL		
LCPFOS-br_00004	10/14/20	Wellingt	on Laboratories, Lot br	PFOSK1015	(Purchased Reage	ent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL		
LCPFOSA_00010	09/30/21	Welling	ton Laboratories, Lot F	OSA0916I	(Purchased Reag	ent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL		
LCPFPeA_00007	05/31/21	-	ton Laboratories, Lot Pl		(Purchased Reag	ent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL		
LCPFTeDA_00006	12/09/20		ton Laboratories, Lot PF		(Purchased Reag	ent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL		
LCPFTrDA_00006	02/12/21	_	ton Laboratories, Lot PF		(Purchased Reage		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL		
LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot Pl	FUdA1016	(Purchased Reage	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL		
LCPFC LL2 00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00032	10 mL	d3-NMeFOSAA	2.5 ng/mL		
		, , ,	, , ,				d5-NEtFOSAA	2.5 ng/mL		
									M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL		
							13C2-PFHxDA	2.5 ng/mL		
							13C2-PFTeDA	2.5 ng/mL		
							13C4-PFHpA	2.5 ng/mL		
							13C5 PFPeA	2.5 ng/mL		
							13C8 FOSA	2.5 ng/mL		
							13C4 PFBA	2.5 ng/mL		
							13C3-PFBS	2.325 ng/mL		
							13C2 PFDA	2.5 ng/mL		
							13C2 PFDoA	2.5 ng/mL		
								13C2 PFHxA	2.5 ng/mL	
							1802 PFHxS	2.365 ng/mL		
							13C5 PFNA	2.5 ng/mL		
							13C4 PFOA	2.5 ng/mL		
							13C4 PFOS	2.39 ng/mL		
						:	13C2 PFUnA	2.5 ng/mL		
					LCPFC-IS 00023	10 mT	13C2-PFOA	2.5 ng/mL		
					LCPFCSP 00129		Sodium	0.0467 ng/mL		
					Lerresi_00123	100 41	1H,1H,2H,2H-perfluorohexane	0.040/ 119/1111		
							sulfonate (4:2)			
							Sodium	0.0474 ng/mL		
							1H,1H,2H,2H-perfluorooctane	0.01/1 119/1112		
							sulfonate (6:2)			
							Sodium	0.0479 ng/mL		
							1H,1H,2H,2H-perfluorodecane			
							sulfonate (8:2)			
							N-ethyl perfluorooctane	0.05 ng/mL		
							sulfonamidoacetic acid			
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL		
							Perfluorobutanoic acid (PFBA)	0.05 ng/mL		
							Perfluorobutanesulfonic acid	0.0442 ng/mL		
							(PFBS)			

Lab	Name:	TestAmerica	Sacrament	o Job No.:	: 320-35042-1

				Beagant	Parent Reager	nt		
	Exp	Prep	Dilutant	Reagent Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid	0.05 ng/mL
							(PFDoA)	
							Perfluorodecanesulfonic acid	0.0482 ng/mL
							(PFDS)	0.05/
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid	0.0476 ng/mL
							(PFHpS)	0.01/0 119/1112
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexadecanoic acid	0.05 ng/mL
							Perfluorohexanesulfonic acid	0.0455 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05 ng/mL
							Perfluorooctadecanoic acid	0.05 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.05 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.05 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid	0.05 ng/mL
							(PFUnA)	_
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006		d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006		M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008		M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013		13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012		13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012		13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013		13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016 LCMPFBA 00013		13C8 FOSA 13C4 PFBA	0.05 ug/mL
					LCMPFBS 00006		13C4 PFBA 13C3-PFBS	0.05 ug/mL 0.0465 ug/mL
					LCMPFDA 00018		13C2 PFDA	0.0465 ug/mL
					LCMPFDoA 00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA 00013		13C5 PFNA	0.05 ug/mL
					LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS 00025		13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00014		13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA_00006	05/19/22	WE	LLINGTON, Lot d3NMeFOSAA	0517	(Purchased Reag	ent)	d3-NMeFOSAA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1	
---	--

				Reagent	Parent Re	eagent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCd5-NEtFOSAA 00006	11/08/22	WEI	LINGTON, Lot d5NEtFOSAA1	1117	(Purchased	Reagent)	d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00006	02/17/22	W	ELLINGTON, Lot M262FTS02	17	(Purchased	Reagent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00008	07/05/22	M	ELLINGTON, Lot M282FTS07	17	(Purchased	Reagent)	M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA 00013	07/13/22	Wellingt	on Laboratories, Lot M2P	FHxDA0717	(Purchased	Reagent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00012	11/30/22	Wellingt	on Laboratories, Lot M2P	FTeDA1117	(Purchased	Reagent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22	Wellingt	on Laboratories, Lot M4H	PFHpA0517	(Purchased	Reagent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00013	07/20/22		on Laboratories, Lot M5H		(Purchased	Reagent)	13C5 PFPeA	50 ug/mL
LCM8FOSA 00016	10/11/22	Wellingt	on Laboratories, Lot M8E	OSA1017I	(Purchased	Reagent)	13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22		ton Laboratories, Lot ME	PFBA0417	(Purchased	Reagent)	13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22	Welling	ton Laboratories, Lot M3	PFBS0815	(Purchased	Reagent)	13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22		gton Laboratories, Lot ME		(Purchased		13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22		ton Laboratories, Lot MP		(Purchased		13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22		ton Laboratories, Lot MP		(Purchased	<u> </u>	13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22		ton Laboratories, Lot MP		(Purchased		1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21		gton Laboratories, Lot ME		(Purchased		13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22		ton Laboratories, Lot ME		(Purchased		13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22		gton Laboratories, Lot MI		(Purchased		13C4 PFOS	47.8 ug/mL
LCMPFUGA 00014	11/22/21		ton Laboratories, Lot MP		(Purchased	<u> </u>	13C2 PFUnA	50 ug/mL
.LCPFC-IS 00023			Methanol, Lot 090285		LCM2PFOA 00008		13C2-PFOA	0.05 ug/mL
LCM2PFOA 00008	06/28/18		ton Laboratories, Lot M2		(Purchased		13C2-PFOA	
				T10000 T	LCPFCSP 00127	<u> </u>	Sodium	50 ug/mL 0.0934 ug/mL
.LCPFCSP_00129	06/23/18	12/23/17	Methanol, Lot 090285	10000 ui	LCPFCSP_00127	1 1111	1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	-
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mI
							Perfluorobutanoic acid (PFBA)	0.1 ug/mI
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL

Lab	Name:	TestAmerica	Sacramento) Job	No.:	320-3504	42-1		

				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid	0.0928 ug/mL
							(PFOS)	_
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA 00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA 00007		Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA 00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00009		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00009		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
----------------------------------	----------------------

				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007		Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS121	6	(Purchased Rea		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS061		(Purchased Rea		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS081		(Purchased Rea		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21		LLINGTON, Lot NETFOSAA09		(Purchased Rea	_	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21		LLINGTON, Lot NMeFOSAA09		(Purchased Rea		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA 00007	05/27/21	Wellin	gton Laboratories, Lot P	FBA0516	(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21	_	ton Laboratories, Lot Ll		(Purchased Rea	_	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00008	05/29/22	Wellin	gton Laboratories, Lot P	FDA0517	(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22	_	ton Laboratories, Lot Pl		(Purchased Rea	-	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21		ton Laboratories, Lot Ll		(Purchased Rea		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21	_	ton Laboratories, Lot Pl	=	(Purchased Rea	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22	_	ton Laboratories, Lot LP	_	(Purchased Rea	· .	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA_00007	12/22/20	Welling	gton Laboratories, Lot Pl	FHxA1215	(Purchased Rea		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00009	07/13/22	Welling	ton Laboratories, Lot PF	HxDA0717	(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00004	07/03/20		on Laboratories, Lot brP		(Purchased Rea	_	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22		gton Laboratories, Lot P		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00009	09/27/22		gton Laboratories, Lot P		(Purchased Rea	J /	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00009	07/13/22	Welling	gton Laboratories, Lot PI	FODA0717	(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00004	10/14/20		on Laboratories, Lot br		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21	-	ton Laboratories, Lot F		(Purchased Rea	· .	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21	_	gton Laboratories, Lot Pl		(Purchased Rea	_	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00006	12/09/20	Welling	ton Laboratories, Lot PF	TeDA1215	(Purchased Rea	gent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
-	
SDG No.:	

				Reagent . Final Volume	Parent Reagen	ıt		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Reagent ID	Volume Added	Analyte	Concentration
LCPFTrDA_00006	02/12/21	Welling	ton Laboratories, Lot P	FTrDA0216	(Purchased Reage	ent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Welling	gton Laboratories, Lot H	PFUdA1016	(Purchased Reage	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL3_00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023		13C2-PFOA	2.5 ng/mL
					LCPFCSP_00129	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.2335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.237 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.2395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							Perfluorobutanoic acid (PFBA)	0.25 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.25 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.25 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.238 ng/mL

ab Name: TestAmerica Sacramento	Job No.: 320-35042-1
---------------------------------	----------------------

Neagent ID					Reagent	Parent Reager	nt		
Perfluorobeanosic acid 0.25	Reagent ID	-	_		Final	Reagent ID		Analyte	Concentration
Perfluoronexamesulfonic acid (PPRTN)								Perfluorohexanoic acid (PFHxA)	0.25 ng/mL
Perfluoronexameulfonic acid (PPRN) 0.25								Perfluorohexadecanoic acid	0.25 ng/mL
Perfluorocotanoia caid (PPA) 0.25									0.2275 ng/mL
Defiliprococtane is all (PFGA) 0.25 Perfluoroctane acid (0.25 Perfluoroctane acid (0.25 Perfluoroctane sulfonamide (0.25 Perfluoroctane sulfonam									0.25 ng/mL
Reflucrocotadecancic acid (0.25 Perflucrocotadecancic acid (0.25 Perflucrocotadecancic acid (0.25 Perflucrocotadesulfonic acid (0.25 Perflucropentanoic ac								, ,	0.25 ng/mL
Comparison Com									0.25 ng/mL
Derfluoroctane Sulfonamide C.25 Perfluoroctane Sulfonamide Per								Perfluorooctanesulfonic acid	0.232 ng/mL
CMPPPEA 00013 CMPPPEA 00014 CAPPENS 00006 CAPPENS 00006 CAPPENS 00016 CAPPENS 0001								Perfluorooctane Sulfonamide	0.25 ng/mL
LCMPFC_ALL_SU_00032								Perfluoropentanoic acid	0.25 ng/mL
LCMPFC_ALL_SU_00032									0.25 ng/mL
LCMPFC_ALL_SU_00032								(PFTriA)	0.25 ng/mL
LCMPFC_ALL_SU_00032									0.25 ng/mL
LCG5-NEFOSAA 00006 200 uL d5-NEFOSAA 0.05	.LCMPFC_ALL_SU_00032	06/28/18	12/28/17		200 mL	LCd3-NMeFOSAA_00006	200 uL		0.05 ug/mL
LCM2-6:FTS 00006 200 uL M2-6:2FTS 0.0479				141039		7.0.15 3771 70.07.7 0.000.6	000 -	15 377 70 77 7	0.05 / 7
LCM2-FFENDA 00013									0.05 ug/mL
LCM2PFHXDA 00013									0.0475 ug/mL
LCM2FFTEDA 00012									
LCM3FFHPA 00012						_			0.05 ug/mI
LCM5FFPEA 00013									0.05 ug/mI
LCM8FOSA 00016						_			
LCMPFBA 00013									
LCMPFDA 00016									
LCMPFDA 00018 200 uL 13C2 PFDA 0.05									
LCMPFDA 00013									
LCMPFHXA 00019 200 uL 13C2 PFHXA 0.05						_			
LCMPFHxS 00013						_			
LCMPFNA 00013 200 uL 13C5 PFNA 0.05 LCMPFOA 00017 200 uL 13C4 PF0A 0.05 LCMPFOS 00025 200 uL 13C4 PF0S 0.0478 LCMPFUDA 00014 200 uL 13C2 PFUDA 0.05 LCMSPFUDA 00015 02/17/22 WELLINGTON, Lot d5NEtFOSAA0517 (Purchased Reagent) d5-NEtFOSAA 50 LCM2-6:FTS 00006 02/17/22 WELLINGTON, Lot M262FTS0217 (Purchased Reagent) M2-6:2FTS 47.5 LLCM2-8:2FTS 00008 07/05/22 WELLINGTON, Lot M282FTS0717 (Purchased Reagent) M2-8:2FTS 47.5 LCM2-8:2FTS 00008 07/13/22 Wellington Laboratories, Lot M2PFHXDA0717 (Purchased Reagent) 13C2-PFHXDA 50 LCM2PFTDA 00012 11/30/22 Wellington Laboratories, Lot M2PFTDA1117 (Purchased Reagent) 13C2-PFTDA 50 LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHPA0517 (Purchased Reagent) 13C4-PFHDA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M4PFHPA0517 (Purchased Reagent) 13C4-PFHDA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M4PFHPA0517 (Purchased Reagent) 13C4-PFHDA 50									0.05 ug/mI
LCMPFOA 00017 200 uL 13C4 PFOA 0.05 LCMPFOS 00025 200 uL 13C4 PFOS 0.0478 LCMPFUDA 00014 200 uL 13C4 PFOS 0.0478 LCMPFUDA 00014 200 uL 13C2 PFUDA 0.05 .LCC3-NMEFOSAA 00006 05/19/22 WELLINGTON, Lot d3NMEFOSAA0517 (Purchased Reagent) d3-NMEFOSAA 50 .LCC45-NEtFOSAA 00006 11/08/22 WELLINGTON, Lot d5NEtFOSAA1117 (Purchased Reagent) d5-NEtFOSAA 50 .LCM2-6:FTS 00006 02/17/22 WELLINGTON, Lot M262FTS0217 (Purchased Reagent) M2-6:2FTS 47.5 .LCM2-8:2FTS 00008 07/05/22 WELLINGTON, Lot M282FTS0717 (Purchased Reagent) M2-8:2FTS 47.9 .LCM2PFHXDA 00013 07/13/22 Wellington Laboratories, Lot M2PFHxDA0717 (Purchased Reagent) 13C2-PFHxDA 50 .LCM2PFTEDA 00012 11/30/22 Wellington Laboratories, Lot M2PFTEDA1117 (Purchased Reagent) 13C2-PFTEDA 50 .LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 .LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 .LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M5PFPEA0717 (Purchased Reagent) 13C4-PFHpA 50									
LCMPFOS_00025									0.05 ug/mI
LCMPFUdA 00014 200 uL 13C2 PFUNA 0.05 .LCd3-NMeFOSAA 00006 05/19/22 WELLINGTON, Lot d3NMeFOSAA0517 (Purchased Reagent) d3-NMeFOSAA 50 .LCd5-NEtFOSAA 00006 11/08/22 WELLINGTON, Lot d5NEtFOSAA1117 (Purchased Reagent) d5-NEtFOSAA 50 .LCM2-6:FTS 00006 02/17/22 WELLINGTON, Lot M262FTS0217 (Purchased Reagent) M2-6:2FTS 47.5 .LCM2-8:2FTS 00008 07/05/22 WELLINGTON, Lot M282FTS0717 (Purchased Reagent) M2-8:2FTS 47.9 .LCM2PFHXDA 00013 07/13/22 Wellington Laboratories, Lot M2PFHXDA0717 (Purchased Reagent) 13C2-PFHXDA 50 .LCM2PFTeDA 00012 11/30/22 Wellington Laboratories, Lot M2PFTeDA1117 (Purchased Reagent) 13C2-PFTeDA 50 .LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHPA0517 (Purchased Reagent) 13C4-PFHPA 50 .LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M4PFPA0717 (Purchased Reagent) 13C4-PFHPA 50									0.05 ug/mI
LCd3-NMeFOSAA 00006 05/19/22 WELLINGTON, Lot d3NMeFOSAA0517 (Purchased Reagent) d3-NMeFOSAA 50 LCd5-NEtFOSAA 00006 11/08/22 WELLINGTON, Lot d5NEtFOSAA1117 (Purchased Reagent) d5-NEtFOSAA 50 LCM2-6:FTS 00006 02/17/22 WELLINGTON, Lot M262FTS0217 (Purchased Reagent) M2-6:2FTS 47.5 LCM2-8:2FTS 00008 07/05/22 WELLINGTON, Lot M282FTS0717 (Purchased Reagent) M2-8:2FTS 47.9 LCM2PFHXDA 00013 07/13/22 Wellington Laboratories, Lot M2PFHxDA0717 (Purchased Reagent) 13C2-PFHXDA 50 LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C4-PFHpA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C5 PFPeA 50						_			
LCd5-NetFoSAA 00006 11/08/22 WELLINGTON, Lot d5NetFoSAA1117 (Purchased Reagent) d5-NetFoSAA 50 LCM2-6:FTS 00006 02/17/22 WELLINGTON, Lot M262FTS0217 (Purchased Reagent) M2-6:2FTS 47.5 LCM2-8:2FTS 00008 07/05/22 WELLINGTON, Lot M282FTS0717 (Purchased Reagent) M2-8:2FTS 47.9 LCM2PFHxDA 00013 07/13/22 Wellington Laboratories, Lot M2PFHxDA0717 (Purchased Reagent) 13C2-PFHxDA 50 LCM2PFTeDA 00012 11/30/22 Wellington Laboratories, Lot M2PFTeDA1117 (Purchased Reagent) 13C4-PFHpA 50 LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C5 PFPeA 50	ICAS NIMOTEOGRA OOOOC	05/10/22	[-717 T	TINCHON TOF JOHN-TOOM	0517	_			0.05 ug/mI
LCM2-6:FTS_00006 02/17/22 WELLINGTON, Lot M262FTS0217 (Purchased Reagent) M2-6:2FTS 47.5 LCM2-8:2FTS_00008 07/05/22 WELLINGTON, Lot M282FTS0717 (Purchased Reagent) M2-8:2FTS 47.9 LCM2PFHxDA_00013 07/13/22 Wellington Laboratories, Lot M2PFHxDA0717 (Purchased Reagent) 13C2-PFHxDA 50 LCM2PFTeDA_00012 11/30/22 Wellington Laboratories, Lot M2PFTeDA1117 (Purchased Reagent) 13C2-PFTeDA 50 LCM4PFHPA_00012 05/03/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 LCM5PFPEA_00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C5 PFPeA 50									50 ug/mI
LCM2-8:2FTS 00008 07/05/22 WELLINGTON, Lot M282FTS0717 (Purchased Reagent) M2-8:2FTS 47.9 LCM2PFHxDA 00013 07/13/22 Wellington Laboratories, Lot M2PFHxDA0717 (Purchased Reagent) 13C2-PFHxDA 50 LCM2PFTeDA 00012 11/30/22 Wellington Laboratories, Lot M2PFTeDA1117 (Purchased Reagent) 13C2-PFTeDA 50 LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C5 PFPeA 50									50 ug/mL
LCM2PFHxDA 00013 07/13/22 Wellington Laboratories, Lot M2PFHxDA0717 (Purchased Reagent) 13C2-PFHxDA 50 LCM2PFTeDA 00012 11/30/22 Wellington Laboratories, Lot M2PFTeDA1117 (Purchased Reagent) 13C2-PFTeDA 50 LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C5 PFPeA 50									47.5 ug/mL
LCM2PFTeDA 00012 11/30/22 Wellington Laboratories, Lot M2PFTeDA1117 (Purchased Reagent) 13C2-PFTeDA 50 LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C5 PFPeA 50									47.9 ug/mL
LCM4PFHPA 00012 05/03/22 Wellington Laboratories, Lot M4PFHpA0517 (Purchased Reagent) 13C4-PFHpA 50 LCM5PFPEA 00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C5 PFPeA 50									50 ug/mI
LCM5PFPEA_00013 07/20/22 Wellington Laboratories, Lot M5PFPeA0717 (Purchased Reagent) 13C5 PFPeA 50									50 ug/mL 50 ug/mL
						<u> </u>			
Lumorusa uuuto						<u> </u>			50 ug/mL
									50 ug/mL 50 ug/mL

: 320-35042-1

			Reagent	Parent Reage	ent		
	Exp Prep	Dilutant	Final		Volume		
Reagent ID	Date Date		Volume	Reagent ID	Added	Analyte	Concentration
LCMPFBS 00006	05/24/22 Welli	ngton Laboratories, Lot	M3PFBS0815	(Purchased Rea	igent)	13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22 Well	ington Laboratories, Lot	MPFDA0717	(Purchased Rea	igent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22 Welli	ngton Laboratories, Lot	MPFDoA0517	(Purchased Rea	igent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22 Welli	ngton Laboratories, Lot	MPFHxA1017	(Purchased Rea	igent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00013		ngton Laboratories, Lot		(Purchased Rea	igent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00013		ington Laboratories, Lot		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22 Well	ington Laboratories, Lot	MPFOA1017	(Purchased Rea	igent)	13C4 PFOA	50 ug/mL
LCMPFOS_00025		ington Laboratories, Lot		(Purchased Rea	igent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA_00014		ngton Laboratories, Lot		(Purchased Rea	<i></i>	13C2 PFUnA	50 ug/mL
.LCPFC-IS_00023		17 Methanol, Lot 090285		LCM2PFOA_00008		13C2-PFOA	0.05 ug/mL
LCM2PFOA_00008		ngton Laboratories, Lot		(Purchased Rea		13C2-PFOA	50 ug/mL
.LCPFCSP_00129	06/23/18 12/23/	17 Methanol, Lot 090285	10000 uL	LCPFCSP_00127	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
						Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) Sodium	0.0948 ug/mL
						1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
						N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
						N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
						Perfluorobutanoic acid (PFBA)	0.1 ug/mL
						Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
						Perfluorodecanoic acid (PFDA)	0.1 ug/mL
						Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
						Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
						Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
						Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
						Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
						Perfluorohexadecanoic acid	0.1 ug/mL
						Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
						Perfluorononanoic acid (PFNA)	0.1 ug/mL
						Perfluorooctanoic acid (PFOA)	0.1 ug/mL
						Perfluorooctadecanoic acid	0.1 ug/mL
						Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
						Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
						Perfluoropentanoic acid (PFPeA)	0.1 ug/mL

Lab	Name:	TestAmerica	Sacramento	ob No.: 320-35042-1	

				Reagent	Parent Reage	nt											
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration									
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL									
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL									
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL									
LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL									
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL									
					LC8:2FTS_00003		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL									
					LCN-EtFOSAA_00004		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL									
					LCN-MeFOSAA_00005		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL									
					LCPFBA 00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL									
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL									
					LCPFDA 00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL									
					LCPFDoA_00008		Perfluorododecanoic acid (PFDoA)	1 ug/mL									
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL									
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL									
														LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA 00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL									
				LCPFHxDA 00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL										
			LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL											
					LCPFNA 00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL									
					LCPFOA 00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL									
					LCPFODA 00009		Perfluorooctadecanoic acid	1 ug/mL									
											LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL			
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL									
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	1 ug/mL									
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL									
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL									
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL									

Lab Name: TestAmerica Sacramento Job	No.: 320-35042-1
--------------------------------------	------------------

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS12	216	(Purchased Rea	igent)	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS0		(Purchased Rea	J ,	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21	,	WELLINGTON, Lot 82FTS08	816	(Purchased Rea	igent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21	WE	ELLINGTON, Lot NETFOSAA	0916	(Purchased Rea	igent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21		ELLINGTON, Lot NMeFOSAA		(Purchased Rea		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA_00007	05/27/21		gton Laboratories, Lot	PFBA0516	(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21		gton Laboratories, Lot		(Purchased Rea	igent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22	Wellin	gton Laboratories, Lot	PFDA0517	(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22		gton Laboratories, Lot		(Purchased Rea		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21		gton Laboratories, Lot		(Purchased Rea		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21		gton Laboratories, Lot	(Purchased Rea	-	Perfluoroheptanoic acid (PFHpA)	50 ug/mL	
LCPFHpSA_00003	09/01/22	Welling	ton Laboratories, Lot 1	LPFHpS0817	(Purchased Rea	igent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA 00007	12/22/20		gton Laboratories, Lot		(Purchased Rea		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00009	07/13/22	Welling	ton Laboratories, Lot	PFHxDA0717	(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00004	07/03/20		on Laboratories, Lot b		(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22		gton Laboratories, Lot		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00009	09/27/22		gton Laboratories, Lot		(Purchased Rea	, ,	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00009	07/13/22	Welling	ton Laboratories, Lot	PFODA0717	(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00004	10/14/20	_	con Laboratories, Lot b		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21		gton Laboratories, Lot		(Purchased Rea		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21		gton Laboratories, Lot		(Purchased Rea	-	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00006	12/09/20		ton Laboratories, Lot 1		(Purchased Rea		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00006	02/12/21	_	ton Laboratories, Lot 1		(Purchased Rea	igent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Welling	gton Laboratories, Lot	PFUdA1016	(Purchased Rea	igent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC LL4 00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
	, ., .,		, , , , , , , , , , , , , , , , , , , ,				d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
----------------------------------	----------------------

				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS 00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP 00127		Sodium	0.934 ng/mL
							1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0,000 1000,000
							Sodium	0.948 ng/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.310 Hg, III
							Sodium	0.958 ng/mL
							1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0000 3397 332
							N-ethyl perfluorooctane	1 ng/mL
							sulfonamidoacetic acid N-methyl perfluorooctane	1 /T
							sulfonamidoacetic acid	1 ng/mL
							Perfluorobutanoic acid (PFBA)	1 ng/mL
							Perfluorobutanesulfonic acid	0.884 ng/mL
							(PFBS)	1/
							Perfluorodecanoic acid (PFDA)	1 ng/mL
							Perfluorododecanoic acid (PFDoA)	1 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid	0.928 ng/mL
I						1	(PFOS)	

: 320-35042-1

				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mI	LCd3-NMeFOSAA_00006		d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006		d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006		M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA 00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA 00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA 00016		13C8 FOSA	0.05 ug/mL
					LCMPFBA 00013		13C4 PFBA	0.05 ug/mL
					LCMPFBS 00006		13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00018		13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA 00013		13C5 PFNA	0.05 ug/mL
					LCMPFOA 00017		13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025		13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014		13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA_00006	05/19/22		LLINGTON, Lot d3NMeFOSA		(Purchased Reag		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA_00006	11/08/22		LLINGTON, Lot d5NEtFOS		(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS_00006	02/17/22		ELLINGTON, Lot M262FTS		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS_00008	07/05/22		ELLINGTON, Lot M282FTS		(Purchased Reag		M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA_00013	07/13/22		on Laboratories, Lot M		(Purchased Reag		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00012	11/30/22		on Laboratories, Lot M		(Purchased Reag		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00012	05/03/22	Wellingt	ton Laboratories, Lot D	44PFHpA0517	(Purchased Reag		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00013	07/20/22		ton Laboratories, Lot D		(Purchased Reag	ent)	13C5 PFPeA	50 ug/mL
LCM8FOSA_00016	10/11/22	Wellingt	ton Laboratories, Lot D	48FOSA1017I	(Purchased Reag	ent)	13C8 FOSA	50 ug/mL
LCMPFBA_00013	04/12/22	Welling	gton Laboratories, Lot	MPFBA0417	(Purchased Reag	ent)	13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22	Welling	ton Laboratories, Lot	M3PFBS0815	(Purchased Reag	ent)	13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22		gton Laboratories, Lot		(Purchased Reag	ent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22	Welling	ton Laboratories, Lot	MPFDoA0517	(Purchased Reag	ent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22		ton Laboratories, Lot		(Purchased Reag		13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22		ton Laboratories, Lot		(Purchased Reag		1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21		gton Laboratories, Lot		(Purchased Reag		13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22		gton Laboratories, Lot		(Purchased Reag		13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22		gton Laboratories, Lot		(Purchased Reag		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21		ton Laboratories, Lot		(Purchased Reag		13C2 PFUnA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1	
	Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

				Reagent	Parent Reage	ent			
	Exp	Prep	Dilutant	Final		Volume			
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration	
.LCPFC-IS 00023	06/28/18		Methanol, Lot 090285	200 mL	LCM2PFOA 00008	200 uL	13C2-PFOA	0.05 ug/mL	
LCM2PFOA 00008	02/12/21	Welling	ton Laboratories, Lot M2	PFOA0216	(Purchased Rea	gent)	13C2-PFOA	50 ug/mL	
.LCPFCSP_00127	06/23/18		Methanol, Lot 090285	10000 uL		200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL	
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL	
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL	
				LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL		
				LCN-MeFOSAA_00005		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL		
					LCPFBA_00007		Perfluorobutanoic acid (PFBA)	1 ug/mL	
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL	
					LCPFDA_00008		Perfluorodecanoic acid (PFDA)	1 ug/mL	
				LCPFDoA_00008 200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL			
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL	
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL	
					LCPFHpSA_00003		Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL	
					LCPFHxA 00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL	
					LCPFHxDA 00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL	
						LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009		Perfluorononanoic acid (PFNA)	1 ug/mL	
			LCPFOA_00009		Perfluorooctanoic acid (PFOA)	1 ug/mL			
					LCPFODA_00009		Perfluorooctadecanoic acid	1 ug/mL	
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL	
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL	
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	1 ug/mL	
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL	
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL	
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL	
LC4:2FTS_00003	12/12/21	Ī	WELLINGTON, Lot 42FTS121	6	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL	

Lab	Name:	TestAmerica	Sacramento	Job No.:	: 320-35042-1

			Prep Dilutant Date Used	Reagent Final Volume	Parent Reagent			
Reagent ID		Date			Reagent ID	Volume Added	- Analyte	Concentration
LC6:2FTS_00003	06/25/21	WE	LLINGTON, Lot 62FTS0	0616	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mI
LC8:2FTS_00003	08/22/21		LLINGTON, Lot 82FTS((Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mI
LCN-EtFOSAA_00004	09/30/21	WELI	INGTON, Lot NETFOSA	A0916	(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCN-MeFOSAA_00005	10/12/21		INGTON, Lot NMeFOSA		(Purchased Reag		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCPFBA 00007	05/27/21		on Laboratories, Lot		(Purchased Reag	ent)	Perfluorobutanoic acid (PFBA)	50 ug/mI
LCPFBS_00008	03/15/21	<u> </u>	n Laboratories, Lot		(Purchased Reag	,	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mI
LCPFDA 00008	05/29/22	Wellingt	on Laboratories, Lot	PFDA0517	(Purchased Reag		Perfluorodecanoic acid (PFDA)	50 ug/mI
LCPFDoA_00008	05/29/22	=	n Laboratories, Lot		(Purchased Reag		Perfluorododecanoic acid (PFDoA)	50 ug/mI
LCPFDSA_00002	05/24/21	-	n Laboratories, Lot		(Purchased Reag		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mI
LCPFHpA_00008	12/02/21	=	n Laboratories, Lot	-	(Purchased Reag		Perfluoroheptanoic acid (PFHpA)	50 ug/mI
LCPFHpSA_00003	09/01/22	Wellingto:	n Laboratories, Lot	LPFHpS0817	(Purchased Reag	ent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mI
LCPFHxA 00007	12/22/20		on Laboratories, Lot		(Purchased Reag		Perfluorohexanoic acid (PFHxA)	50 ug/mI
LCPFHxDA 00009	07/13/22	Wellingto:	n Laboratories, Lot	PFHxDA0717	(Purchased Reag		Perfluorohexadecanoic acid	50 ug/mI
LCPFHxS-br_00004	07/03/20	_	Laboratories, Lot b		(Purchased Reag		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mI
LCPFNA_00009	07/20/22		on Laboratories, Lot		(Purchased Reag		Perfluorononanoic acid (PFNA)	50 ug/mI
LCPFOA_00009	09/27/22		on Laboratories, Lot		(Purchased Reag		Perfluorooctanoic acid (PFOA)	50 ug/mI
LCPFODA_00009	07/13/22	Wellingto	n Laboratories, Lot	PFODA0717	(Purchased Reag		Perfluorooctadecanoic acid	50 ug/mI
LCPFOS-br_00004	10/14/20		Laboratories, Lot		(Purchased Reag		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mI
LCPFOSA_00010	09/30/21		n Laboratories, Lot		(Purchased Reag		Perfluorooctane Sulfonamide (FOSA)	50 ug/mI
LCPFPeA_00007	05/31/21	-	n Laboratories, Lot		(Purchased Reag	,	Perfluoropentanoic acid (PFPeA)	50 ug/mI
LCPFTeDA_00006	12/09/20	<u> </u>	n Laboratories, Lot		(Purchased Reag		Perfluorotetradecanoic acid (PFTeA)	50 ug/mI
LCPFTrDA_00006	02/12/21	_	n Laboratories, Lot		(Purchased Reag		Perfluorotridecanoic Acid (PFTriA)	50 ug/mI
LCPFUdA_00007	10/18/21	Wellingto	n Laboratories, Lot	PFUdA1016	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mI
LCPFC LL5 00003	06/23/18	01/02/18 M	eOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00032	10 mL	d3-NMeFOSAA	2.5 ng/mI
							d5-NEtFOSAA	2.5 ng/mI
							M2-6:2FTS	2.375 ng/mI
							M2-8:2FTS	2.395 ng/mI
							13C2-PFHxDA	2.5 ng/mI
							13C2-PFTeDA	2.5 ng/mI
							13C4-PFHpA	2.5 ng/mI
							13C5 PFPeA	2.5 ng/mI

|--|

				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentratio
							13C8 FOSA	2.5 ng/m
							13C4 PFBA	2.5 ng/m
							13C3-PFBS	2.325 ng/m
							13C2 PFDA	2.5 ng/m
							13C2 PFDoA	2.5 ng/m
							13C2 PFHxA	2.5 ng/m
							1802 PFHxS	2.365 ng/m
							13C5 PFNA	2.5 ng/m
							13C4 PFOA	2.5 ng/m
							13C4 PFOS	2.39 ng/m
							13C2 PFUnA	2.5 ng/m
					LCPFC-IS 00023	10 mT	13C2-PFOA	2.5 ng/m
					LCPFCSP 00127		Sodium	2.335 ng/m
					LCFFCSF_00127	J00 ul	1H,1H,2H,2H-perfluorohexane	2.333 119/11
							sulfonate (4:2)	
							Sodium	2.37 ng/m
							1H,1H,2H,2H-perfluorooctane	2.57 119/11
							sulfonate (6:2)	
							Sodium	2.395 ng/m
							1H,1H,2H,2H-perfluorodecane	2.030 11971
							sulfonate (8:2)	
							N-ethyl perfluorooctane	2.5 ng/m
							sulfonamidoacetic acid	,
							N-methyl perfluorooctane	2.5 ng/m
							sulfonamidoacetic acid	
							Perfluorobutanoic acid (PFBA)	2.5 ng/m
							Perfluorobutanesulfonic acid	2.21 ng/m
							(PFBS)]
							Perfluorodecanoic acid (PFDA)	2.5 ng/m
							Perfluorododecanoic acid	2.5 ng/m
							(PFDoA)	
							Perfluorodecanesulfonic acid	2.41 ng/m
							(PFDS)	
							Perfluoroheptanoic acid	2.5 ng/m
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	2.38 ng/m
							(PFHpS)	
							Perfluorohexanoic acid (PFHxA)	
							Perfluorohexadecanoic acid	2.5 ng/m
							Perfluorohexanesulfonic acid	2.275 ng/m
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	2.5 ng/m
							Perfluorooctanoic acid (PFOA)	2.5 ng/m
							Perfluorooctadecanoic acid	2.5 ng/m
							Perfluorooctanesulfonic acid	2.32 ng/m
							(PFOS)	
							Perfluorooctane Sulfonamide	2.5 ng/m
							(FOSA)	
							Perfluoropentanoic acid	2.5 ng/m
							(PFPeA)	1

Lab 1	Name:	TestAmerica	Sacramento	Job No.: 320-35042-1
-------	-------	-------------	------------	----------------------

				Reagent	Parent Reager	nt		
December 7D	Exp	Prep	Dilutant	Final	December 10	Volume	33	
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006		d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006		M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008		M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013		13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012		13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012		13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013		13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016		13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013		13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006		13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00018		13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00019		13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013		1802 PFHxS	0.0473 ug/mL
					LCMPFNA_00013 LCMPFOA 00017		13C5 PFNA 13C4 PFOA	0.05 ug/mL 0.05 ug/mL
					LCMPFOS 00025		13C4 PFOA	0.03 ug/mL 0.0478 ug/mL
					LCMPFUdA 00014		13C2 PFUnA	0.0478 ug/mL
LCd3-NMeFOSAA 00006	05/19/22	MET	l LLINGTON, Lot d3NMeFOSAA(1517	(Purchased Reag		d3-NMeFOSAA	50 ug/mL
LCd5-NETFOSAA 00006	11/08/22		LINGTON, Lot d5NEtFOSAA1		(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00006	02/17/22		ELLINGTON, Lot M262FTS02		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00008	07/05/22		ELLINGTON, Lot M282FTS07		(Purchased Reag		M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA 00013	07/13/22		on Laboratories, Lot M2P		(Purchased Reag		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00012	11/30/22		on Laboratories, Lot M2P		(Purchased Reag		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22		ton Laboratories, Lot M41		(Purchased Reag		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00013	07/20/22		on Laboratories, Lot M5		(Purchased Reag		13C5 PFPeA	50 ug/mL
LCM8FOSA 00016	10/11/22		on Laboratories, Lot M8E		(Purchased Reag		13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22		ton Laboratories, Lot ME		(Purchased Reag		13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22		ton Laboratories, Lot M3		(Purchased Reag		13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22		ton Laboratories, Lot ME		(Purchased Reag		13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22		ton Laboratories, Lot MP		(Purchased Reag		13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22	Welling	ton Laboratories, Lot MP	FHxA1017	(Purchased Reag		13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22		ton Laboratories, Lot MP		(Purchased Reag	ent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21	Welling	gton Laboratories, Lot ME	PFNA0916	(Purchased Reag	ent)	13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22	Welling	gton Laboratories, Lot ME	PFOA1017	(Purchased Reag	ent)	13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22		gton Laboratories, Lot ME		(Purchased Reag	ent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21	Welling	ton Laboratories, Lot MP	FUdA1116	(Purchased Reag	ent)	13C2 PFUnA	50 ug/mL
.LCPFC-IS 00023	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA 00008	200 uL	13C2-PFOA	0.05 ug/mL
LCM2PFOA_00008	02/12/21	Welling	ton Laboratories, Lot M2	PFOA0216	(Purchased Reag	ent)	13C2-PFOA	50 ug/mL

: 320-35042-1

			Dilutant Used	Reagent . Final Volume	Parent Reagent			
Reagent ID	Exp Date	Prep Date			Reagent ID	Volume Added	Analyte	Concentration
.LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
I					LCPFBA 00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008		Perfluorodecanoic acid (PFDA) Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDoA_00008			1 ug/mL
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003		Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
						LCPFHxA_00007		Perfluorohexanoic acid (PFHxA)
					LCPFHxDA_00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
						LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)
					LCPFNA_00009		Perfluorononanoic acid (PFNA)	1 ug/mL
I					LCPFOA_00009		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004		Perfluorooctadecanoic acid Perfluorooctanesulfonic acid	1 ug/mL 0.928 ug/mL
				LCPFOSA_00010	200 uL	(PFOS) Perfluorooctane Sulfonamide (FOSA)	1 ug/mL	
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS12	16	(Purchased Rea	igent)	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS06	16	(Purchased Rea	igent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
----------------------------------	----------------------

				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS08	816	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSAA_00004	09/30/21		LLINGTON, Lot NETFOSAA		(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSAA_00005	10/12/21	WE	LLINGTON, Lot NMeFOSAA	.0916	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA_00007	05/27/21	Wellin	gton Laboratories, Lot	PFBA0516	(Purchased Reag		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21	Welling	ton Laboratories, Lot	LPFBS0316	(Purchased Reag	ent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22	Wellin	gton Laboratories, Lot	PFDA0517	(Purchased Reag		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22		ton Laboratories, Lot		(Purchased Reag	•	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21	_	ton Laboratories, Lot		(Purchased Reag	ent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21	_	ton Laboratories, Lot	-	(Purchased Reag		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22	_	ton Laboratories, Lot I	=	(Purchased Reag		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA_00007	12/22/20	Welling	ton Laboratories, Lot	PFHxA1215	(Purchased Reag		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00009	07/13/22	Welling	ton Laboratories, Lot E	PFHxDA0717	(Purchased Reag		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00004	07/03/20	_	on Laboratories, Lot br		(Purchased Reag		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22	Welling	gton Laboratories, Lot	PFNA0717	(Purchased Reag		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00009	09/27/22	Wellin	gton Laboratories, Lot	PFOA0917	(Purchased Reag		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00009	07/13/22		ton Laboratories, Lot		(Purchased Reag		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00004	10/14/20		on Laboratories, Lot b		(Purchased Reag		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21	_	ton Laboratories, Lot		(Purchased Reag		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21	_	ton Laboratories, Lot		(Purchased Reag	•	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00006	12/09/20	_	ton Laboratories, Lot E		(Purchased Reag		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00006	02/12/21	_	ton Laboratories, Lot E		(Purchased Reag		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot	PFUdA1016	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC LL6 00004	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
			•				d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL

Lab Nai	ame: TestAmerica	Sacramento	Job No.: 320-35042-1
---------	------------------	------------	----------------------

				Reagent	Parent Read	gent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS 00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00127	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	4.67 ng/mL
							Sodium	4.74 ng/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	4.79 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							Perfluorobutanoic acid (PFBA)	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
----------------------------------	----------------------

				Reagent	Parent Reagen	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorotridecanoic Acid	5 ng/mL
							(PFTriA)	J 119/11111
							Perfluoroundecanoic acid	5 ng/mL
							(PFUnA)	_
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006		d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006		d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006		M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008		M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013		13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012		13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012		13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013		13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA 00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS 00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00013		13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00013	200 uL	1802 PFHxS	0.0473 ug/mL
					LCMPFNA 00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA 00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS 00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00014	200 uL	13C2 PFUnA	0.05 ug/mL
LCd3-NMeFOSAA 00006	05/19/22		LINGTON, Lot d3NMeFOSAA0		(Purchased Reage	ent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00006	11/08/22		LINGTON, Lot d5NEtFOSAA1		(Purchased Reage		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS_00006	02/17/22	W	ELLINGTON, Lot M262FTS021	17	(Purchased Reage	ent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS_00008	07/05/22	W	ELLINGTON, Lot M282FTS071	17	(Purchased Reage	ent)	M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA_00013	07/13/22		on Laboratories, Lot M2PH		(Purchased Reage	ent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00012	11/30/22	Wellingt	on Laboratories, Lot M2PH	FTeDA1117	(Purchased Reage	ent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00012	05/03/22	Wellingt	on Laboratories, Lot M4P	FHpA0517	(Purchased Reage		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00013	07/20/22		on Laboratories, Lot M5P		(Purchased Reage	ent)	13C5 PFPeA	50 ug/mL
LCM8FOSA_00016	10/11/22		on Laboratories, Lot M8F		(Purchased Reage		13C8 FOSA	50 ug/mL
LCMPFBA_00013	04/12/22		ton Laboratories, Lot MP		(Purchased Reage		13C4 PFBA	50 ug/mL
LCMPFBS_00006	05/24/22		ton Laboratories, Lot M31		(Purchased Reage		13C3-PFBS	46.5 ug/mL
LCMPFDA_00018	07/13/22		ton Laboratories, Lot MP		(Purchased Reage		13C2 PFDA	50 ug/mL
LCMPFDoA_00013	05/23/22		ton Laboratories, Lot MPI		(Purchased Reage		13C2 PFDoA	50 ug/mL
LCMPFHxA_00019	10/27/22		ton Laboratories, Lot MPH		(Purchased Reage		13C2 PFHxA	50 ug/mL
LCMPFHxS_00013	02/17/22		ton Laboratories, Lot MPI		(Purchased Reage		1802 PFHxS	47.3 ug/mL
LCMPFNA_00013	09/30/21	_	ton Laboratories, Lot MP		(Purchased Reage		13C5 PFNA	50 ug/mL
LCMPFOA_00017	10/17/22		ton Laboratories, Lot MP		(Purchased Reage		13C4 PFOA	50 ug/mL
LCMPFOS_00025	10/17/22		ton Laboratories, Lot MP		(Purchased Reage		13C4 PFOS	47.8 ug/mL
LCMPFUdA_00014	11/22/21		ton Laboratories, Lot MPI		(Purchased Reage		13C2 PFUnA	50 ug/mL
.LCPFC-IS_00023			Methanol, Lot 090285	200 mL			13C2-PFOA	0.05 ug/mL
LCM2PFOA_00008	02/12/21		ton Laboratories, Lot M21		(Purchased Reage		13C2-PFOA	50 ug/mL
.LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL		0.934 ug/mL
							1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
----------------------------------	----------------------

				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LC6:2FTS 00003	200 117	Sodium	0.948 ug/mL
					160.2113_00003	200 41	1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007		Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008		Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008		Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003		Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007		Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00009		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS121		(Purchased Reag		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS061	6	(Purchased Reag		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS081	6	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL

Lab Nai	ame: TestAmerica	Sacramento	Job No.: 320-35042-1
---------	------------------	------------	----------------------

				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCN-EtFOSAA 00004	09/30/21		LLINGTON, Lot NEtFOSAA		(Purchased Read		N-ethyl perfluorooctane	50 ug/mL
Len Berosini_00004	03/30/21		EBINGTON, LOC NECTOSIER	0010	(Tarchasea near	gene,	sulfonamidoacetic acid	30 dg/11111
LCN-MeFOSAA_00005	10/12/21		LLINGTON, Lot NMeFOSAA((Purchased Read	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFBA_00007	05/27/21		gton Laboratories, Lot		(Purchased Read	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00008	03/15/21	_	ton Laboratories, Lot I		(Purchased Read	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00008	05/29/22	Welling	gton Laboratories, Lot	PFDA0517	(Purchased Read		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00008	05/29/22	_	ton Laboratories, Lot I		(Purchased Read	· .	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDSA_00002	05/24/21	_	ton Laboratories, Lot I		(Purchased Read	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00008	12/02/21	Welling	ton Laboratories, Lot I	PFHpA1216	(Purchased Read	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00003	09/01/22	_	ton Laboratories, Lot L	=	(Purchased Read	gent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
LCPFHxA 00007	12/22/20	Welling	ton Laboratories, Lot B	PFHxA1215	(Purchased Read		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA 00009	07/13/22		on Laboratories, Lot P		(Purchased Read	gent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00004	07/03/20	Wellingto	on Laboratories, Lot br	PFHxSK0615	(Purchased Read	gent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00009	07/20/22		gton Laboratories, Lot		(Purchased Read	<i></i>	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00009	09/27/22	Welling	gton Laboratories, Lot	PFOA0917	(Purchased Read		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00009	07/13/22	Welling	ton Laboratories, Lot I	PFODA0717	(Purchased Read		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00004	10/14/20		on Laboratories, Lot b		(Purchased Read	· .	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00010	09/30/21		ton Laboratories, Lot H		(Purchased Read	-	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00007	05/31/21	_	ton Laboratories, Lot I		(Purchased Read		Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00006	12/09/20	_	ton Laboratories, Lot P		(Purchased Read		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00006	02/12/21	_	on Laboratories, Lot P		(Purchased Read		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot !	PFUdA1016	(Purchased Read	gent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL7_00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC ALL SU 00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL

Lab Nai	ame: TestAmerica	Sacramento	Job No.: 320-35042-1
---------	------------------	------------	----------------------

				Reagent	Parent Rea	gent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							1802 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS 00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00127	2 mL	Sodium	9.34 ng/mL
					_		1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	9.48 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	9.58 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutanoic acid (PFBA)	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid (PFDA)	10 ng/mL
							Perfluorododecanoic acid (PFDoA)	10 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	9.52 ng/mL
							Perfluorohexanoic acid (PFHxA)	10 ng/mL
							Perfluorohexadecanoic acid	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10 ng/mL
							Perfluorooctadecanoic acid	10 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	10 ng/mL
							Perfluoropentanoic acid (PFPeA)	10 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	10 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	10 ng/mL
							Perfluoroundecanoic acid (PFUnA)	10 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
----------------------------------	----------------------

Reagent ID		Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent			
	Exp Date				Reagent ID	Volume Added	Analyte	Concentration
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mI
					LCd5-NEtFOSAA 00006	200 uL	d5-NEtFOSAA	0.05 ug/ml
					LCM2-6:FTS 00006	200 uL	M2-6:2FTS	0.0475 ug/m
					LCM2-8:2FTS 00008	200 uL	M2-8:2FTS	0.0479 ug/m
					LCM2PFHxDA 00013	200 uL	13C2-PFHxDA	0.05 ug/m
					LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	0.05 ug/m
					LCM4PFHPA 00012	200 uL	13C4-PFHpA	0.05 ug/m
					LCM5PFPEA 00013		13C5 PFPeA	0.05 ug/ml
					LCM8FOSA 00016	200 uL	13C8 FOSA	0.05 ug/ml
					LCMPFBA 00013	200 uL	13C4 PFBA	0.05 ug/ml
					LCMPFBS 00006	200 uL	13C3-PFBS	0.0465 ug/mI
					LCMPFDA 00018	200 uL	13C2 PFDA	0.05 ug/mI
					LCMPFDoA 00013	200 uL	13C2 PFDoA	0.05 ug/mI
					LCMPFHxA 00019	200 uL	13C2 PFHxA	0.05 ug/mI
					LCMPFHxS 00013	200 uL	1802 PFHxS	0.0473 ug/mI
					LCMPFNA 00013	200 uL	13C5 PFNA	0.05 ug/mI
					LCMPFOA 00017	200 uL	13C4 PFOA	0.05 ug/mI
					LCMPFOS 00025	200 uL	13C4 PFOS	0.0478 ug/mI
					LCMPFUdA 00014	200 uL	13C2 PFUnA	0.05 ug/mI
.LCd3-NMeFOSAA 00006	05/19/22	WEI	LINGTON, Lot d3NMeFOSAAC	517	(Purchased Reag		d3-NMeFOSAA	50 ug/mI
.LCd5-NEtFOSAA 00006	11/08/22	WEI	LINGTON, Lot d5NEtFOSAA1	.117	(Purchased Reag	ent)	d5-NEtFOSAA	50 ug/mI
.LCM2-6:FTS 00006	02/17/22	W	ELLINGTON, Lot M262FTS02	17	(Purchased Reag	ent)	M2-6:2FTS	47.5 ug/mI
.LCM2-8:2FTS 00008	07/05/22	W	ELLINGTON, Lot M282FTS07	17	(Purchased Reag	ent)	M2-8:2FTS	47.9 ug/ml
.LCM2PFHxDA 00013	07/13/22	Wellingt	on Laboratories, Lot M2P	FHxDA0717	(Purchased Reag	ent)	13C2-PFHxDA	50 ug/m
LCM2PFTeDA 00012	11/30/22		on Laboratories, Lot M2P	FTeDA1117	(Purchased Reag	ent)	13C2-PFTeDA	50 ug/ml
LCM4PFHPA 00012	05/03/22	Wellingt	on Laboratories, Lot M4E	FHpA0517	(Purchased Reag	ent)	13C4-PFHpA	50 ug/mI
LCM5PFPEA 00013	07/20/22	Wellingt	on Laboratories, Lot M5E	FPeA0717	(Purchased Reag	ent)	13C5 PFPeA	50 ug/mI
LCM8FOSA 00016	10/11/22		on Laboratories, Lot M8E		(Purchased Reag	ent)	13C8 FOSA	50 ug/mI
LCMPFBA 00013	04/12/22	Welling	ton Laboratories, Lot ME	FBA0417	(Purchased Reag	ent)	13C4 PFBA	50 ug/mI
LCMPFBS 00006	05/24/22	Welling	ton Laboratories, Lot M3	PFBS0815	(Purchased Reag	ent)	13C3-PFBS	46.5 ug/mI
LCMPFDA 00018	07/13/22	Welling	ton Laboratories, Lot ME	FDA0717	(Purchased Reag	ent)	13C2 PFDA	50 ug/mI
.LCMPFDoA 00013	05/23/22	Welling	ton Laboratories, Lot MP	FDoA0517	(Purchased Reag	ent)	13C2 PFDoA	50 ug/mI
LCMPFHxA 00019	10/27/22	Welling	ton Laboratories, Lot MP	FHxA1017	(Purchased Reag	ent)	13C2 PFHxA	50 ug/mI
LCMPFHxS 00013	02/17/22	Welling	ton Laboratories, Lot MP	FHxS0217	(Purchased Reag	ent)	1802 PFHxS	47.3 ug/mI
LCMPFNA 00013	09/30/21		ton Laboratories, Lot ME		(Purchased Reag		13C5 PFNA	50 ug/mI
LCMPFOA 00017	10/17/22		ton Laboratories, Lot ME		(Purchased Reag		13C4 PFOA	50 ug/mI
LCMPFOS 00025	10/17/22		ton Laboratories, Lot ME		(Purchased Reag		13C4 PFOS	47.8 ug/mI
LCMPFUdA 00014	11/22/21		ton Laboratories, Lot MP		(Purchased Reag		13C2 PFUnA	50 ug/mI
LCPFC-IS 00023	06/28/18		Methanol, Lot 090285	200 mL		200 uL		0.05 ug/mI
.LCM2PFOA 00008	02/12/21		ton Laboratories, Lot M2		(Purchased Reag		13C2-PFOA	50 ug/ml
LCPFCSP_00127		12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mI
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mI

ab Name: TestAmerica Sacramento	Job No.: 320-35042-1
---------------------------------	----------------------

					Parent Reage	nt		
	Erm	Prep	Dilutant	Reagent Final		Volume		
Reagent ID	Exp Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
Reagene 15	Date	Date		VOTAME			=	
					LC8:2FTS_00003	200 uL	Sodium	0.958 ug/mL
							1H,1H,2H,2H-perfluorodecane	
					T CNT . FL FO CN N . 00004	200 +	sulfonate (8:2)	1 . /
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane	1 ug/mL
					TON MAROON OOOG	200	sulfonamidoacetic acid N-methyl perfluorooctane	1
					LCN-MeFOSAA_00005	200 uL	sulfonamidoacetic acid	1 ug/mL
					LCPFBA 00007	200 117	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008		Perfluorobutanesulfonic acid	0.884 ug/mL
					TCLLP2_00000	200 uL	(PFBS)	0.004 ug/IIIL
					LCPFDA 00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA 00008	200 uL	Perfluorododecanoic acid	1 ug/mL
					_		(PFDoA)	
					LCPFDSA 00002	200 uL	Perfluorodecanesulfonic acid	0.964 ug/mL
					_		(PFDS)	
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid	1 ug/mL
							(PFHpA)	
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
							(PFHpS)	
					LCPFHxA_00007		Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00009		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br 00004		Perfluorooctanesulfonic acid	0.928 ug/mL
					_		(PFOS)	
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA 00007	200 117	Perfluoropentanoic acid	1 ug/mL
					LCFFFEA_00007	200 ul	(PFPeA)	I ug/IIII
					LCPFTeDA 00006	200 11T.	Perfluorotetradecanoic acid	1 ug/mL
						200 41	(PFTeA)	1 49/1111
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LC4:2FTS 00003	12/12/21	W	ELLINGTON, Lot 42FTS121	6	(Purchased Read	gent)	Sodium	46.7 ug/mL
	,,			-	(= == == == = = = = = = = = = = = = = =)/	1H,1H,2H,2H-perfluorohexane	1
							sulfonate (4:2)	
LC6:2FTS 00003	06/25/21	W	ELLINGTON, Lot 62FTS061	6	(Purchased Read	gent)	Sodium	47.4 ug/mL
_							1H,1H,2H,2H-perfluorooctane	_
					<u> </u>		sulfonate (6:2)	
LC8:2FTS_00003	08/22/21	W	ELLINGTON, Lot 82FTS081	6	(Purchased Read	gent)	Sodium	47.9 ug/mL
							1H,1H,2H,2H-perfluorodecane	
							sulfonate (8:2)	
LCN-EtFOSAA_00004	09/30/21	WEI	LINGTON, Lot NEtFOSAA09	916	(Purchased Read	gent)	N-ethyl perfluorooctane	50 ug/mL
							sulfonamidoacetic acid	

ab Name: TestAmerica Sacramento	Job No.: 320-35042-1
---------------------------------	----------------------

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCN-MeFOSAA_00005	10/12/21	WE	LLINGTON, Lot NMeFOSAA	0916	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCPFBA 00007	05/27/21		gton Laboratories, Lot		(Purchased Reag		Perfluorobutanoic acid (PFBA)	50 ug/mI
LCPFBS_00008	03/15/21	_	ton Laboratories, Lot		(Purchased Reag	ent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mI
LCPFDA_00008	05/29/22		gton Laboratories, Lot		(Purchased Reag		Perfluorodecanoic acid (PFDA)	50 ug/mI
LCPFDoA_00008	05/29/22	_	ton Laboratories, Lot		(Purchased Reag		Perfluorododecanoic acid (PFDoA)	50 ug/mI
LCPFDSA_00002	05/24/21	_	ton Laboratories, Lot		(Purchased Reag		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mI
LCPFHpA_00008	12/02/21	_	ton Laboratories, Lot	_	(Purchased Reag	ent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mI
LCPFHpSA_00003	09/01/22	Wellingt	con Laboratories, Lot I	LPFHpS0817	(Purchased Reag	ent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mI
LCPFHxA_00007	12/22/20		ton Laboratories, Lot		(Purchased Reag		Perfluorohexanoic acid (PFHxA)	50 ug/mI
LCPFHxDA_00009	07/13/22		ton Laboratories, Lot E		(Purchased Reag		Perfluorohexadecanoic acid	50 ug/mI
LCPFHxS-br_00004	07/03/20	_	on Laboratories, Lot br		(Purchased Reag		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mI
LCPFNA_00009	07/20/22	Welling	gton Laboratories, Lot	PFNA0717	(Purchased Reag		Perfluorononanoic acid (PFNA)	50 ug/mI
LCPFOA 00009	09/27/22	Welling	gton Laboratories, Lot	PFOA0917	(Purchased Reag		Perfluorooctanoic acid (PFOA)	50 ug/mI
LCPFODA_00009	07/13/22	Welling	ton Laboratories, Lot	PFODA0717	(Purchased Reag		Perfluorooctadecanoic acid	50 ug/mI
LCPFOS-br_00004	10/14/20		on Laboratories, Lot b		(Purchased Reag		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mI
LCPFOSA_00010	09/30/21		ton Laboratories, Lot		(Purchased Reag		Perfluorooctane Sulfonamide (FOSA)	50 ug/mI
LCPFPeA_00007	05/31/21	_	ton Laboratories, Lot		(Purchased Reag		Perfluoropentanoic acid (PFPeA)	50 ug/mI
LCPFTeDA_00006	12/09/20	_	con Laboratories, Lot E		(Purchased Reag		Perfluorotetradecanoic acid (PFTeA)	50 ug/mI
LCPFTrDA_00006	02/12/21		ton Laboratories, Lot E		(Purchased Reag	,	Perfluorotridecanoic Acid (PFTriA)	50 ug/mI
LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot	PFUdA1016	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mI
LCPFCIC_FULL_00009	06/28/18	01/02/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC ALL SU 00029	0.5 mL	d3-NMeFOSAA	2.5 ng/mI
							d5-NEtFOSAA	2.5 ng/mI
							M2-6:2FTS	2.375 ng/mI
							M2-8:2FTS	2.395 ng/mI
							13C2-PFHxDA	2.5 ng/mI
							13C2-PFTeDA	2.5 ng/mI
							13C4-PFHpA	2.5 ng/mI
							13C5 PFPeA	2.5 ng/mI
							13C8 FOSA	2.5 ng/mI
							13C4 PFBA	2.5 ng/mI
							13C3-PFBS	2.325 ng/mI
							13C2 PFDA	2.5 ng/mI
							13C2 PFDoA	2.5 ng/mI
							13C2 PFHxA	2.5 ng/mI
							1802 PFHxS	2.365 ng/mI
							13C5 PFNA	2.5 ng/mI

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1	
	Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

				Reagent	Parent Reagen	t		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFAC-24PAR 00001	250 uL	Perfluorobutanesulfonic acid	2.2125 ng/mL
					_		(PFBS)	
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.4125 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.375 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.28 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.31375 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid	2.5 ng/mL
							(PFTriA)	
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ALL_SU_00029	06/28/18	12/28/17	Methanol, Lot Baker 141039	10000 uL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	1 ug/mL
			141033		LCd5-NEtFOSAA 00006	2.00 tiTi	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00006		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00008		M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA 00013		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00012	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00012	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00013	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00016		13C8 FOSA	1 ug/mL
					LCMPFBA_00013		13C4 PFBA	1 ug/mL
					LCMPFBS 00006		13C3-PFBS	0.93 ug/mL
					LCMPFDA 00018		13C2 PFDA	1 ug/mL
					LCMPFDoA 00013		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00019		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00013		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	1 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
----------------------------------	----------------------

				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCMPFOA 00017	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00025	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00014		13C2 PFUnA	1 ug/mL
LCd3-NMeFOSAA 00006	05/19/22	WEI	LINGTON, Lot d3NMeFOSA	AA0517	(Purchased Rea	agent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00006	11/08/22	WEI	LINGTON, Lot d5NEtFOSA	AA1117	(Purchased Rea	agent)	d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00006	02/17/22	W]	ELLINGTON, Lot M262FTS	0217	(Purchased Rea	agent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00008	07/05/22	W]	ELLINGTON, Lot M282FTS	0717	(Purchased Rea	agent)	M2-8:2FTS	47.9 ug/mL
LCM2PFHxDA 00013	07/13/22	Wellingto	on Laboratories, Lot M	2PFHxDA0717	(Purchased Rea	agent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00012	11/30/22	Wellingto	on Laboratories, Lot M	2PFTeDA1117	(Purchased Rea	agent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00012	05/03/22	Wellingt	on Laboratories, Lot N	M4PFHpA0517	(Purchased Rea	agent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00013	07/20/22		on Laboratories, Lot N		(Purchased Rea		13C5 PFPeA	50 ug/mL
LCM8FOSA 00016	10/11/22	Wellingt	on Laboratories, Lot N	M8FOSA1017I	(Purchased Rea	agent)	13C8 FOSA	50 ug/mL
LCMPFBA 00013	04/12/22		ton Laboratories, Lot		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFBS 00006	05/24/22		on Laboratories, Lot		(Purchased Rea		13C3-PFBS	46.5 ug/mL
LCMPFDA 00018	07/13/22		ton Laboratories, Lot		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00013	05/23/22		ton Laboratories, Lot	MPFDoA0517	(Purchased Rea	agent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00019	10/27/22		on Laboratories, Lot		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00013	02/17/22		ton Laboratories, Lot		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00013	09/30/21		ton Laboratories, Lot		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00017	10/17/22		ton Laboratories, Lot		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00025	10/17/22		ton Laboratories, Lot		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00014	11/22/21		on Laboratories, Lot		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFAC-24PAR 00001	09/15/22		llington Laboratories,		(Purchased Rea		Perfluorobutanesulfonic acid	1.77 ug/mL
_			PFAC24PAR0917		,	J ,	(PFBS)	
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid	1.93 ug/mL
							(PFDS)	
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid	2 ug/mL
							(PFDoA)	
							Perfluoroheptanesulfonic Acid	1.9 ug/mL
							(PFHpS)	- /
							Perfluoroheptanoic acid	2 ug/mL
							(PFHpA) Perfluorohexanesulfonic acid	1 004 - /
							(PFHxS)	1.824 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctane Sulfonamide	2 ug/mL
							(FOSA)	2 ug/11111
							Perfluorooctanesulfonic acid	1.851 ug/mL
							(PFOS)	1.001 49/1111
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid	2 ug/mL
							(PFPeA)	2 49/1112
							Perfluorotetradecanoic acid	2 ug/mL
							(PFTeA)]
							Perfluorotridecanoic Acid	2 ug/mL
							(PFTriA)	1

Lab	Name:	TestAmerica	Sacramento	O	320-35	JU4.	2-1	

				Reagent	Parent Reagent			
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added		Concentration
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
LCPFCSP_00119	03/29/18	10/02/17	Methanol, Lot 090285	250 mL	LC4:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.01868 ug/mL
					LC6:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.01896 ug/mL
					LC8:2FTS_00003		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.01916 ug/mL
					LCN-EtFOSA-M_00005		N-ethylperfluoro-1-octanesulfo namide	0.02 ug/mL
					LCN-EtFOSAA_00004		N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCN-MeFOSA-M 00004	100 uL	MeFOSA	0.02 ug/mL
					LCN-MeFOSAA_00004		N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA 00007	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mI
				LCPFBS_00008		Perfluorobutane Sulfonate Perfluorobutanesulfonic acid	0.01768 ug/mL 0.01768 ug/mL	
					TODED 3 00007	100	(PFBS)	0 00/
				LCPFDA_00007 LCPFDoA_00007		Perfluorodecanoic acid (PFDA) Perfluorododecanoic acid (PFDoA)	0.02 ug/mL 0.02 ug/mL	
				LCPFDSA_00002	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL	
					LCPFHpA_00008		Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003		Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00007		Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00008		Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00004	100 uL	Perfluorohexane Sulfonate Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL 0.0182 ug/mL
					LCPFNA 00009	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFOA 00008		Perfluorooctanoic acid (PFOA)	0.02 ug/mL
					LCPFODA 00008	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00004		Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00010		Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00007		Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFTeDA_00007		Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00007	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1	
---	--

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFUdA_00007	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.LC4:2FTS_00003	12/12/21	W.	ELLINGTON, Lot 42FTS1	216	(Purchased Rea	,	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
.LC6:2FTS_00003	06/25/21	W.	ELLINGTON, Lot 62FTS0	616	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
.LC8:2FTS_00003	08/22/21	W.	ELLINGTON, Lot 82FTS0	816	(Purchased Rea	gent)	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
.LCN-EtFOSA-M_00005	05/24/21	WEI	LINGTON, Lot NEtFOSA	0516M	(Purchased Rea	gent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
.LCN-EtFOSAA_00004	09/30/21	WEI	LLINGTON, Lot NETFOSA	A0916	(Purchased Rea	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCN-MeFOSA-M 00004	05/24/21	WEI	LLINGTON, Lot NMeFOSA	0516M	(Purchased Rea	gent)	MeFOSA	50 ug/mL
.LCN-MeFOSAA_00004	10/12/21	WEI	LLINGTON, Lot NMeFOSA	A0916	(Purchased Rea	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCPFBA 00007	05/27/21	Welling	ton Laboratories, Lot	PFBA0516	(Purchased Rea	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS 00008	03/15/21	Wellingt	on Laboratories, Lot	LPFBS0316	(Purchased Rea	gent)	Perfluorobutane Sulfonate	44.2 ug/mL
_							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00007	05/31/21		ton Laboratories, Lot		(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00007	05/31/21	_	con Laboratories, Lot		(Purchased Rea	_	Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDSA_00002	05/24/21	_	con Laboratories, Lot		(Purchased Rea		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00008	12/02/21		on Laboratories, Lot		(Purchased Rea	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22	Wellingt	on Laboratories, Lot	LPFHpS0817	(Purchased Rea	gent)	Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
.LCPFHxA_00007	12/22/20	,	on Laboratories, Lot		(Purchased Rea	J /	Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA_00008	05/25/21		on Laboratories, Lot		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00004	07/03/20	Wellingto	n Laboratories, Lot b	rPFHxSK0615	(Purchased Rea	gent)	Perfluorohexane Sulfonate Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL 45.5 ug/mL
.LCPFNA 00009	07/20/22	Welling	ton Laboratories, Lot	PFNA0717	(Purchased Rea	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA 00008	08/02/21		ton Laboratories, Lot		(Purchased Rea	gent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA 00008	04/29/21		on Laboratories, Lot		(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00004	10/14/20			(Purchased Rea	gent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL	
.LCPFOSA_00010	09/30/21	_	on Laboratories, Lot		(Purchased Rea	gent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00007	05/31/21	_	on Laboratories, Lot		(Purchased Rea		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFTeDA_00007	09/30/21	Wellingt	on Laboratories, Lot	PFTeDA0916	(Purchased Rea	gent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00007	02/12/21	Wellingt	on Laboratories, Lot	PFTrDA0216	(Purchased Rea	gent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL

Job No.: 320-35042-1

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
.LCPFUdA_00007	10/18/21	Welling	ton Laboratories, Lot PF	FUdA1016	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC4:2FTS_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

4:2FTS

LOT NUMBER:

42FTS1216

COMPOUND:

Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE:

CAS #:

Not available

F F F H H SO₃ Ne⁴

MOLECULAR FORMULA:

C_aH₄F_aSO₃Na

MOLECULAR WEIGHT:

350.13

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

46.7 ± 2.3 μg/ml (4:2FTS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/12/2016

EXPIRY DATE: (mm/dd/yyyy)

12/12/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B C Chillin

Date:

: <u>12/21/201</u>

(mm/dd/yyyy)

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

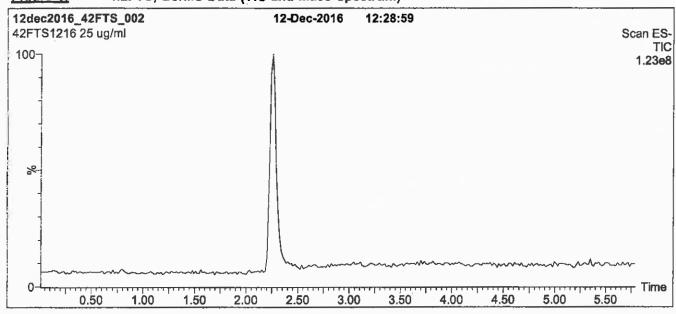
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

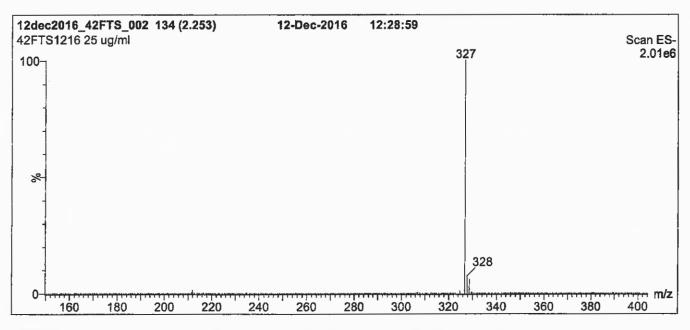


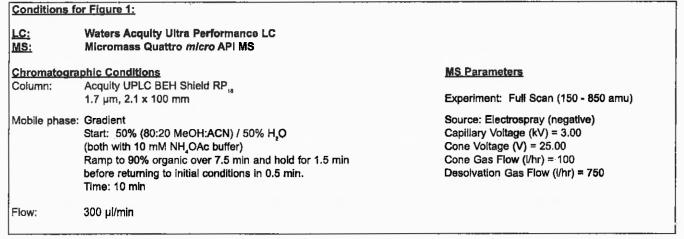


For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

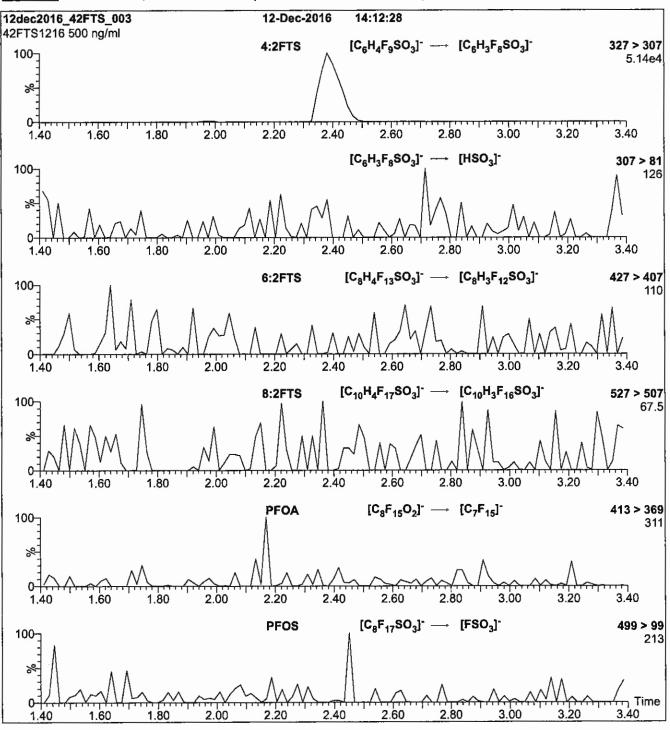
Figure 1: 4:2FTS; LC/MS Data (TIC and Mass Spectrum)

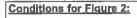






4:2FTS; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





injection:

Flow:

Direct loop injection

10 µl (500 ng/ml 4:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH OAc buffer)

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3 Collision Energy (eV) = 25

Reagent

LC6:2FTS_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

6:2FTS

LOT NUMBER:

62FTS0616

COMPOUND:

Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C_BH₄F₁₃SO₃Na

MOLECULAR WEIGHT:

450.15

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$

47.4 ± 2.4 µg/ml

(Na salt) SOLVENT(S):

(6:2FTS anion)

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/25/2016

EXPIRY DATE: (mm/dd/yyyy)

06/25/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 06/29/2016

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the Independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_{i}(y(x_{1},x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n} u(y,x_{i})^{2}}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

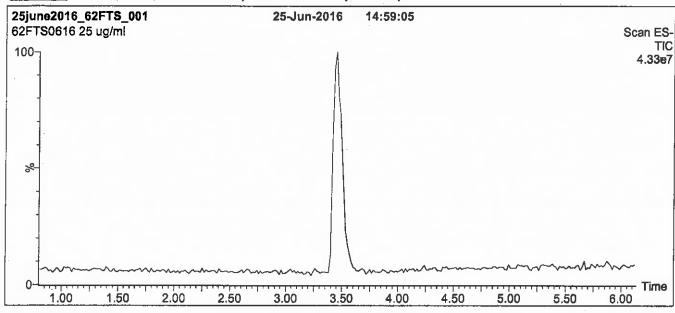
QUALITY MANAGEMENT:

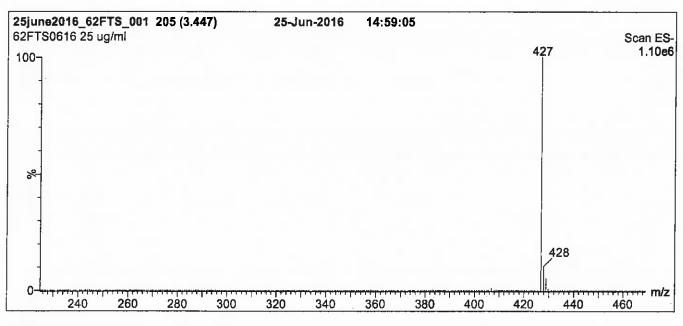
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: 6:2FTS; LC/MS Data (TIC and Mass Spectrum)





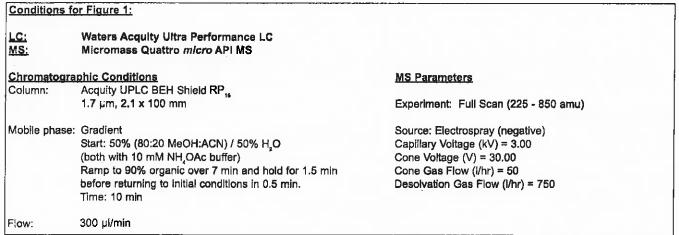
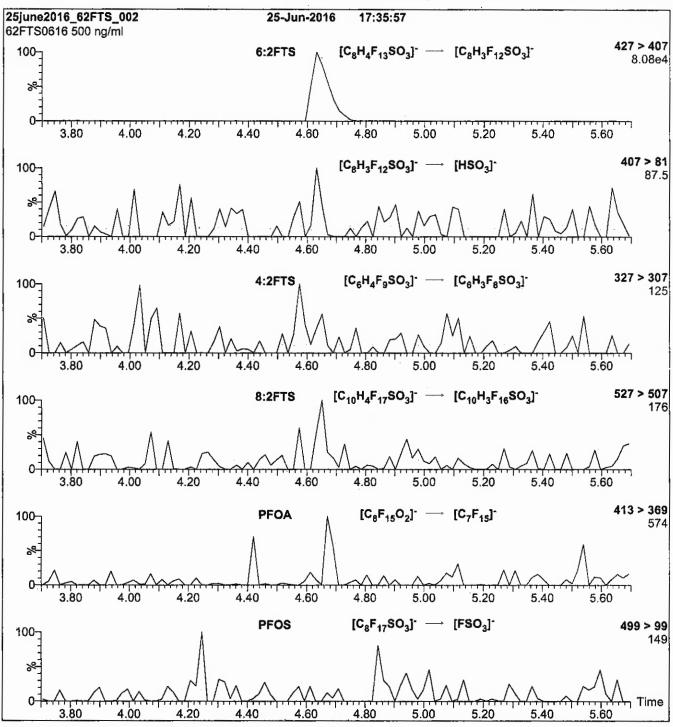
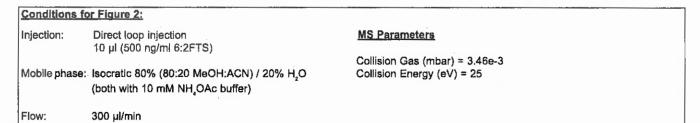


Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LC8:2FTS_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

8:2FTS

LOT NUMBER:

82FTS0816

COMPOUND:

-

Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE:

CAS #:

Not available

(8:2FTS anion)

MOLECULAR FORMULA:

C₁₀H₄F₁₇SO₃Na

47.9 ± 2.4 µg/ml

MOLECULAR WEIGHT:

550.16

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

08/22/2016

EXPIRY DATE; (mm/dd/yyyy)

08/22/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>08/25/2016</u> (mm/dd/yyyy)

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unamblguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of Interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_i(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_{\epsilon}(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

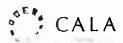
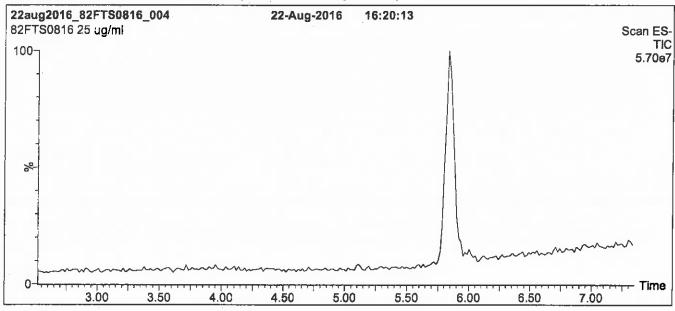
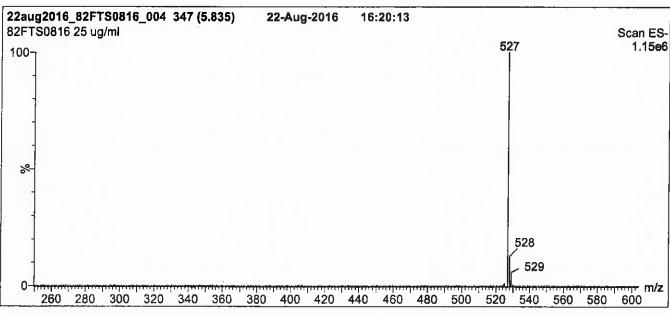




Figure 1: 8:2FTS; LC/MS Data (TIC and Mass Spectrum)





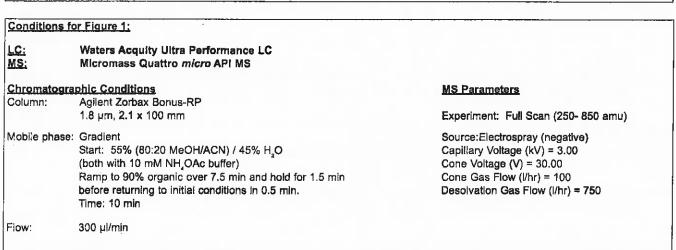
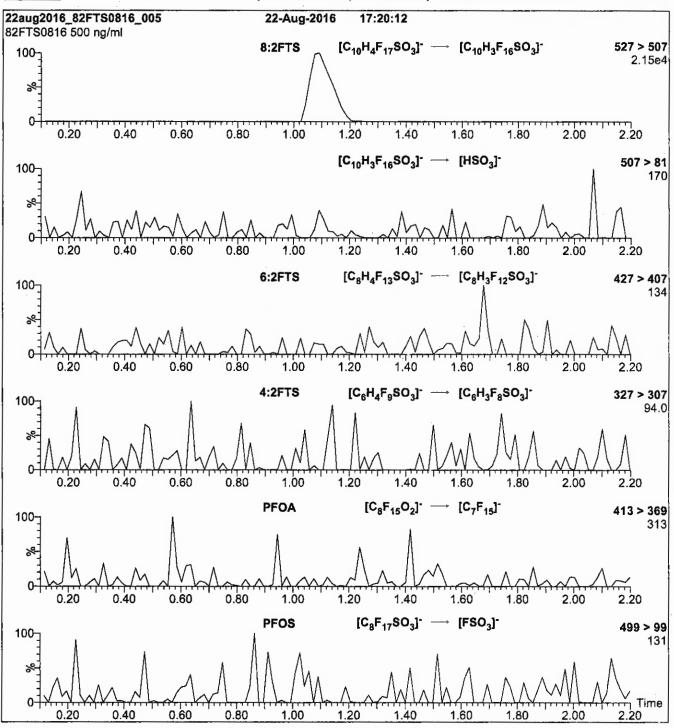
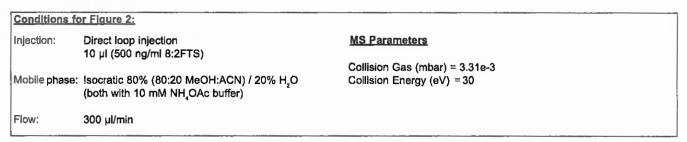


Figure 2: 8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCd3-NMeFOSAA_00006



ID: LCd3-NMeFOSAA_00006 Exp: 05/19/22 Prpd; CCL d3-N-MeFOSAA





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d3-N-MeFOSAA

LOT NUMBER:

d3NMeFOSAA0517

COMPOUND:

N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₁₁D₃H₃F₁₇NO₄S

 $50 \pm 2.5 \, \mu g/ml$

MOLECULAR WEIGHT:

574.23

CONCENTRATION:

SOLVENT(S):

ISOTOPIC PURITY:

Methanol Water (<1%)

≥98% ²H_a

CHEMICAL PURITY: LAST TESTED: (mm/dd/ywy) >98%

05/19/2017

EXPIRY DATE: (mm/dd/yyyy)

05/19/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 05/31/2017

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_x(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The Individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

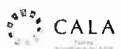
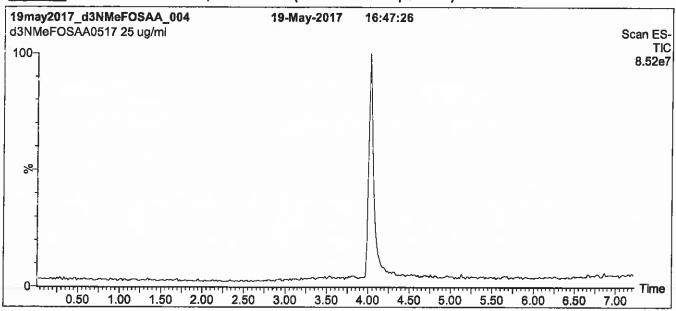
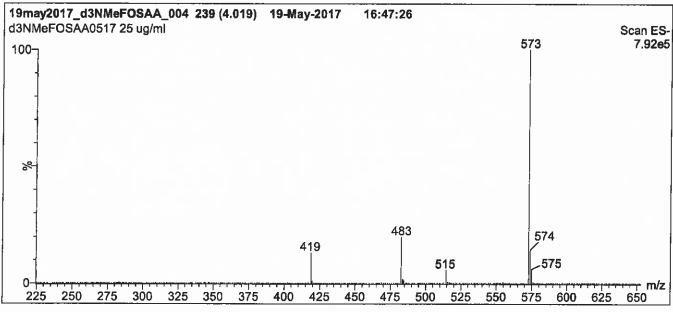




Figure 1: d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





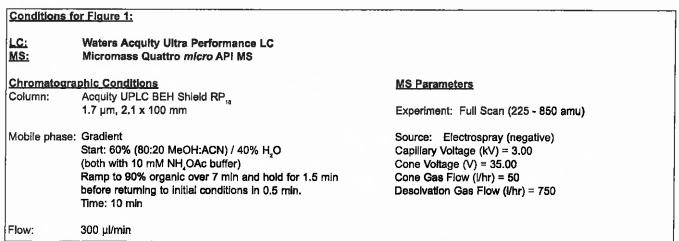
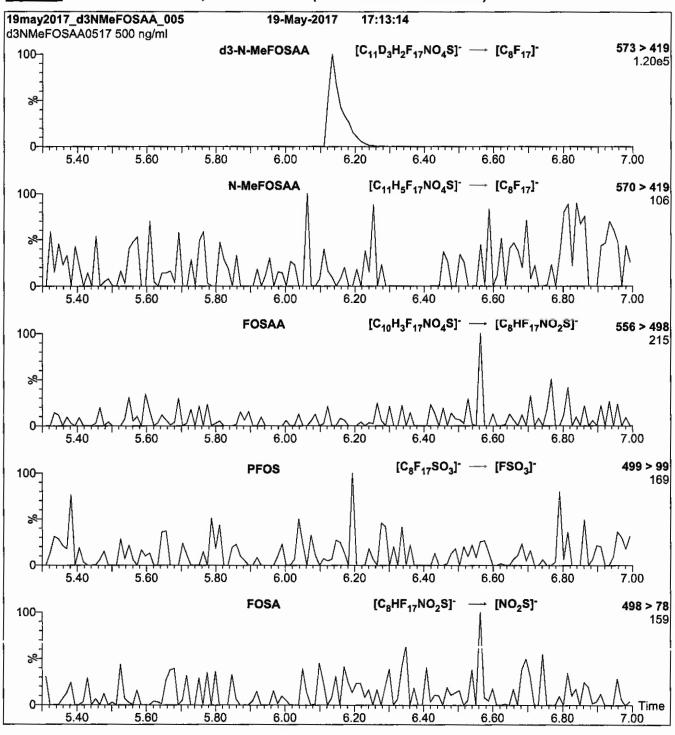
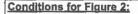


Figure 2: d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 μl (500 ng/ml d3-N-MeFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH OAc buffer)

300 µl/min

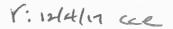
MS Parameters

Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 20

LCd5-NEtFOSAA_00006



ID: LCd5-NEtFOSAA_00006 Exp: 11/08/22 Prpd: CCL d5-N-EtFOSAA





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d5-N-EtFOSAA

LOT NUMBER:

d5NEtFOSAA1117

COMPOUND:

N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

Not available

$$\mathsf{F} = \mathsf{C} =$$

MOLECULAR FORMULA:

C,2D,H3F,7NO4S

MOLECULAR WEIGHT:

590.26

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

Water (<1%) ≥98% ²H_e

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

11/08/2017

EXPIRY DATE: (mm/dd/yyy)

11/08/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eg. of NaOH to prevent the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 11/16/2017

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS;

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_x(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ... x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

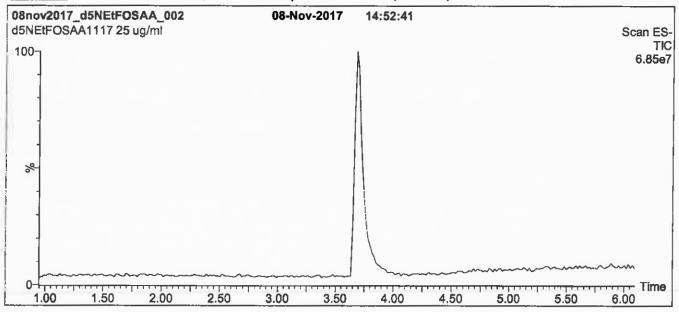
QUALITY MANAGEMENT:

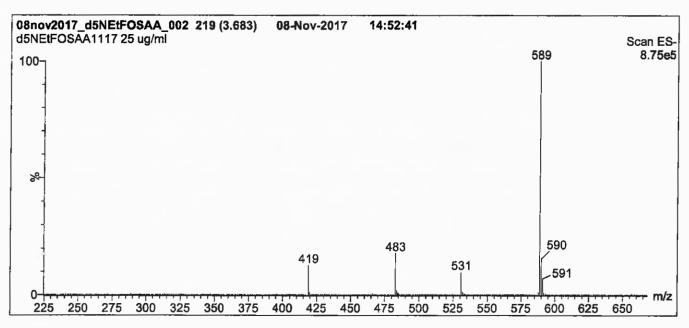
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





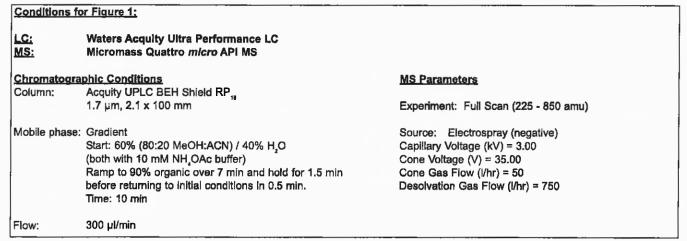
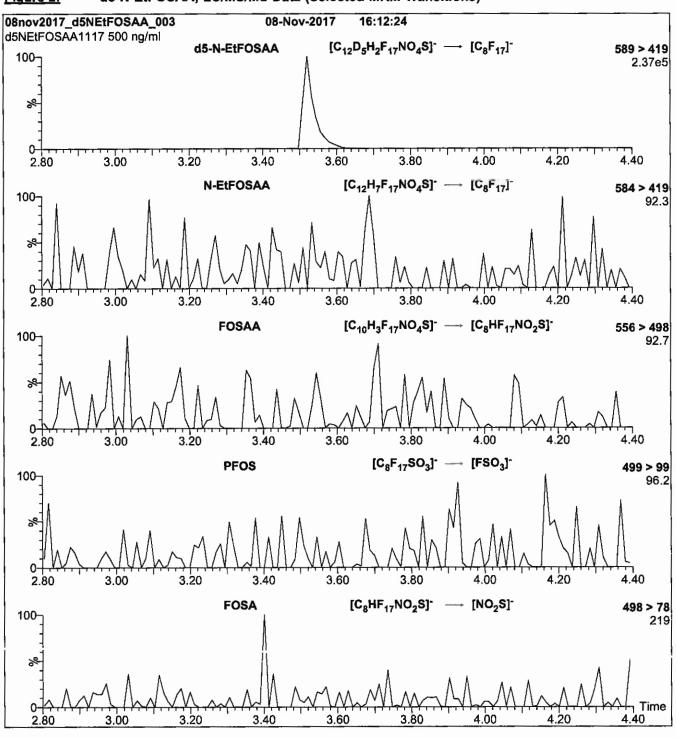
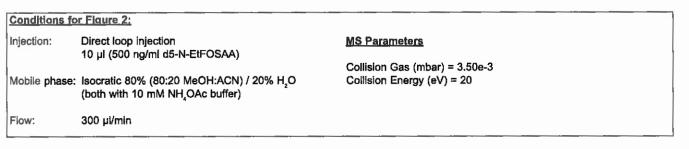


Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)

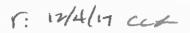




LCM2-6:FTS_00006



ID: LCM2-6:FTS_00006 Exp: 62/17/22 Prod: CCL M2-6:2FTS





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-6:2FTS

LOT NUMBER:

M262FTS0217

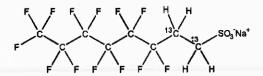
COMPOUND:

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C,]octane sulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₆H₄F₁₃SO₃Na

MOLECULAR WEIGHT:

452.13

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt) SOLVENT(S):

Methanoi

 $47.5 \pm 2.4 \,\mu g/ml$

(M2-6:2FTS anion)

>99% 13C

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

(1,2-13C₂)

LAST TESTED: (mm/dd/yyyy)

02/17/2017

EXPIRY DATE: (mm/dd/yyyy)

02/17/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

The native 6:2FTS contains 4.22% of 34S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 02/24/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • Info@well-labs.com

The products prepared by Wellington Laboratorles Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_{x}(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

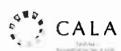
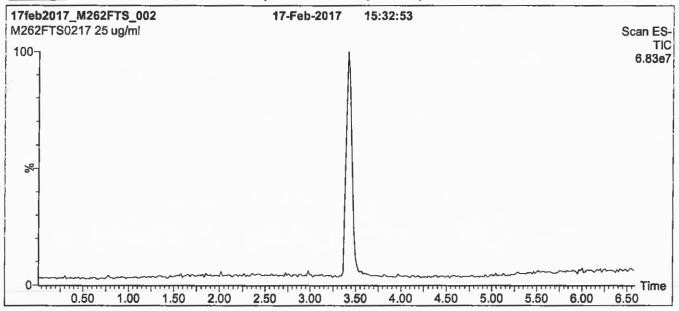
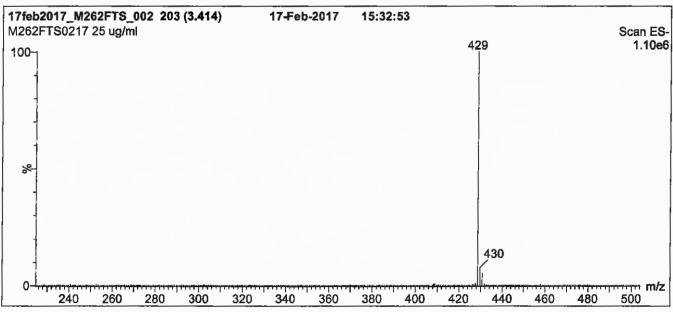




Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)





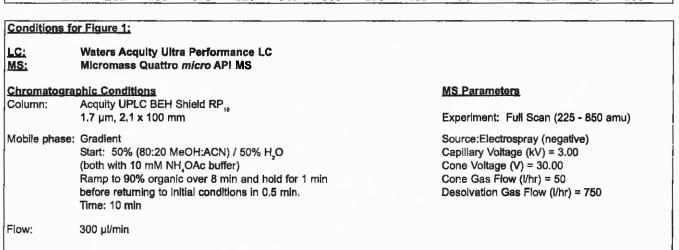
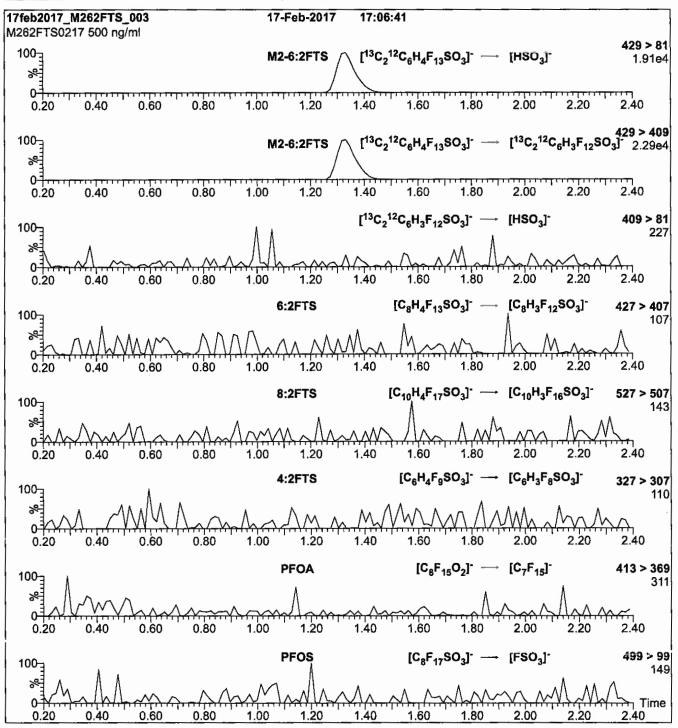
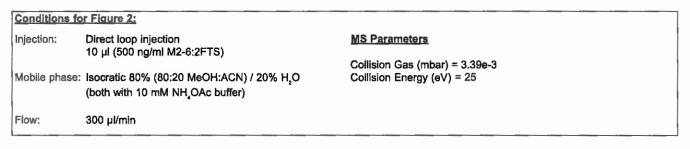


Figure 2: M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)

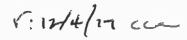




LCM2-8:2FTS 00008



D: LCM2-8:2FTS_00008 Exp: 67/05/22 Prpd; CCI, M2-8:2FTS





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-8:2FTS

LOT NUMBER:

M282FTS0717

COMPOUND:

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C,]decane sulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₂H₄F₁,SO₃Na

MOLECULAR WEIGHT:

552.15

CONCENTRATION:

50.0 ± 2.5 µg/ml

SOLVENT(S):

Methanol

(Na salt) (M2-8:2FTS anion) 47.9 ± 2.4 µg/ml

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99% 13C

LAST TESTED: (mrn/dd/yyyy)

07/05/2017

(1,2-13C₂)

EXPIRY DATE: (mm/dd/yyyy)

07/05/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

The native 8:2FTS contains 4.22% of 34S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_{x}(y)$, of a value y and the uncertainty of the independent parameters

$$\mathbf{x}_{i}, \mathbf{x}_{2},...\mathbf{x}_{n}$$
 on which it depends is:
$$u_{c}(y(x_{1},x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n}u(y,x_{i})^{2}}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

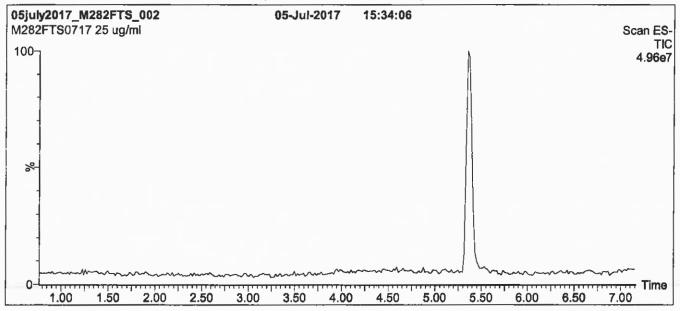
QUALITY MANAGEMENT:

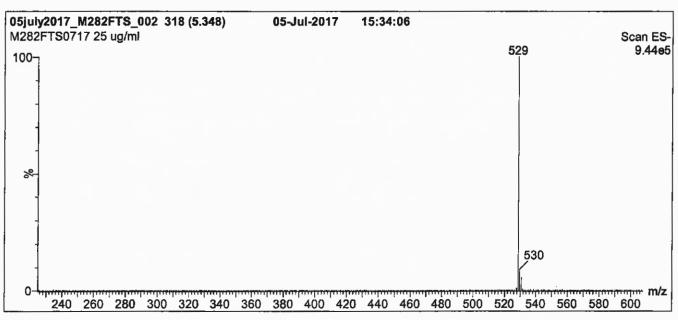
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





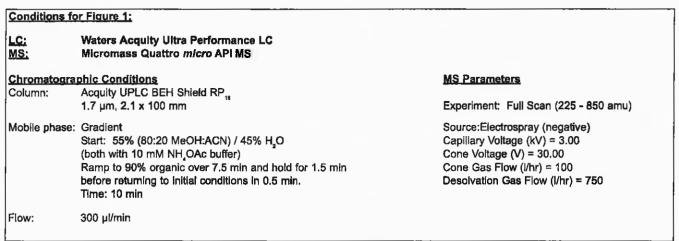
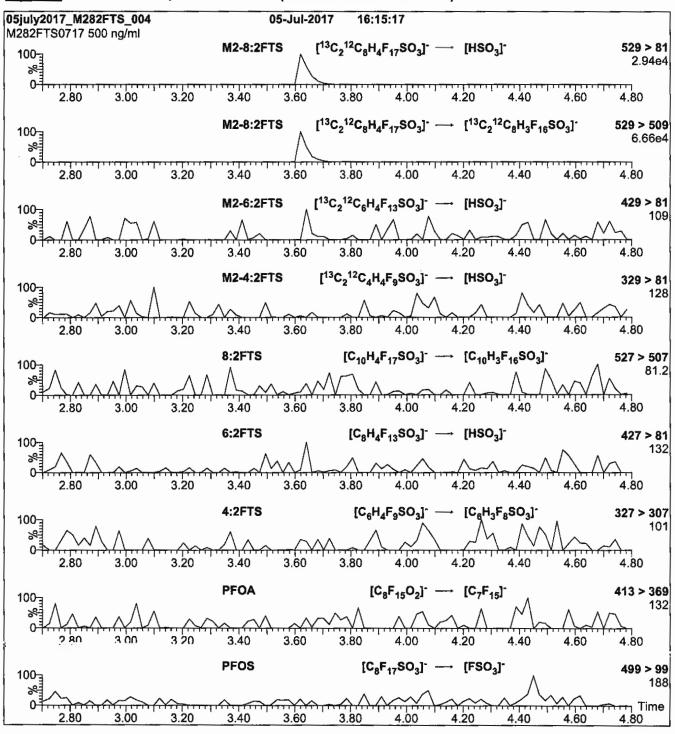
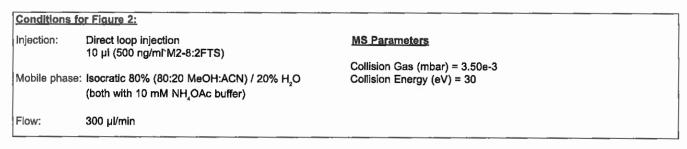


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)

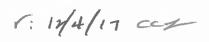




LCM2PFHxDA_00013



ID: LCM2PFHxDA_00013 Exp: 07/13/22 Prpd: CCL 13C2-PFHxDA at 50ug/mL





CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA0717

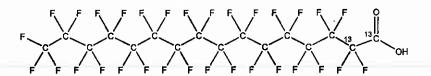
COMPOUND:

Perfluoro-n-[1,2-13C,]hexadecanolc acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₄HF₃₁O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

SOLVENT(S):

816.11 **Methanol**

 $(1,2^{-13}C_2)$

Water (<1%) ≥99% 13C

CHEMICAL PURITY: LAST TESTED: (mm/dd/yyyy)

07/13/2017

>98%

EXPIRY DATE: (mm/dd/yyyy)

07/13/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

Form#:27, Issued 2004-11-10

Revision#:4, Revised 2017-03-06

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel famillar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_{x}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ... x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2, ... x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

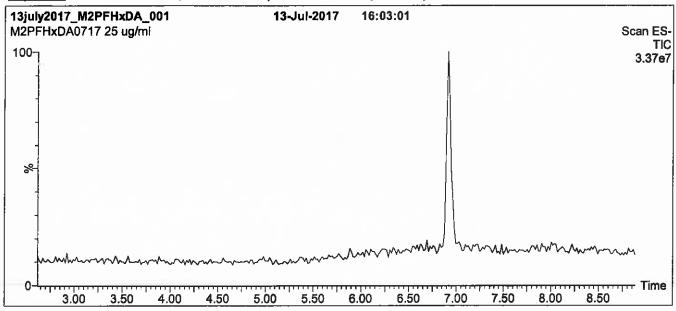
QUALITY MANAGEMENT:

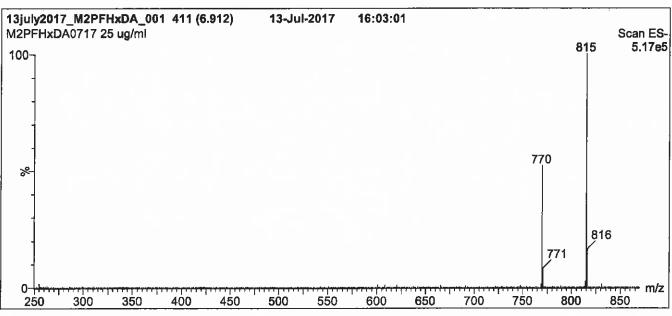
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)





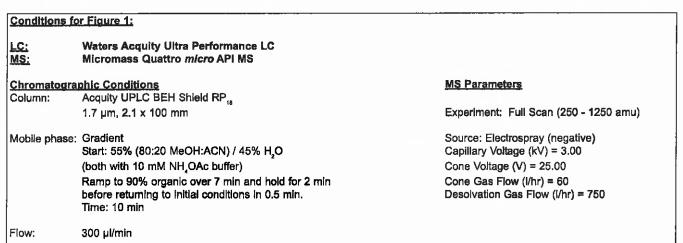
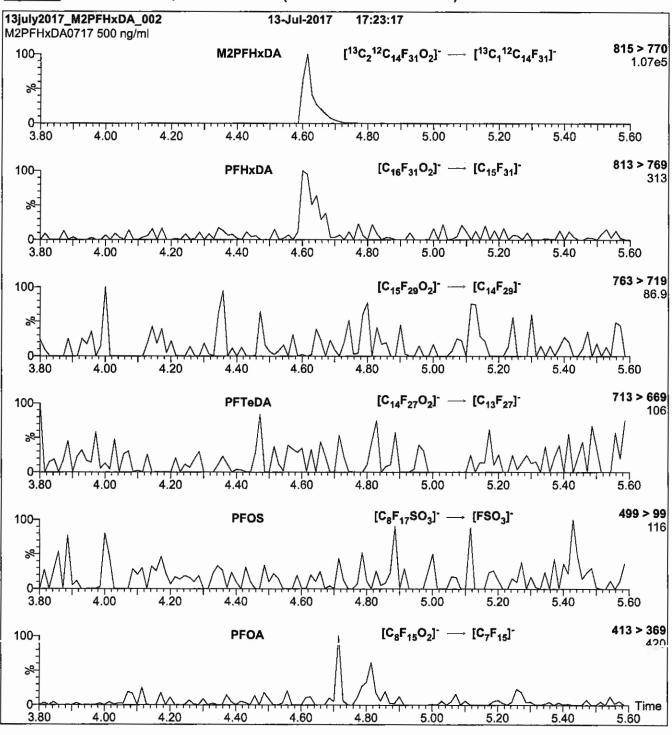


Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 15

LCM2PFOA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFOA

LOT NUMBER:

M2PFOA0216

COMPOUND:

Perfluoro-n-[1,2-13C] octanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₆HF₁₆O₂

MOLECULAR WEIGHT:

416.05

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(\$):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C (1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy)

02/12/2016

EXPIRY DATE: (mm/dd/yyyy)

02/12/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

02/24/2016 (mm/dd/ww)

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ... x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY;

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

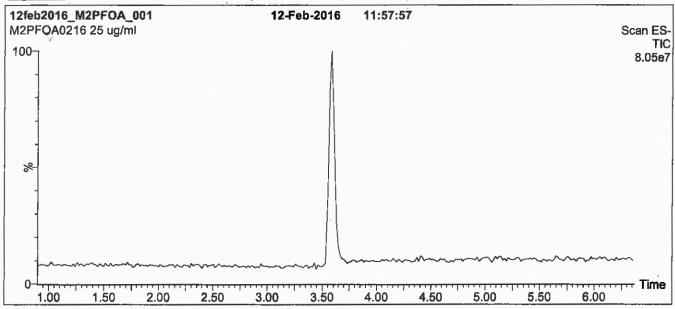
QUALITY MANAGEMENT:

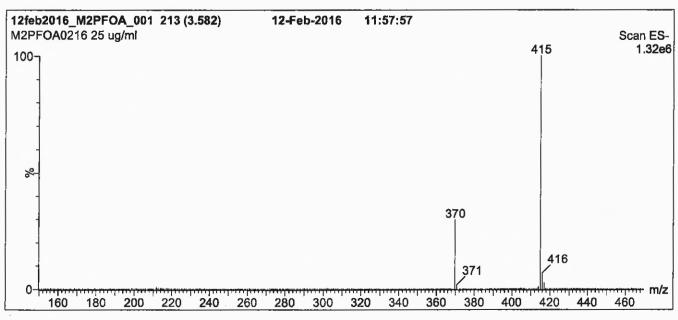
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M2PFOA; LC/MS Data (TIC and Mass Spectrum)





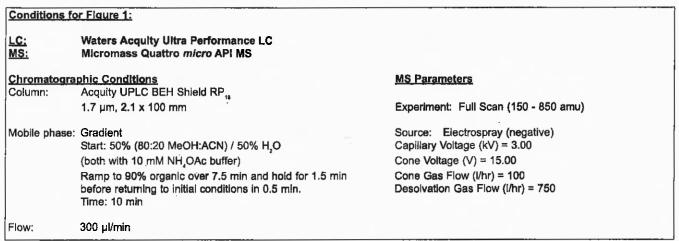
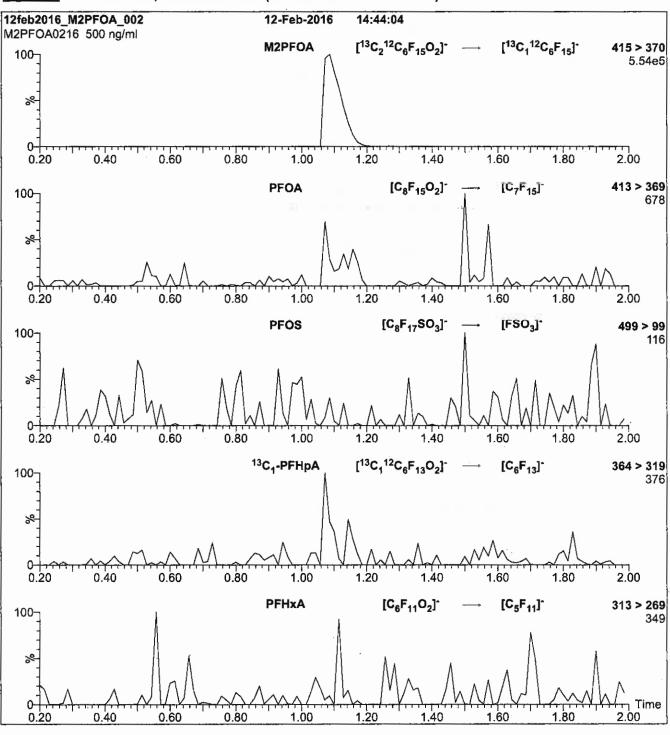
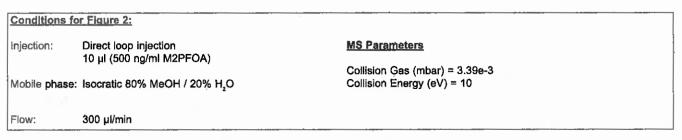


Figure 2: M2PFOA; LC/MS/MS Data (Selected MRM Transitions)





LCM2PFTeDA_00012



ID: LCM2PFTeDA_00012 Exp: 1180/22 Prpd: CCL 13C2-PFTeDA at 50ug/mi.





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFTeDA

LOT NUMBER:

M2PFTeDA1117

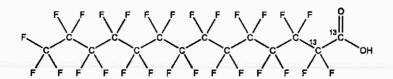
COMPOUND:

Perfluoro-n-[1,2-13C,]tetradecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₂HF₂₇O₂

50

MOLECULAR WEIGHT:

716,10

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) ≥99% ¹³C (1,2-¹³C₃)

LAST TESTED: (mm/dd/yyyy)

11/30/2017

EXPIRY DATE: (mm/dd/yyyy)

11/30/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 12/01/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS;

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

$$\mathbf{x}_{i}, \mathbf{x}_{2},...\mathbf{x}_{n}$$
 on which it depends is:
$$u_{c}(y(x_{i},x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n} u(y,x_{i})^{2}}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The Individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

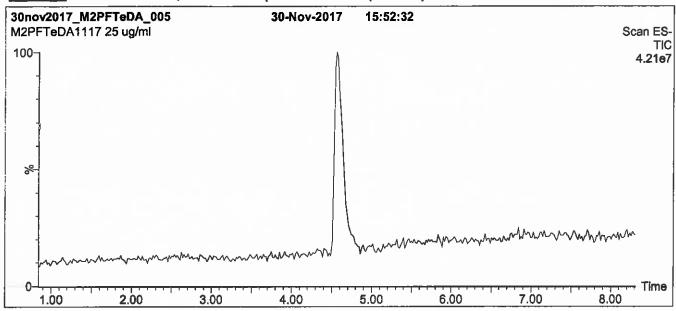
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

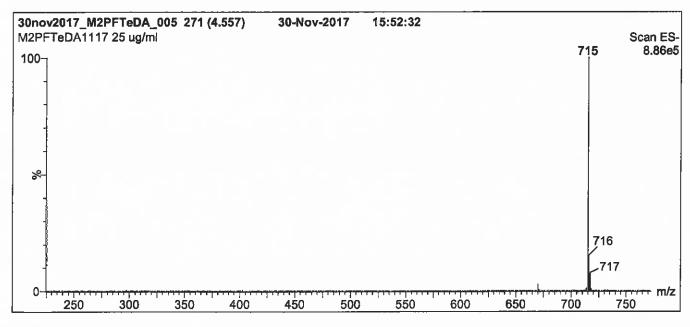


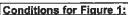




M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)







LC:

Waters Acquity Ultra Performance LC

MS:

Micromass Quattro micro API MS

Chromatographic Conditions

Column:

Acquity UPLC BEH Shield RP,

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 65% (80:20 MeOH:ACN) / 35% H₂O

(both with 10 mM NH,OAc buffer)

Ramp to 90% organic over 7.5 min and hold for 1.5 min

before returning to initial conditions in 0.5 mln.

Time: 10 min

Flow:

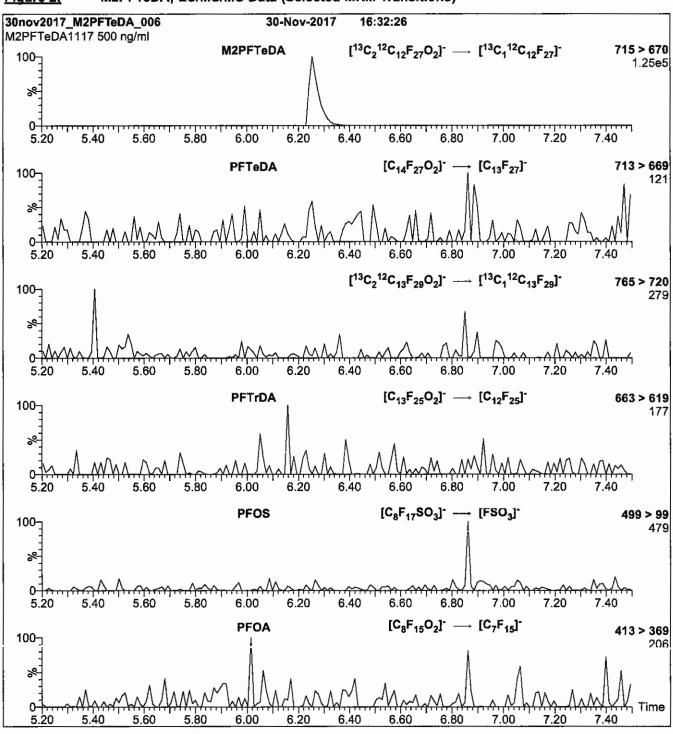
300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative) Capillary Voltage (kV) = 3.00 Cone Voltage (V) = 15.00 Cone Gas Flow (I/hr) = 100 Desolvation Gas Flow (I/hr) = 750

Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

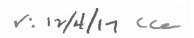
MS Parameters

Collision Gas (mbar) = 3.31e-3 Collision Energy (eV) = 14

LCM4PFHPA_00012



ID: LCM4PFHPA_00012 Exp: 05/03/22 Prpd: CCL 13C4-Perfluoroheptanoic a





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M4PFHpA

Perfluoro-n-[1,2,3,4-13C] heptanoic acid

LOT NUMBER:

M4PFHpA0517

STRUCTURE:

COMPOUND:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₃HF₁₃O₃

CONCENTRATION:

CHEMICAL PURITY:

 $50 \pm 2.5 \, \mu g/ml$

MOLECULAR WEIGHT:

368.03

SOLVENT(S):

Methanol

Water (<1%) **ISOTOPIC PURITY:**

≥99%13C

(1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyyy)

05/03/2017

>98%

EXPIRY DATE: (mm/dd/yyyy)

05/03/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/11/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_{x}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

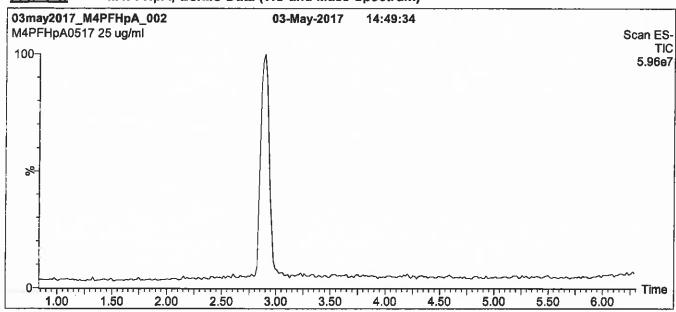
QUALITY MANAGEMENT:

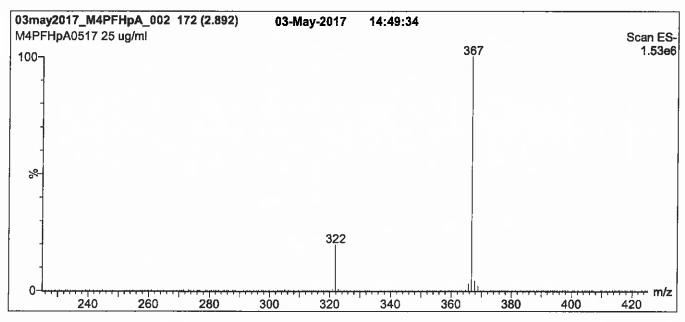
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)





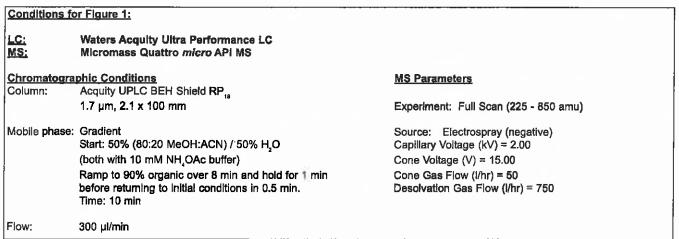
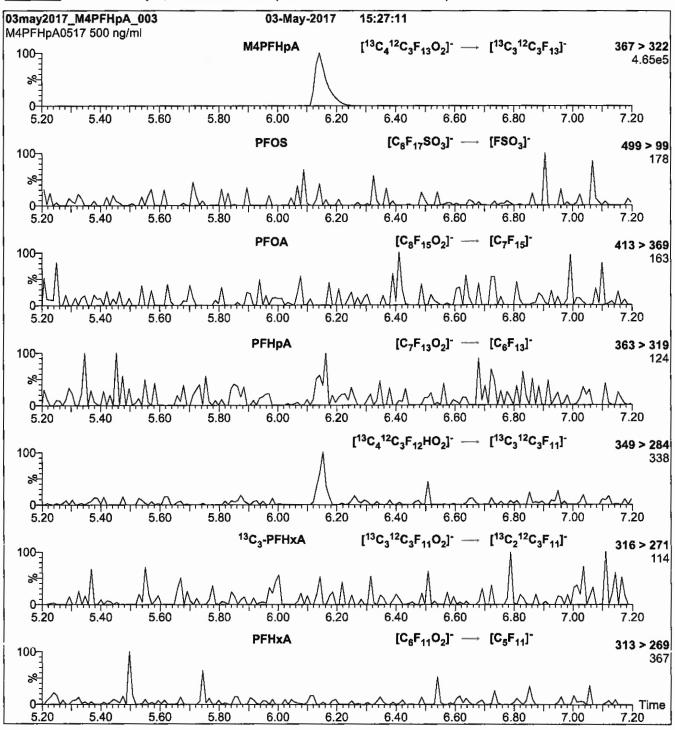
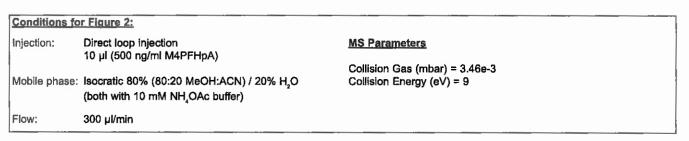


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)

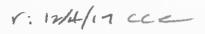




LCM5PFPEA_00013



1106313 ID: LCM5PFPEA_00013 Exp: 37/20/22 Pape: CC: 13C5-Perfluoropentanoic a





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M5PFPeA

Perfluoro-n-[13C_]pentanoic acid

LOT NUMBER:

STRUCTURE:

COMPOUND:

CAS #:

Not available

M5PFPeA0717

F F F F

MOLECULAR FORMULA:

CONCENTRATION:

¹³C₆HF₆O₂

 $50 \pm 2.5 \, \mu g/ml$

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

SOLVENT(S):

269.01 Methanol

(13C₄)

Water (<1%) >99% ¹³C

CHEMICAL PURITY:

>98%

07/

LAST TESTED: (mm/dd/yyyy)

07/20/2017

EXPIRY DATE: (mm/ad/yyyy)

07/20/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains < 0.1% of perfluoro-n-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 07/26/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • Info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning furne hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_{x}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ..., x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

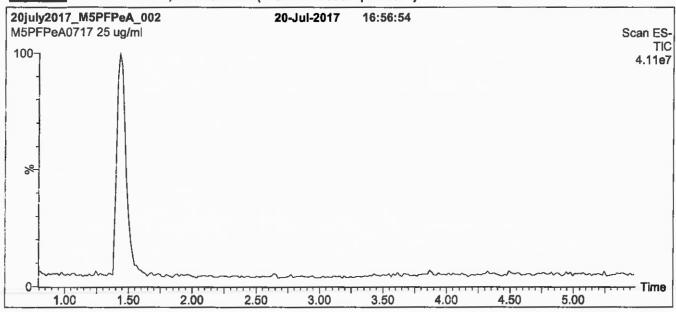
QUALITY MANAGEMENT:

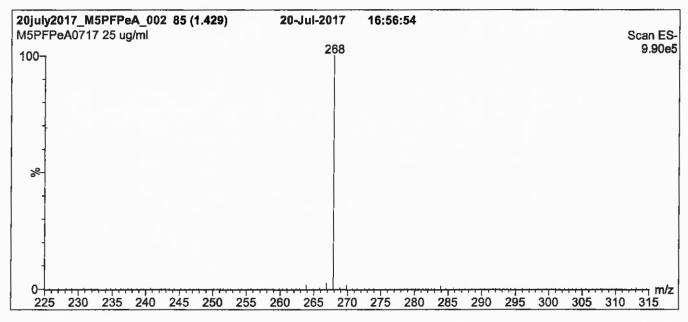
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M5PFPeA; LC/MS Data (TIC and Mass Spectrum)





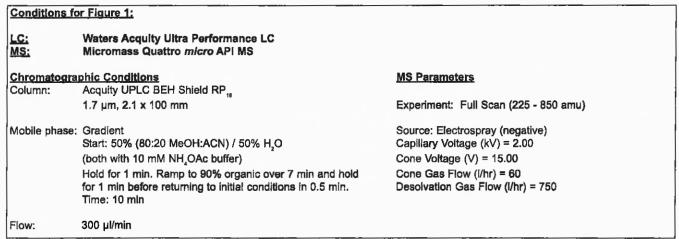
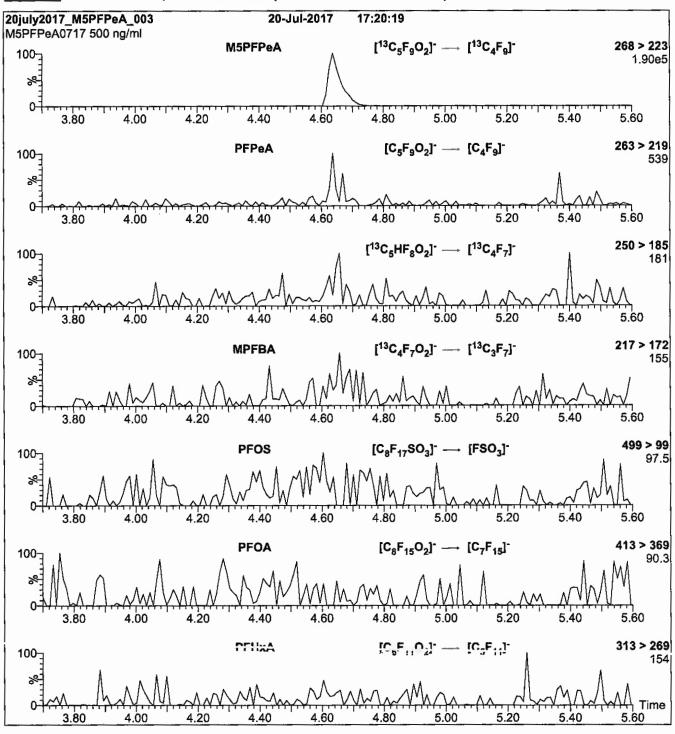
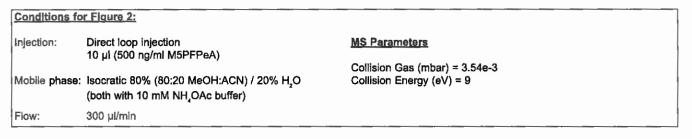


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





LCM8FOSA_00016



ID: LCM8FOSA_00016 Exp: 19/11/22 Prpd: CCL 13C8-Perfluorocctanesulfo





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M8FOSA-I

LOT NUMBER:

M8FOSA1017I

COMPOUND:

Perfluoro-1-[13C_s]octanesulfonamide

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C。H。F。,NO。S

CONCENTRATION:

50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/11/2017

EXPIRY DATE: (mm/dd/yyyy)

10/11/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

MOLECULAR WEIGHT:

SOLVENT(S):

Isopropanol

507.09

ISOTOPIC PURITY:

>99% 13C

(13C_a)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains ~ 1.1% of perfluoro-1-[13C] octanesulfonamide and ~ 0.01% of perfluoro-1-[13C,]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_i(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

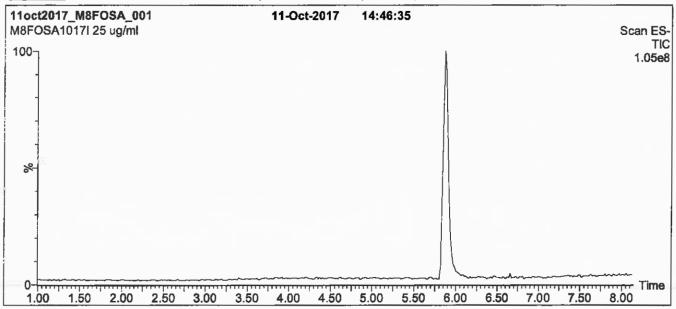
QUALITY MANAGEMENT:

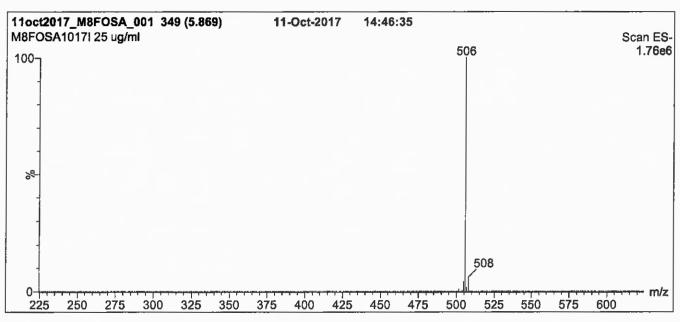
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





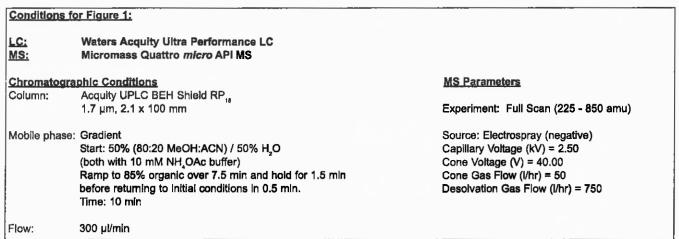
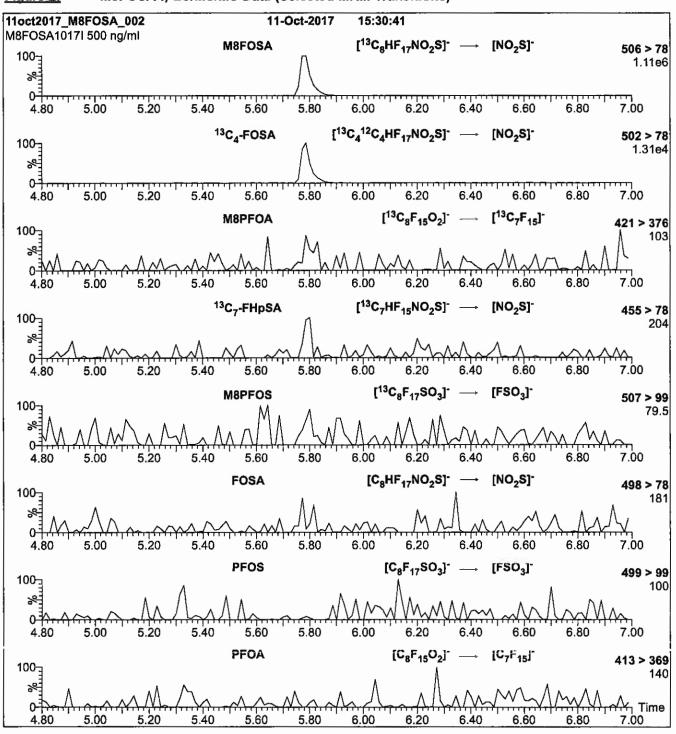
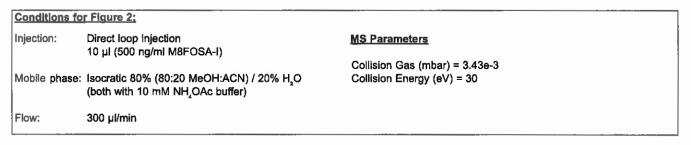


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





LCMPFBA_00013



1106251 ID: LCMPFBA_00013 Exp: 04/12/22 Prpd: CCL 13C4-Perfluorobutanoic ac





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFBA

LOT NUMBER:

MPFBA0417

COMPOUND:

Perfluoro-n-[1,2,3,4-13C] butanoic acid

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

13C, HF, O,

MOLECULAR WEIGHT:

218.01

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99%13C

(1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyyy)

04/12/2017

EXPIRY DATE: (mm/dd/yyyy)

04/12/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 04/20/2017

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_x(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

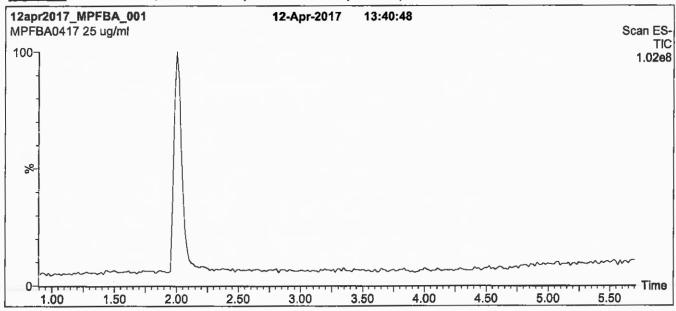
QUALITY MANAGEMENT:

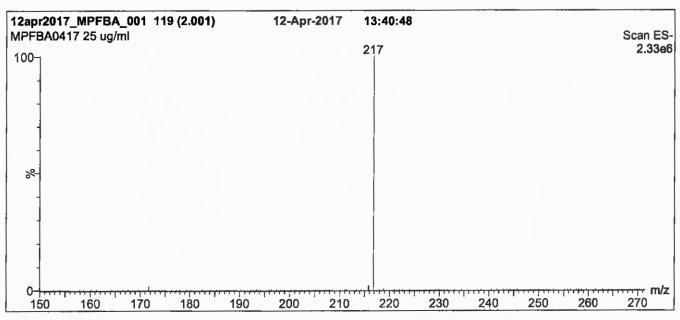
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)





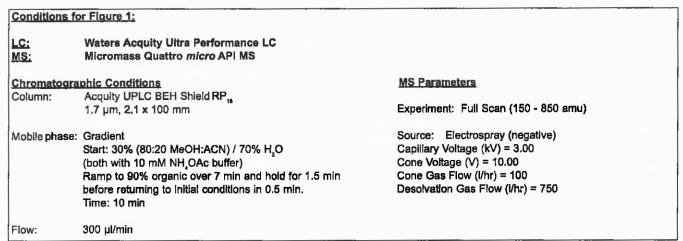
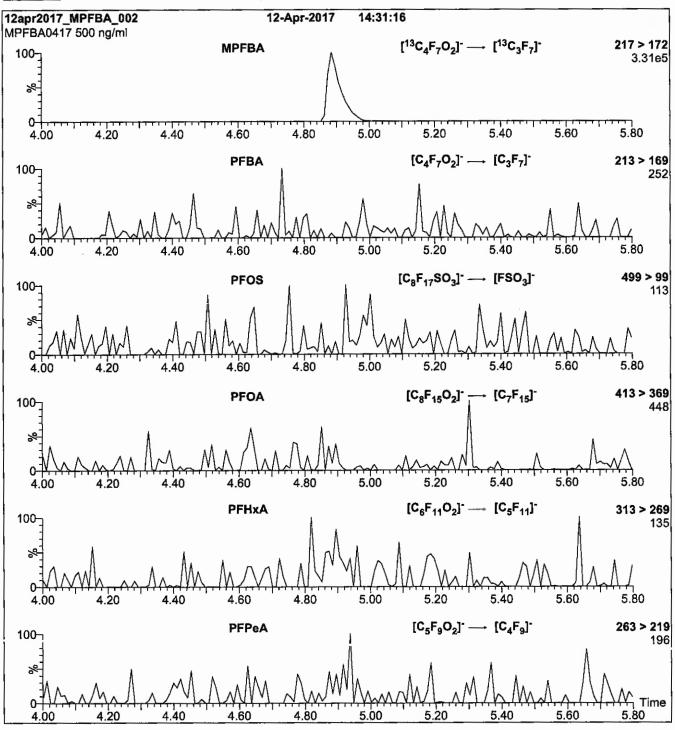
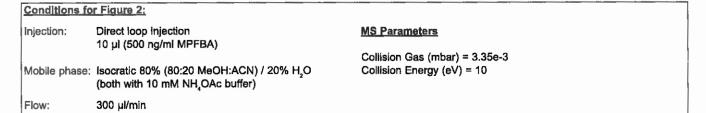


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)

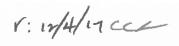




LCMPFBS_00006



D: LCMPFBS_00006 Exp: 06/24/22 Prpd: CCL 13C3-Perfluorobutanesuilo





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M3PFBS

LOT NUMBER:

M3PFBS0815

COMPOUND:

Sodium perfluoro-1-[2,3,4-13C,]butanesulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

13C, 12CF, SO, Na

MOLECULAR WEIGHT:

325.06

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

05/24/2017

(2,3,4-13C₃)

EXPIRY DATE: (mm/dd/yyyy)

05/24/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

 $46.5 \pm 2.3 \,\mu\text{g/ml}$ (M3PFBS anion)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: _05/25/2017

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_n(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

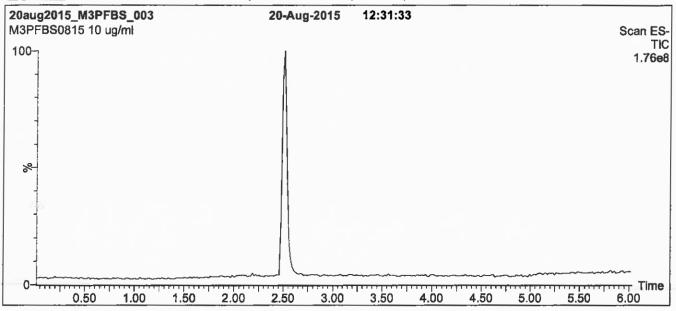
QUALITY MANAGEMENT:

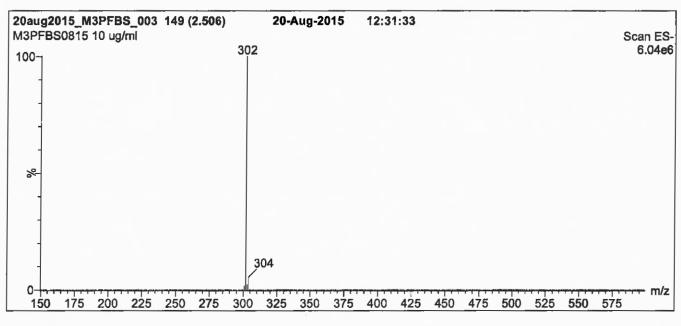
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: M3PFBS; LC/MS Data (TIC and Mass Spectrum)





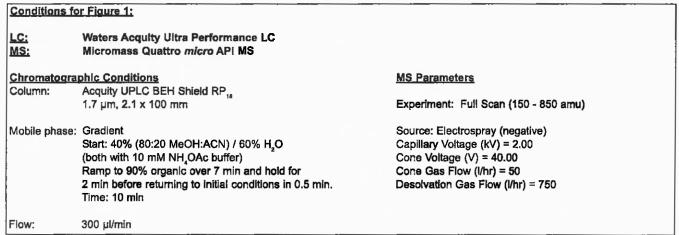
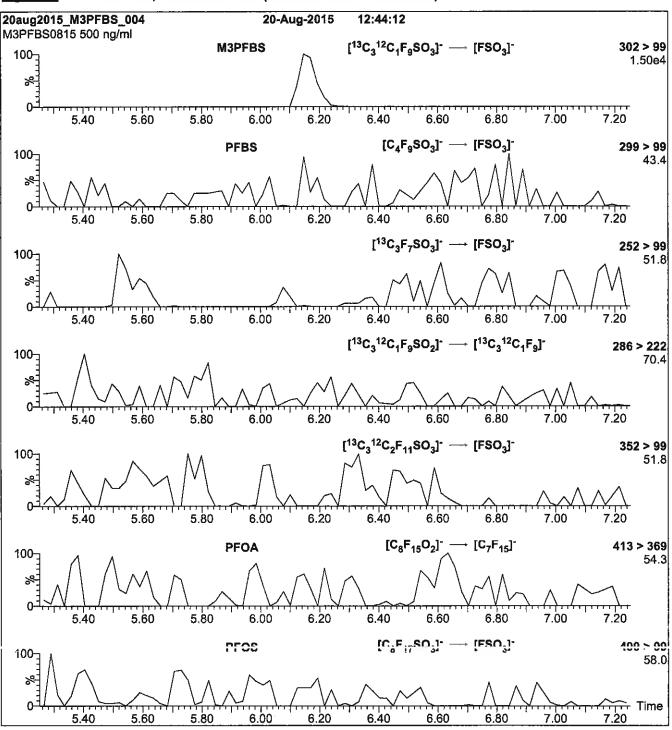
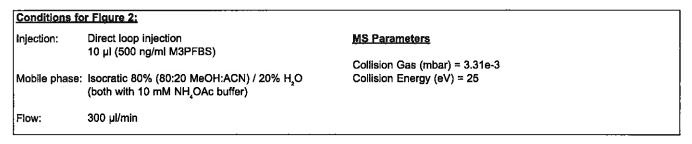


Figure 2: M3PFBS; LC/MS/MS Data (Selected MRM Transitions)





LCMPFDA_00018



ID: LCMPFDA_00018 Esp: 87/13/22 Papt: CCL 13C2-Perfluomodecanoic a V:12/4/17 ce



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

Perfluoro-n-[1,2-13C,]decanoic acid

LOT NUMBER:

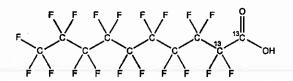
MPFDA0717

STRUCTURE:

COMPOUND:

CAS #:

Not available



MOLECULAR FORMULA:

CONCENTRATION:

¹³C₂¹²C₈HF₁₉O₉

 $50 \pm 2.5 \,\mu g/ml$

MOLECULAR WEIGHT:

SOLVENT(S):

ISOTOPIC PURITY:

516.07 Methanol

Water (<1%)

≥99% ¹³C

(1,2-13C₂)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/13/2017

EXPIRY DATE: (mm/dd/yyyy)

07/13/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains < 0.1% of 13C,-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 07/14/2017

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_{x}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

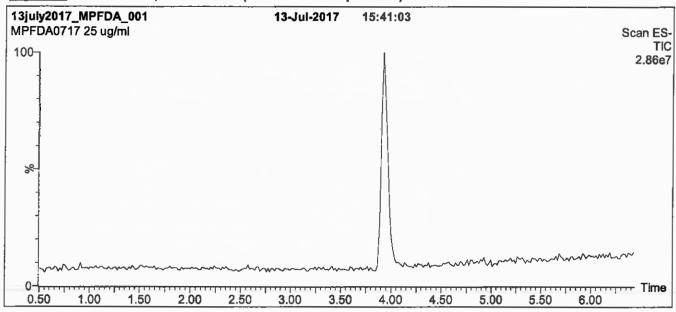
QUALITY MANAGEMENT:

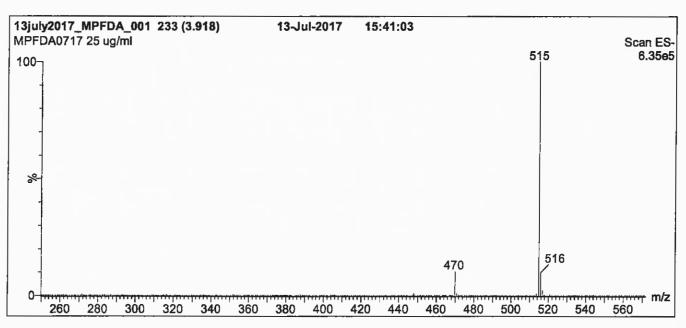
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





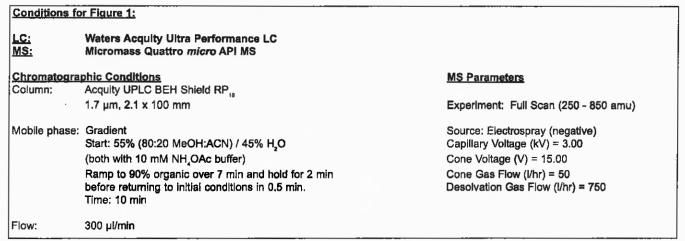
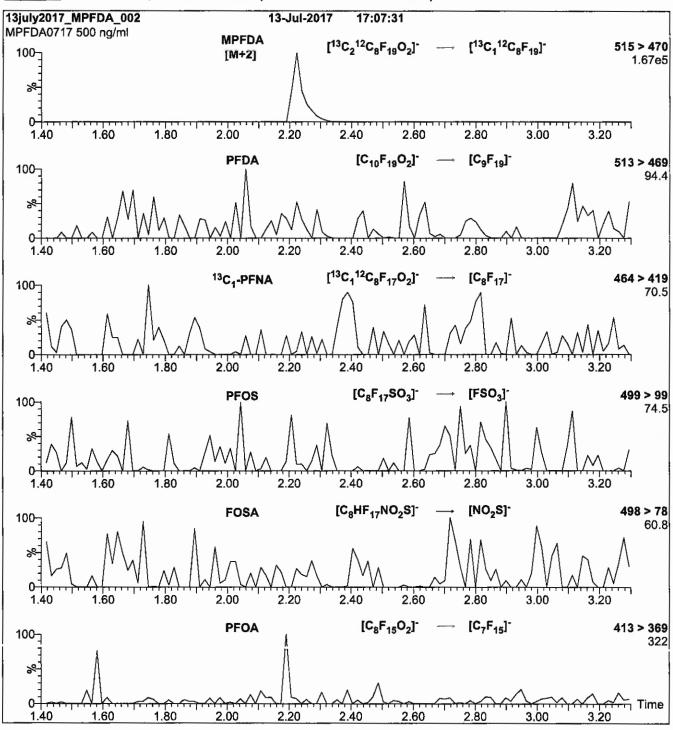
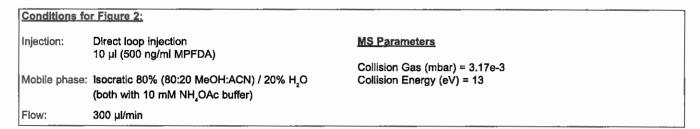


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)

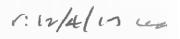




LCMPFDoA_00013



ID: LCMPFDoA_00013 Exp: C6/23/22 Prpd: CCL 13C2-Perfluornododecancic





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDoA

Perfluoro-n-[1,2-13C,]dodecanoic acid

LOT NUMBER:

MPFDoA0517

STRUCTURE:

COMPOUND:

CAS #:

Not available



MOLECULAR FORMULA:

13C, 12C, HF, O,

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

616.08

CONCENTRATION:

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% 13C (1,2-13C₂)

LAST TESTED: (mm/dd/yyy)

05/23/2017

EXPIRY DATE: (mm/dd/yyyy)

05/23/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acld to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: _ 05/26/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of Interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

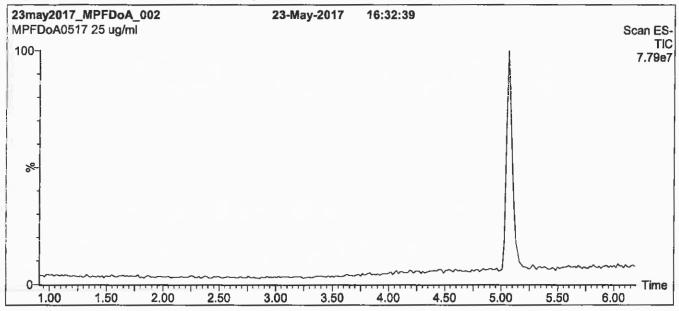
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

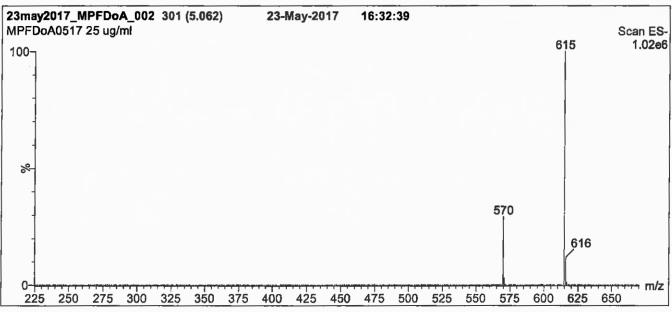




For additional Information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: MPFDoA; LC/MS Data (TIC and Mass Spectrum)





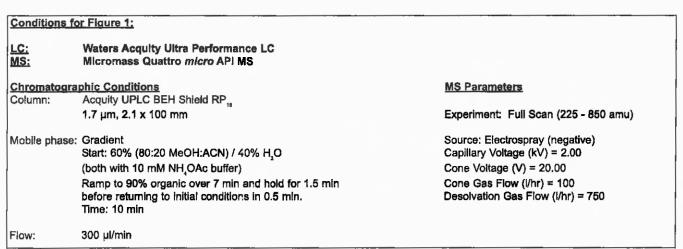
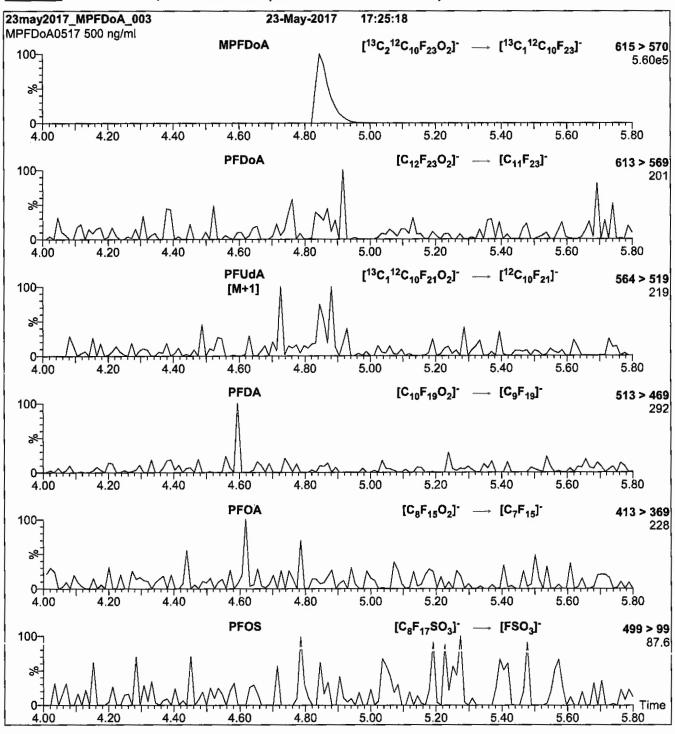
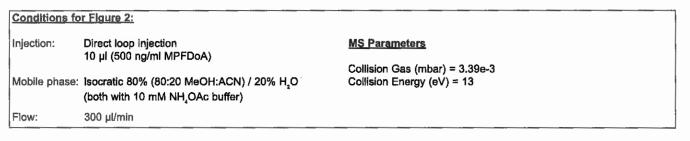


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFHxA_00019



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxA

LOT NUMBER:

MPFHxA1017

COMPOUND:

Perfluoro-n-[1,2-13C]hexanoic acid

STRUCTURE:

CAS #:

Not available

F F F F F

MOLECULAR FORMULA:

13C,12C,HF,O,

2

MOLECULAR WEIGHT:

316.04

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

Water (<1%) ≥99%¹³C (1,2-¹³C₃)

LAST TESTED: (mm/dd/yyyy)

,

10/27/2017

EXPIRY DATE: (mm/dd/yyyy)

10/27/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains < 0.1% of perfluoro-n-hexanoic acid and < 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 10/30/2017

(mm/dd/yy

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

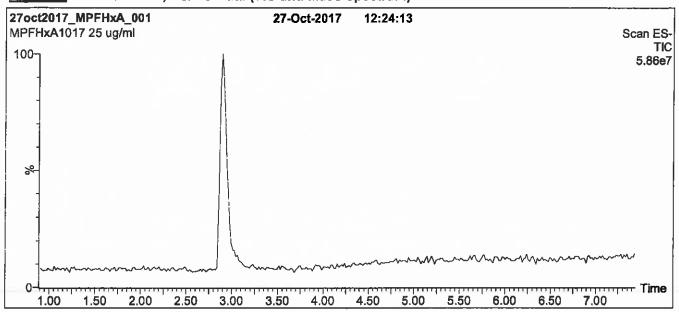
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

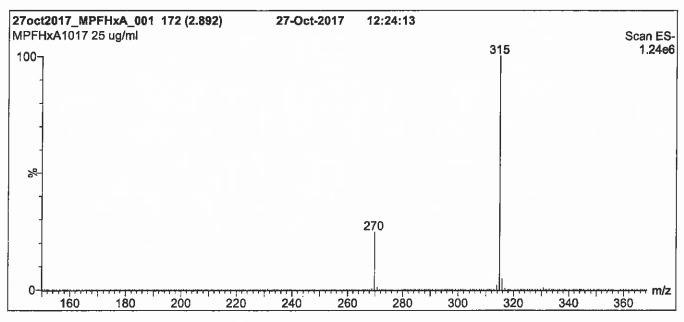




For additional Information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)





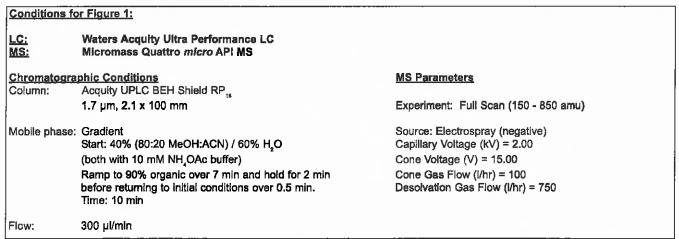
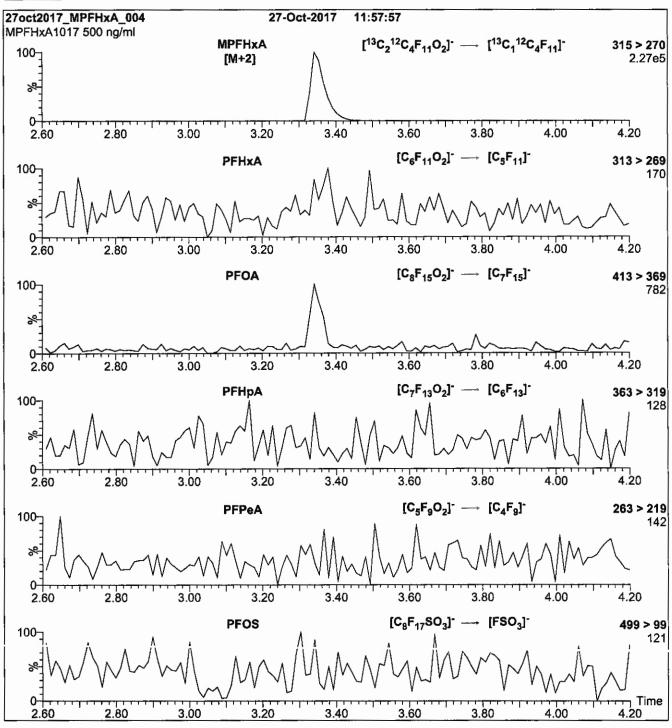
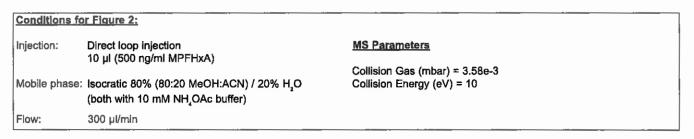


Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFHxS_00013



1106238 ID: LCMPFHxS_00013 r: 14/17 cc=



Ep: 02/17/22 Prod: CCL 18O2-Perfluorohexanesulfo

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxS

LOT NUMBER:

MPFHxS0217

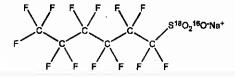
COMPOUND:

Sodium perfluoro-1-hexane[18O2]sulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

C₆F₁₃S¹⁸O₂¹⁶ONa

MOLECULAR WEIGHT:

426.10

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

SOLVENT(S):

ISOTOPIC PURITY:

Methanoi

>94% (18O₂)

CHEMICAL PURITY:
LAST TESTED: (mm/dd/yyy)

>98%

>98

02/17/2017

EXPIRY DATE: (mm/dd/yyyy)

02/17/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

 $47.3 \pm 2.4 \mu g/ml$ (MPFHxS anion)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS (C₈F₁₃S¹⁸O₂¹⁶O') has been observed to be up to 10% lower than for PFHxS (C₈F₁₃S¹⁸O₃') when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[¹⁸O₂]sulfonate (¹⁸O₂-PFOS).
- Due to the isotopic purity of the starting material (18O₂ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date:

03/02/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_{c}(y(x_{1}, x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n} u(y, x_{i})^{2}}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The Individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

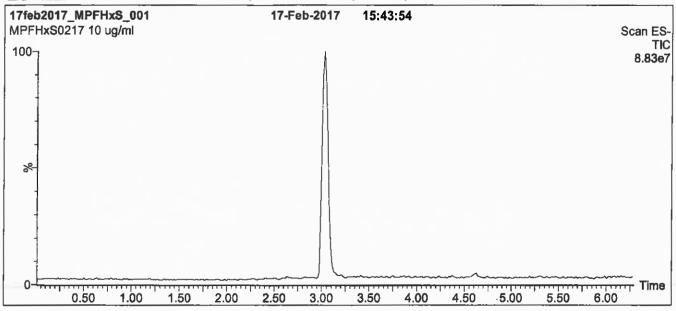
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

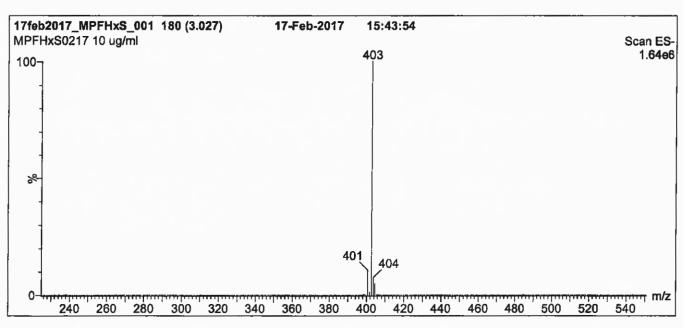




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: MPFHxS; LC/MS Data (TIC and Mass Spectrum)





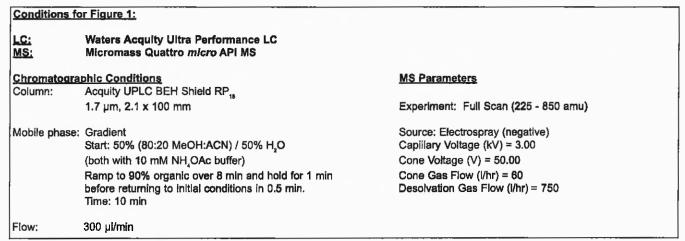
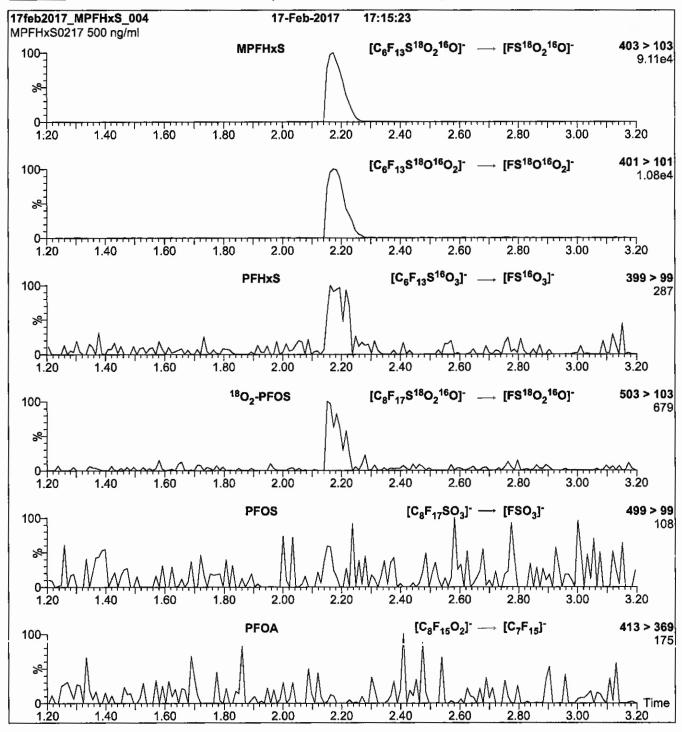
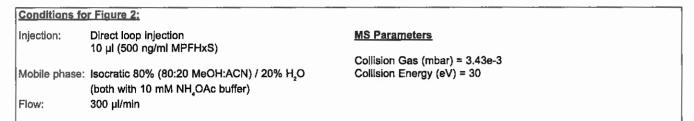


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)

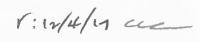




LCMPFNA_00013



!D: LCMPFNA_00013 Exp. 09/30/21 Prpd: CCL 13C5-Perfluomonanoic aci





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0916

COMPOUND:

Perfluoro-n-[1,2,3,4,5-13C_s]nonanoic acid

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

13C, 12C, HF,,O,

CONCENTRATION:

CHEMICAL PURITY:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

469.04

Methanol Water (<1%)

(1,2,3,4,5-13C_e)

ISOTOPIC PURITY:

MOLECULAR WEIGHT:

>99%13C

>98% 09/30/2016

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyyy)

09/30/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxyllc acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 10/11/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_s(y), of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

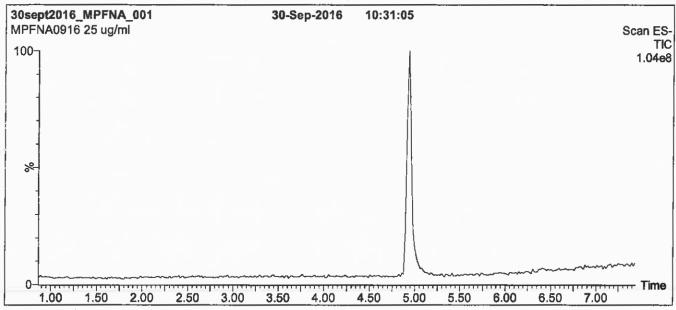
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

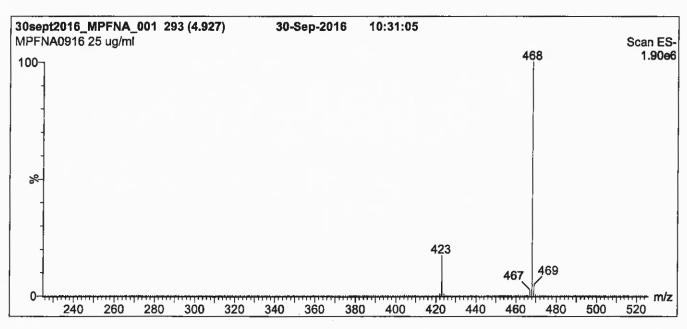




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)





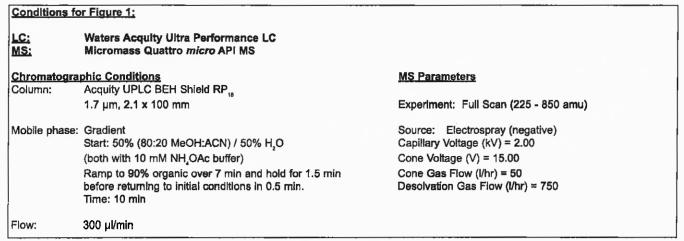
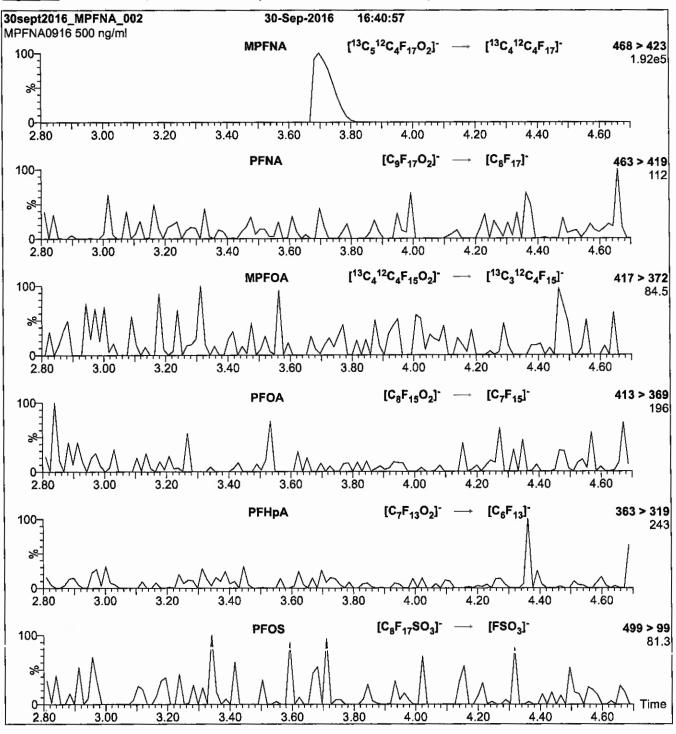
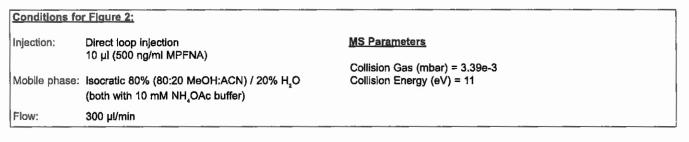


Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOA_00017





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOA

LOT NUMBER:

MPFOA1017

COMPOUND:

Perfluoro-n-[1,2,3,4-13C] octanoic acid

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

¹³C₂¹²C₂HF₄O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

418.04

SOLVENT(S):

Methano! Water (<1%)

CHEMICAL PURITY:

>98%

10/17/2017

LAST TESTED: (mm/dd/yyyy) EXPIRY DATE: (mm/dd/yyyy)

10/17/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

ISOTOPIC PURITY:

≥99% 13C

(1,2,3,4-13C₄)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS;

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_x(y)$, of a value y and the uncertainty of the independent parameters

$$x_i$$
, x_2 ,... x_n on which it depends is:
$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

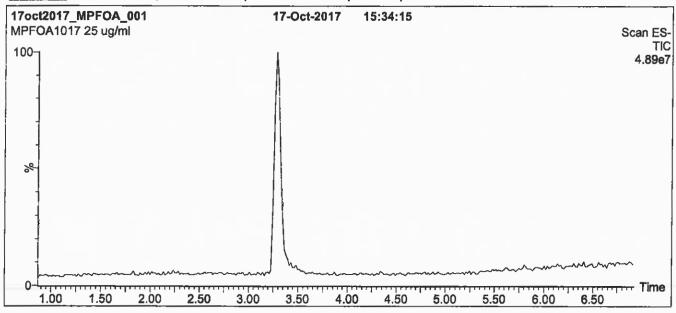
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

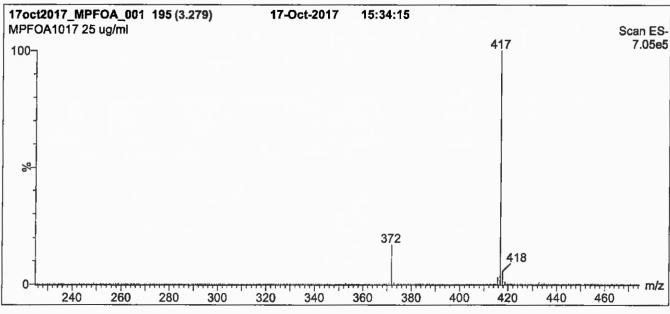




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: MPFOA; LC/MS Data (TIC and Mass Spectrum)





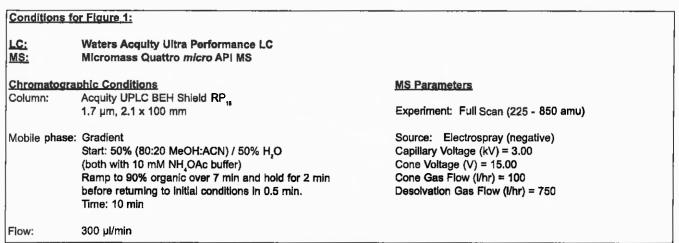
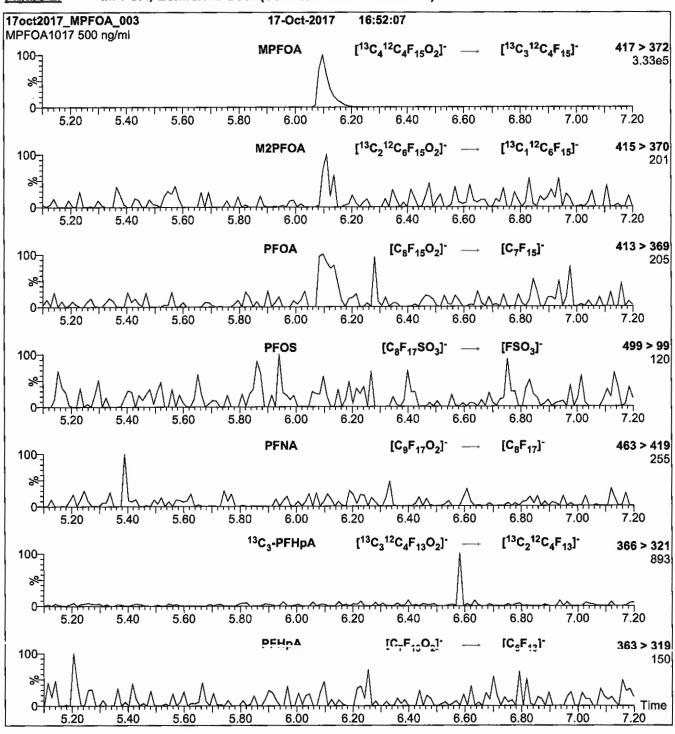
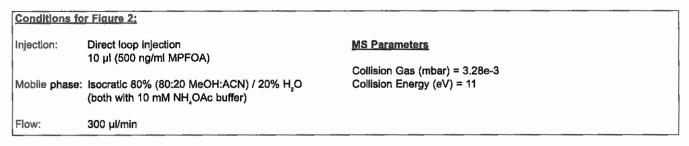


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOS_00025



1: 12/4/17 CCL

ID: LCMPFOS_00025 Exp: 10/17/22 Prpd: SKV 13C4-Perfluorooctanesulfo



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOS

LOT NUMBER:

MPFOS1017

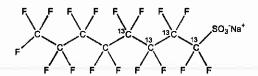
COMPOUND:

Sodium perfluoro-1-[1,2,3,4-13C,]octanesulfonate

STRUCTURE:

CAS #;

Not available



MOLECULAR FORMULA:

13C, 12C, F, SO, Na

MOLECULAR WEIGHT:

526.08

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

(1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyw)

10/17/2017

EXPIRY DATE: (mm/dd/yyyr)

10/17/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

 $47.8 \pm 2.4 \mu g/ml$ (MPFOS anion)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains ~ 0.4% Sodium perfluoro-1-[1,2,3-13C,]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 10/18/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_n(y)$, of a value y and the uncertainty of the independent parameters

$$x_i, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

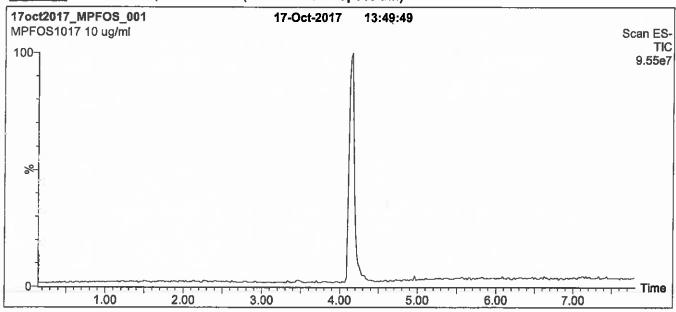
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

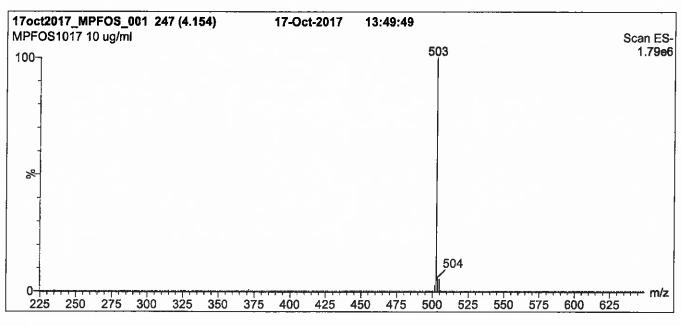




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at lnfo@well-labs.com

Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)





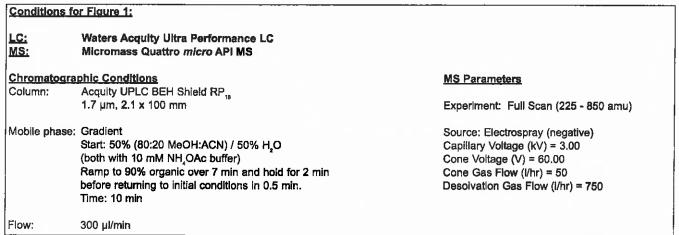
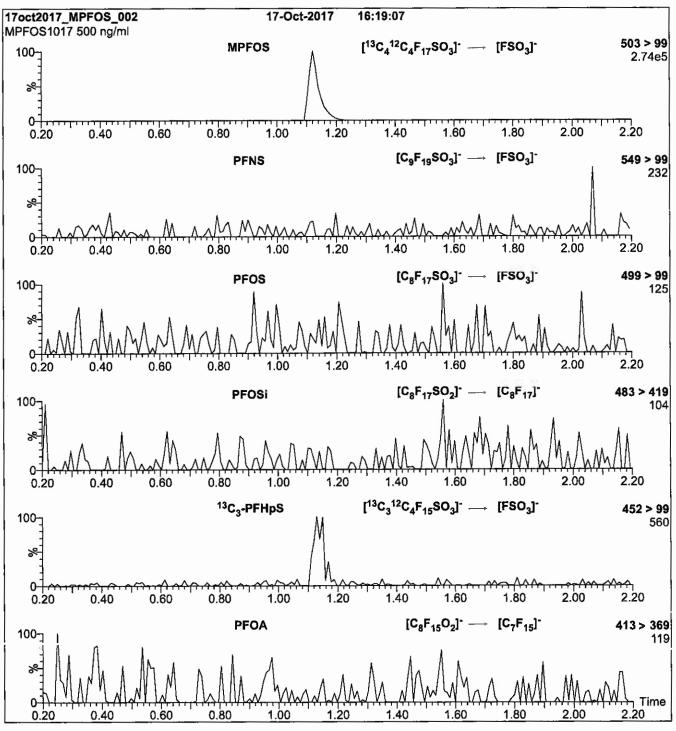
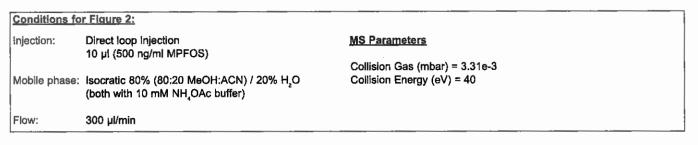


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)





LCMPFUdA_00014



ID: LCMPFUdA 00014 Exp: 11/22/21 Prpd: CCL 13C2-Perfluomoundecanoic





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA1116

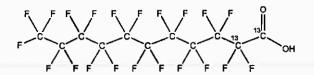
COMPOUND:

Perfluoro-n-[1,2-13C]undecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

13C, 12C, HF, O,

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

MOLECULAR WEIGHT:

SOLVENT(S):

566.08

Methanol Water (<1%)

ISOTOPIC PURITY:

≥99% ¹³C (1,2-13C₂)

LAST TESTED: (mm/dd/yyyy)

11/22/2016

>98%

EXPIRY DATE: (mm/dd/yyyy)

CHEMICAL PURITY:

11/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Presence of 1-13C,-PFUdA (~1%; see Figure 2), 2-13C,-PFUdA (~1%), and PFUdA (~0.2%; see Figure are due to the isotopic purity of the ¹³C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_a(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

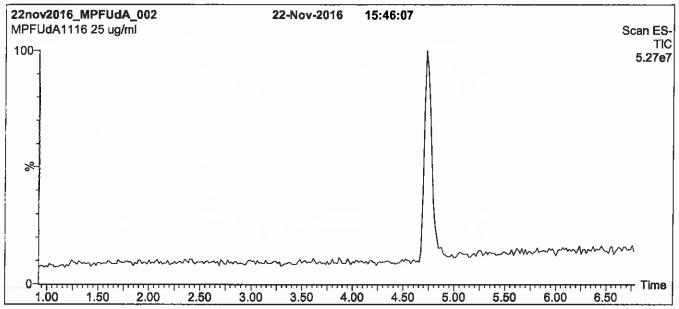
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

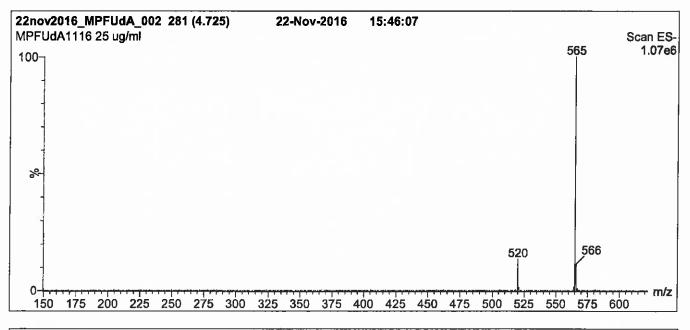




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: MPFUdA; LC/MS Data (TIC and Mass Spectrum)





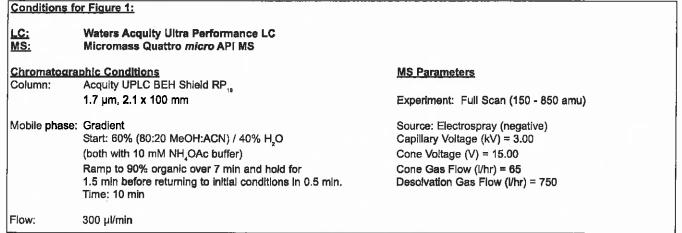
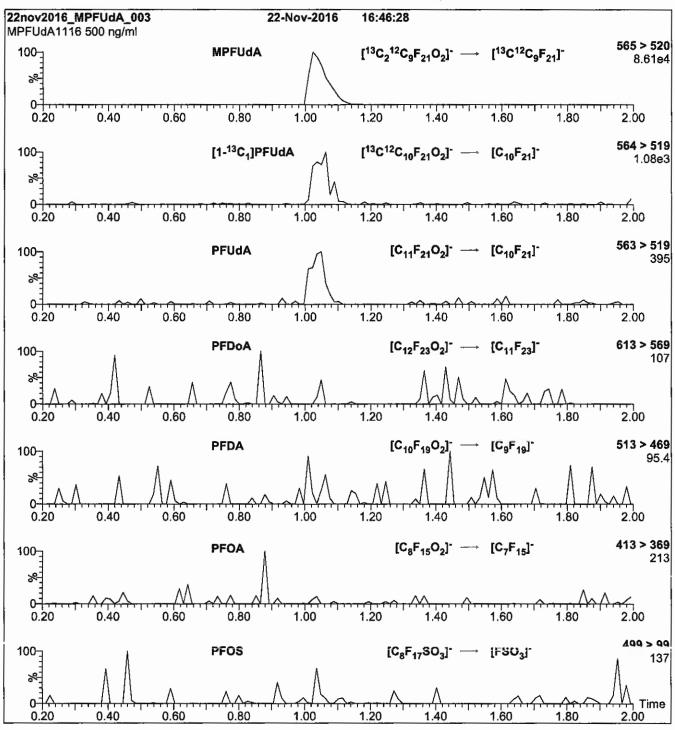
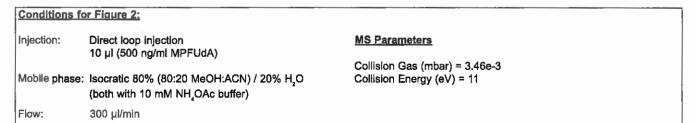


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





LCN-EtFOSA-M_00005



PRODUCT CODE:

N-EtFOSA-M

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

NEtFOSA0516M

527.20

Methanol

COMPOUND:

N-ethylperfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

4151-50-2

MOLECULAR FORMULA:

C,H,F,NO2S

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/24/2016

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/27/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_{\epsilon}(y(x_1, x_2, ... x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

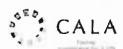
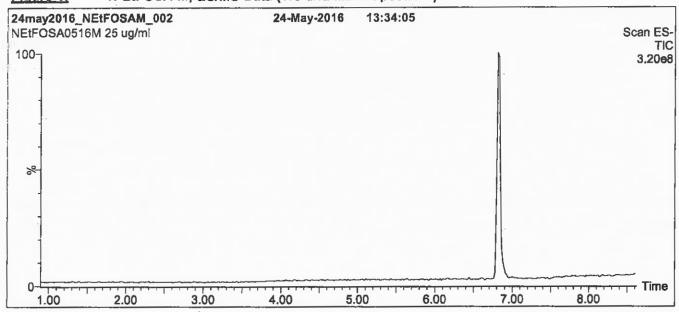
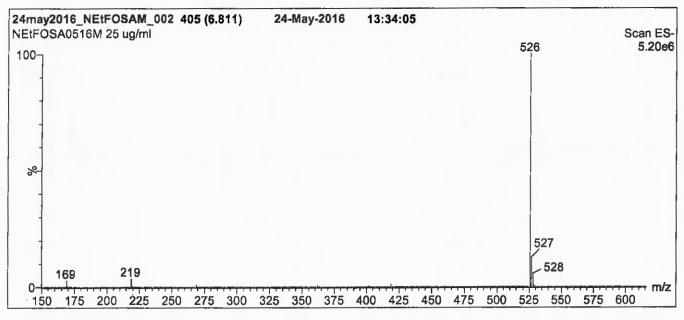
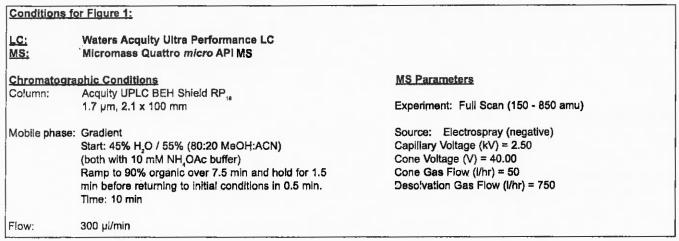




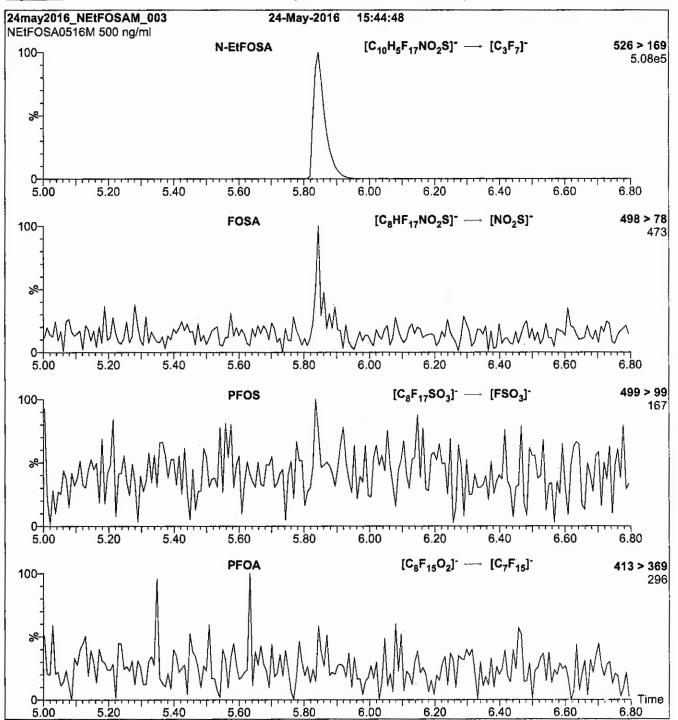
Figure 1: N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)

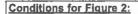






N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml N-EtFOSA-M)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30

Flow:

300 µl/min

LCN-EtFOSAA_00004



PRODUCT CODE:

N-EtFOSAA

LOT NUMBER:

NEtFOSAA0916

COMPOUND:

N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2991-50-6

MOLECULAR FORMULA:

C₁₂H₈F₁₇NO₄S

MOLECULAR WEIGHT:

585.23

CONCENTRATION:

 $50 \pm 2.5 \mu g/m!$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/30/2016

EXPIRY DATE: (mm/dd/yyyy)

09/30/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

O Olding

Date: 10/07/2016

(mm/dd/www)

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_z(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ..., x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

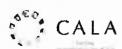
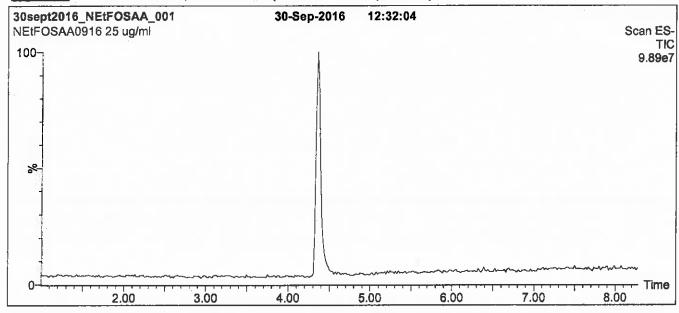
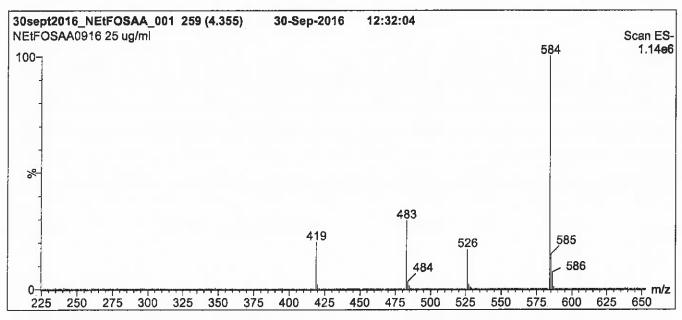




Figure 1: N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





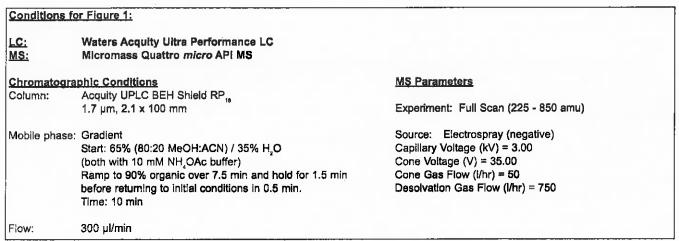
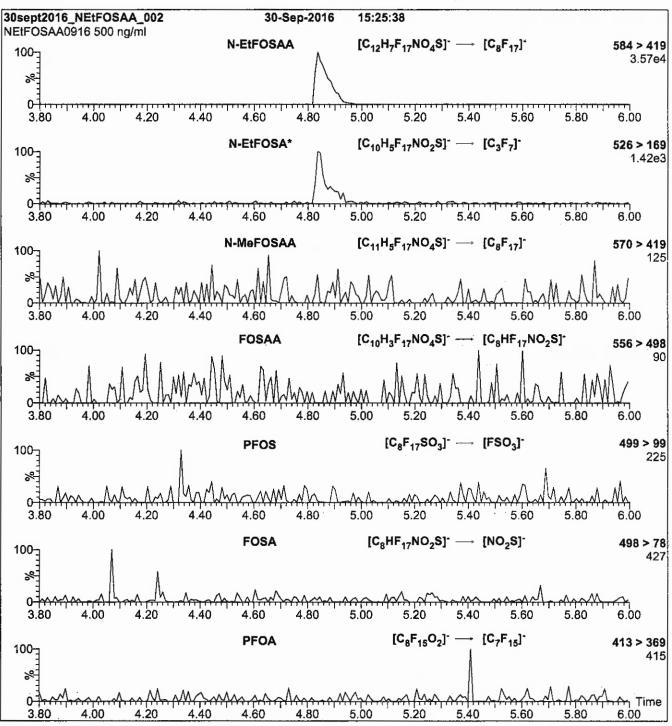
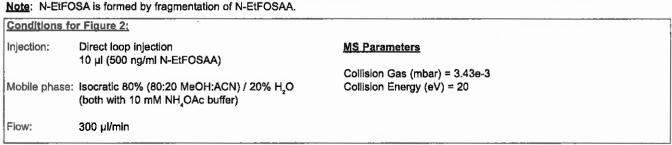


Figure 2: N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)





LCN-MeFOSA-M_00004



PRODUCT CODE:

N-MeFOSA-M

N-methylperfluoro-1-octanesulfonamide

LOT NUMBER:

NMeFOSA0516M

COMPOUND: STRUCTURE:

CAS #:

31506-32-8

MOLECULAR FORMULA:

C₈H₄F₁₇NO₂S 50 ± 2.5 µg/ml

CONCENTRATION: CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/24/2016

EXPIRY DATE: (mm/dd/ywy)

05/24/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

MOLECULAR WEIGHT: SOLVENT(S):

513.17 Methanol

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/26/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_z(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ... x_n$$
 on which it depends is:

$$u_{c}(y(x_{1},x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n} u(y,x_{i})^{2}}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

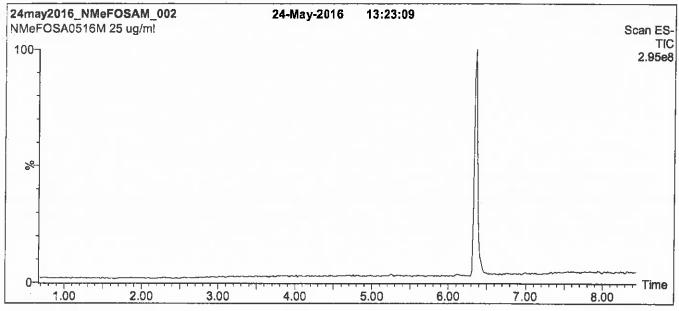
QUALITY MANAGEMENT:

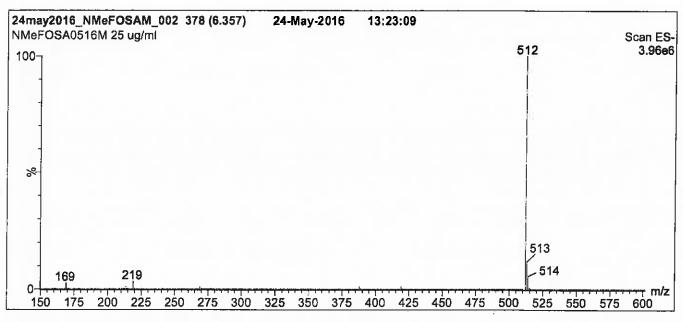
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).











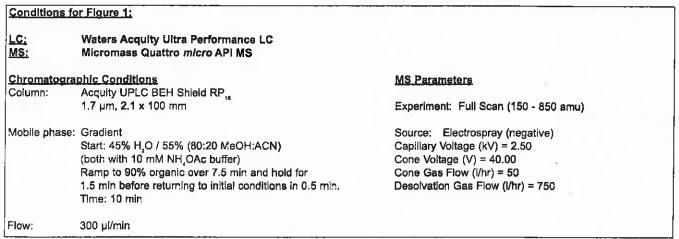
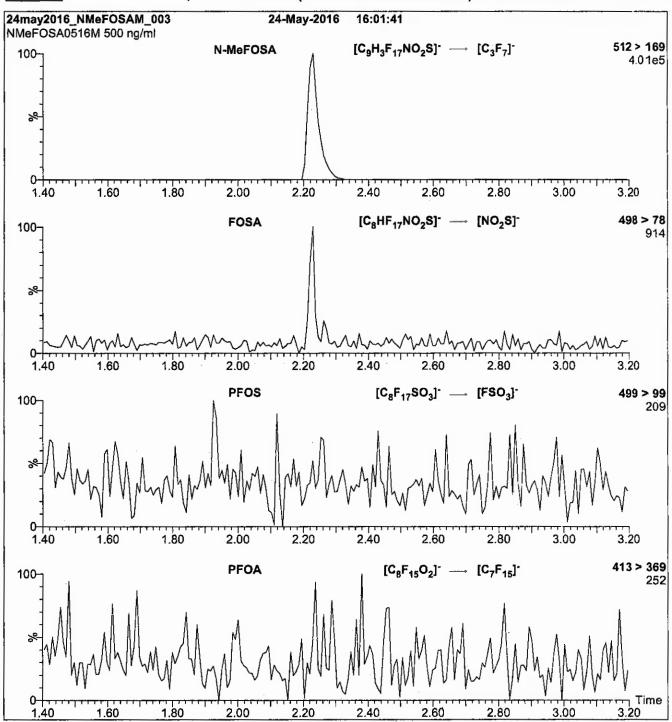
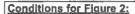


Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml N-MeFOSA-M)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

300 µl/min Flow:

MS Parameters

Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30

LCN-MeFOSAA_00004



PRODUCT CODE:

N-MeFOSAA

LOT NUMBER:

NMeFOSAA0916

COMPOUND:

N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2355-31-9

MOLECULAR FORMULA:

C,H,F,,NO,S

MOLECULAR WEIGHT:

571.21

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/12/2016

EXPIRY DATE: (mm/ddyyyy)

10/12/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 10/25/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

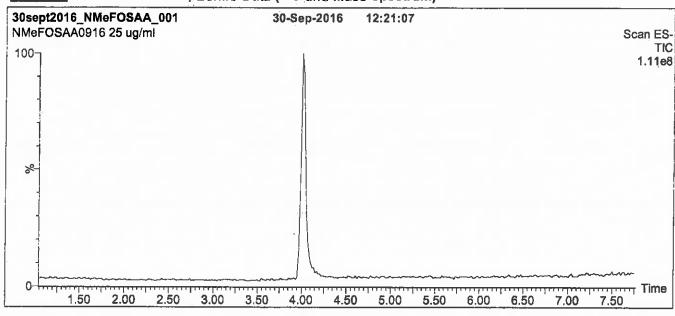
QUALITY MANAGEMENT:

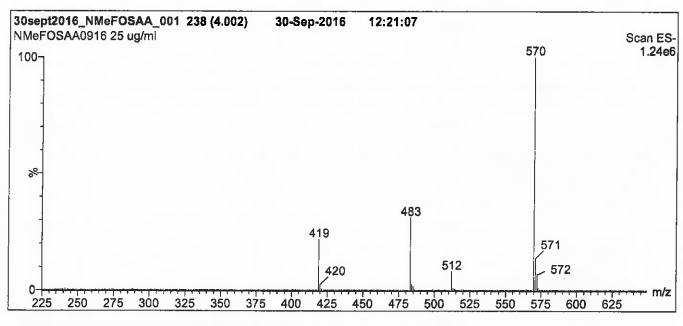
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





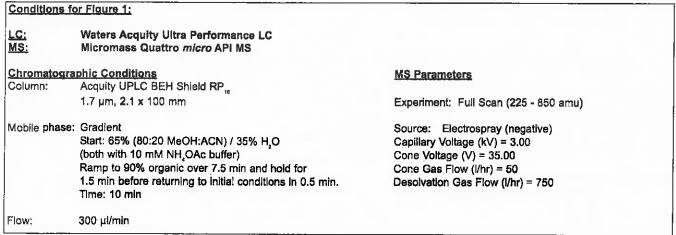
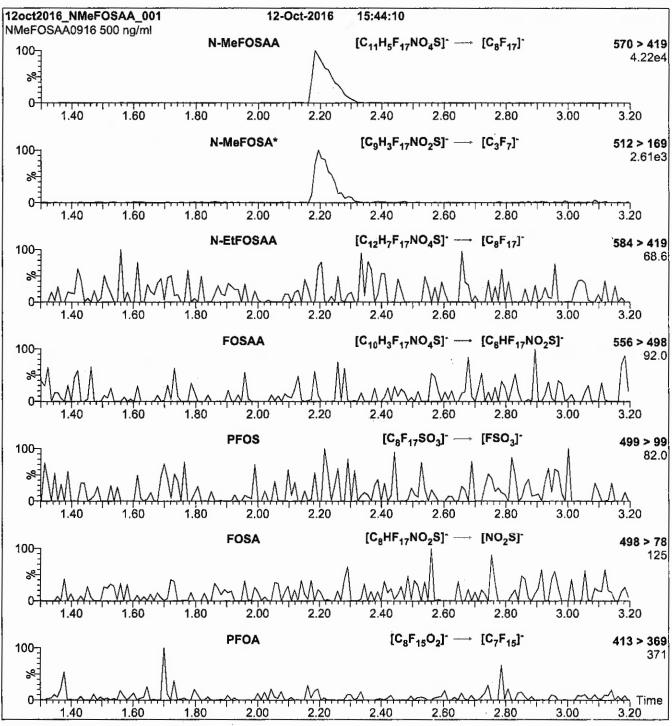
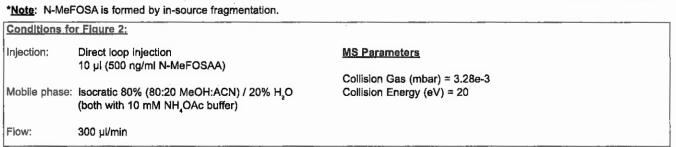


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





LCN-MeFOSAA_00005



PRODUCT CODE:

N-MeFOSAA

LOT NUMBER:

NMeFOSAA0916

COMPOUND:

N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2355-31-9

MOLECULAR FORMULA:

C,H,F,,NO,S

MOLECULAR WEIGHT:

571.21

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/12/2016

EXPIRY DATE: (mm/ddyyyy)

10/12/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 10/25/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products:

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

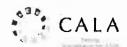
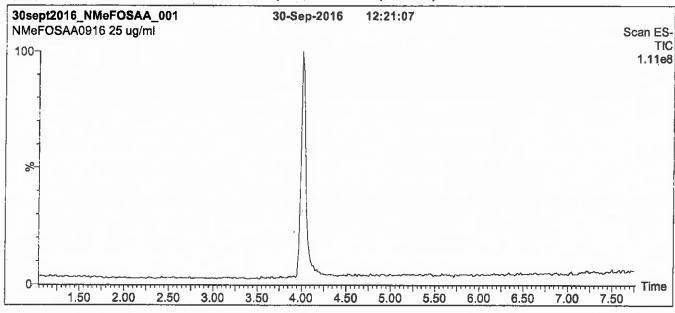
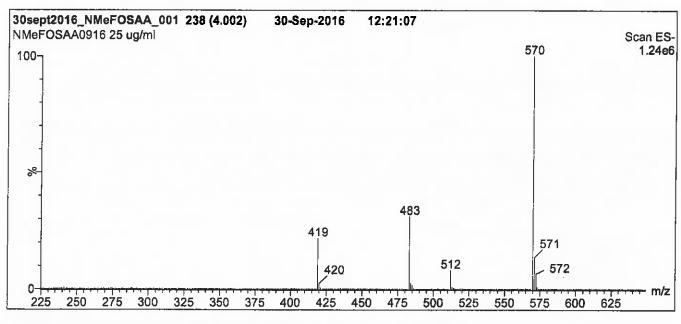




Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





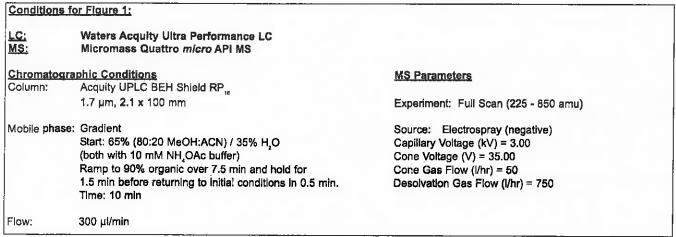
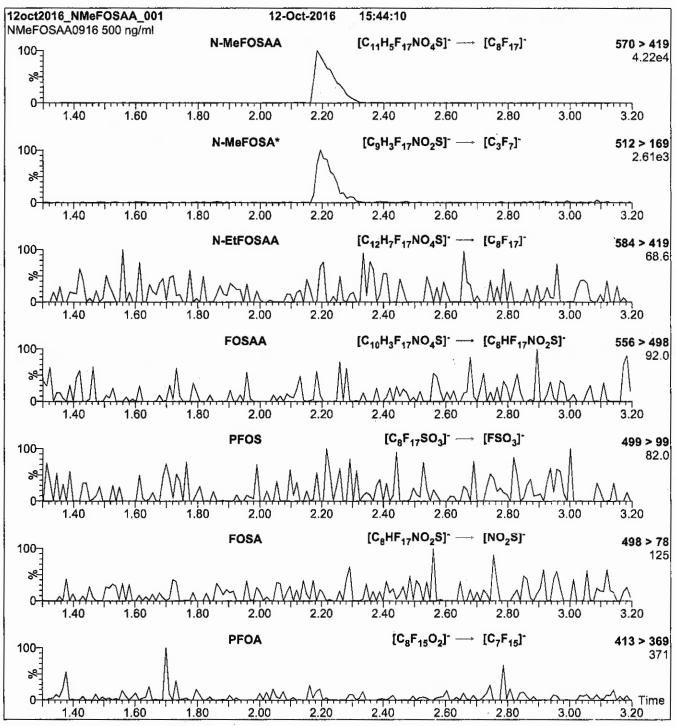
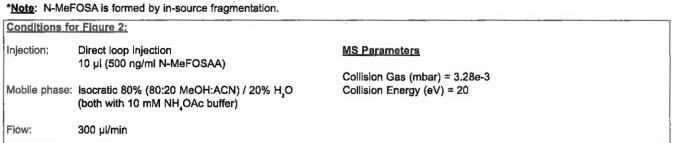


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





LCPFAC-24PAR_00001

PFAC-24PAR

Native Per- and Poly-fluoroalkyl Substance Precision and Recovery Standard Solution

PRODUCT CODE:

PFAC-24PAR

LOT NUMBER:

PFAC24PAR0917

SOLVENT(S):

Methano! / Isopropanoi (4%) / Water (<1%)

DATE PREPARED: (mm/dd/yyyy)

09/13/2017

LAST TESTED: (mm/dd/yyyy)

09/15/2017

EXPIRY DATE: (mm/dd/yyyy)

09/15/2022

RECOMMENDED STORAGE:

Refrigerate ampoule

DESCRIPTION:

PFAC-24PAR is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C_4 - C_{14}), seven native perfluoroalkylsulfonates (C_4 , C_5 , C_7 , C_9 , and C_{10} linear; C_8 and C_8 linear and branched), three native telomer sulfonates (4:2, 6:2, and 8:2), two native perfluorocatanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide. The components and their concentrations are given in Table A.

The individual native perfluoroalkylcarboxylic acids, native perfluoroalkylsulfonates, native telomer sulfonates, native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: Isomeric Components and Percent Composition of PFHxSK
Table C: Isomeric Components and Percent Composition of PFOSK

Figure 1: LC/MS Data (SIR)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning furne hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon reguest.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Table A: PFAC-24PAR; Components and Concentrations (ng/ml, ± 5% in Methanol / Isopropanol (4%) / Water (<1%))

Compound	Abbreviation	Concentration (ng/ml)		Peak Ass!gnment in Figure 1	
Perfluoro-n-butanoic acid	PFBA	2000		A	
Perfluoro-n-pentanoic acid	PFPeA	2000		В	
Perfluoro-n-hexanoic acid	PFHxA	20	000	E	
Perfluoro-n-heptanoic acid	PFHpA	2000		G	
Perfluoro-n-octanoic acid	PFOA	2000		K	
Perfluoro-n-nonanoic acid	PFNA	2000		М	
Perfluoro-n-decanoic acid	PFDA	2000		Q	
Perfluoro-n-undecanoic acid	PFUdA	2000		٧	
Perfluoro-n-dodecanoic acid	PFDoA	2000		х	
Perfluoro-n-tridecanoic acid	PFTrDA	2000		Y	
Perfluoro-n-tetradecanoic acid	PFTeDA	2000		Z	
Perfluoro-1-octanesulfonamide	FOSA	2000		Т	
N-methylperfluoro-1-octanesulfonamidoacetic acid	N-MeFOSAA	2000		S	
N-ethylperfluoro-1-octanesulfonamidoacetic acid	N-EtFOSAA	2000		U	
Compound	Abbreviation	Concentration (ng/ml)		Peak Assignment	
		as the salt	as the anion	In Figure 1	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	С	
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2000	1880	F	
7.4	PFHxSK: linear isomer	1620	1480	1	
Potassium perfluorohexanesulfonate*	PFHxSK: ∑ branched Isomers	378	344	Н	
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2000	1900	L	
	PFOSK: linear isomer	1580	1460	0	
Potassium perfluorooctanesulfonate**	PFOSK: ∑ branched isomers	422	391	N	
Sodium perfluoro-1-nonanesulfonate	L-PFNS	2000	1920	Ŕ	
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	W	
Sodium 1H,1H,2H,2H-perfluoro-1-hexanesulfonate	4:2FTS	2000	1870	D	
Sodium 1H,1H,2H,2H-perfluoro-1-octanesulfonate	6:2FTS	2000	1900	J	
Sodium 1H,1H,2H,2H-perfluoro-1-decanesulfonate	8:2FTS	2000	1920	P	

See Table B for percent composition of linear and branched PFHxSK isomers. See Table C for percent composition of linear and branched PFOSK isomers.

PFHxSK; Isomeric Components and Percent Composition (by 19F-NMR)* Table B:

Isomer	Name	Name Structure		cent osition -NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺	81.1	81.1
2	Potassium 1-trifiuoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CFSO ₃ -K ⁺ CF ₃	2.9	
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CFCF ₂ SO ₃ -K ⁺ CF ₃	1.4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CFCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	5.0	18.9
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	8.9	10.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ ·K⁺ CF ₃	0.2	
7	Other Unidentified Isomers		0.5	

Percent of total perfluorohexanesulfonate isomers only. Systematic Name: Potassium perfluorohexane-2-sulfonate.

<u>Table C:</u> PFOSK; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

Isomer	Name Structure		Percent Composition by ¹⁹ F-NMR	
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ SO ₃ -K+	78.8	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CFSO ₃ ·K ⁺ CF ₃	1.2	
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CFCF ₂ SO ₃ -K ⁺ CF ₃	0.6	
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CFCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	1.9	
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	2.2	
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CFCF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	4.5	21.1
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	10.0	21.1
8	Potassium 5,5- di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ CF ₂ SO ₃ *K [†] CF ₃	0.2	
9	Potassium 4,4- di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF ₂ CCF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.03	
10	Potassium 4,5- di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CFCFCF ₂ CF ₂ CF ₂ SO ₃ ·K ⁺ CF ₃	0.4	
11	Potassium 3,5- di(trifluoromethy!)perfluorohexanesulfonate	CF ₃ CF ₃ CFCF ₂ CFCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	0.07	

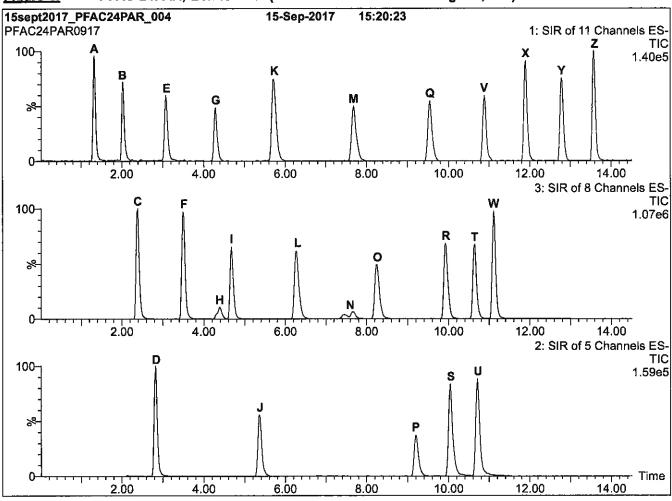
Percent of total perfluorooctanesulfonate isomers only.
 Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By:

B.G. Chittim, General Manager

Date: 09/19/2017 (mm/dd/yyyy)

Figure 1: PFAC-24PAR; LC/MS Data (Total Ion Current Chromatogram; SIR)





<u>LC:</u> MS: Waters Acquity Ultra Performance LC Micromass Quattro *micro* API MS

Chromatographic Conditions

Column:

Acquity UPLC BEH Shield RP, s

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 40% (80:20 MeOH:ACN) / 60% H₂O (both with 10 mM NH₄OAc buffer) Ramp to 55% organic over 3.5 min.

Ramp to 70% organic over 6.5 min.
Ramp to 85% organic over 5 min and hold for
1 min before returning to initial conditions in 0.5 min.

Time: 17 min

Flow:

300 µl/min

MS Parameters

Experiment: SIR

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (10-70)

Cone Gas Flow (I/hr) = 50

Desolvation Gas Flow (I/hr) = 750

Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)

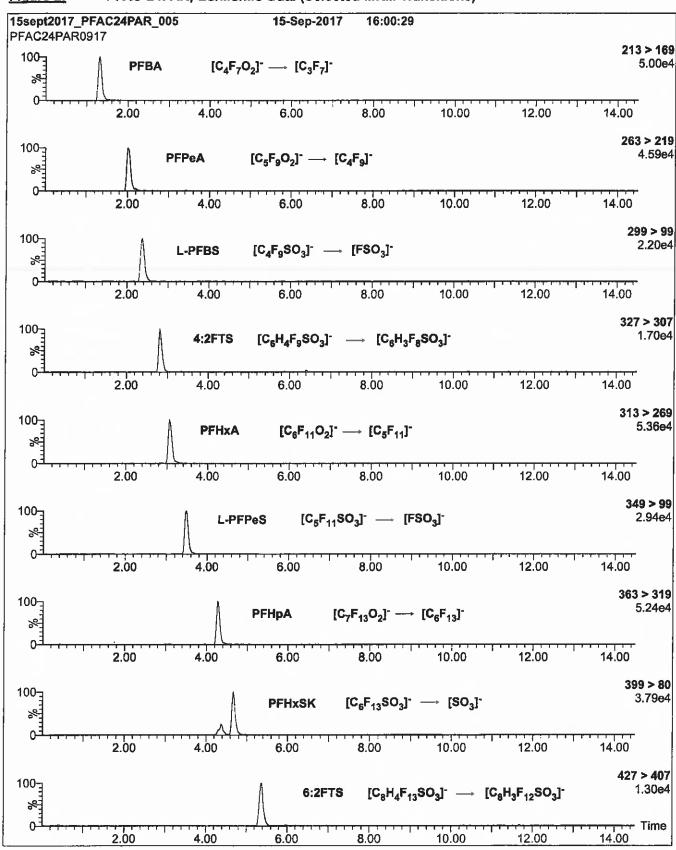
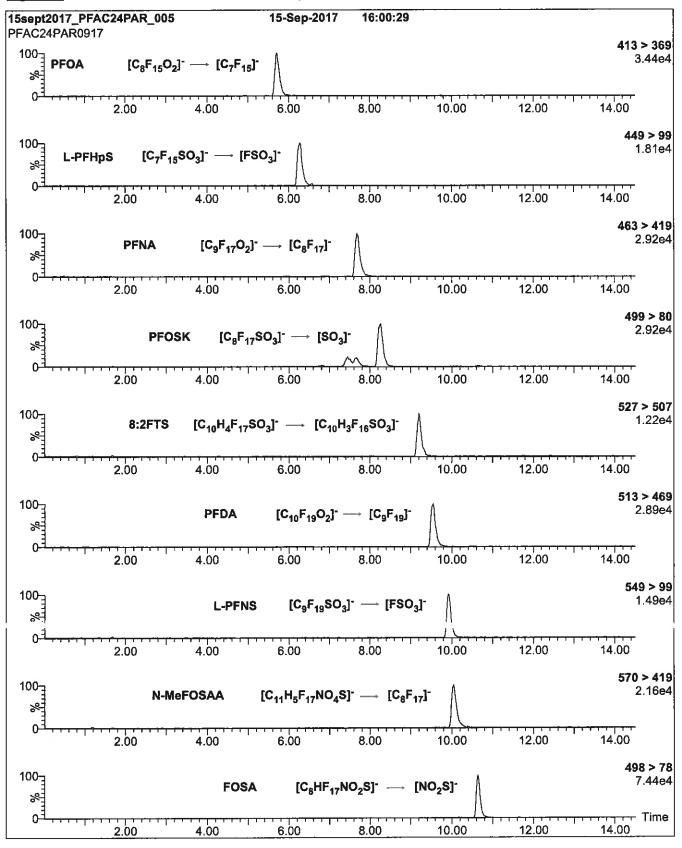
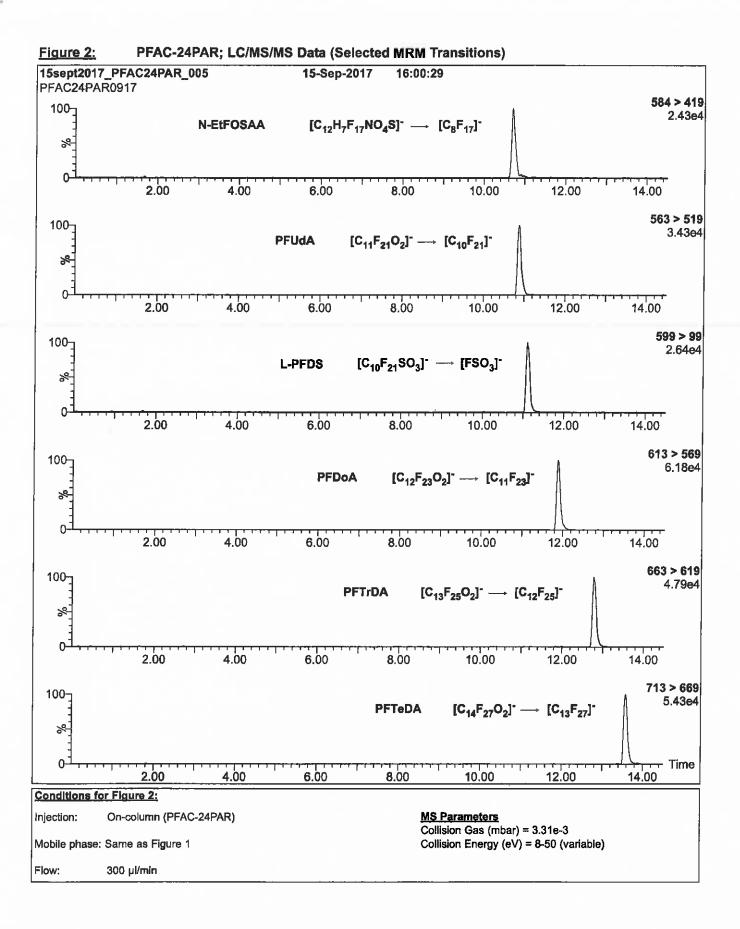


Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)





Page 21	6	οf	606	
---------	---	----	-----	--

LCPFBA 00007



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0516

COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

214.04

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/odd/yyyy)

05/27/2016

EXPIRY DATE: (mmidd/yyyy)

05/27/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/31/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

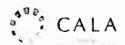
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

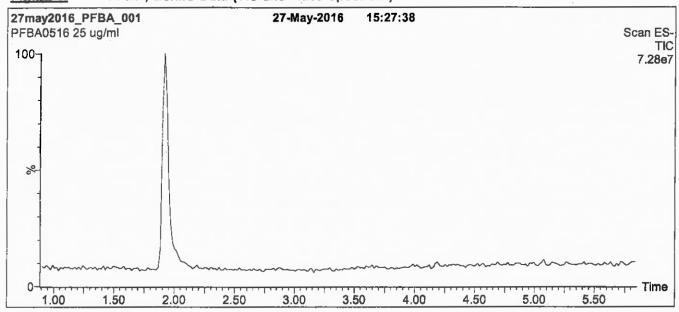
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

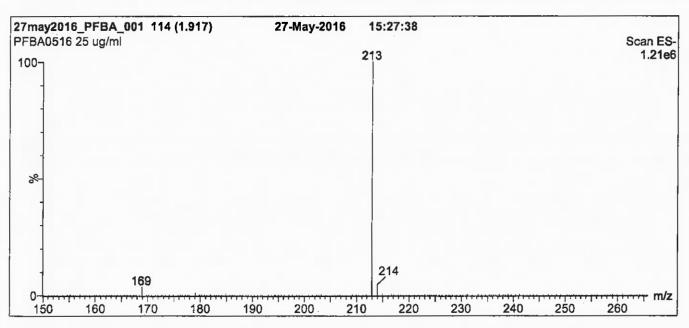


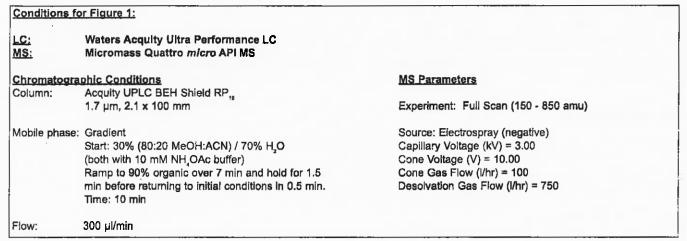


For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

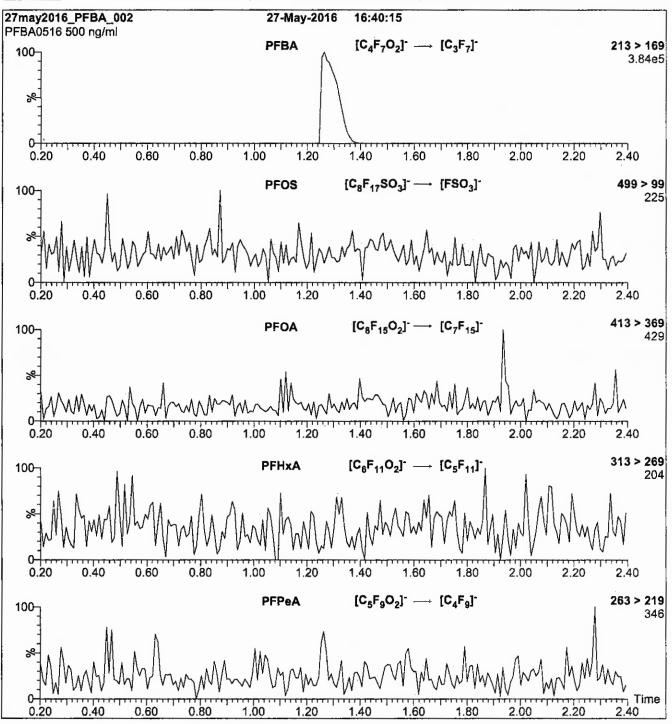
Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)

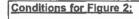






PFBA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O (both with 10 mM NH₄OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 10

300 µl/min

LCPFBS 00008

R: 8BC 9/13/16



ID: LCPFBS_00007 Exp: 03/15/21 Prpd: SBC PF-1-butanesuifonate K sa



ID: LCPFBS_00008 Exp: 03/16/21 Prpd: SBC PF-1-butanesulfonate K sa



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

LPFBS0316

COMPOUND:

Potassium perfluoro-1-butanesulfonate

CAS #:

29420-49-3

338.19

Methanol

STRUCTURE:

MOLECULAR FORMULA:

C,F,SO,K

50.0 ± 2.5 µg/ml (K salt)

 $44.2 \pm 2.2 \mu g/ml$ (PFBS anion)

CHEMICAL PURITY:

CONCENTRATION:

LAST TESTED: (mrn/dd/yyyy)

03/15/2016

>98%

EXPIRY DATE: (mm/dd/yyyy)

03/15/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 03/21/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline tot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_(y), of a value y and the uncertainty of the independent parameters

 $x_1, x_2, ... x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

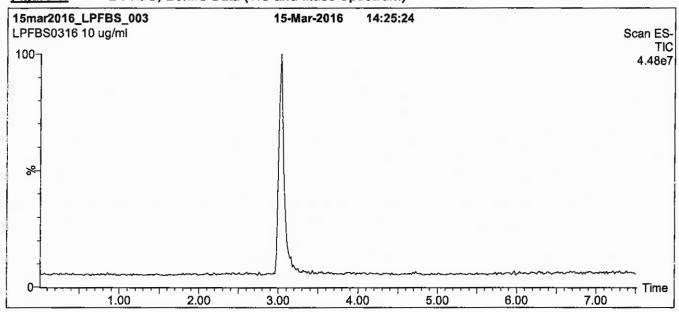
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

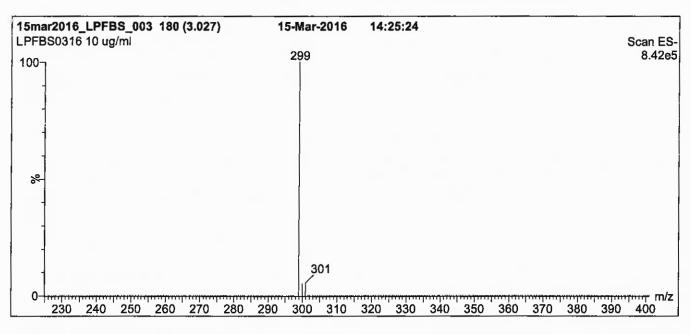




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.weil-labs.com or contact us directly at info@well-labs.com

Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)





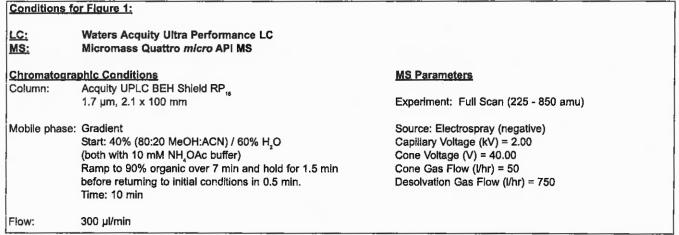
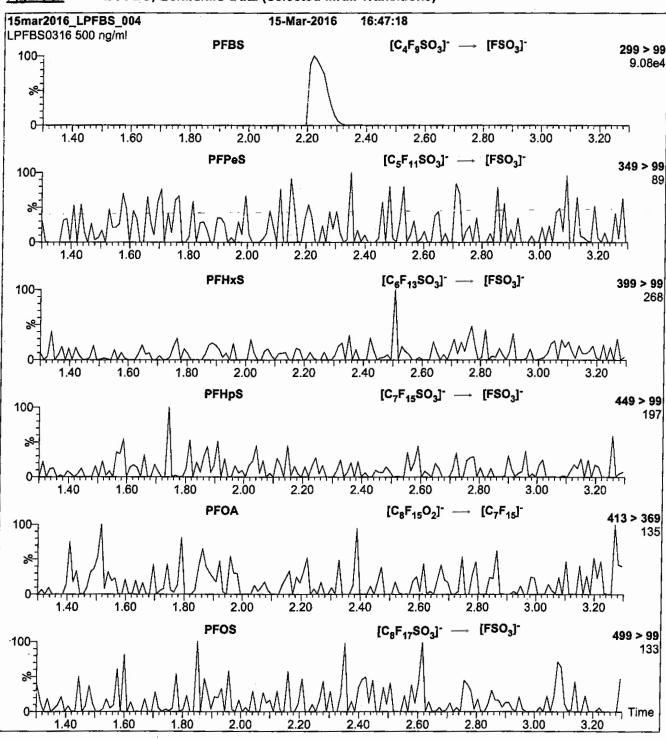
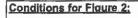


Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

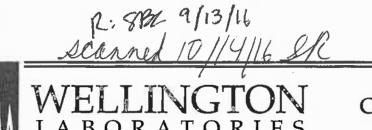
MS Parameters

Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 25

Flow:

300 µl/min

LCPFDA_00007







Exp: 05/31/21 Prpd: SBC PF-п-decanoic acid

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0516

COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

514.08

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/31/2016

EXPIRY DATE: (mrr/sid/yyyy)

05/31/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of Perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: _ 06/13/2016

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_i(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

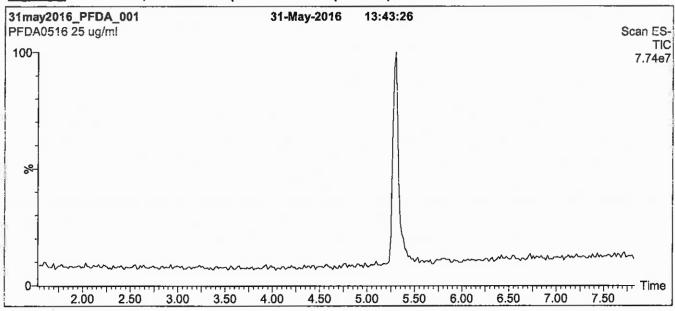
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

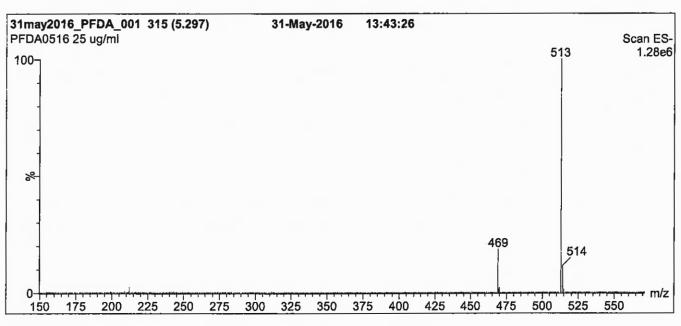




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFDA; LC/MS Data (TIC and Mass Spectrum)





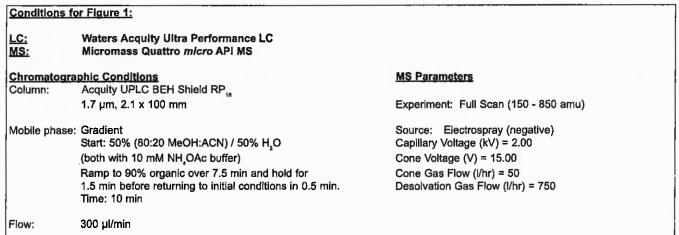
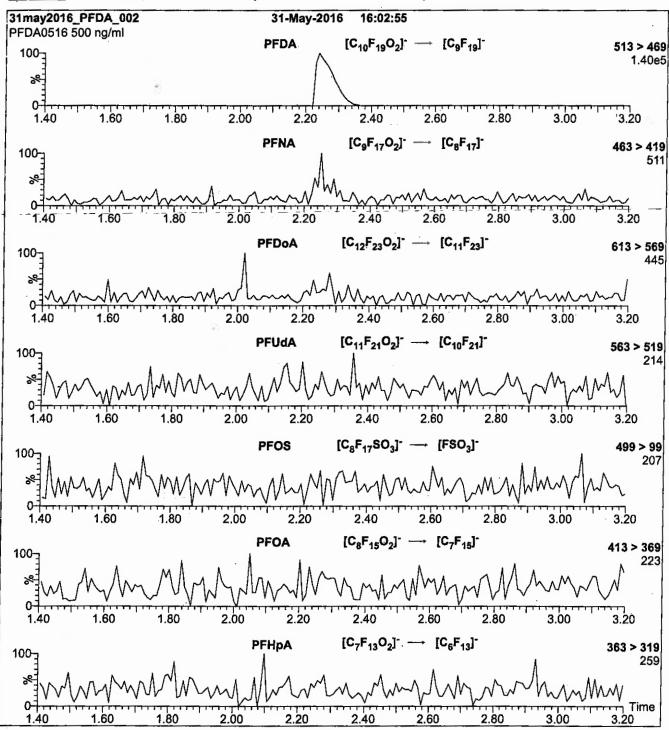
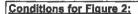


Figure 2: PFDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 13

LCPFDA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0517

COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2

MOLECULAR FORMULA:

C, HF, O,

 $50 \pm 2.5 \,\mu g/ml$

MOLECULAR WEIGHT:

SOLVENT(S):

514.08 Methanol

Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

05/29/2017

EXPIRY DATE: (mm/dd/yyyy)

05/29/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.2% of perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/30/2017

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solublity in a given diffuent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_x(y)$, of a value y and the uncertainty of the independent parameters

$$x_1$$
, x_2 ,... x_n on which it depends is:
$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

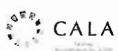
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

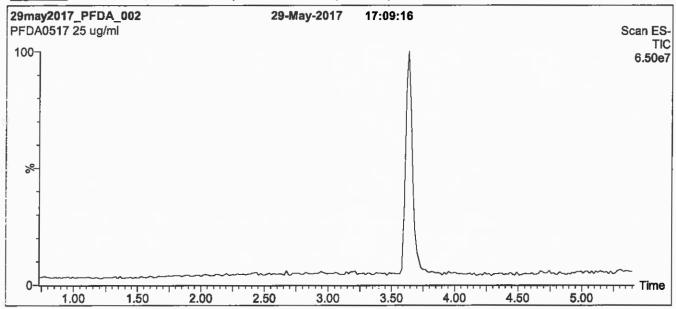
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

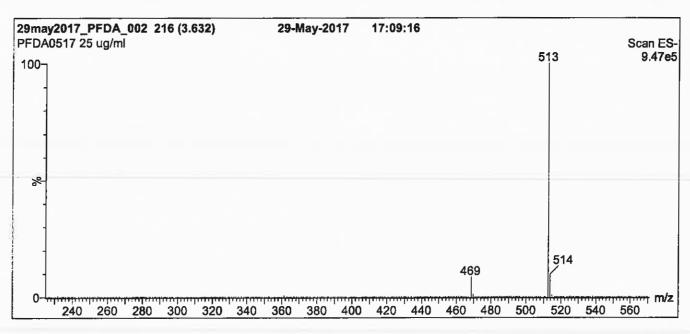




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.weil-labs.com or contact us directly at info@weil-labs.com

Figure 1: PFDA; LC/MS Data (TIC and Mass Spectrum)





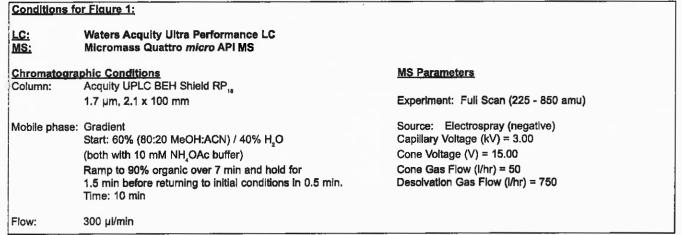
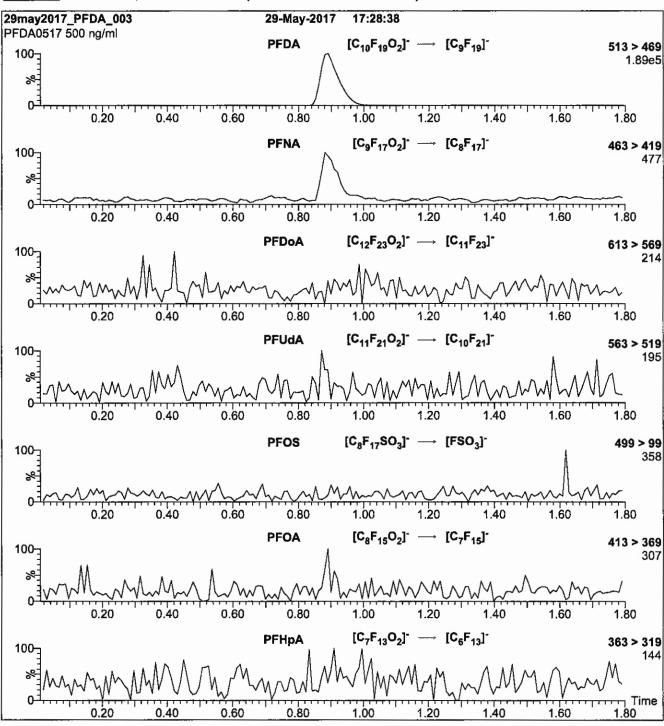


Figure 2: PFDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 13

LCPFDoA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDoA

LOT NUMBER: PFDoA0516

COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

614,10

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED; (mm/dd/yyyy)

05/31/2016

EXPIRY DATE: (mm/dd/yyy)

05/31/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 06/02/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certifled reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

x,, x,...x on which it depends is:

$$u_c(y(x_1, x_2 ... x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA, A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

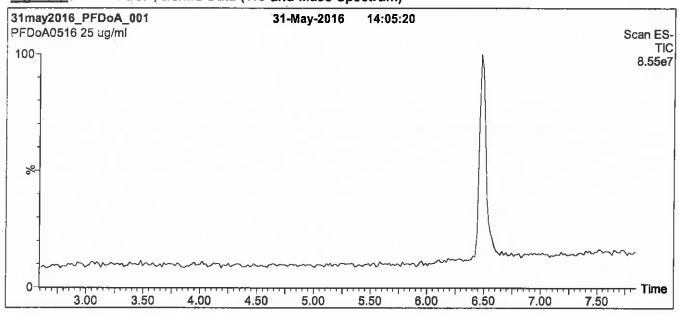


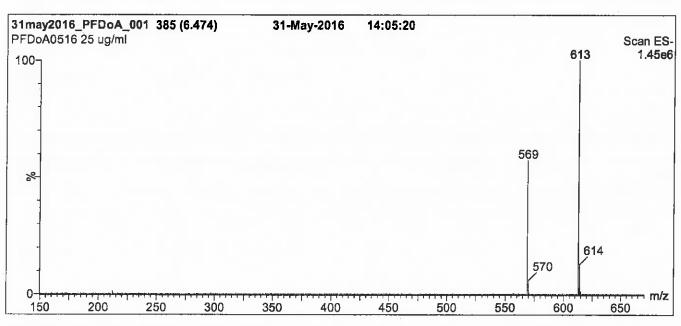


For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFDoA; LC/MS Data (TIC and Mass Spectrum)

Ĭ.,





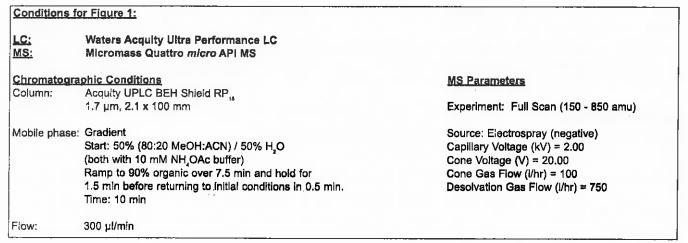
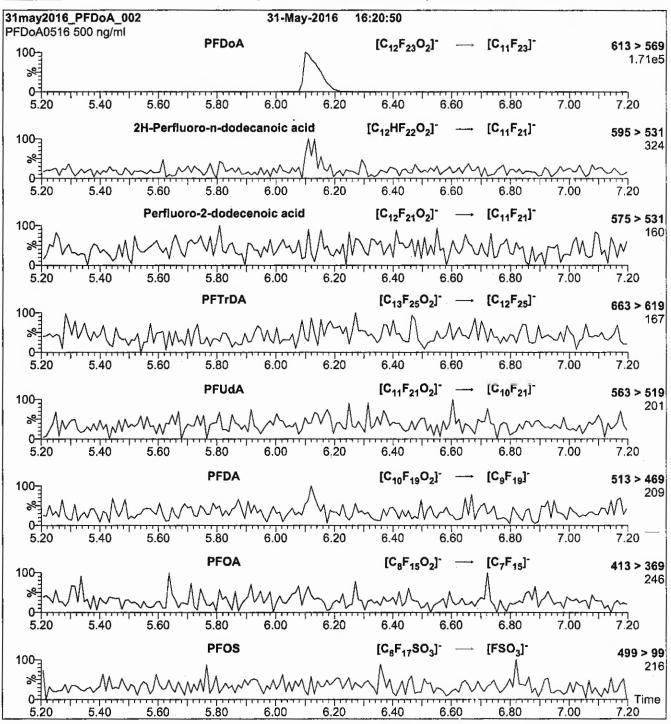
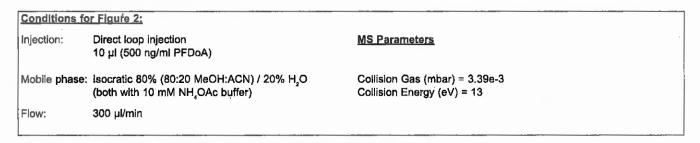


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





LCPFDoA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDoA

LOT NUMBER:

PFDoA0517

COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1

MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

614.10

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yww)

05/29/2017

EXPIRY DATE: (mm/dd/yyyy)

05/29/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 05/30/2017

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

$$x_i, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

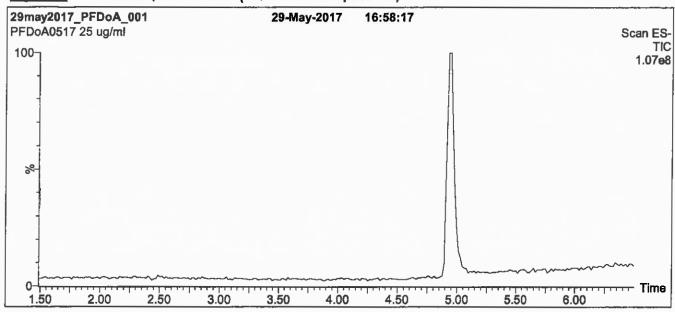
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

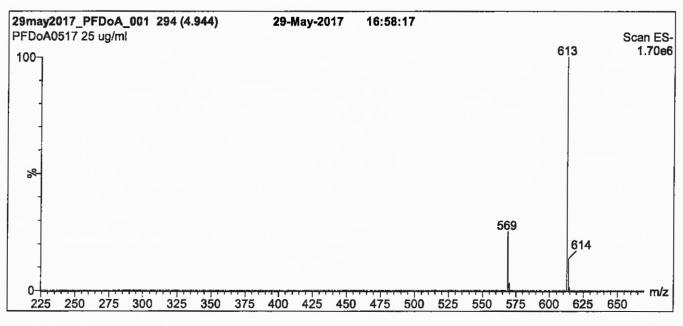




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFDoA; LC/MS Data (TIC and Mass Spectrum)





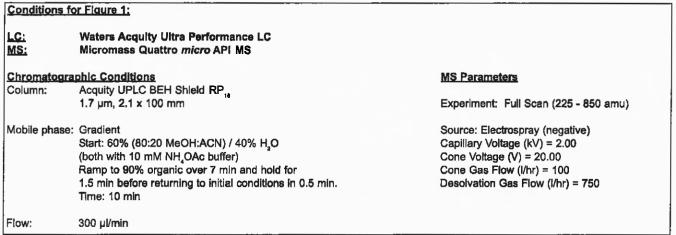
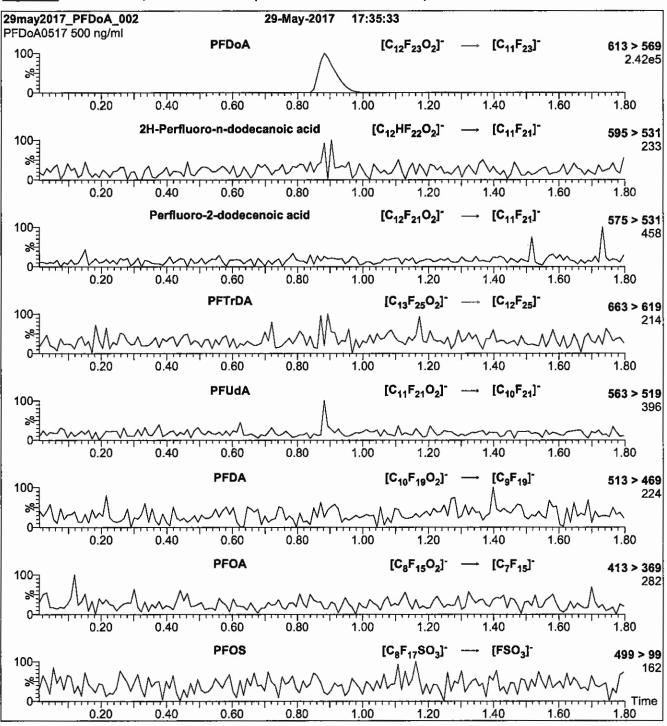


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

MS Parameters

Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 13

(both with 10 mM NH₄OAc buffer) 300 μl/min

Flow:

LCPFDSA_00002



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFDS

LOT NUMBER:

LPFDS0516

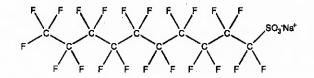
COMPOUND:

Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #:

2806-15-7



MOLECULAR FORMULA:

C₁₀F₂,SO₃Na

MOLECULAR WEIGHT:

622.13

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

 $48.2 \pm 2.4 \mu g/ml$ (PFDS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/www)

05/24/2016

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/26/2016

The products prepared by Wellington Laboratorles Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_i(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_{c}(y(x_{1}, x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n} u(y, x_{i})^{2}}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

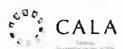
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

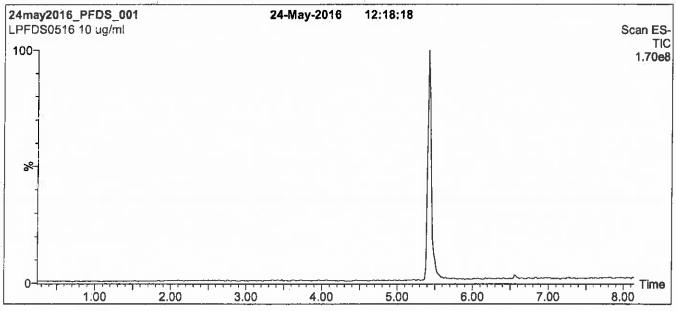


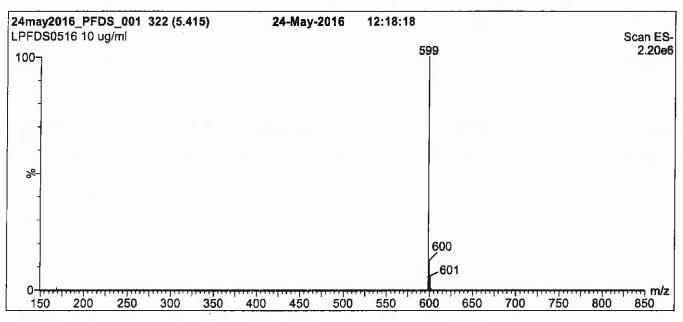


For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com



1





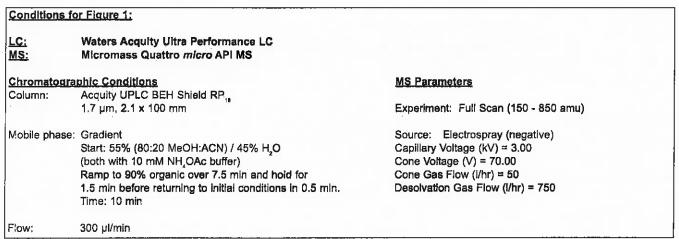
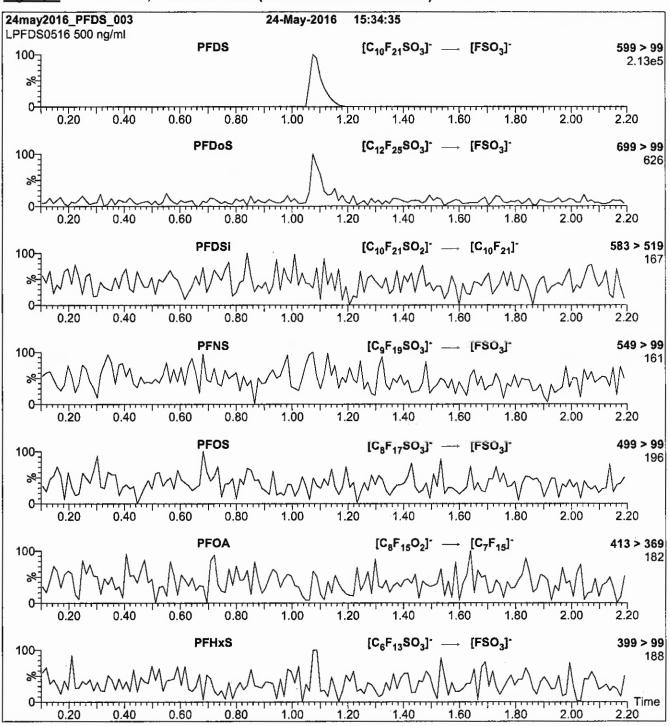
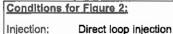


Figure 2: L-PFDS; LC/MS/MS Data (Selected MRM Transitions)





10 µl (500 ng/ml L-PFDS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.70e-3 Collision Energy (eV) = 50

Flow:

300 µl/min

LCPFHpA_00008



PRODUCT CODE:

PFHpA

LOT NUMBER:

PFHpA1216

COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:

CAS #:

375-85-9

MOLECULAR FORMULA:

CONCENTRATION:

C,HF,O,

 $50 \pm 2.5 \mu g/ml$

MOLECULAR WEIGHT:

364.06

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/02/2016

EXPIRY DATE: (mm/dd/yyyy)

12/02/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/12/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_1(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

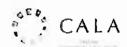
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

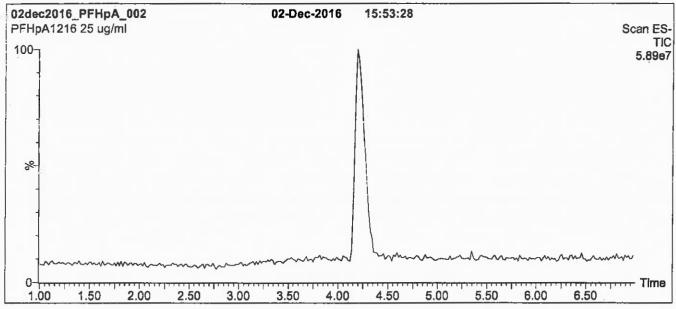
QUALITY MANAGEMENT:

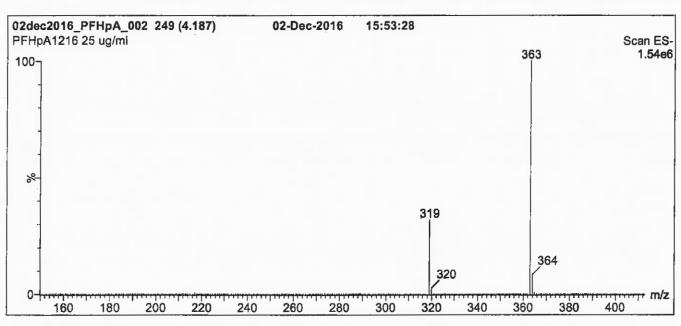
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).











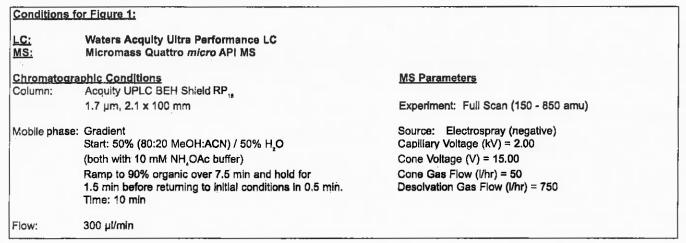
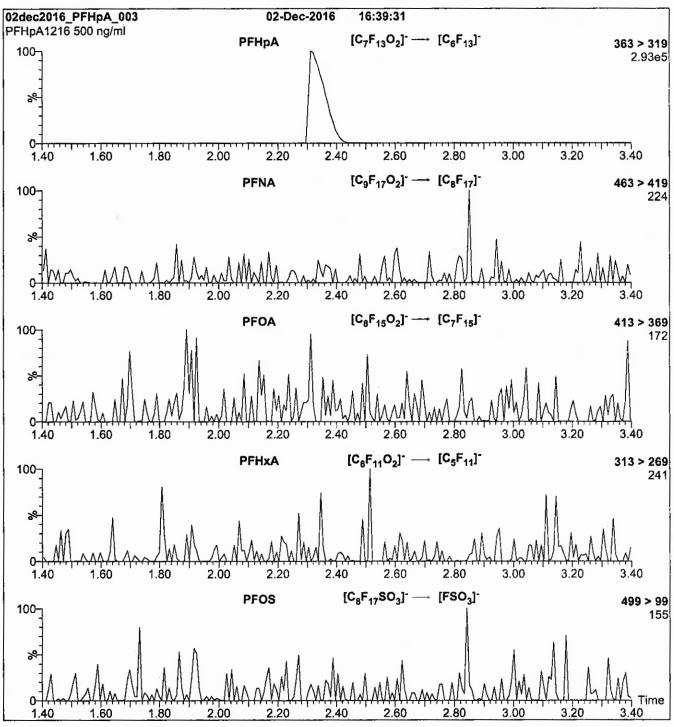
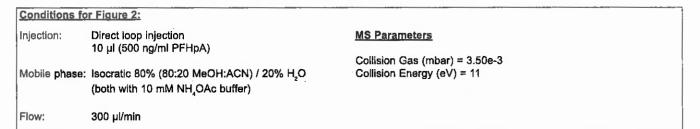


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





LCPFHpSA_00003



PRODUCT CODE:

L-PFHpS

LOT NUMBER:

LPFHpS0817

COMPOUND:

Sodium perfluoro-1-heptanesulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₇F₁₅SO₃Na

MOLECULAR WEIGHT:

472.10

CONCENTRATION:

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt)

 $47.6 \pm 2.4 \mu g/ml$ (PFHpS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/01/2017

EXPIRY DATE: (mm/dd/yyyy)

09/01/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains ~ 0.2% of L-PFHxS (C_xF_{1x}SO₃Na) and ~ 0.1% of L-PFOS (C_xF_{1x}SO₃Na).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date:

09/07/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • Info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_s(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

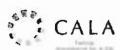
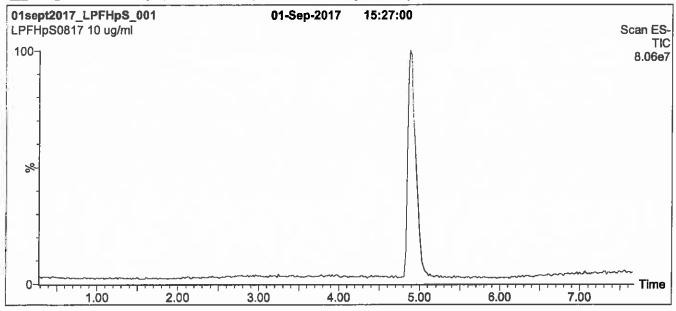
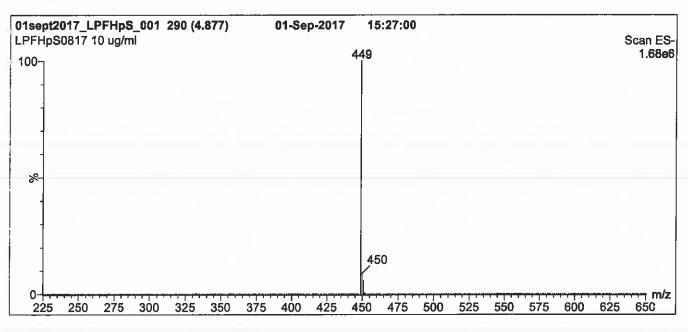




Figure 1: L-PFHpS; LC/MS Data (TIC and Mass Spectrum)





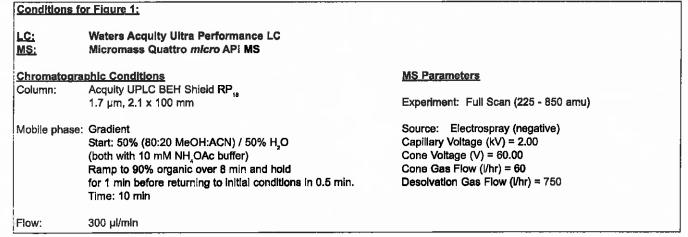
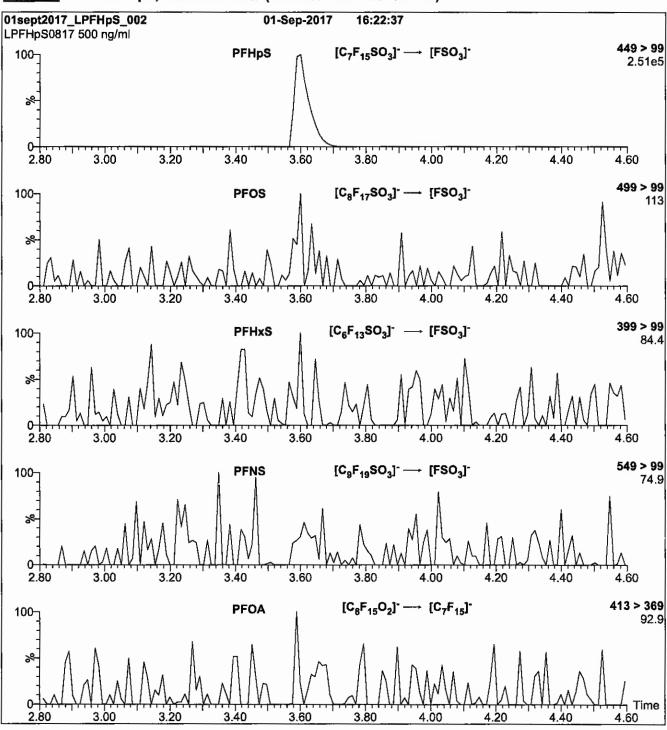
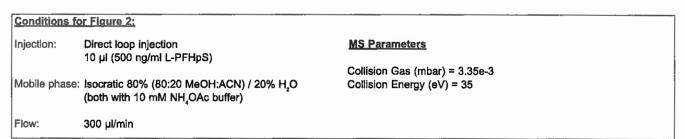


Figure 2: L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)





LCPFHxA_00007



PRODUCT CODE:

PFHxA

LOT NUMBER:

PFHxA1215

COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #:

307-24-4

MOLECULAR FORMULA:

CHF,O,

CONCENTRATION:

 $50 \pm 2.5 \,\mu g/ml$

MOLECULAR WEIGHT:

314.05

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/23/2015

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u (y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_{c}(y(x_{1},x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n} u(y,x_{i})^{2}}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The Individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

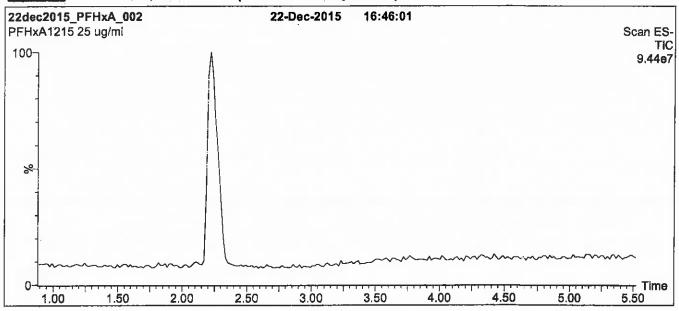
QUALITY MANAGEMENT:

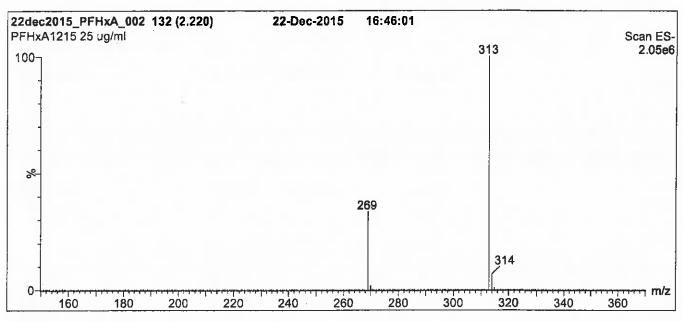
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: PFHxA; LC/MS Data (TIC and Mass Spectrum)





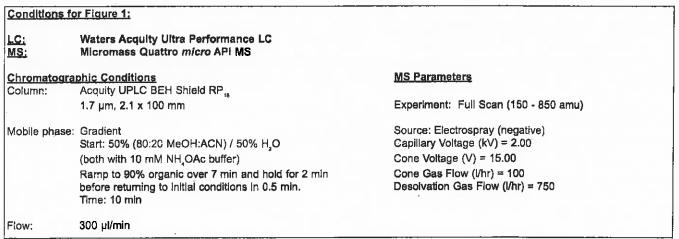
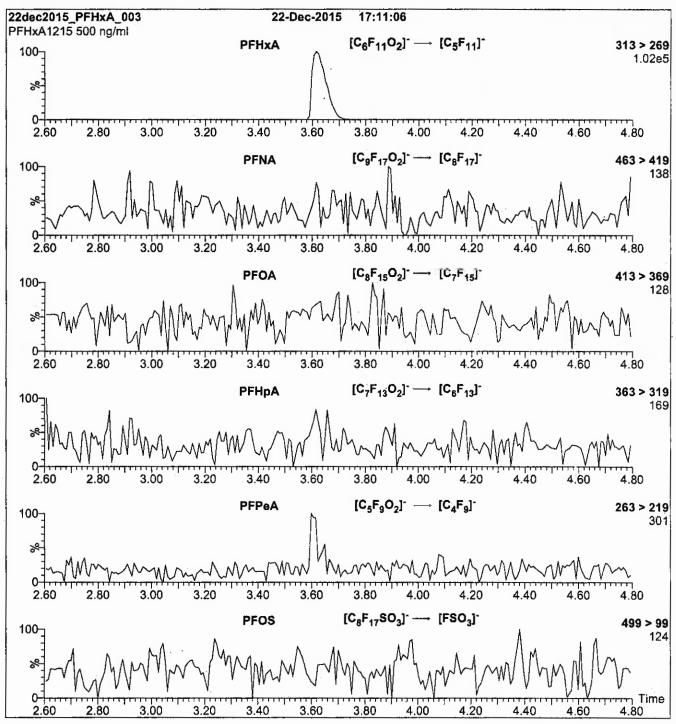
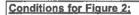


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 10

LCPFHxDA_00008



PRODUCT CODE:

PFHxDA

LOT NUMBER:

PFHxDA0516

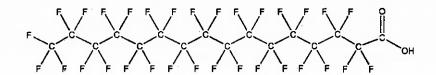
COMPOUND:

Perfluoro-n-hexadecanoic acid

STRUCTURE:

CAS #:

67905-19-5



MOLECULAR FORMULA:

C,8HF31O2

MOLECULAR WEIGHT:

814.13

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/25/2016

EXPIRY DATE: (mm/ed/yyyy)

05/25/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxyllc acid to the methyl ester.

Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

P.C. Christian

Date: 05/27/2016

(mm/dd/www)

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

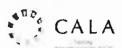
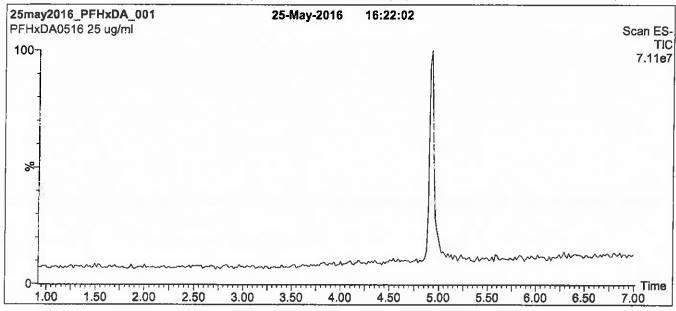
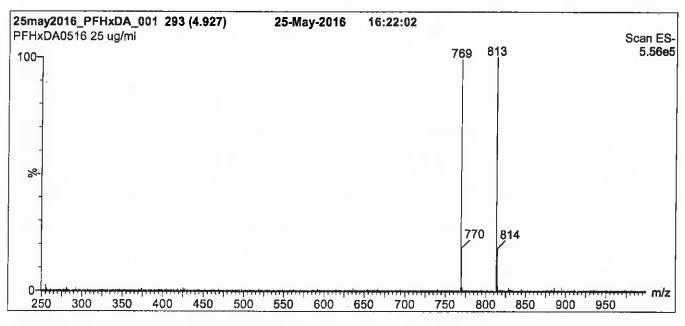




Figure 1: PFHxDA; LC/MS Data (TIC and Mass Spectrum)





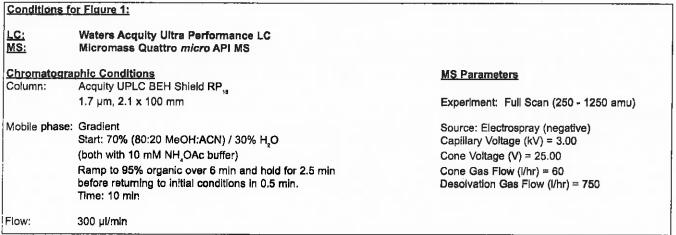
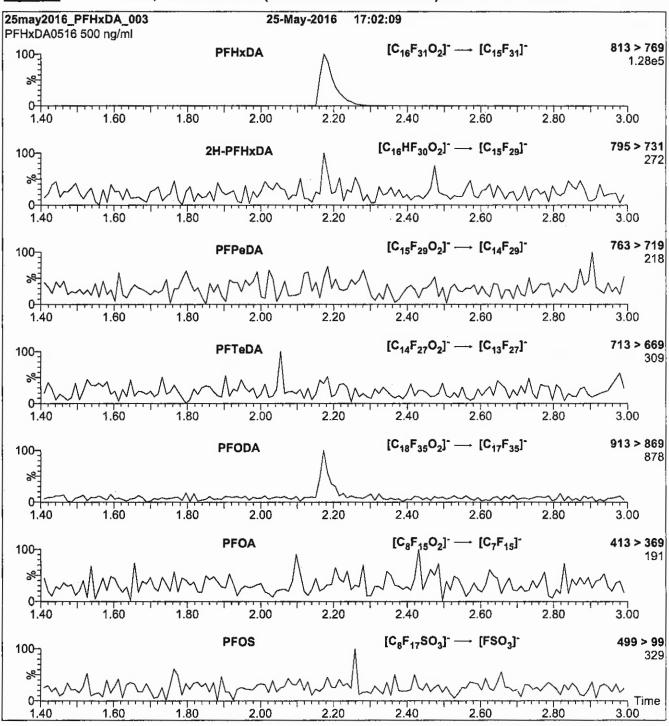


Figure 2: PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFHxDA)

to pir (soo rig/riii i i i i kb/)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3 Collision Energy (eV) = 15

LCPFHxDA_00009



PRODUCT CODE:

PFHxDA

LOT NUMBER:

PFHxDA0717

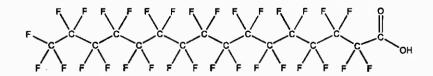
COMPOUND:

Perfluoro-n-hexadecanoic acid

STRUCTURE:

CAS #:

67905-19-5



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

814.13

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/13/2017

EXPIRY DATE: (mm/dd/yyyy)

07/13/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 08/04/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_{x}(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ..., x_n$$
 on which it depends is:
$$u_c(y(x_1, x_2, ..., x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

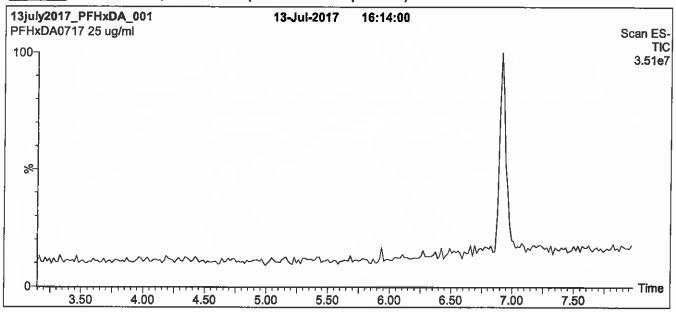
QUALITY MANAGEMENT:

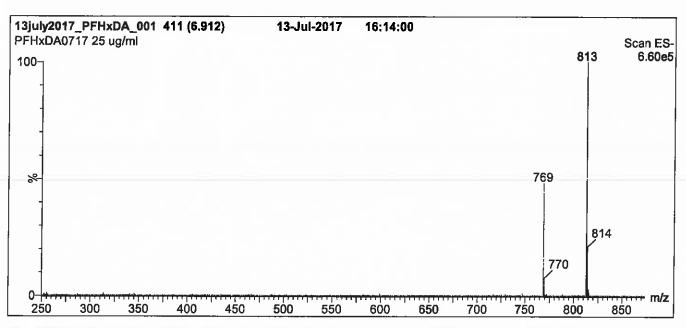
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Figure 1: PFHxDA; LC/MS Data (TIC and Mass Spectrum)





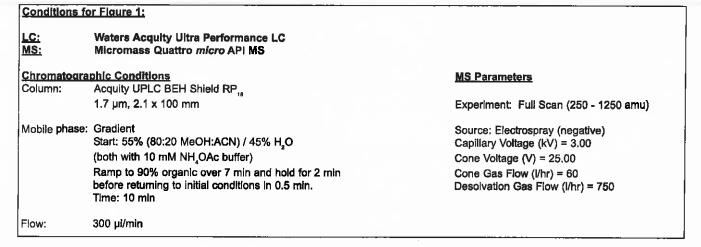
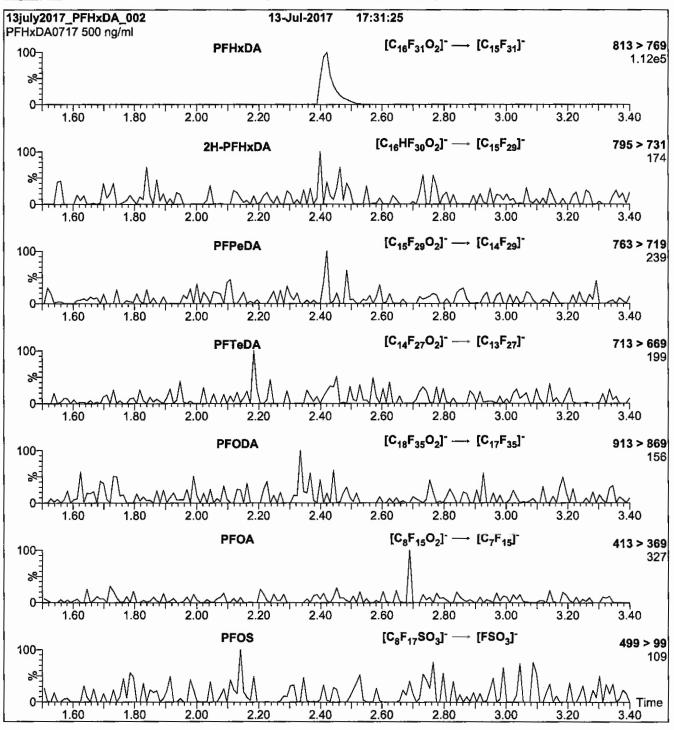
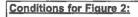


Figure 2: PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.13e-3 Collision Energy (eV) = 15

LCPFHxS-br_00004



br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFHxSK

LOT NUMBER:

brPFHxSK0615

CONCENTRATION:

 $50.0 \pm 2.5 \mu g/ml$ (total potassium salt)

45.5 ± 2.3 µg/ml (total PFHxS anion)

SOLVENT(S):

Methanol

DATE PREPARED: (mm/dd/yyyy)

06/29/2015

LAST TESTED: (mm/dd/yyyy)

07/03/2015

EXPIRY DATE: (mm/dd/yyyy)

07/03/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be \geq 98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by 19F-NMR

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS Data

Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • Info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_{c}(y(x_{1}, x_{2},...x_{n})) = \sqrt{\sum_{i=1}^{n} u(y, x_{i})^{2}}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





Table A: br-PFHxSK; Isomeric Components and Percent Composition (by 19F-NMR)*

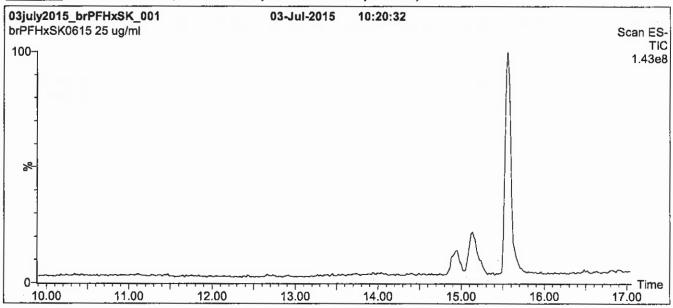
isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CFSO ₃ -K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CFCF ₂ SO ₃ ·K ⁺ CF ₃	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CFCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ SO ₃ ·K ⁺ CF ₃	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	0.2
7	Other Unidentified Isomers		0.5

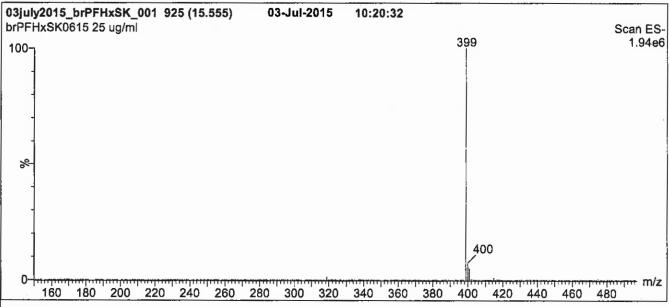
Percent of total perfluorohexanesulfonate isomers only.
 Systematic Name: Potasslum perfluorohexane-2-sulfonate.

Certified By:

Date: 09/27/2016 (mm/dd/yyyy)

Figure 1: br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)





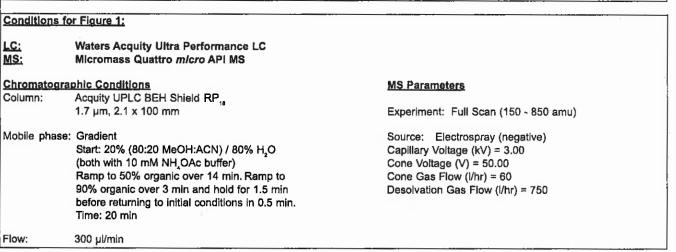
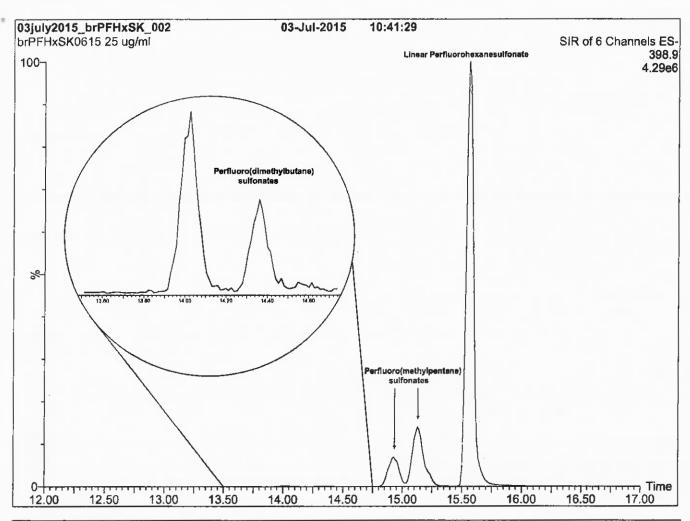


Figure 2: br-PFHxSK; LC/MS Data



Conditions for Figure 2:

LC: MS: Waters Acquity Ultra Performance LC Micromass Quattro micro API MS

Chromatographic Conditions

Column:

Acquity UPLC BEH Shleld RP,

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 20% (80:20 MeOH:ACN) / 80% H₂O

(both with 10 mM NH OAc buffer)

Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min

before returning to initial conditions in 0.5 min.

Time: 20 min

Flow:

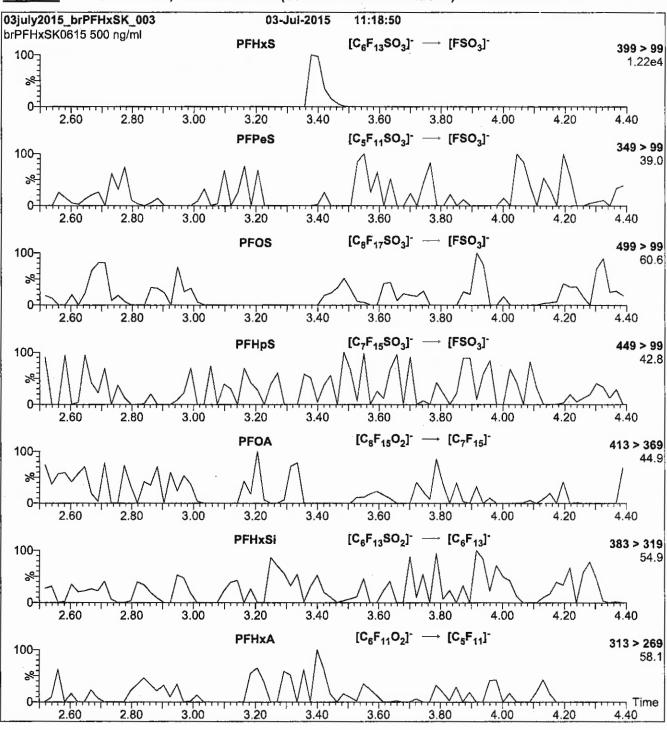
300 µl/min

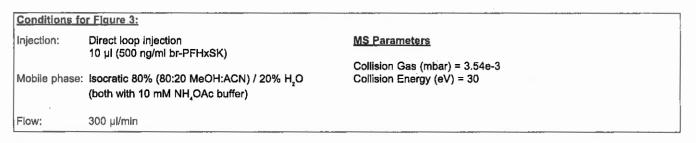
MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)





LCPFNA 00009



PRODUCT CODE:

PFNA

LOT NUMBER:

PFNA0717

COMPOUND:

Perfluoro-n-nonanoic acid

STRUCTURE:

CAS #:

375-95-1

F F F F F F F

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

50 ± 2.5 μg/ml

MOLECULAR WEIGHT:

464.08

μg/**ml**

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/20/2017

EXPIRY DATE: (mm/dd/yyyy)

07/20/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manage

Date:

(mm/dd/yyyy

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_c(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

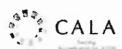
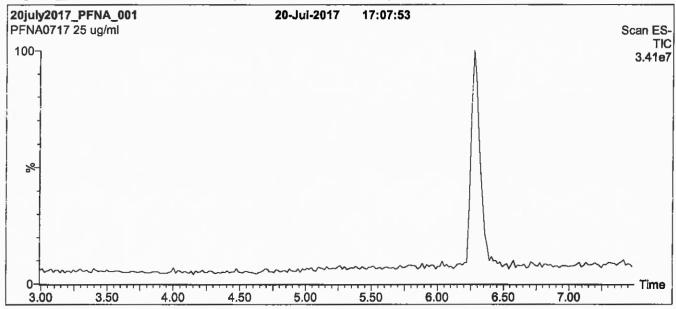
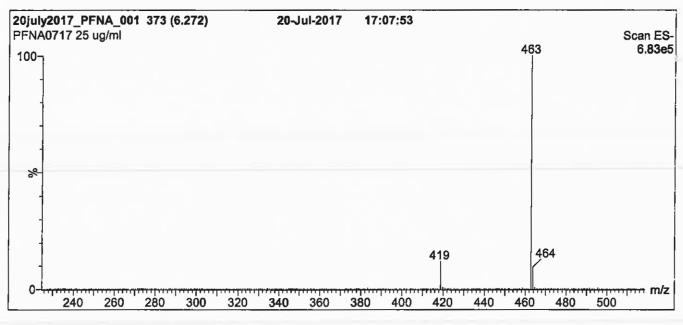




Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)





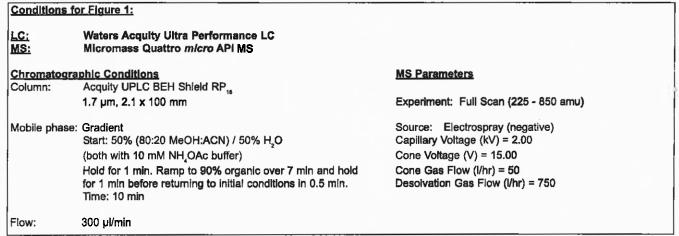
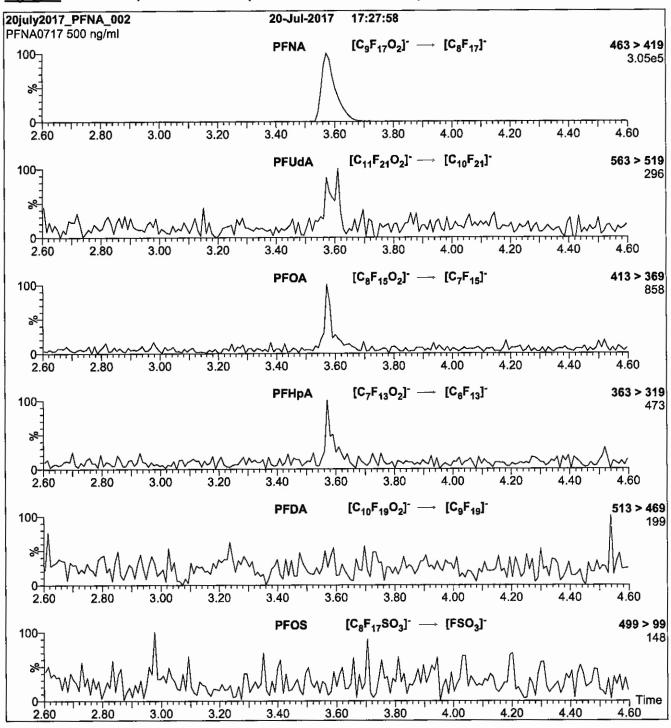


Figure 2: PFNA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 11

LCPFOA 00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFOA

LOT NUMBER:

PFOA0716

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1

MOLECULAR FORMULA:

CONCENTRATION:

CaHFIGO,

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

SOLVENT(S):

414.07

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

08/02/2016

EXPIRY DATE: (mm/dd/yyyy)

08/02/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 08/05/2016

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

 $x_1, x_2, ... x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

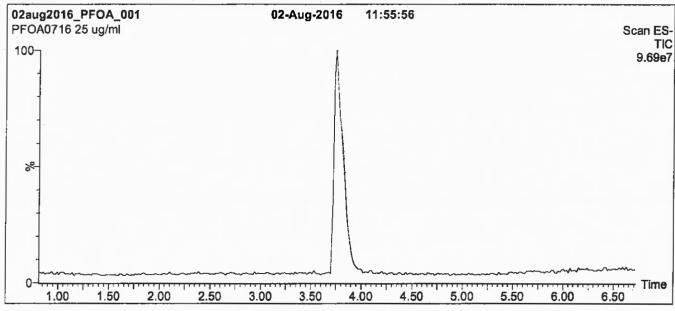
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

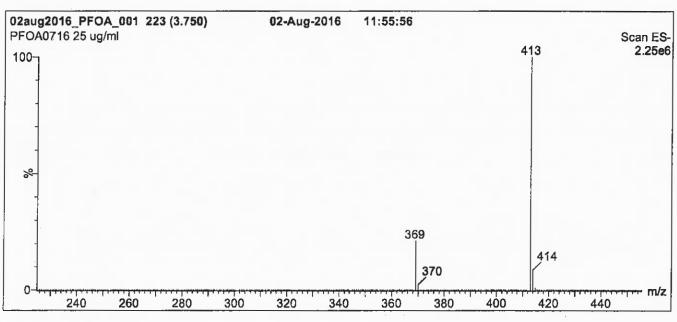




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com







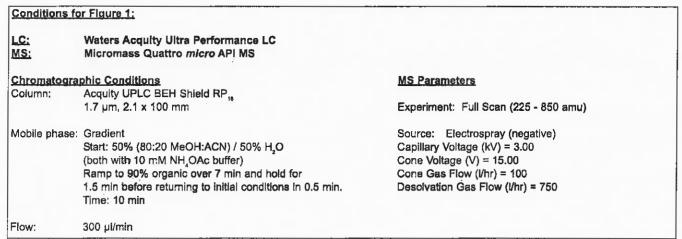
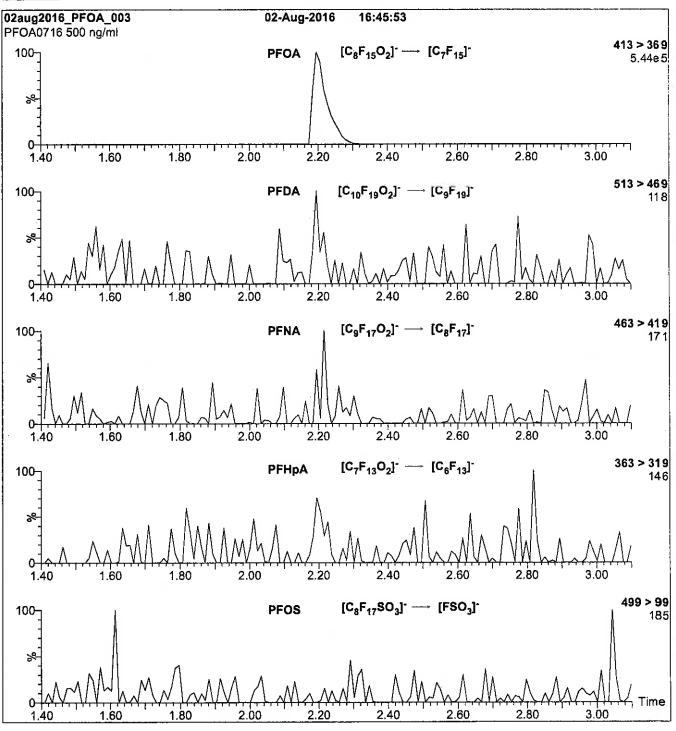


Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)





injection:

Direct loop injection

10 μl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 10

LCPFOA_00009

P: 10/20/17 Stal



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFOA

LOT NUMBER:

PFOA0917

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1

F C C C C OH

MOLECULAR FORMULA:

CONCENTRATION:

C,HF,O, $50 \pm 2.5 \, \mu g/ml$ **MOLECULAR WEIGHT:**

414.07

SOLVENT(S):

Methanoi

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/27/2017

EXPIRY DATE: (mm/dd/yyyy)

09/27/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acld to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 09/28/2017

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_x(y)$, of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is: $u_c(y(x_1, x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y_i, x_i)^2}$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

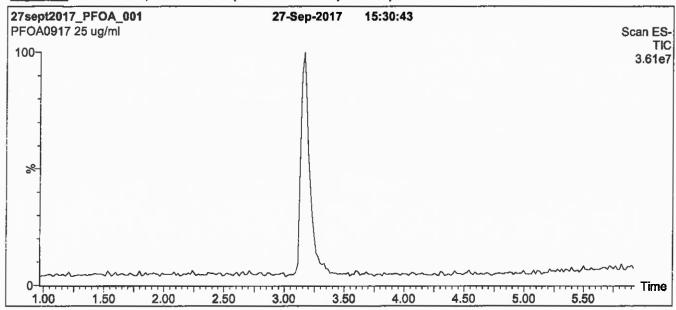
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

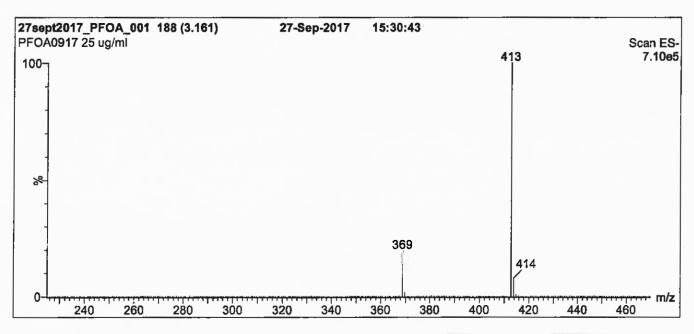




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFOA; LC/MS Data (TIC and Mass Spectrum)





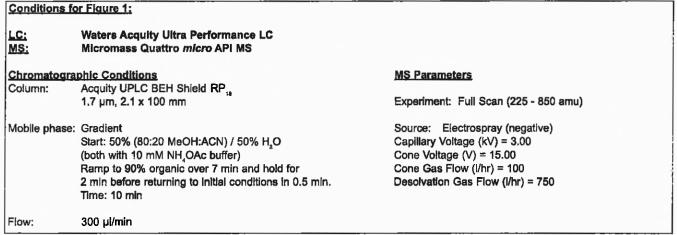
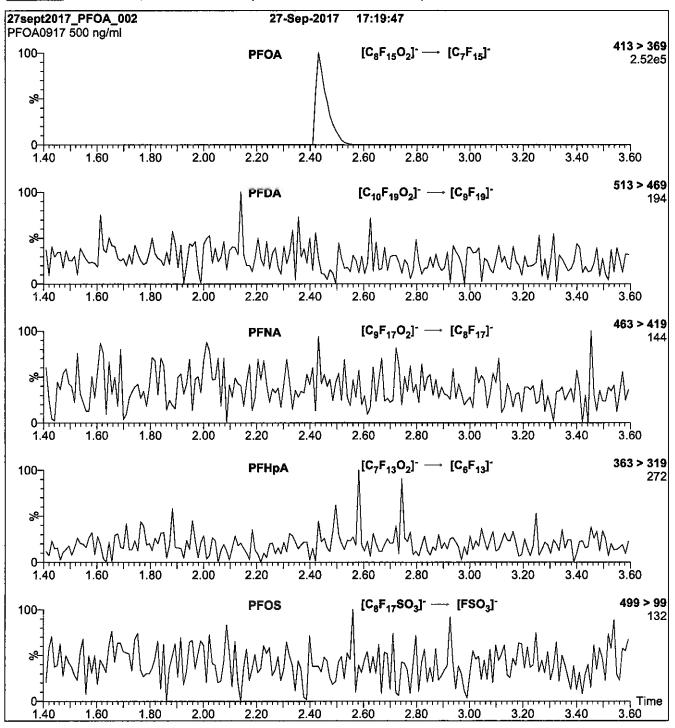
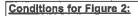


Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

300 μl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 11

LCPFODA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0416

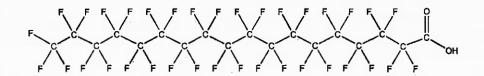
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

C18HF36O2

MOLECULAR WEIGHT:

914.14

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mrv/dd/yyyy)

04/29/2016

EXPIRY DATE: (mm/dd/yww)

04/29/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: <u>05/20</u>

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

<u>INTENDED USE:</u>

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_x(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_{\epsilon}(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

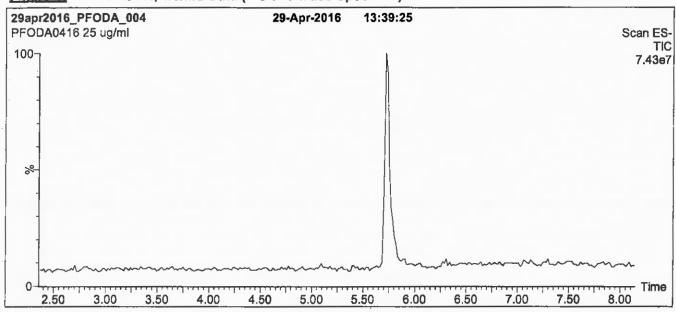
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

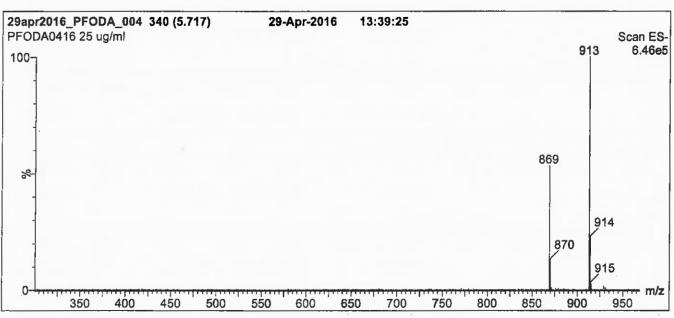




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFODA; LC/MS Data (TIC and Mass Spectrum)





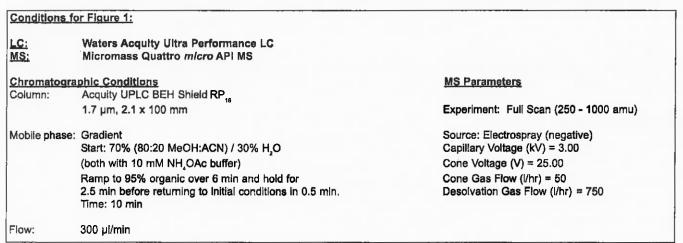
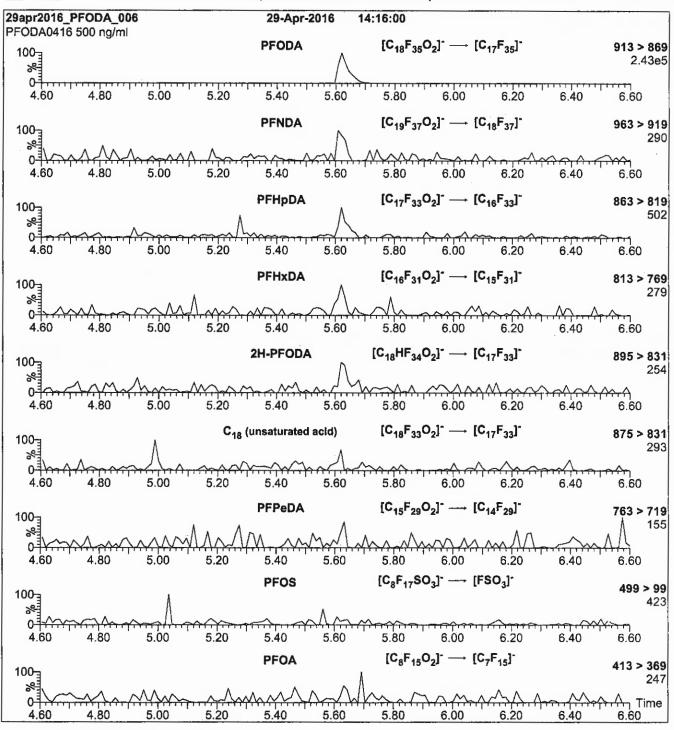
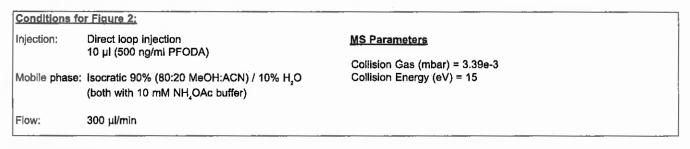


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





LCPFODA_00009



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0717

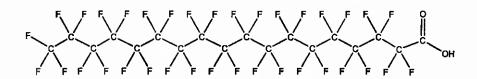
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

914.14

CONCENTRATION:

 $50 \pm 2.5 \, \mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/13/2017

EXPIRY DATE: (mm/dd/yyyy)

07/13/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: (

07/14/2017

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS;

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_c(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:
$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

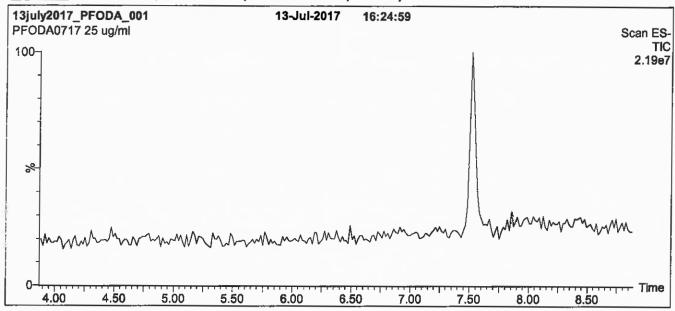
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

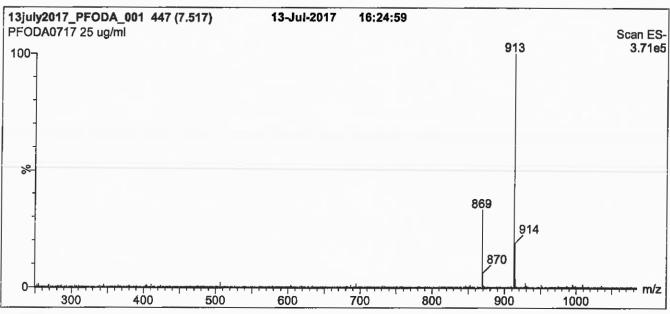




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFODA; LC/MS Data (TIC and Mass Spectrum)





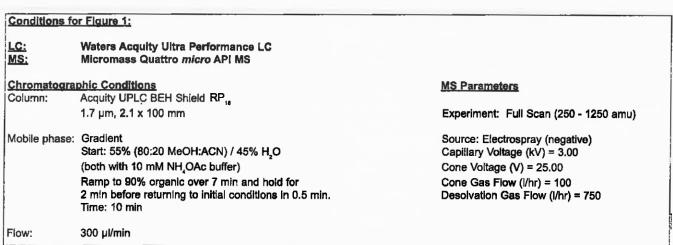
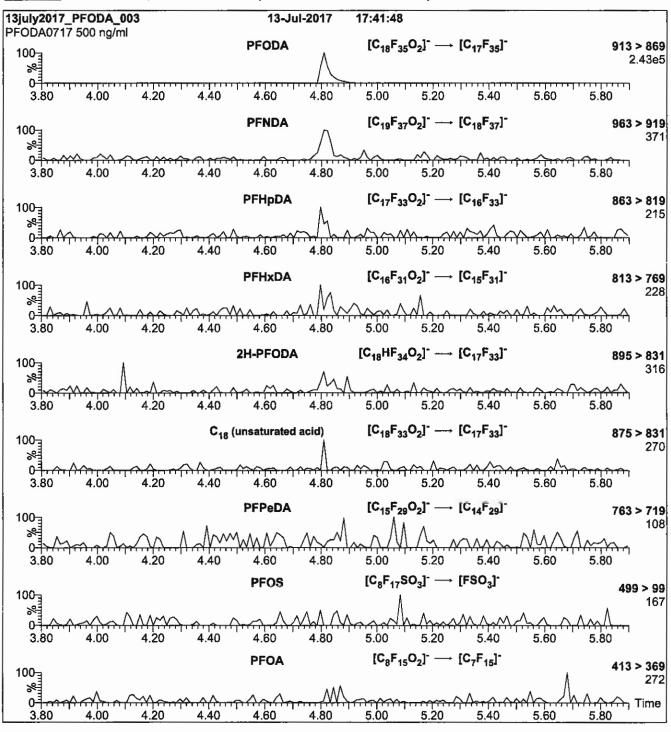
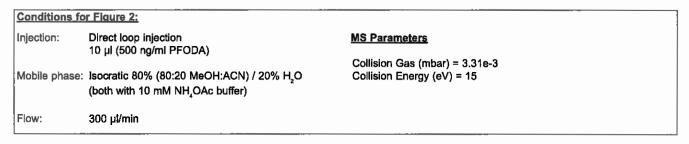


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





LCPFOS-br_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFOSK

LOT NUMBER:

brPFOSK1015

CONCENTRATION:

50 ± 2.5 μg/ml (total potassium sait)

46.4 ± 2.3 µg/ml (total PFOS anion)

SOLVENT(S):

Methanol

DATE PREPARED: (mm/dd/yyyy)

10/13/2015

LAST TESTED: (mm/dd/yyyy)

10/14/2015

EXPIRY DATE: (mm/dd/yyy)

10/14/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by 19F-NMR

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS Data (SIR)

Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.

CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HAZARDS;

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u_i(y), of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.weil-labs.com or contact us directly at info@well-labs.com

Table A: br-PFOSK; Isomeric Components and Percent Composition (by 19F-NMR)*

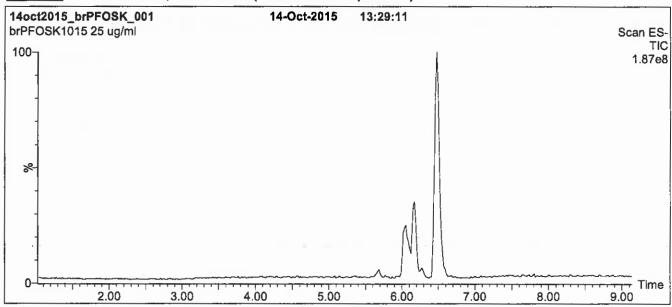
Isomer	Name	Structure	Percent Composition by "F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF3CF2CF2CF2CF2CF2CF2CF2SO3K*	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CFSO ₃ K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CFCF ₂ SO ₃ K ⁺ CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁴ CF ₃	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CFCF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ -CCF ₂ CF ₂ CF ₂ SO ₃ K* CF ₃	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF3 CF3CF2-C-CF2CF2CF2SO3K* CF3	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF-CF-CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesuifonate	CF ₃ -CF-CF ₂ -CF-CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.07

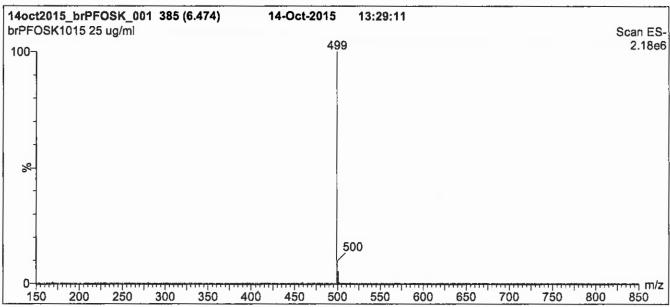
Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
 Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: Date: 10/15/2015

B.G. Chittim

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)





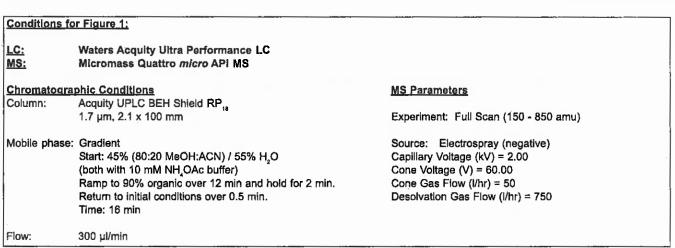
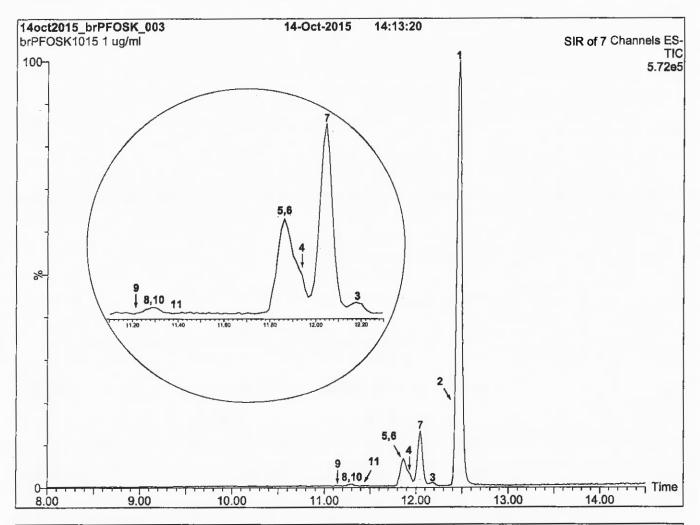


Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP ts (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

Mobile Phase: Gradient

45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₂OAc buffer)

Ramp to 90% organic over 15 min and hold for 3 min.

Return to initial conditions over 1 min.

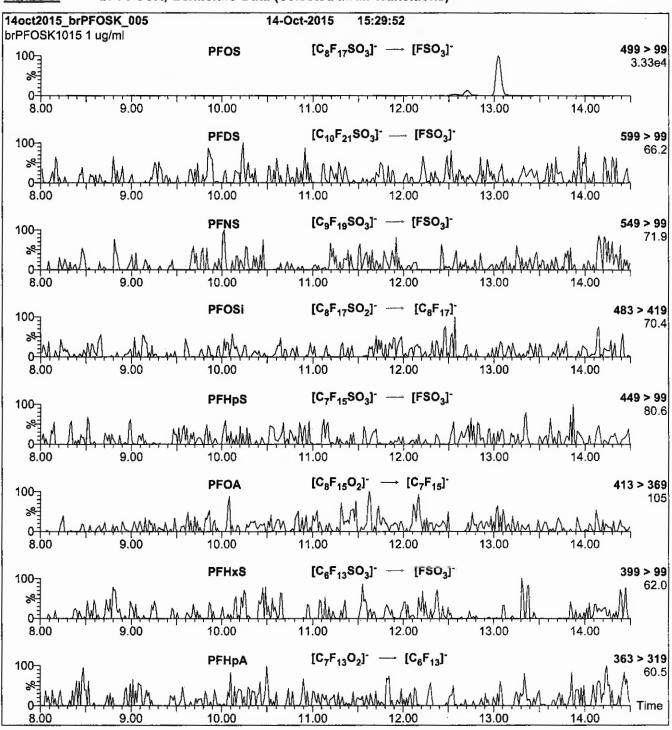
Time: 20 min

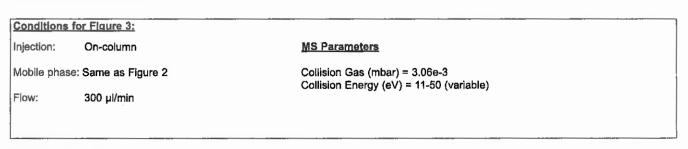
Flow: 300 µl/min

MS Conditions:

SIR (ES) Source = 110 °C Desolvation = 325 °C Cone Voltage = 60V

Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)





LCPFOSA_00010



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

FOSA-I

Perfluoro-1-octanesulfonamide

LOT NUMBER:

FOSA0916I

STRUCTURE:

COMPOUND:

CAS #:

754-91-6

MOLECULAR FORMULA:

CONCENTRATION:

CHEMICAL PURITY:

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyy)

RECOMMENDED STORAGE:

CaHaFi,NO2S

 $50 \pm 2.5 \,\mu g/ml$

>98%

09/30/2016

09/30/2021

Refrigerate ampoule

MOLECULAR WEIGHT:

SOLVENT(S):

499.14

Isopropano!

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 10/07/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

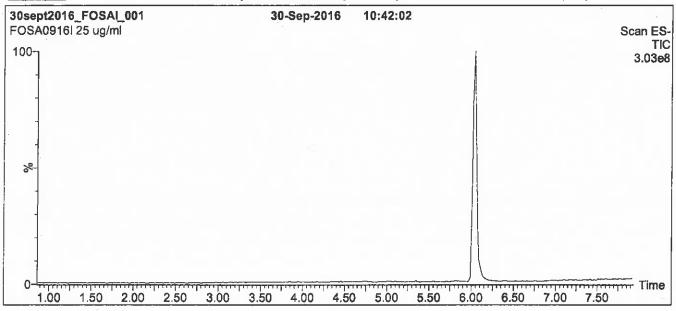
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

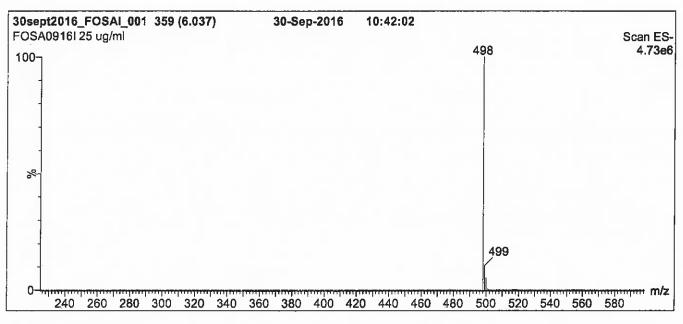




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: FOSA-I; LC/MS Data (TIC and Mass Spectrum)





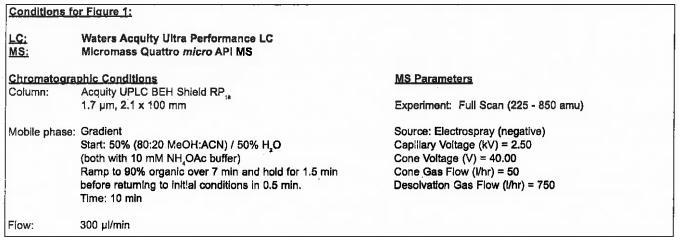
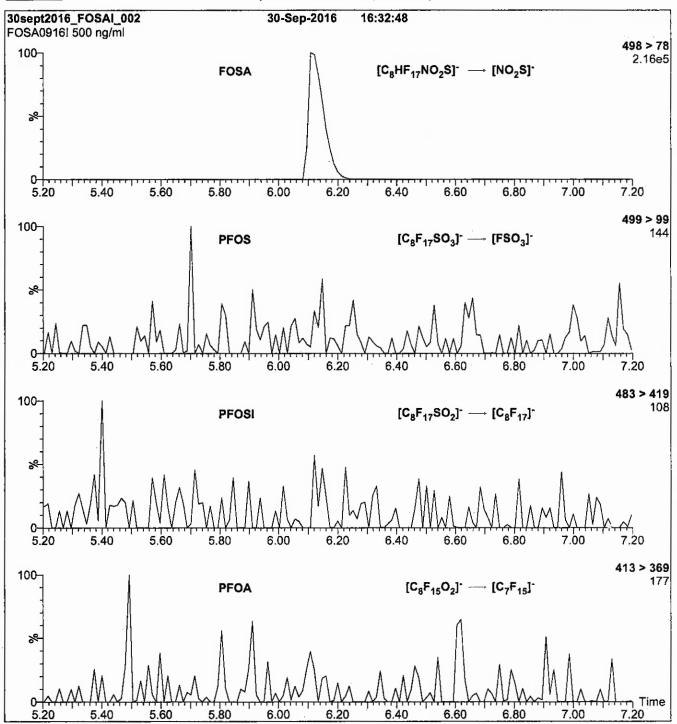
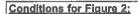


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

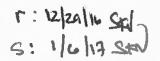
(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 30

LCPFPeA_00007





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFPeA

LOT NUMBER:

PFPeA0516

COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:

CAS #:

2706-90-3

MOLECULAR FORMULA:

CONCENTRATION:

C,HF,O,

 $50 \pm 2.5 \, \mu g/ml$

MOLECULAR WEIGHT:

SOLVENT(S):

264.05 Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yww)

05/31/2016

EXPIRY DATE: (mm/dd/yyyy)

05/31/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of C₂H₂F₂O₃ (hydrido - derivative) as measured by 19F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 06/02/2016

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

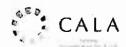
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

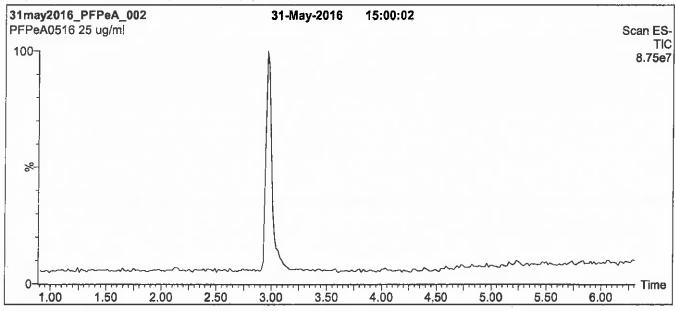
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

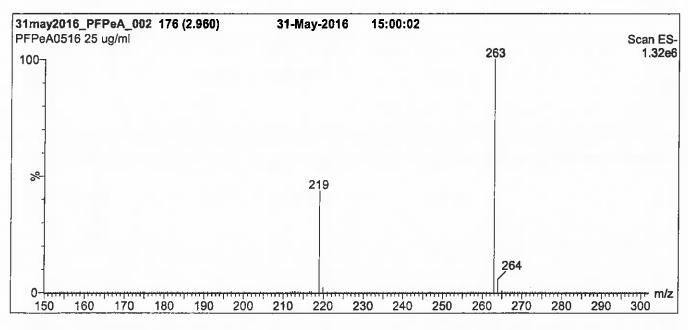




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFPeA; LC/MS Data (TIC and Mass Spectrum)





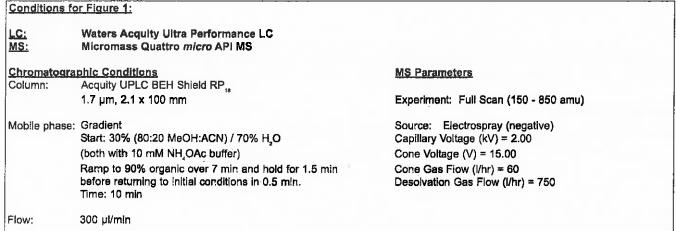
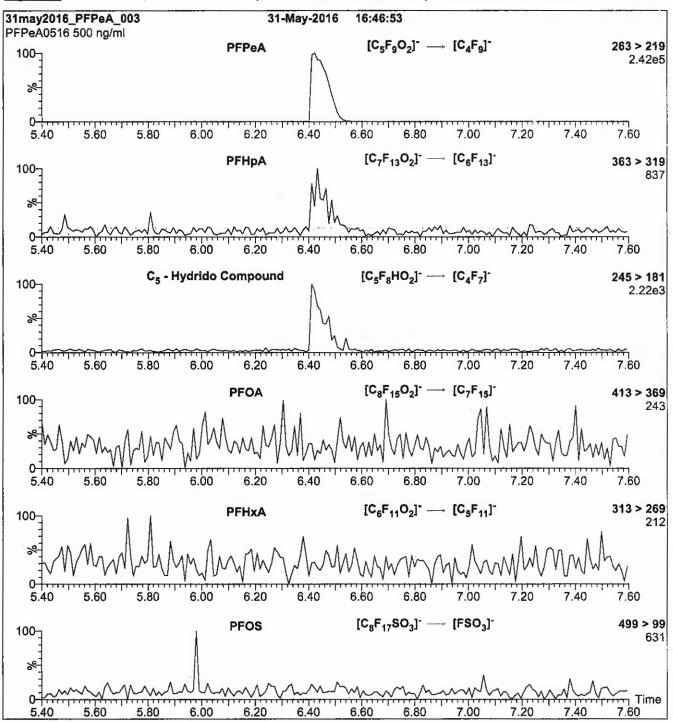
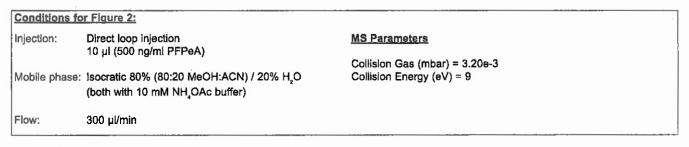


Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LCPFTeDA_00006



ID: LCPFTeDA 00005 Exp: 12/09/20 Prod: SBC

ID: LCPFTeDA_00006 Exp: 12/09/20 Prpd: SBC PF-n-tetradecanoic acid



ELLINGTON ABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

PFTeDA1215

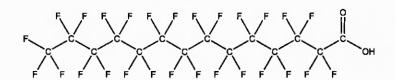
COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7



MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

714.11

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/09/2015

EXPIRY DATE: (mm/dd/yyyy)

12/09/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains $\sim 0.2\%$ of PFDoA (C₁₂HF₂₃O₂) and $\sim 0.2\%$ of PFPeDA (C₁₅HF₂₉O₂).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/09/2015

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning furne hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u (y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2, ... x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ... x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

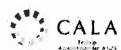
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

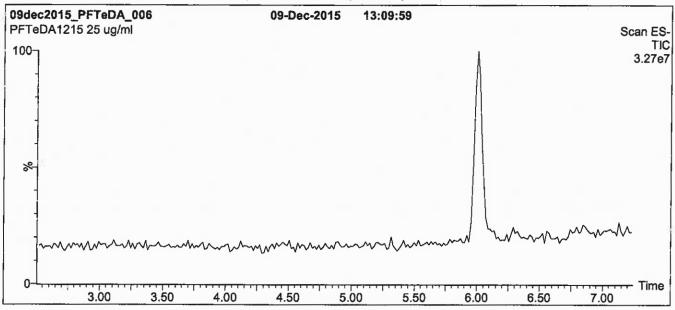
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

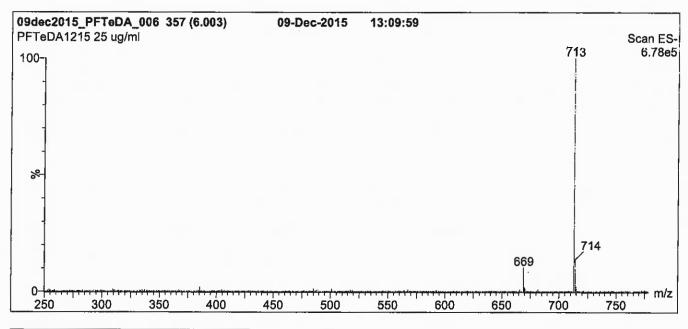




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFTeDA; LC/MS Data (TIC and Mass Spectrum)





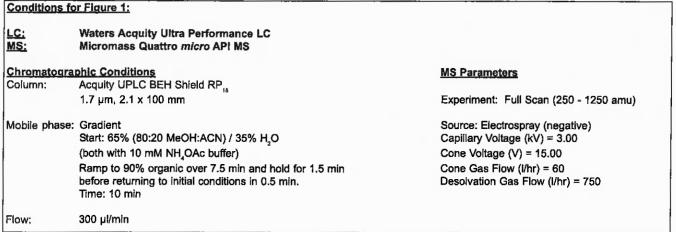
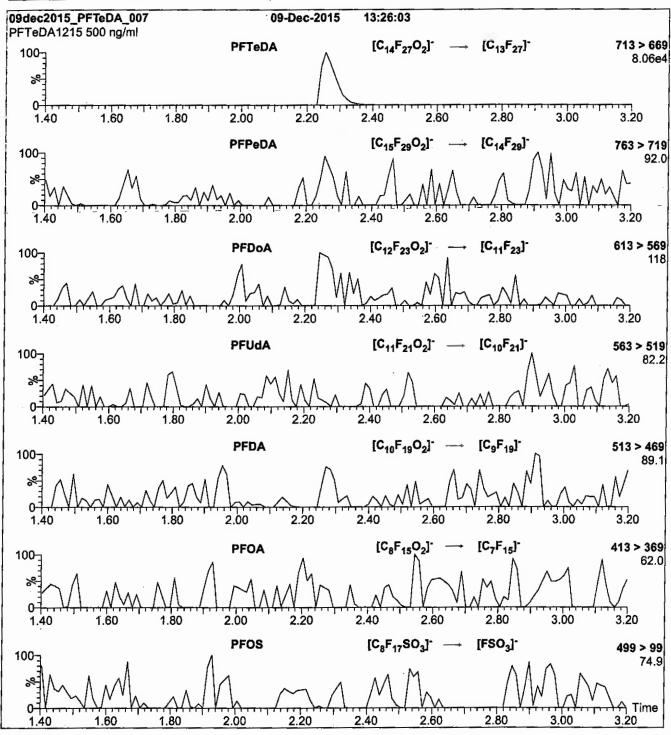
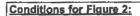


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH,OAc buffer)

MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 14

Flow:

300 µl/min

Reagent

LCPFTeDA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

PFTeDA0916

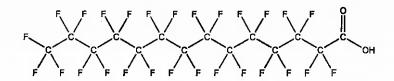
COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7



MOLECULAR FORMULA:

C14HF27O2

MOLECULAR WEIGHT:

714.11

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/30/2016

EXPIRY DATE: (mm/dd/yyyy)

09/30/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.2% of PFDoA ($C_{19}HF_{23}O_{2}$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_{2}$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 10/05/2016

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, u(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

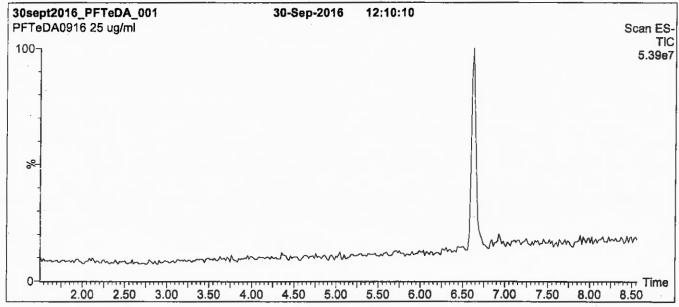
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

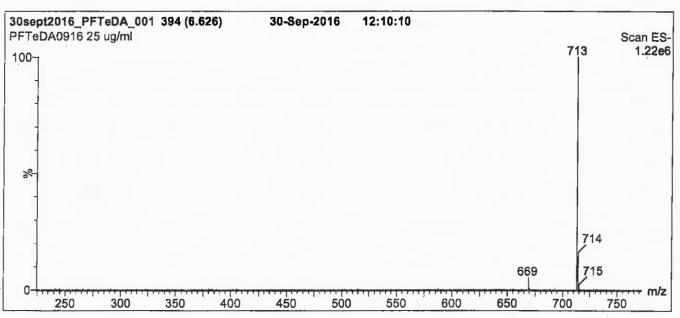




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com







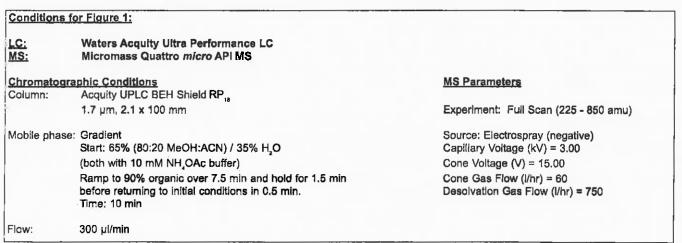
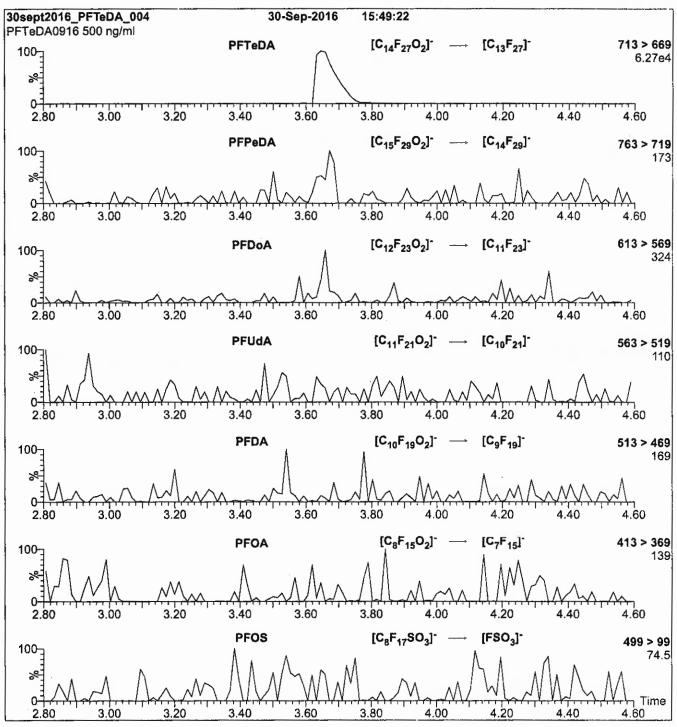
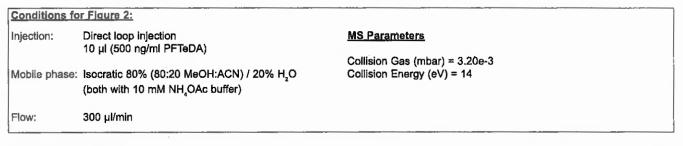


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LCPFTrDA_00006



ID: LCPFTrDA_00005 Exp: 02/12/21 Prpd: SBC PF-n-tridecanoic acid



ID: LCPFTrDA 00006 Exp: 02/12/21 Prod: SBC



BORATORIES

CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

PFTrDA

LOT NUMBER:

PFTrDA0216

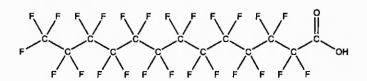
COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:

CAS #:

72629-94-8



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

664.11

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

02/12/2016

EXPIRY DATE: (mm/dd/yyyy)

02/12/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.1% of PFUdA (C,HF,O,), ~ 0.4% of PFDoA (C,HF,O,), and ~ 0.1% of PFTeDA (C, HF, O,).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 02/16/2016

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters.

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1,x_2,...x_n)) = \sqrt{\sum_{i=1}^n u(y,x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

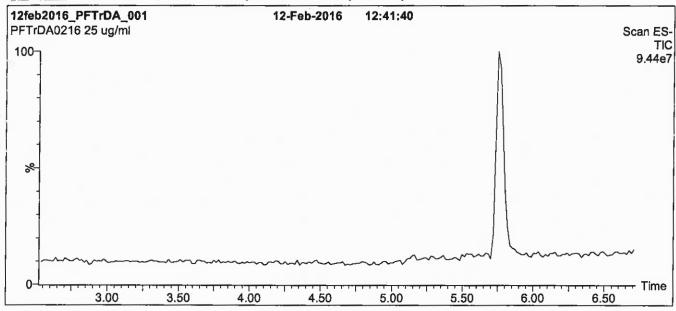
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

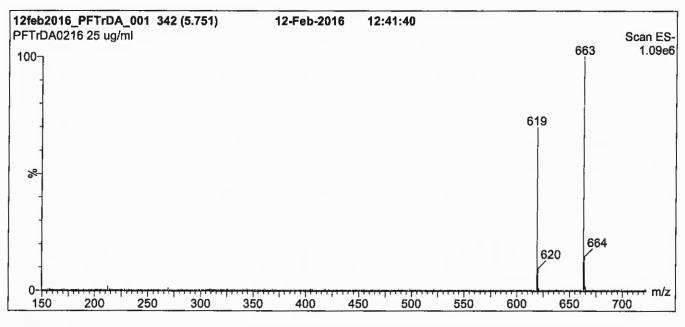




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)





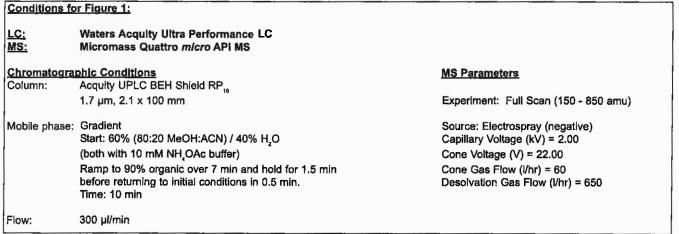
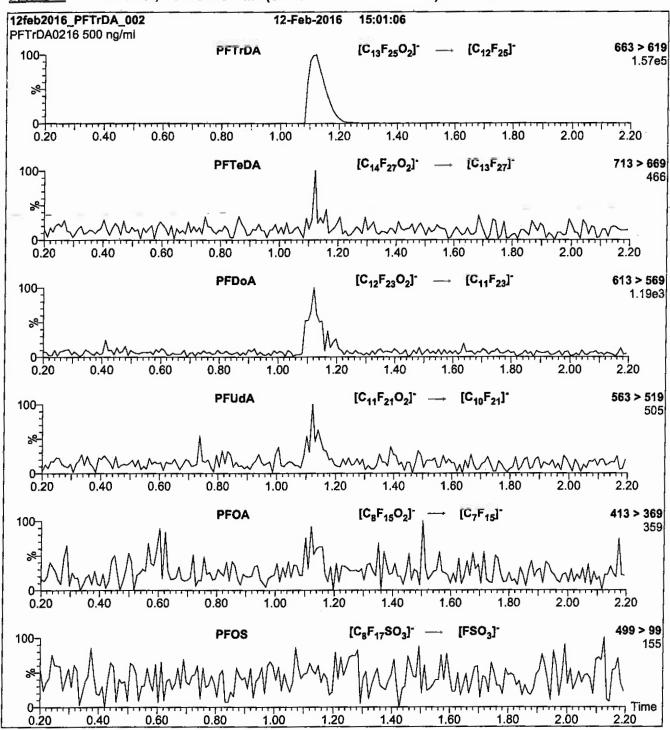
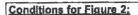


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H2O

MS Parameters

Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 15

Flow:

300 µl/min

Reagent

LCPFTrDA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTrDA

LOT NUMBER:

PFTrDA0216

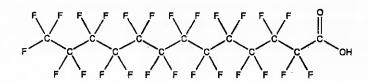
COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:

CAS #:

72629-94-8



MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

664,11

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

02/12/2016

EXPIRY DATE: (mm/dd/yyyy)

02/12/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

Contains ~ 0.1% of PFUdA (C, HF, O,), ~ 0.4% of PFDoA (C, HF, O,), and ~ 0.1% of PFTeDA (C, HF, O,).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_i(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

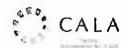
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

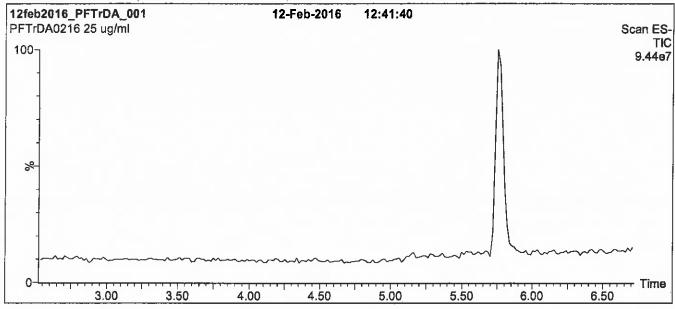
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

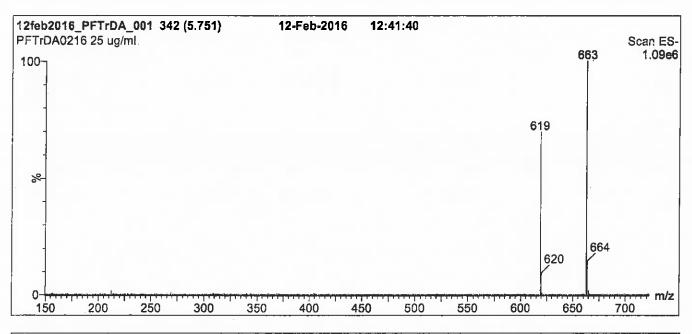




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)





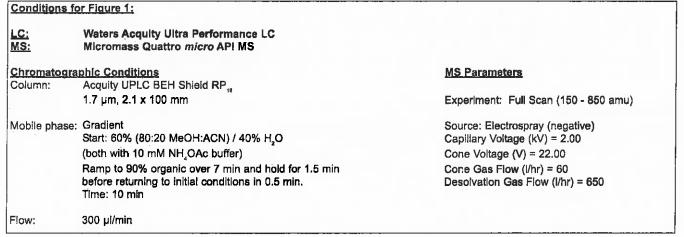
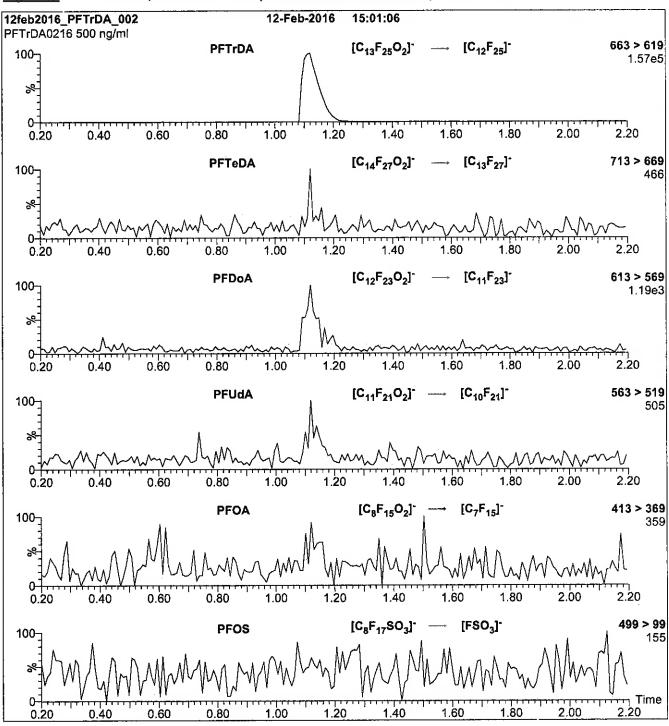
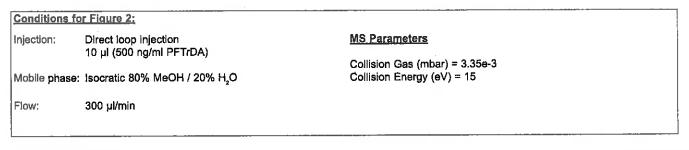


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LCPFUdA_00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFUdA

LOT NUMBER:

PFUdA1016

COMPOUND:

Perfluoro-n-undecanoic acid

STRUCTURE:

CAS #:

2058-94-8

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

564.09

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/18/2016

EXPIRY DATE: (mm/dd/yyyy)

10/18/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/19/201

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA 519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_{ij}(y)$, of a value y and the uncertainty of the independent parameters

 $x_1, x_2,...x_n$ on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

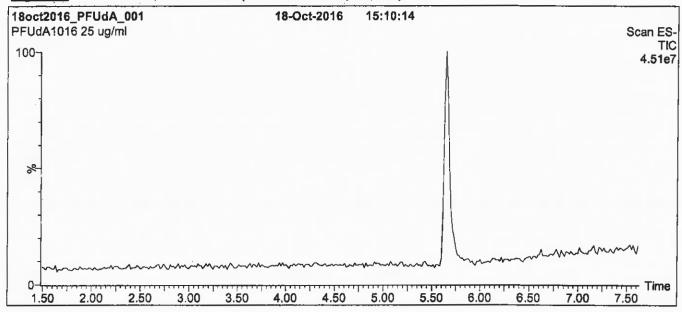
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

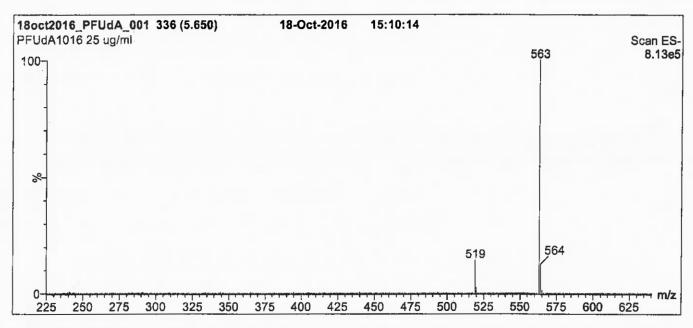




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFUdA; LC/MS Data (TIC and Mass Spectrum)





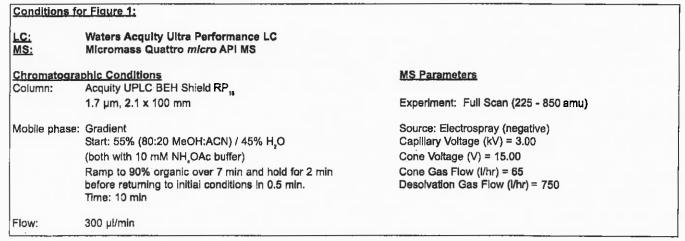
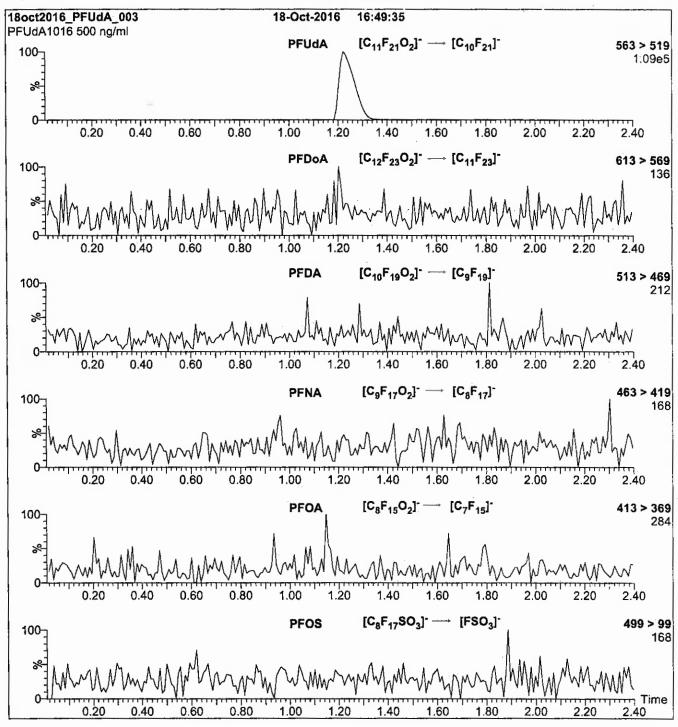
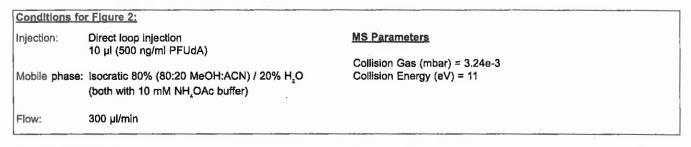


Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)





Method PFC DOD

Fluorinated Hydrocarbons (LC/MS) by Method PFAS DOD

FORM II LCMS SURROGATE RECOVERY

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-35042-1
-----	-------	-------------	------------	----------	-------------

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

	Ι								
Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-025-TPI	320-35042-1	114	141	123	118	121	122	103	124
TP-PFC-025-TPI DL	320-35042-1 DL	101	104	118	101	96	99	103	100
TP-PFC-025-MID-CAR BON	320-35042-2	104	102	98	98	100	99	102	104
TP-PFC-025-TPE	320-35042-3	105	107	99	101	110	102	107	106
TP-PFC-025-TPE-D	320-35042-4	105	109	99	108	108	103	107	107
	MB 320-204105/1-A	104	108	101	102	101	104	102	106
	LCS 320-204105/2-A	98	101	96	97	97	94	100	95
	LCSD 320-204105/3-A	104	106	105	108	104	100	104	103

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 1802 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

FORM II 537 (modified)

FORM II LCMS SURROGATE RECOVERY

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-35042-1
-----	-------	-------------	------------	----------	-------------

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-025-TPI	320-35042-1	124	112	125	128	109	108
TP-PFC-025-TPI DL	320-35042-1 DL	101	95	102	106	94	95
TP-PFC-025-MID-CAR BON	320-35042-2	100	92	97	100	90	94
TP-PFC-025-TPE	320-35042-3	100	87	89	99	93	94
TP-PFC-025-TPE-D	320-35042-4	108	98	102	108	102	99
	MB 320-204105/1-A	104	91	100	107	96	98
	LCS 320-204105/2-A	93	84	94	100	91	92
	LCSD 320-204105/3-A	101	92	102	99	94	99

	QC LIMITS
PFOS = 13C4 PFOS	25-150
PFOSA = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

FORM II 537 (modified)

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento		amento	Job No.: 320-35042-1				
SDG No.	:						
Matrix:	Water	Level: Low	Lab File	ID:	2018.01.18LLA_003.d		
Lab ID:	LCS 320-204105/2-A		Client II	D:			

	SPIKE	LCS	LCS	QC	
	ADDED	CONCENTRATION	િ	LIMITS	#
COMPOUND	(ng/L)	(ng/L)	REC	REC	
Perfluorobutanoic acid (PFBA)	40.0	39.2	98	89-128	
Perfluoropentanoic acid	40.0	36.2	90	66-136	
(PFPeA)					
Perfluorohexanoic acid (PFHxA)	40.0	36.9	92	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	38.0	95	89-127	
Perfluorooctanoic acid (PFOA)	40.0	36.9	92	80-120	
Perfluorononanoic acid (PFNA)	40.0	38.8	97	77-137	
Perfluorodecanoic acid (PFDA)	40.0	40.0	100	84-123	
Perfluoroundecanoic acid	40.0	34.4	86		
(PFUnA)					
Perfluorododecanoic acid	40.0	40.3	101	82-122	
(PFDoA)					
Perfluorotridecanoic Acid	40.0	39.4	99	56-163	
(PFTriA)					
Perfluorotetradecanoic acid	40.0	40.7	102	66-120	
(PFTeA)	25.4	24.0	0.0	00 100	
Perfluorobutanesulfonic acid	35.4	34.9	99	88-130	
(PFBS) Perfluorohexanesulfonic acid	36.4	34.8	96	87-126	
(PFHxS)	30.4	34.0	90	07-120	
Perfluoroheptanesulfonic Acid	38.1	38.0	100	92-135	
(PFHpS)		33.3]]]	
Perfluorooctanesulfonic acid	37.1	36.0	97	83-126	
(PFOS)					
Perfluorodecanesulfonic acid	38.6	40.0	104	80-129	
(PFDS)					
Perfluorooctane Sulfonamide	40.0	39.5	99	91-133	
(FOSA)					
13C8 FOSA	100	83.6	84		
13C4 PFBA	100	98.4	98		
13C2 PFHxA	100	96.9	97		
13C4 PFOA	100	99.9	100	l	
13C5 PFNA	100	94.8	95	l I	
13C2 PFDA	100	93.9	94	25-150	
13C2 PFUnA	100	99.5	100	25-150	
13C2 PFDoA	100	90.6	91	25-150	
1802 PFHxS	94.6	89.0	94		
13C4 PFOS	95.6	89.2	93		
13C2-PFTeDA	100	91.5	92		
13C4-PFHpA	100	97.4	97		
13C5 PFPeA	100	101	101		
13C3-PFBS	93.0	89.4	96		
1303 1100	23.0			23 130	

[#] Column to be used to flag recovery and RPD values FORM III 537 (modified)

FORM III LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name	e: <u>TestAmerica Sacr</u>	ramento	Job No.:	320-	-35042-1
SDG No.	:				
Matrix:	Water	Level: Low	Lab File	ID:	2018.01.18LLA_004.d

Lab ID: LCSD 320-204105/3-A Client ID:

	SPIKE ADDED	LCSD CONCENTRATION	LCSD	96	QC LI	IMITS	#
COMPOUND	(ng/L)	(ng/L)	REC	RPD	RPD	REC	#
Perfluorobutanoic acid (PFBA)	40.0	38.1	95	3	30	89-128	
Perfluoropentanoic acid (PFPeA)	40.0	35.9	90	1	30	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	35.7	89	3	30	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	37.2	93	2	30	89-127	
Perfluorooctanoic acid (PFOA)	40.0	37.8	94		30	80-120	
Perfluorononanoic acid (PFNA)	40.0	37.5	94	3	30	77-137	
Perfluorodecanoic acid (PFDA)	40.0	37.9	95	6	30	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	37.2	93	8	30	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	39.8	100	1	30	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	38.6	97	2	30	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7	102		30	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	33.8	96		30	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.8	93	3	30	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.5	98	2	30	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3	93	5	30	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	36.9	96	8	30	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	36.6	92	8	30	91-133	
13C8 FOSA	100	92.0	92			25-150	
13C4 PFBA	100	104	104			25-150	
13C2 PFHxA	100	108	108			25-150	
13C4 PFOA	100	104	104			25-150	
13C5 PFNA	100	103	103			25-150	
13C2 PFDA	100	102	102			25-150	
13C2 PFUnA	100	98.5	99			25-150	
13C2 PFDoA	100	94.3	94			25-150	
1802 PFHxS	94.6	94.8	100			25-150	
13C4 PFOS	95.6	96.8	101			25-150	
13C2-PFTeDA	100	98.6	99			25-150	
13C4-PFHpA	100	104	104			25-150	
13C5 PFPeA	100	106	106			25-150	
13C3-PFBS	93.0	98.0	105			25-150	

[#] Column to be used to flag recovery and RPD values
FORM III 537 (modified)

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
SDG No.:	
Lab File ID: 2018.01.18LLA_002.d	Lab Sample ID: MB 320-204105/1-A
Matrix: Water	Date Extracted: 01/16/2018 09:18
Instrument ID: A8_N	Date Analyzed: 01/18/2018 17:37
Level: (Low/Med) Low	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
	LCS 320-204105/2-A	2018.01.18L	01/18/2018 17:45
		LA 003.d	01/10/0010 17.50
	LCSD 320-204105/3-A	2018.01.18L	01/18/2018 17:53
		LA 004.d	
TP-PFC-025-TPI	320-35042-1	2018.01.18L	01/18/2018 18:01
		LA 005.d	
TP-PFC-025-MID-CARBON	320-35042-2	2018.01.18L	01/18/2018 18:08
		LA 006.d	
TP-PFC-025-TPE	320-35042-3	2018.01.18L	01/18/2018 18:16
		LA 007.d	
TP-PFC-025-TPE-D	320-35042-4	2018.01.18L	01/18/2018 18:24
		LA 008.d	
TP-PFC-025-TPI DL	320-35042-1 DL	2018.01.19L	01/19/2018 16:58
		LC_010.d	

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI Lab Sample ID: 320-35042-1

Matrix: Water Lab File ID: 2018.01.18LLA_005.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) Date Analyzed: 01/18/2018 18:01

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL	
CAS NO.	COMPOUND NAME	KESOLI	<u> </u>	ПОО	ЦОВ	 ПП	
375-22-4	Perfluorobutanoic acid (PFBA)	73		2.0	0.98	0.34	
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		2.0	0.98	0.48	
307-24-4	Perfluorohexanoic acid (PFHxA)	340		3.9	2.0	0.57	
375-85-9	Perfluoroheptanoic acid (PFHpA)	67		2.0	0.98	0.24	
335-67-1	Perfluorooctanoic acid (PFOA)	1300	M E	3.9	2.0	0.83	
375-95-1	Perfluorononanoic acid (PFNA)	2.4		2.0	0.98	0.26	
335-76-2	Perfluorodecanoic acid (PFDA)	0.89	J	2.0	0.98	0.30	
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1	
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54	
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	2.9	1.3	
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.98	0.28	
375-73-5	Perfluorobutanesulfonic acid (PFBS)	51		2.0	0.98	0.29	
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	360	E	2.0	0.98	0.29	
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.1		2.0	0.98	0.29	
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	340		3.9	2.0	0.53	
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.98	0.31	
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	Ū	2.0	0.98	0.34	

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI Lab Sample ID: 320-35042-1

Matrix: Water Lab File ID: 2018.01.18LLA_005.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) Date Analyzed: 01/18/2018 18:01

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC Q		LIMITS	
STL01056	13C8 FOSA	112		25-150	
STL00992	13C4 PFBA	114		25-150	
STL00993	13C2 PFHxA	118		25-150	
STL00990	13C4 PFOA	103		25-150	
STL00995	13C5 PFNA	124		25-150	
STL00996	13C2 PFDA	125		25-150	
STL00997	13C2 PFUnA	128		25-150	
STL00998	13C2 PFDoA	109		25-150	
STL00994	1802 PFHxS	122		25-150	
STL00991	13C4 PFOS	124		25-150	
STL02116	13C2-PFTeDA	108		25-150	
STL01892	13C4-PFHpA	121		25-150	
STL01893	13C5 PFPeA	141		25-150	
STL02337	13C3-PFBS	123		25-150	

Report Date: 19-Jan-2018 15:50:59 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_005.d

Lims ID: 320-35042-A-1-A Client ID: TP-PFC-025-TPI

Sample Type: Client

Inject. Date: 18-Jan-2018 18:01:06 ALS Bottle#: 44 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-35042-a-1-a Misc. Info.: Plate: 1 Rack: 5

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:49:58

	First Level Reviewer: roycea			Date: 19-Jan-2018 15:49:5			,8				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA											
	217.00 > 172.00		1.411	-0.006	0.537	7288609	2.86		114	20627	
	2 Perfluorobuty 212.90 > 169.00	•	1 /112	-0.008	1.000	5101681	1.87			524	
	D 3 13C5-PFPe		1.413	-0.006	1.000	3101001	1.07			324	
	267.90 > 223.00		1.659	-0.002	0.633	5319366	3.53		141	34460	
	4 Perfluoropen										
	262.90 > 219.00		1.662	-0.005	1.000	12274468	4.90			4844	
	D 47 13C3-PFBS 301.90 > 83.00		1.695	-0.002	0.647	95153	2.85		123	2197	
	5 Perfluorobuta			-0.002	0.047	73133	2.00		123	2171	
	298.90 > 80.00		1.697	-0.004	1.000	4110596	1.30			6414	
	298.90 > 99.00	1.693	1.697	-0.004	1.000	1730486		2.38(1.25-3.74)		4785	
	D 7 13C2 PFHx		1 000	0.001	0.740	4700740	2.05		110	2000/	
	315.00 > 270.00 6 Perfluorohex		1.939	-0.001	0.740	4790740	2.95		118	39096	
	313.00 > 269.00		1.939	-0.012	0.995	17181190	8.65			20188	
	313.00 > 119.00	1.938	1.939	-0.001	1.000	1403643		12.24(5.03-15.10)		14489	
	D 9 13C4-PFHp		0017		0.040	4/04/05			404	00004	
	367.00 > 322.00		2.267	-0.009	0.863	4691685	3.03		121	28991	
	10 Perfluorohej 363.00 > 319.00		2.268	-0.010	1.000	3546989	1.72			4512	
	363.00 > 169.00			-0.010	1.000	1405477		2.52(1.13-3.40)		9709	
8 Perfluorohexanesulfonic acid											
	399.00 > 80.00 399.00 > 99.00		2.280 2.280	-0.009 -0.009	1.000 1.000	23815404 7910504	9.21	3.01(1.50-4.49)		25331 20907	E
	D 11 18O2 PFH:		2.200	-0.009	1.000	7910004		3.01(1.30-4.49)		20907	
	403.00 > 84.00		2.282	-0.011	0.868	5490770	2.88		122	51779	

Report Date: 19-Jan-2018 15:50:59 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File:	\\Chr	omNa\Sa	crament	o\Chrom	Data\A8_N\201	80118-5306	6.b\2018.01.18LLA_	_005.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO		2 4 2 2	0.005	1 000	2004024	2.50		102	27250	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	A									
417.00 > 372.00		2.622	-0.005	1.000	3906924	2.58		103	27259	
* 62 13C2-PFOA	A									
415.00 > 370.00	2.617	2.622	-0.005		4209333	2.50			26112	
15 Perfluorooct										EM
413.00 > 369.00		2.623	-0.006	1.000	59521551	32.5			9590	EM
413.00 > 169.00			-0.006	1.000	41758687		1.43(0.84-2.52)		12570	M
16 Perfluorohe				4 000	0/0004	0.4005			400	
449.00 > 80.00 449.00 > 99.00			-0.005	1.000	368984	0.1825	2 24/1 04 E 02)		138	
		2.629	-0.005	1.000	113910		3.24(1.94-5.82)		271	
D 19 13C5 PFN/ 468.00 > 423.00		2 002	-0.005	1.141	3802263	3.09		124	28260	
17 Perfluorooct				1.141	3002203	3.07		124	20200	
499.00 > 80.00	2.987	2.992	ر -0.005	1.000	14596177	8.74			2414	
499.00 > 99.00		2.992	-0.005	1.000	3224214	0.74	4.53(2.31-6.93)		3874	
D 18 13C4 PFO							(,			
503.00 > 80.00		2.992	-0.005	1.141	3566895	2.96		124	22028	
20 Perfluoronoi	nanoic a	cid								
463.00 > 419.00		2.992	-0.005	1.000	95262	0.0607			126	
463.00 > 169.00	2.987	2.992	-0.005	1.000	24042		3.96(1.90-5.69)		89.6	
22 Perfluorooct	ane Sulf	fonamide	Э							
498.00 > 78.00	3.335	3.338	-0.003	1.000	6902	0.003700			18.5	
D 21 13C8 FOS	A									
506.00 > 78.00	3.335	3.338	-0.003	1.274	4747315	2.80		112	26223	
D 23 13C2 PFD/	Д									
515.00 > 470.00	3.350	3.352	-0.002	1.280	3317023	3.12		125	29192	
24 Perfluorodeo	canoic a	cid								
513.00 > 469.00		3.353	-0.003	1.000	29225	0.0227			74.8	
513.00 > 169.00	3.342	3.353	-0.011	0.998	5526		5.29(2.36-7.09)		48.9	
D 30 13C2 PFUr										
565.00 > 520.00		3.679	-0.006	1.404	2581650	3.21		128	25155	
D 36 13C2 PFD										
615.00 > 570.00	3.975	3.979	-0.004	1.519	2377921	2.72		109	26960	
D 43 13C2-PFT6										
715.00 > 670.00	4.473	4.483	-0.010	1.709	3088544	2.70		108	17009	

OC Flag Legend Processing Flags

E - Exceeded Maximum Amount

Review Flags

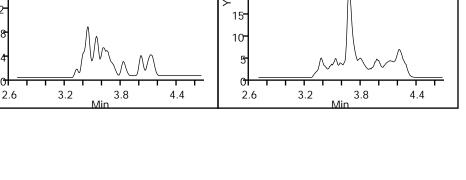
M - Manually Integrated

Report Date: 19-Jan-2018 15:50:59 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 18-Jan-2018 18:01:06 Instrument ID: A8_N Lims ID: 320-35042-A-1-A Lab Sample ID: 320-35042-1 Client ID: TP-PFC-025-TPI Operator ID: SACINSTLCMS01 ALS Bottle#: 44 Worklist Smp#: 5 Injection Vol: Dil. Factor: 1.0000 2.0 ul Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x (000015⁻ X12-(000012° × (×1000012° × (×1000012° (018 000 0015 \sum_{12} 0.9 8.0 1.4 0.3 1.5 2.1 0.2 2.0 1.0 1.6 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 (12° (200000) (10° (12° (12°) 30 035- ©25- ×₂₀ ×25 15 15 10 10 1.9 1.2 1.8 2.4 1.3 2.2 8.0 1.7 2.3 1.0 1.1 1.4 2.0 5 Perfluorobutanesulfonic acid 7 13C2 PFHxA 6 Perfluorohexanoic acid D Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x (015° (0000012° (12° (13°) (15 642 636 (0042 ×35 $\times 30$ ≻28 21 18 12 1.7 2.0 2.3 1.7 2.0 2.2 1.4 1.4 2.3 2.6 1.3 3.1 1.1 1.1 6 Perfluorohexanoic acid D 9 13C4-PFHpA 10 Perfluoroheptanoic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x Exp1:m/z 363.00 > 319.00:Moving5PtAverage_ (X100000) (00005 X) (0001 ×) 28 0 0 1.4 1.7 2.0 2.3 2.6 1.5 3.0 1.6 1.9 2.2 2.5 2.8 1.3 1.1

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_005.d 10 Perfluoroheptanoic acid 8 Perfluorohexanesulfonic acid 8 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 169.00:Moving5PtAverage_x Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 399.00 > 99.00:Moving5PtAverage_x3 ∑₂₄-) ≻36 27 12 18 2.3 2.2 2.8 1.9 1.7 2.0 2.6 2.9 1.0 1.6 3.4 1.3 2.5 3.1 D 11 1802 PFHxS D 14 13C4 PFOA 62 13C2-PFOA Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3 Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x Exp1:m/z 415.00 > 370.00:Moving5PtAverage_> (0000012 (0000010 (0000012) (000015 X) X (000001x) \mathbf{o} 1.9 2.2 2.5 2.7 2.5 2.8 2.1 3.1 3.1 15 Perfluorooctanoic acid (M) 15 Perfluorooctanoic acid (M) 16 Perfluoroheptanesulfonic acid Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x Exp1:m/z 413.00 > 169.00:Moving5PtAverage_> Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 (012 (00000010 8 (83⁻ 0071⁻ 59⁻ 12 35 23 11 0 2.2 2.5 2.8 3.1 2.2 2.5 2.8 2.2 2.5 2.8 1.9 1.9 3.1 16 Perfluoroheptanesulfonic acid D 19 13C5 PFNA 17 Perfluorooctane sulfonic acid Exp1:m/z 449.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 468.00 > 423.00:Moving5PtAverage_x Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3 (0000012-(000001X) × 8 35 630 ×25 ∑20 16 15 12 10 0 0 2.2 2.5 2.8 2.4 2.7 3.0 3.3 8.0 2.0 3.2 4.4

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:50:59



33

22⁻ 11⁻

2.6

3.2

3.8

3.9

3.6

4.2

4.5

4.8

Report Date: 19-Jan-2018 15:51:00 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_005.d

Injection Date: 18-Jan-2018 18:01:06 Instrument ID: A8_N

Lims ID: 320-35042-A-1-A Lab Sample ID: 320-35042-1

Client ID: TP-PFC-025-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 44 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

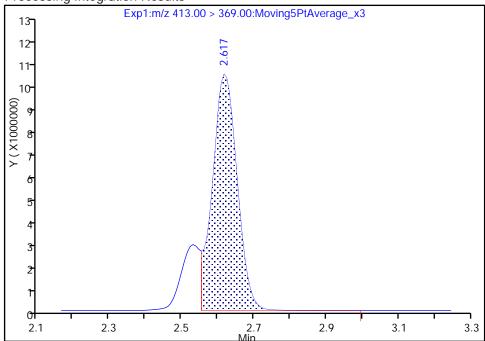
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

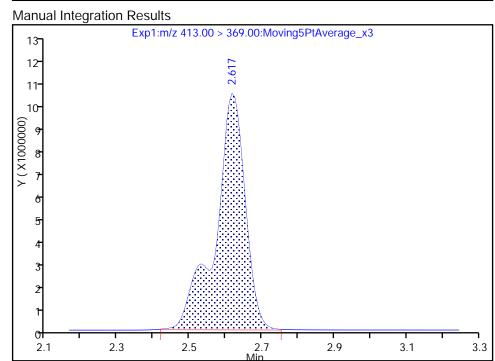
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.62 Area: 49196549 Amount: 26.858293 Amount Units: ng/ml **Processing Integration Results**



RT: 2.62 Area: 59521551 Amount: 32.495109 Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:49:10

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 365 of 606

Report Date: 19-Jan-2018 15:51:00 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_005.d

Injection Date: 18-Jan-2018 18:01:06 Instrument ID: A8_N

Lims ID: 320-35042-A-1-A Lab Sample ID: 320-35042-1

Client ID: TP-PFC-025-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 44 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

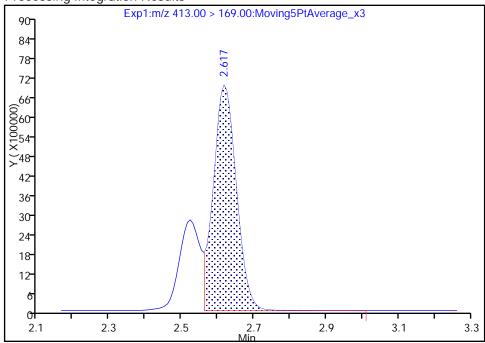
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

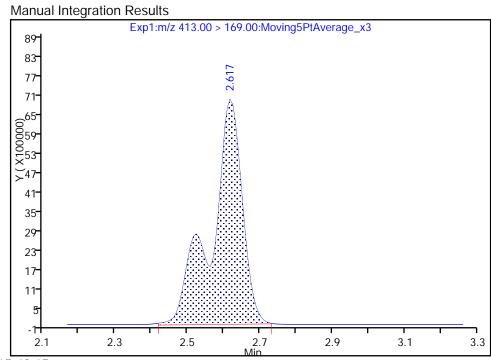
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 2.62 Area: 30667807 Amount: 26.858293 Amount Units: ng/ml **Processing Integration Results**



RT: 2.62 Area: 41758687 Amount: 32.495109 Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:49:15

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 366 of 606

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI DL Lab Sample ID: 320-35042-1 DL

Matrix: Water Lab File ID: 2018.01.19LLC_010.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) Date Analyzed: 01/19/2018 16:58

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 10

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204757 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74	D	20	9.8	3.4
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	D	20	9.8	4.8
307-24-4	Perfluorohexanoic acid (PFHxA)	350	D	39	20	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	75	D	20	9.8	2.4
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D M	39	20	8.3
375-95-1	Perfluorononanoic acid (PFNA)	9.8	U	20	9.8	2.6
335-76-2	Perfluorodecanoic acid (PFDA)	9.8	U	20	9.8	3.0
2058-94-8	Perfluoroundecanoic acid (PFUnA)	29	U	39	29	11
307-55-1	Perfluorododecanoic acid (PFDoA)	20	U	39	20	5.4
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	29	U	39	29	13
376-06-7	Perfluorotetradecanoic acid (PFTeA)	9.8	U	20	9.8	2.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	41	D	20	9.8	2.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	410	D	20	9.8	2.9
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	8.7	JD	20	9.8	2.9
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	340	D	39	20	5.3
335-77-3	Perfluorodecanesulfonic acid (PFDS)	9.8	U	20	9.8	3.1
754-91-6	Perfluorooctane Sulfonamide (FOSA)	9.8	U	20	9.8	3.4

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI DL Lab Sample ID: 320-35042-1 DL

Matrix: Water Lab File ID: 2018.01.19LLC_010.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) Date Analyzed: 01/19/2018 16:58

Con. Extract Vol.: 10.0(mL) Dilution Factor: 10

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204757 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	95		25-150
STL00992	13C4 PFBA	101		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	100		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	106		25-150
STL00998	13C2 PFDoA	94		25-150
STL00994	1802 PFHxS	99		25-150
STL00991	13C4 PFOS	101		25-150
STL02116	13C2-PFTeDA	95		25-150
STL01892	13C4-PFHpA	96		25-150
STL01893	13C5 PFPeA	104		25-150
STL02337	13C3-PFBS	118		25-150

Report Date: 22-Jan-2018 09:48:48 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_010.d

Lims ID: 320-35042-A-1-A Client ID: TP-PFC-025-TPI

Sample Type: Client

Inject. Date: 19-Jan-2018 16:58:19 ALS Bottle#: 4 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-35042-a-1-a 10X

Misc. Info.: Plate: 1 Rack: 3

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 22-Jan-2018 09:48:36 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK027

First Level Reviewer: roycea Date: 22-Jan-2018 09:46:10

First Level R	Reviewe	er: royo	cea			Date:	2	2-Jan-2018 09:46:1	0		
Signal		RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 F	PFRA										
217.00 > 17		.412	1.411	0.001	0.539	780426	0.2529		101	3694	
2 Perfluor	robutyri	ic acid									
212.90 > 16	69.00 1	.412	1.413	-0.001	1.000	553531	0.1898			93.3	
D 3 13C5-F	PFPeA										
267.90 > 22	23.00 1	.660	1.659	0.001	0.634	473103	0.2589		104	5239	
4 Perfluor	•										
262.90 > 21		.660	1.662	-0.002	1.000	1133171	0.5083			662	
D 47 13C3-											
301.90 > 83			1.695	0.0	0.647	11138	0.2753		118	397	
5 Perfluor 298.90 > 80				0.000	1.000	204011	0.1020			1.470	
298.90 > 80 298.90 > 99			1.697 1.697	-0.002 -0.002	1.000	384011 167500	0.1038	2.29(1.25-3.74)		1479 1195	
D 7 13C2 F		.075	1.077	0.002	1.000	107300		2.27(1.20 0.74)		1175	
315.00 > 27		.941	1.939	0.002	0.741	495558	0.2517		101	8430	
6 Perfluor											
313.00 > 26			1.939	0.002	1.000	1855045	0.9029			4314	
313.00 > 11	19.00 1	.941	1.939	0.002	1.000	151968		12.21(5.03-15.10)		2824	
D 913C4-F	•										
367.00 > 32	22.00 2	2.262	2.267	-0.005	0.864	450617	0.2403		96.1	5852	
10 Perfluo											
363.00 > 31			2.268	-0.006	1.000	379741	0.1917	0 (0(4 40 0 40)		500	
363.00 > 16				-0.006	1.000	144826		2.62(1.13-3.40)		1001	
8 Perfluor					1 000	2/02072	1.0/			05/1	
399.00 > 80 399.00 > 99			2.280	-0.005 -0.005	1.000 1.000	2693873 836814	1.06	3.22(1.50-4.49)		9561 5312	
D 11 1802			2.200	0.000	1.000	030014		5.22(1.50-4.47)		JJ 12	
403.00 > 84			2.282	-0.007	0.869	538182	0.2331		98.6	9916	
.00.00 / 01	2			0.50,	0.007	000102	0.2001		, 5.0		

Report Date: 22-Jan-2018 09:48:48 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Bate. 22 30	111 2010 07.10.10	7110111 Revision: 2.2 00 Dec 2017 11:11.20
Data File:	\\ChromNa\Sacramento\ChromData\A\	3_N\20180119-53121.b\2018.01.19LLC_010.d

Data File.	WOTH	minass	cramen		Data/A0_11/201	00117-3312	1.b(2010.01.19LLC_	_010.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	Δ									
417.00 > 372.00		2.622	-0.002	1.000	473904	0.2579		103	7770	
* 62 13C2-PFOA	١									
415.00 > 370.00	2.620	2.622	-0.002		510199	0.2500			7391	
15 Perfluorooct	anoic ac	id								M
413.00 > 369.00		2.623	-0.003	1.000	9964013	4.48			3204	M
413.00 > 169.00			-0.003	1.000	5777661		1.72(0.84-2.52)		13973	M
16 Perfluoroher				4 000	44575	0.0000				
449.00 > 80.00 449.00 > 99.00			-0.002 -0.009	1.000 0.997	44565 13170	0.0222	3.38(1.94-5.82)		141 192	
		2.029	-0.009	0.997	13170		3.30(1.94-3.02)		192	
D 19 13C5 PFNA 468.00 > 423.00		2.992	-0.002	1.141	373416	0.2507		100	5985	
17 Perfluorooct				1.141	373410	0.2307		100	3703	
499.00 > 80.00			-0.002	1.000	1433034	0.8656			424	
499.00 > 99.00			-0.002	1.000	345046		4.15(2.31-6.93)		689	
D 18 13C4 PFOS	S									
503.00 > 80.00	2.990	2.992	-0.002	1.141	353452	0.2420		101	5780	
22 Perfluorooct	ane Sulf	onamide	Э							
498.00 > 78.00	3.336	3.338	-0.002	1.000	2249	0.001171			30.1	
D 21 13C8 FOS										
506.00 > 78.00		3.338	-0.002	1.274	488901	0.2380		95.2	6710	
D 23 13C2 PFD										
515.00 > 470.00		3.352	-0.008	1.277	326774	0.2539		102	4482	
D 30 13C2 PFUr		0 (70	0.004	4 400	050470	0.0/55		40/	4550	
565.00 > 520.00		3.679	-0.004	1.403	259179	0.2655		106	4552	
D 36 13C2 PFDc		2.070	0.010	1 [1[240/00	0.2257		04.2	2020	
615.00 > 570.00		3.979	-0.010	1.515	249688	0.2356		94.3	2829	
D 43 13C2-PFTe 715.00 > 670.00		4.483	-0.007	1.709	329225	0.2378		95.1	2943	
713.00 > 070.00	4.470	4.403	-0.007	1.707	327223	0.2370		70.1	Z 74J	

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 22-Jan-2018 09:48:48 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 19-Jan-2018 16:58:19 Instrument ID: A8_N Lims ID: 320-35042-A-1-A Lab Sample ID: Client ID: TP-PFC-025-TPI Operator ID: SACINSTLCMS01 ALS Bottle#: Worklist Smp#: 2 Injection Vol: Dil. Factor: 10.0000 2.0 ul Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x (18 00015 ∑₁₂ 0.9 1.5 1.9 1.8 1.2 1.8 2.1 0.7 1.0 1.6 1.2 1.5 2.1 D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 30 ©24 Y (X10000) ∑20 ×₂₀ 15- 12 10 1.2 1.2 2.4 2.4 1.3 1.9 1.5 1.8 2.1 0.6 1.8 1.0 2.2 5 Perfluorobutanesulfonic acid D 7 13C2 PFHxA 6 Perfluorohexanoic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 49 49 (014⁻ 0012⁻ 0042 ×35 042 ×35 ×28 ∑₁₀ >28 21 21 01 1.7 2.0 2.3 1.5 1.8 2.1 2.7 1.4 2.0 1.4 1.2 2.4 8.0 1.1 2.6 6 Perfluorohexanoic acid D 9 13C4-PFHpA 10 Perfluoroheptanoic acid Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x Exp1:m/z 363.00 > 319.00:Moving5PtAverage_ (15 000012 X (X10000) (X10000) (X10000) 836 ×30 18 0 0 1.3 1.9 2.5 3.1 1.5 3.0 1.7 2.0 2.3 2.6 2.9 0.7 1.4

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_010.d 10 Perfluoroheptanoic acid 8 Perfluorohexanesulfonic acid 8 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 169.00:Moving5PtAverage_x Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 399.00 > 99.00:Moving5PtAverage_x3 060 060 036 30 × 24 ∑50⁻ ∑40**-**18 30 12 20 10 2.3 1.5 1.8 2.1 2.4 2.7 3.0 1.3 1.6 1.9 2.2 2.5 2.8 1.4 1.7 2.0 2.6 2.9 3.2 D 11 1802 PFHxS D 14 13C4 PFOA 62 13C2-PFOA Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3 Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x (000012 ×) > 9 0015 000 12 12 (0000 LX) > 9 2.7 1.8 3.0 2.3 2.6 2.9 2.1 2.7 2.4 2.0 15 Perfluorooctanoic acid (M) 15 Perfluorooctanoic acid (M) 16 Perfluoroheptanesulfonic acid Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 413.00 > 169.00:Moving5PtAverage_> Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x 27 00023 ×19 (014° (0000011° (10000011° ©12 00 12 ×10 2.1 2.4 2.7 1.9 2.2 2.5 2.8 2.5 2.8 1.8 3.0 3.3 3.1 2.2 D 19 13C5 PFNA 17 Perfluorooctane sulfonic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 499.00 > 80.00:Moving5PtAverage_x3 28 (X10000) X (X10000) X (X10000) 8 0024 0024 0020 ×28 ∑16 21 0 2.6 2.9 2.4 2.7 3.0 3.3 0.9 2.1 3.3 4.5 2.3

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 22-Jan-2018 09:48:48

3.8

4.4

2.6

3.2

3.8

4.4

3.2

0

2.6

0

2.6

3.2

3.8

Chrom Revision: 2.2 08-Dec-2017 11:41:26

3.8

4.1

4.7

Report Date: 22-Jan-2018 09:48:48 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_010.d

Injection Date: 19-Jan-2018 16:58:19 Instrument ID: A8_N

Lims ID: 320-35042-A-1-A Lab Sample ID:

Client ID: TP-PFC-025-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 10.0000

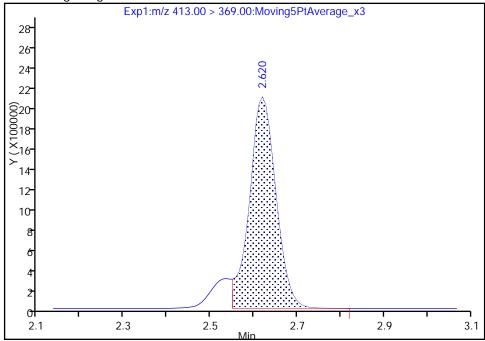
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

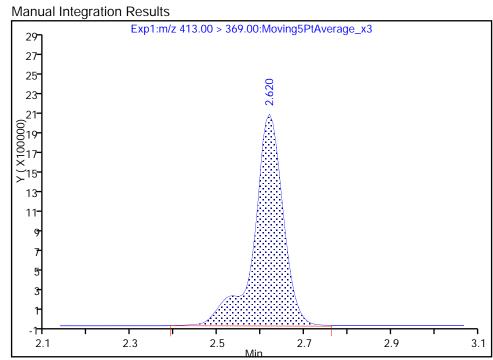
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.62 Area: 8889365 Amount: 4.000913 Amount Units: ng/ml **Processing Integration Results**



RT: 2.62 Area: 9964013 Amount: 4.484589 Amount Units: ng/ml



Reviewer: roycea, 22-Jan-2018 09:45:11

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 375 of 606

Chrom Revision: 2.2 08-Dec-2017 11:41:26 Report Date: 22-Jan-2018 09:48:48 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:

Injection Date: 19-Jan-2018 16:58:19 Instrument ID: $A8_N$

Lims ID: 320-35042-A-1-A Lab Sample ID:

TP-PFC-025-TPI Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Method: **A8 N** LC PFC_DOD ICAL Limit Group:

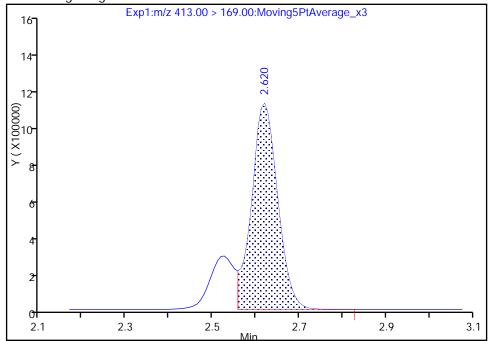
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

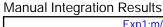
Signal: 2

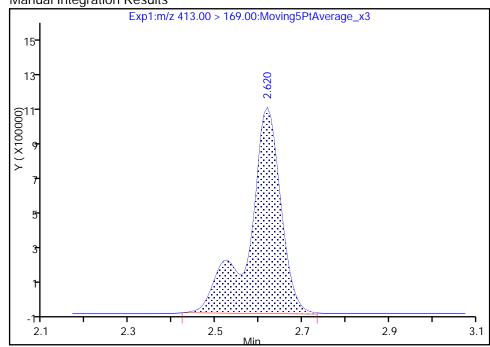
RT: 2.62 Area: 4667585 Amount: 4.000913 Amount Units: ng/ml

Processing Integration Results



RT: 2.62 5777661 Area: Amount: 4.484589 Amount Units: ng/ml





Reviewer: roycea, 22-Jan-2018 09:45:19

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 376 of 606

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-MID-CARBON Lab Sample ID: 320-35042-2

Matrix: Water Lab File ID: 2018.01.18LLA_006.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:05

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253.9(mL) Date Analyzed: 01/18/2018 18:08

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	170		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	72		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.3	М	2.0	0.98	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	13	М	3.9	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.98	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.98	Ū	2.0	0.98	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	Ū	3.9	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	Ū	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	Ū	3.9	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	Ū	2.0	0.98	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.0	0.98	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	J	2.0	0.98	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.98	Ū	2.0	0.98	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	Ū	3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	Ū	2.0	0.98	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	Ū	2.0	0.98	0.34

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-MID-CARBON Lab Sample ID: 320-35042-2

Matrix: Water Lab File ID: 2018.01.18LLA_006.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:05

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253.9(mL) Date Analyzed: 01/18/2018 18:08

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	92		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	98		25-150
STL00990	13C4 PFOA	102		25-150
STL00995	13C5 PFNA	104		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	100		25-150
STL00998	13C2 PFDoA	90		25-150
STL00994	1802 PFHxS	99		25-150
STL00991	13C4 PFOS	100		25-150
STL02116	13C2-PFTeDA	94		25-150
STL01892	13C4-PFHpA	100		25-150
STL01893	13C5 PFPeA	102		25-150
STL02337	13C3-PFBS	98		25-150

Report Date: 19-Jan-2018 15:51:00 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d

Lims ID: 320-35042-A-2-A

Client ID: TP-PFC-025-MID-CARBON

Sample Type: Client

Inject. Date: 18-Jan-2018 18:08:54 ALS Bottle#: 45 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

 Sample Info:
 320-35042-a-2-a

 Misc. Info.:
 Plate: 1 Rack: 5

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:45:32

First Level Revie	wer: royo	cea			Date:	1	9-Jan-2018 15:45:3	2		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA 217.00 > 172.00	1.407	1.411	-0.004	0.538	7799018	2.59		104	20396	
2 Perfluorobuty 212.90 > 169.00 D 3 13C5-PFPe	1.407	1.413	-0.006	1.000	9385437	3.22			1203	
267.90 > 223.00		1.659	-0.005	0.632	4539714	2.54		102	38544	
4 Perfluoropen 262.90 > 219.00	1.654	cid 1.662	-0.008	1.000	9246023	4.32			9275	
D 47 13C3-PFB3 301.90 > 83.00	1.689		-0.006	0.646	89737	2.27		97.8	4564	
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00		nic acid 1.697 1.697	-0.008 -0.008	1.000 1.000	117637 60420	0.0395	1.95(1.25-3.74)		577 449	
D 7 13C2 PFHx 315.00 > 270.00	1.934	1.939	-0.005	0.739	4701020	2.45		97.8	32398	
6 Perfluorohex 313.00 > 269.00 313.00 > 119.00	1.924	id 1.939 1.939	-0.015 -0.005	0.995 1.000	3543396 209332	1.82	16.93(5.03-15.10)		6664 3164	R R
D 9 13C4-PFHp 367.00 > 322.00		2.267	-0.001	0.866	4561586	2.49		99.7	30014	
10 Perfluorohej 363.00 > 319.00 363.00 > 169.00	2.239	2.268	-0.029 -0.015	0.988 0.994	116179 46575	0.0579	2.49(1.13-3.40)		181 263	M M
8 Perfluorohex 399.00 > 80.00	2.266	2.280	-0.014	0.994	63702	0.0257	0.00(4.50.4.40)		250	
D 11 1802 PFH	2.279 xS 2.279	2.280	-0.001	1.0000.871	16644 5268042	2.34	3.83(1.50-4.49)	98.9	11845018	

Report Date: 19-Jan-2018 15:51:00 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d

Data i ile.	''CIIIC	JIIIVa\30			Data 170_111201	00110-3300	0.b\2010.01.10LLA_	_000.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	А									
417.00 > 372.00	2.616	2.622	-0.006	1.000	4588515	2.56		102	35859	
* 62 13C2-PFOA	٨									
415.00 > 370.00	2.616	2.622	-0.006		4979921	2.50			29574	
15 Perfluorooct										M
413.00 > 369.00		2.623	-0.007	1.000	690212	0.3208			312	M
413.00 > 169.00		2.623	-0.007	1.000	462242		1.49(0.84-2.52)		1043	M
D 19 13C5 PFN/		0.000	0.007		07/7700	0.50		101	00/07	
468.00 > 423.00		2.992	-0.007	1.141	3767780	2.59		104	28687	
D 18 13C4 PFO		2.002	0.007	1 1 1 1	22002/0	2.20		00.0	27022	
503.00 > 80.00		2.992	-0.007	1.141	3399268	2.38		99.8	27832	
D 21 13C8 FOSA 506.00 > 78.00		2 220	-0.006	1.274	4605447	2.30		91.9	24255	
D 23 13C2 PFD/		3.330	-0.006	1.274	4003447	2.30		91.9	24233	
515.00 > 470.00		3 352	-0.004	1.280	3032866	2.41		96.6	23505	
D 30 13C2 PFUr		3.332	-0.004	1.200	3032000	2.41		70.0	23303	
565.00 > 520.00		3 679	-0.008	1.403	2372244	2.49		99.6	21911	
D 36 13C2 PFD		0.077	0.000	1.100	2072211	2.17		77.0	21711	
615.00 > 570.00		3.979	-0.007	1.518	2320287	2.24		89.7	24096	
D 43 13C2-PFTe		3,	2.007					.		
715.00 > 670.00		4.483	-0.011	1.709	3162017	2.34		93.6	23209	
	- -	· · · - -		-						

QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

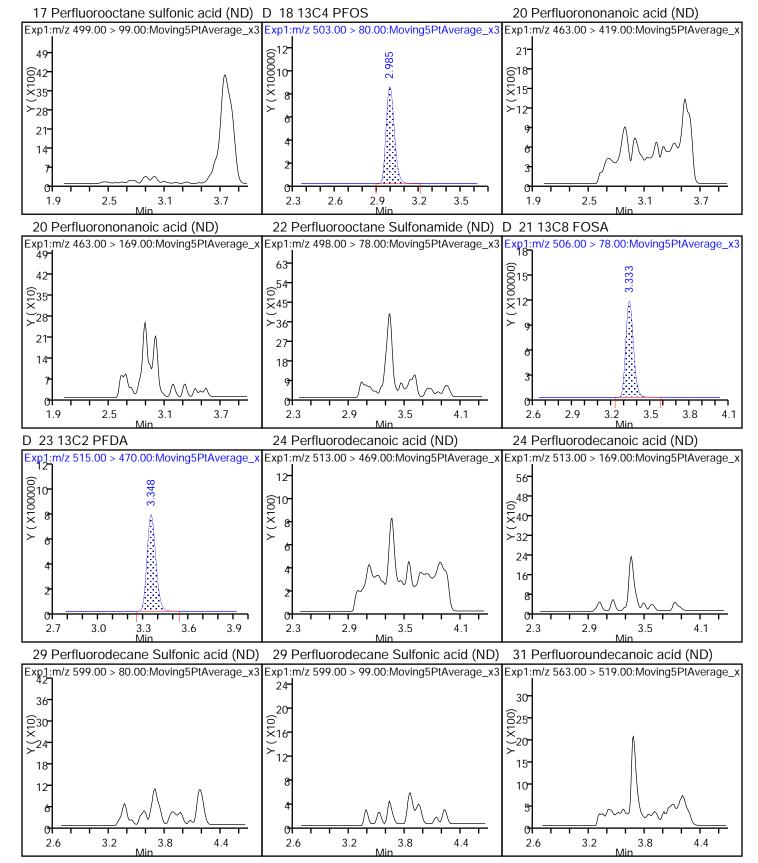
Review Flags

M - Manually Integrated

Report Date: 19-Jan-2018 15:51:00 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d Data File: **Injection Date:** 18-Jan-2018 18:08:54 Instrument ID: A8_N Lims ID: 320-35042-A-2-A Lab Sample ID: 320-35042-2 TP-PFC-025-MID-CARBON Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 45 Worklist Smp#: Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 3 13C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x | Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x (018 000 0015 ©21- 0218-(X100000) \sum_{12} 0.9 1.5 1.0 1.9 0.3 2.1 0.7 1.6 0.6 1.2 1.8 2.4 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 28 000001 00020 30 <u>6</u>25 8₂₀ ∑₁₆ ×₂₀ ∑16⁻ 15 12 10 1.9 2.2 0.9 1.2 1.5 2.4 1.7 2.0 1.0 1.3 1.6 2.5 1.8 2.1 1.1 1.4 2.3 5 Perfluorobutanesulfonic acid 7 13C2 PFHxA 6 Perfluorohexanoic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 70-0060-014 0012 15 (00012 ×) × ∑₁₀ ×50 30 20 10 01 1.7 2.0 2.3 1.5 1.8 2.1 2.7 1.5 2.7 1.4 1.2 2.4 0.9 2.1 1.1 6 Perfluorohexanoic acid D 9 13C4-PFHpA 10 Perfluoroheptanoic acid (M) Exp1:m/z 363.00 > 319.00:Moving5PtAverage_ Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> 21 (0000012 X) 0018 ×15 860 550 √ ≻40 30 20 0 0 1.6 1.9 2.2 2.5 1.5 1.6 1.9 2.2 2.5 2.8 1.3 1.3

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:51:00



3.9

3.6

4.2

4.5

4.8

Report Date: 19-Jan-2018 15:51:01 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d

Injection Date: 18-Jan-2018 18:08:54 Instrument ID: A8_N

Lims ID: 320-35042-A-2-A Lab Sample ID: 320-35042-2

Client ID: TP-PFC-025-MID-CARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 45 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

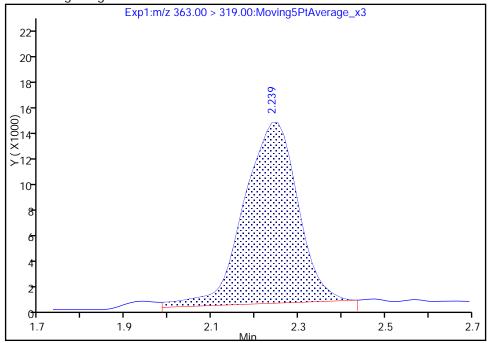
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

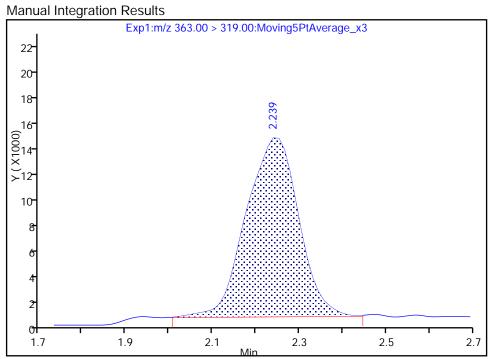
Signal: 1

RT: 2.24
Area: 120706
Amount: 0.060193
Amount Units: ng/ml

Processing Integration Results



RT: 2.24
Area: 116179
Amount: 0.057936
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:44:54

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 385 of 606

Report Date: 19-Jan-2018 15:51:01 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d

Injection Date: 18-Jan-2018 18:08:54 Instrument ID: A8_N

Lims ID: 320-35042-A-2-A Lab Sample ID: 320-35042-2

Client ID: TP-PFC-025-MID-CARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 45 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

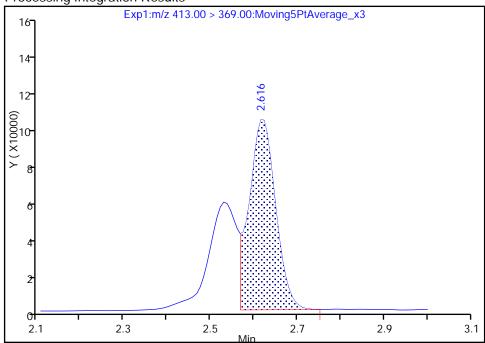
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

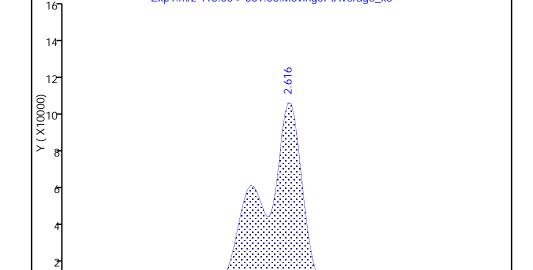
Signal: 1

RT: 2.62 Area: 432998 Amount: 0.201276 Amount Units: ng/ml **Processing Integration Results**

Manual Integration Results



RT: 2.62 Area: 690212 Amount: 0.320840 Amount Units: ng/ml



2.9

3.1

Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x3

Reviewer: roycea, 19-Jan-2018 15:43:59

Audit Action: Manually Integrated

Audit Reason: Isomers

2.5

2.7

Page 386 of 606

2.3

Report Date: 19-Jan-2018 15:51:01 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d

Injection Date: 18-Jan-2018 18:08:54 Instrument ID: A8_N

Lims ID: 320-35042-A-2-A Lab Sample ID: 320-35042-2

Client ID: TP-PFC-025-MID-CARBON

Operator ID: SACINSTLCMS01 ALS Bottle#: 45 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

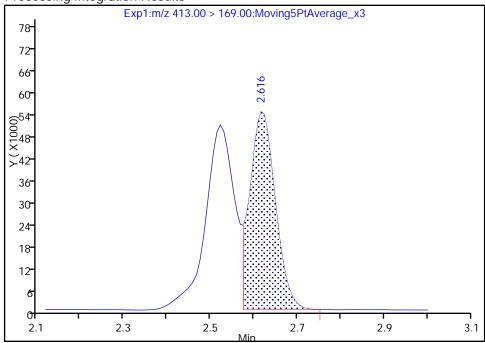
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

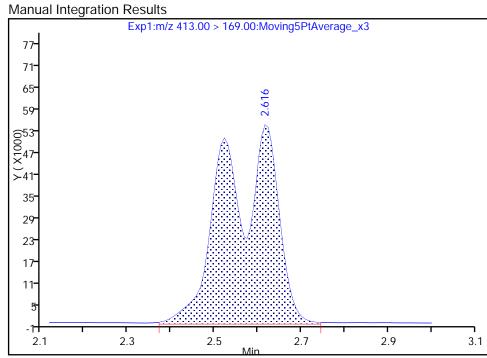
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 2.62 Area: 218577 Amount: 0.201276 Amount Units: ng/ml **Processing Integration Results**



RT: 2.62 Area: 462242 Amount: 0.320840 Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:44:09

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 387 of 606

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE Lab Sample ID: 320-35042-3

Matrix: Water Lab File ID: 2018.01.18LLA_007.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:10

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.7(mL) Date Analyzed: 01/18/2018 18:16

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.9	0.97	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	110		1.9	0.97	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	25		3.9	1.9	0.56
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.43	JМ	1.9	0.97	0.24
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	JМ	3.9	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	0.97	U	1.9	0.97	0.26
335-76-2	Perfluorodecanoic acid (PFDA)	0.97	U	1.9	0.97	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	3.9	1.9	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	Ū	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.97	Ū	1.9	0.97	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.38	J	1.9	0.97	0.29
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.38	J	1.9	0.97	0.29
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.97	Ū	1.9	0.97	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.9	U	3.9	1.9	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.97	U	1.9	0.97	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.97	Ū	1.9	0.97	0.34

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE Lab Sample ID: 320-35042-3

Matrix: Water Lab File ID: 2018.01.18LLA_007.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:10

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.7 (mL) Date Analyzed: 01/18/2018 18:16

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	87		25-150
STL00992	13C4 PFBA	105		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	107		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	89		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	93		25-150
STL00994	1802 PFHxS	102		25-150
STL00991	13C4 PFOS	100		25-150
STL02116	13C2-PFTeDA	94		25-150
STL01892	13C4-PFHpA	110		25-150
STL01893	13C5 PFPeA	107		25-150
STL02337	13C3-PFBS	99		25-150

Report Date: 19-Jan-2018 16:33:15 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d

Lims ID: 320-35042-A-3-A Client ID: TP-PFC-025-TPE

Sample Type: Client

Inject. Date: 18-Jan-2018 18:16:42 ALS Bottle#: 46 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-35042-a-3-a Misc. Info.: Plate: 1 Rack: 5

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 16:33:02 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:56:17

First Level Reviewer: roycea					Date: 19-Jan-2018 15:56:17						
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 113C4 PFBA 217.00 > 172.00		1.411	0.0	0.538	7722621	2.63		105	26091	
	2 Perfluorobuty 212.90 > 169.00 D 3 13C5-PFPe	1.411	1.413	-0.002	1.000	9681577	3.35			1424	
	267.90 > 223.00		1.659	0.007	0.635	4668791	2.68		107	42085	
	4 Perfluoropen 262.90 > 219.00	1.657	cid 1.662	-0.005	0.995	6022018	2.74			5767	
	D 47 13C3-PFB3 301.90 > 83.00		1.695	0.007	0.648	88867	2.31		99.2	3724	
	5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00	1.693	nic acid 1.697 1.697	-0.004 -0.004	0.995 0.995	28513 16348	0.009661	1.74(1.25-3.74)		145 115	
	D 7 13C2 PFHx 315.00 > 270.00	1.948	1.939	0.009	0.742	4735455	2.53		101	35205	
	6 Perfluorohex 313.00 > 269.00 313.00 > 119.00	1.917	id 1.939 1.939	-0.022 0.009	0.984 1.000	1268753 59701	0.6463	21.25(5.03-15.10)		2628 1031	R R
	D 9 13C4-PFHp 367.00 > 322.00		2.267	0.004	0.865	4907094	2.75		110	30322	
	10 Perfluorohej 363.00 > 319.00 363.00 > 169.00	2.245	acid 2.268 2.268	-0.023 -0.010	0.988 0.994	23538 8868	0.0109	2.65(1.13-3.40)		29.6 54.7	M M
	8 Perfluorohex 399.00 > 80.00 399.00 > 99.00	anesulfo 2.284 2.284	onic acid 2.280 2.280	0.004 0.004	1.000 1.000	24597 6616	0.009821	3.72(1.50-4.49)		126 72.0	
	D 11 1802 PFH		2.282	0.002	0.870	5319781	2.42	,	102	31241	

Report Date: 19-Jan-2018 16:33:15 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d

Data File: \(\Cnromina\Sacramento\CnromData\A8_in\20180118-53066.b\2018.01.18LLA_007.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.624	2.622	0.002	1.000	4665018	2.67		107	30697	
* 62 13C2-PFOA										
415.00 > 370.00		2.622	0.002		4857245	2.50			32726	
15 Perfluorooct 413.00 > 369.00			0.001	1.000	63207	0.0000			20.4	M M
413.00 > 369.00 413.00 > 169.00		2.623 2.623	-0.092	0.964	44291	0.0289	1.43(0.84-2.52)		29.6 151	M
D 19 13C5 PFNA										
468.00 > 423.00		2.992	0.003	1.141	3768458	2.66		106	27588	
D 18 13C4 PFO	S									
503.00 > 80.00	2.995	2.992	0.003	1.141	3336948	2.40		100	30252	
D 21 13C8 FOS										
506.00 > 78.00		3.338	-0.003	1.271	4259418	2.18		87.1	19057	
D 23 13C2 PFD/ 515.00 > 470.00		3.352	0.006	1.280	2725154	2.23		89.3	18134	
31 Perfluoroun			0.006	1.280	2735154	2.23		69.3	10134	
563.00 > 519.00		3.678	0.004	1.000	6148	0.006451			31.3	
563.00 > 169.00		3.678	0.004	1.000	1000	0.000101	6.15(0.00-0.00)		67.4	
D 30 13C2 PFU	nA									
565.00 > 520.00	3.682	3.679	0.003	1.403	2308144	2.48		99.3	24042	
D 36 13C2 PFD										
615.00 > 570.00		3.979	0.004	1.518	2342668	2.32		92.9	24438	
D 43 13C2-PFT6		4 400	0.005	4 740	2002146	0.05		00.0	17050	
715.00 > 670.00	4.488	4.483	0.005	1.710	3092140	2.35		93.8	17850	

QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 19-Jan-2018 16:33:15 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 18-Jan-2018 18:16:42 Instrument ID: A8_N Lims ID: 320-35042-A-3-A Lab Sample ID: 320-35042-3 Client ID: TP-PFC-025-TPE Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 7 Injection Vol: Dil. Factor: 1.0000 2.0 ul Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 24 (018 000 0015 \sum_{12} 1.8 2.2 0.0 0.6 2.4 0.4 1.0 1.6 1.0 1.6 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x 70 600 ×500 -40 30 20 10 2.3 1.4 1.7 2.0 1.3 1.9 2.2 1.5 1.8 8.0 1.1 1.0 1.2 2.1 5 Perfluorobutanesulfonic acid D 7 13C2 PFHxA 6 Perfluorohexanoic acid m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 0001 0020 0014 0012 836 ∑₁₀ ×₁₆ \times 30 >₂₄ 18 12 01 1.5 1.8 2.1 1.5 1.8 2.1 2.7 8.0 1.4 1.2 2.4 2.0 2.6 6 Perfluorohexanoic acid 9 13C4-PFHpA 10 Perfluoroheptanoic acid (M) Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> Exp1:m/z 363.00 > 319.00:Moving5PtAverage_ (00005 X) 654**-**245**-≻**36 27 18 0 0| 1.5 1.8 2.1 2.4 2.7 1.5 1.8 2.1 2.4 2.7 3.0 1.2 1.5

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 16:33:15

17 Perfluorooctane sulfonic acid (ND) D 18 13C4 PFOS 20 Perfluorononanoic acid (ND) Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 (X100000) (X100000) (X100000) 0035 × × × (X100 (X100 (X100) (X100) 21 2.9 1.9 2.5 3.1 3.7 2.3 2.6 3.2 3.5 1.9 2.5 3.1 3.7 20 Perfluorononanoic acid (ND) 22 Perfluorooctane Sulfonamide (ND) D 21 13C8 FOSA Exp1:m/z 463.00 > 169.00:Moving5PtAverage_x Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 (0000015 X12 70 70 60 60⁻ 50⁻ © ∑50 >40**≻**40 30 30 20 20 10 10 3.3 2.5 3.1 2.9 3.5 3.0 3.9 3.7 4.1 3.6 Min D 23 13C2 PFDA 24 Perfluorodecanoic acid (ND) 24 Perfluorodecanoic acid (ND) Exp1:m/z 515.00 > 470.00:Moving5PtAverage_x Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x 12 21 (X100000), × (×100) 0 0 3.0 3.3 3.9 2.9 3.5 4.1 2.9 3.6 2.3 2.3 3.5 4.1 2.7 29 Perfluorodecane Sulfonic acid (ND) 29 Perfluorodecane Sulfonic acid (ND) 31 Perfluoroundecanoic acid Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 | Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 | Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x 24 36 ×30 (C) (X) (E) ©30-× × >24-≻24 18 18 12 0 0 3.2 3.8 4.4 2.6 3.2 3.8 4.4 3.3 3.6 3.9 2.6

3.9

3.6

4.2

4.5

4.8

5.1

Report Date: 19-Jan-2018 16:33:15 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d

Injection Date: 18-Jan-2018 18:16:42 Instrument ID: A8_N

Lims ID: 320-35042-A-3-A Lab Sample ID: 320-35042-3

Client ID: TP-PFC-025-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

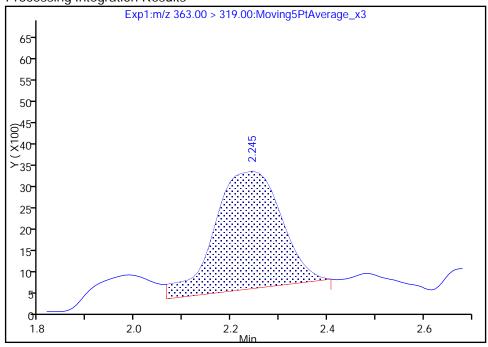
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

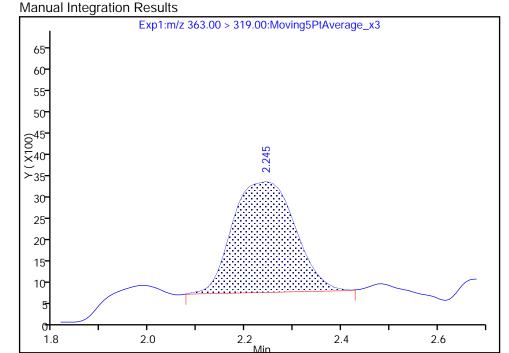
Signal: 1

RT: 2.24
Area: 26877
Amount: 0.012459
Amount Units: ng/ml

Processing Integration Results



RT: 2.24
Area: 23538
Amount: 0.010911
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:27:47 Audit Action: Manually Integrated

Audit Reason: Baseline

Page 396 of 606

Report Date: 19-Jan-2018 16:33:15 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d

Injection Date: 18-Jan-2018 18:16:42 Instrument ID: $A8_N$

Lims ID: Lab Sample ID: 320-35042-3 320-35042-A-3-A

Client ID: TP-PFC-025-TPE

SACINSTLCMS01 ALS Bottle#: Operator ID: 46 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

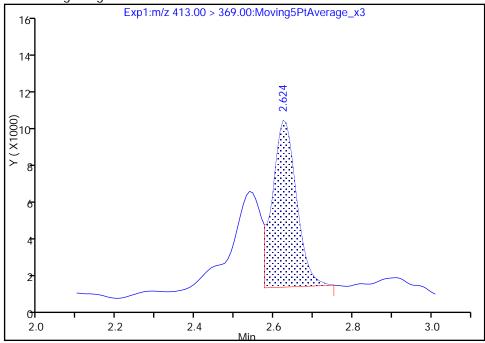
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

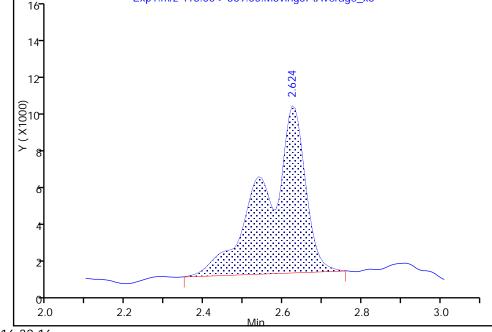
RT: 2.62 Area: 36357 Amount: 0.016623 Amount Units: ng/ml

Processing Integration Results



RT: 2.62 Area: 63207 Amount: 0.028900 Amount Units: ng/ml





Reviewer: roycea, 19-Jan-2018 16:32:16

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 397 of 606

Report Date: 19-Jan-2018 16:33:15 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d

Injection Date: 18-Jan-2018 18:16:42 Instrument ID: A8_N

Lims ID: 320-35042-A-3-A Lab Sample ID: 320-35042-3

Client ID: TP-PFC-025-TPE

Operator ID: SACINSTLCMS01 ALS Bottle#: 46 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

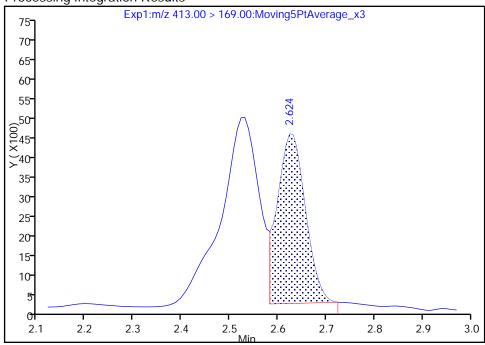
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

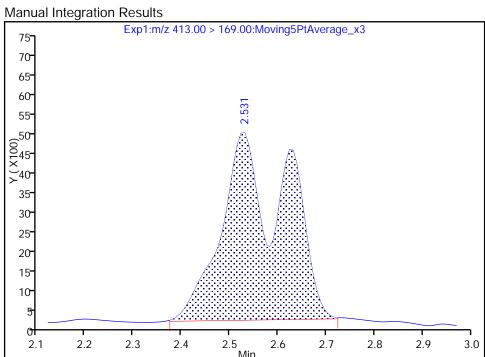
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 2.62 Area: 17397 Amount: 0.016623 Amount Units: ng/ml **Processing Integration Results**



RT: 2.53
Area: 44291
Amount: 0.028900
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:32:27

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 398 of 606

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE-D Lab Sample ID: 320-35042-4

Matrix: Water Lab File ID: 2018.01.18LLA_008.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 00:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253(mL) Date Analyzed: 01/18/2018 18:24

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	0	LOO	LOD	DL
CIID NO.	COIII COND WILLE	RECOLI	ν	LOQ		
375-22-4	Perfluorobutanoic acid (PFBA)	130		2.0	0.99	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	110		2.0	0.99	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	25		4.0	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.43	JM	2.0	0.99	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	JM	4.0	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.99	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.99	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.99	Ū	2.0	0.99	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.45	J	2.0	0.99	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.32	J	2.0	0.99	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.99	Ū	2.0	0.99	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.99	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.99	Ū	2.0	0.99	0.35

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE-D Lab Sample ID: 320-35042-4

Matrix: Water Lab File ID: 2018.01.18LLA_008.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 00:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253(mL) Date Analyzed: 01/18/2018 18:24

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	98		25-150
STL00992	13C4 PFBA	105		25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	107		25-150
STL00995	13C5 PFNA	107		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	108		25-150
STL00998	13C2 PFDoA	102		25-150
STL00994	1802 PFHxS	103		25-150
STL00991	13C4 PFOS	108		25-150
STL02116	13C2-PFTeDA	99		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	109		25-150
STL02337	13C3-PFBS	99		25-150

Report Date: 19-Jan-2018 16:33:17 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Lims ID: 320-35042-A-4-A Client ID: TP-PFC-025-TPE-D

Sample Type: Client

Inject. Date: 18-Jan-2018 18:24:31 ALS Bottle#: 47 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-35042-a-4-a Misc. Info.: Plate: 1 Rack: 5

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 16:33:02 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 16:29:39

First Level Revie	wer: roy	cea			Date:	1	9-Jan-2018 16:29:3	9		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.411	-0.006	0.537	7869622	2.62		105	20022	
2 Perfluorobut 212.90 > 169.00	•	1.413	-0.008	1.000	9691035	3.30			1123	
D 3 13C5-PFP6										
267.90 > 223.00		1.659	-0.001	0.633	4822122	2.72		109	58594	
4 Perfluoroper 262.90 > 219.00		cia 1.662	-0.012	0.995	6340101	2.79			6634	
D 47 13C3-PFB										
	1.694	1.695	-0.001	0.647	90753	2.31		99.3	3925	
5 Perfluorobut 298.90 > 80.00	anesuito 1.685	nic acid 1.697	-0.012	0.995	34394	0.0114			178	
	1.685	1.697	-0.012	0.995	17931		1.92(1.25-3.74)		137	
D 7 13C2 PFHx										
315.00 > 270.00 6 Perfluorohex		1.939	0.0	0.740	5156215	2.70		108	37190	R
313.00 > 269.00		1.939	-0.021	0.989	1335001	0.6245			3120	R
313.00 > 119.00	1.939	1.939	0.0	1.000	60550		22.05(5.03-15.10)		1724	
D 9 13C4-PFH _p		2 2/7	0.006	0.868	4017074	2.70		108	28063	
367.00 > 322.00 10 Perfluorohe		2.267	0.006	0.808	4916964	2.70		108	28003	M
363.00 > 319.00		2.268	-0.035	0.983	23459	0.0109			26.9	M
363.00 > 169.00		2.268	-0.069	0.968	9896		2.37(1.13-3.40)		71.9	
8 Perfluorohex 399.00 > 80.00	canesulfo 2.273	onic acid 2.280	-0.007	0.994	20729	0.008024			90.8	
399.00 > 99.00	2.273	2.280	0.007	1.000	6705	0.000024	3.09(1.50-4.49)		59.4	
D 11 18O2 PFH										
403.00 > 84.00	2.286	2.282	0.004	0.873	5487319	2.45		103	39123	

Report Date: 19-Jan-2018 16:33:17 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d

Data File.	WCIII	JIIIVa\Sa	acrament		Dala/Ao_IN/201	00110-3300	0.D\2U10.U1.10LLA_	_006.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	A									
417.00 > 372.00	2.618	2.622	-0.004	1.000	4757229	2.66		107	30217	
* 62 13C2-PFOA										
415.00 > 370.00			-0.004		4956808	2.50			30607	
15 Perfluorooct 413.00 > 369.00		2.623	-0.005	1.000	64858	0.0291			30.5	M M
413.00 > 369.00			-0.003	0.965	45211	0.0291	1.43(0.84-2.52)		142	M
D 19 13C5 PFN/	A						,			
468.00 > 423.00	2.988	2.992	-0.004	1.141	3858228	2.67		107	29562	
D 18 13C4 PFO										
503.00 > 80.00		2.992	-0.004	1.141	3665866	2.58		108	25830	
D 21 13C8 FOSA 506.00 > 78.00		2 220	0.002	1.274	4913009	2.44		00 E	23028	
D 23 13C2 PFD		3.336	-0.003	1.274	4913009	2.46		98.5	23028	
515.00 > 470.00		3.352	-0.002	1.280	3194873	2.56		102	29213	
D 30 13C2 PFU	nA									
565.00 > 520.00	3.673	3.679	-0.006	1.403	2560045	2.70		108	21333	
D 36 13C2 PFD	οA									
615.00 > 570.00		3.979	-0.005	1.518	2632339	2.56		102	20860	
D 43 13C2-PFT6		4 402	0.010	1 700	2225442	2.40		00.2	22720	
715.00 > 670.00	4.4/3	4.483	-0.010	1.709	3335462	2.48		99.2	23730	

QC Flag Legend Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Report Date: 19-Jan-2018 16:33:17 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 18-Jan-2018 18:24:31 Instrument ID: A8_N Lims ID: 320-35042-A-4-A Lab Sample ID: 320-35042-4 Client ID: TP-PFC-025-TPE-D Operator ID: SACINSTLCMS01 ALS Bottle#: 47 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x (000015 X) 12 12 1.0 2.2 1.0 1.9 1.6 0.7 1.6 0.5 1.1 1.7 2.3 4 Perfluoropentanoic acid D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 (000001X), 30 10 ©25- Y (X1000) ×₂₀ 15 10 1.5 1.6 1.9 2.2 0.9 1.2 2.1 2.4 1.2 1.5 1.8 2.1 1.0 1.3 1.8 6 Perfluorohexanoic acid 5 Perfluorobutanesulfonic acid 7 13C2 PFHxA xp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_> Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 24 (0000015 X)12 (0) 20-<u>235</u> ∑₂₈ <u>≻</u>16• 21 1.5 1.8 2.1 1.5 1.8 2.1 2.7 8.0 1.4 1.2 1.2 2.4 2.0 2.6 6 Perfluorohexanoic acid 9 13C4-PFHpA 10 Perfluoroheptanoic acid (M) Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 363.00 > 319.00:Moving5PtAverage_ Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> 56- 618 000 15 (248 (240 (240) ©18 ∑₁₅ <u></u>32 24 16 0 0| 0.9 1.5 2.1 2.7 1.5 1.8 2.1 2.4 Page 400h of 606 1.8 2.1 2.4 2.7 3.0 1.5

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 16:33:17

17 Perfluorooctane sulfonic acid (ND) D 18 13C4 PFOS 20 Perfluorononanoic acid (ND) Exp1:m/z 503.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 463.00 > 419.00:Moving5PtAverage_x Exp1:m/z 499.00 > 99.00:Moving5PtAverage_x3 56 648 ×40 (018 (00) (15) (12) (18) >32 16 2.9 1.9 2.5 3.1 3.7 2.3 2.6 3.2 3.5 1.9 2.5 3.1 3.7 20 Perfluorononanoic acid (ND) 22 Perfluorooctane Sulfonamide (ND) D 21 13C8 FOSA Exp1:m/z 463.00 > 169.00:Moving5PtAverage_x | Exp1:m/z 498.00 > 78.00:Moving5PtAverage_x3 | Exp1:m/z 506.00 > 78.00:Moving5PtAverage_x3 (0000015 X12 56- ⊙⁴⁸⁻ ⋝40-Y (X100) 24 16 8 3.5 1.9 2.5 3.1 3.7 2.9 3.5 2.9 3.2 4.1 3.8 Min D 23 13C2 PFDA 24 Perfluorodecanoic acid (ND) 24 Perfluorodecanoic acid (ND) Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x Exp1:m/z 515.00 > 470.00:Moving5PtAverage_> Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x (000001X) / 8 21 ⊙¹⁸ ×15 0010-× × 8 0 0 3.0 3.3 3.9 2.9 3.5 2.9 3.6 2.3 4.1 2.3 3.5 2.7 4.1 29 Perfluorodecane Sulfonic acid (ND) 29 Perfluorodecane Sulfonic acid (ND) 31 Perfluoroundecanoic acid (ND) Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x 24 35- 48 (C) (X) (E) €⁴⁰ ×32 ≻20 24 15 16 10 0 3.2 3.8 4.4 2.6 3.2 3.8 4.4 3.2 3.8 4.4 2.6 2.6

3.9

3.6

4.2

4.5

4.8

5.1

5.4

Report Date: 19-Jan-2018 16:33:17 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d

Injection Date: 18-Jan-2018 18:24:31 Instrument ID: A8_N

Lims ID: 320-35042-A-4-A Lab Sample ID: 320-35042-4

Client ID: TP-PFC-025-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 47 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

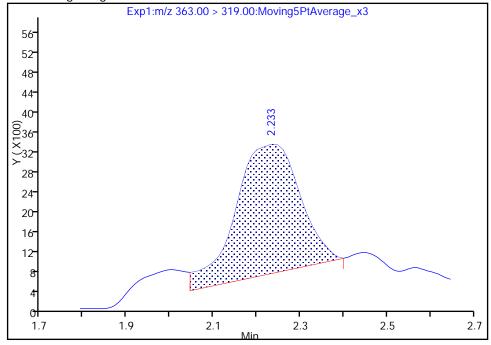
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

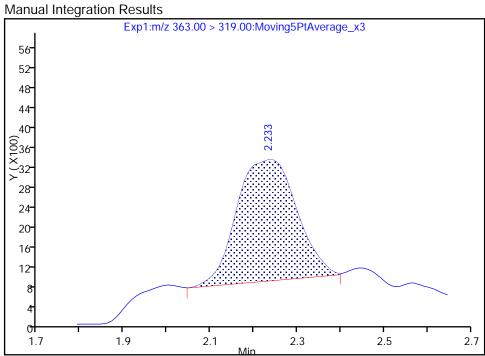
10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

RT: 2.23 Area: 27105 Amount: 0.012540 Amount Units: ng/ml **Processing Integration Results**



RT: 2.23
Area: 23459
Amount: 0.010853
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:28:41

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 407 of 606

Report Date: 19-Jan-2018 16:33:17 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d

Injection Date: 18-Jan-2018 18:24:31 Instrument ID: A8_N

Lims ID: 320-35042-A-4-A Lab Sample ID: 320-35042-4

Client ID: TP-PFC-025-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 47 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

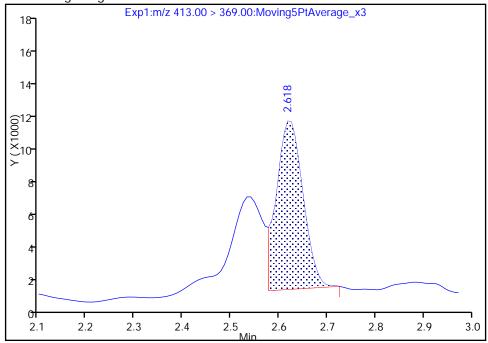
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

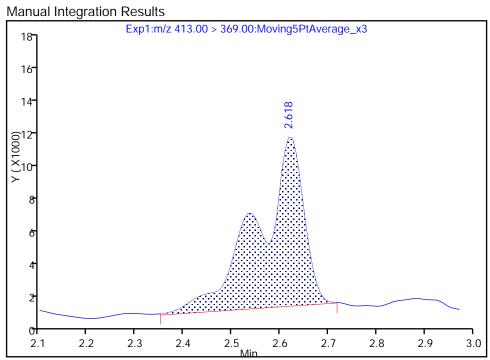
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.62 Area: 36316 Amount: 0.016283 Amount Units: ng/ml **Processing Integration Results**



RT: 2.62
Area: 64858
Amount: 0.029080
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:29:16

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 408 of 606

Report Date: 19-Jan-2018 16:33:17 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d

Injection Date: 18-Jan-2018 18:24:31 Instrument ID: A8_N

Lims ID: 320-35042-A-4-A Lab Sample ID: 320-35042-4

Client ID: TP-PFC-025-TPE-D

Operator ID: SACINSTLCMS01 ALS Bottle#: 47 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

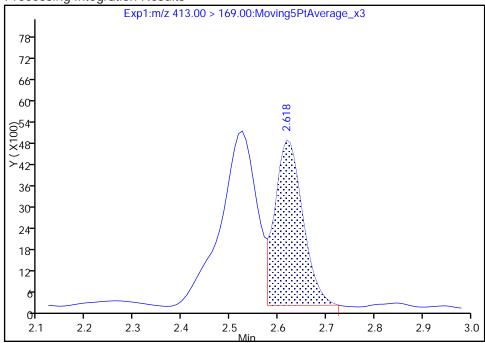
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

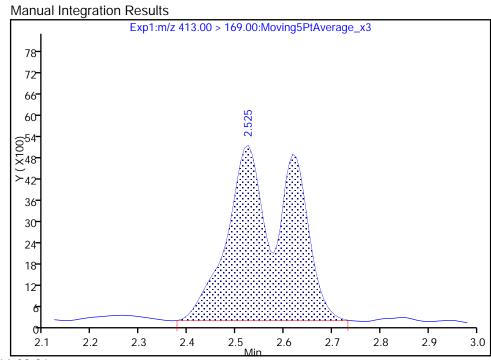
15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 2.62 Area: 18770 Amount: 0.016283 Amount Units: ng/ml **Processing Integration Results**



RT: 2.53
Area: 45211
Amount: 0.029080
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:29:21

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 409 of 606

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-204375/2	2018.01.17CURVELLA 002.d	
Level 2	IC 320-204375/3	2018.01.17CURVELLA 003.d	
Level 3	IC 320-204375/4	2018.01.17CURVELLA 004.d	
Level 4	IC 320-204375/5	2018.01.17CURVELLA 005.d	
Level 5	IC 320-204375/6	2018.01.17CURVELLA 006.d	
Level 6	IC 320-204375/7	2018.01.17CURVELLA 007.d	
Level 7	IC 320-204375/8	2018.01.17CURVELLA 008.d	

ANALYTE			RRF			CURVE		COEFFICIE	NT	# MIN RRF	%RSD			#	MIN R^2
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2			%RS	D OR COI		OR COD
Perfluorobutanoic acid (PFBA)	0.9492 0.9454	0.9387 0.9305	0.9217	0.9121	0.9423	AveID		0.9343			1.4	35	.0		
Perfluoropentanoic acid (PFPeA)	1.2629 1.1486	1.1820 1.1603	1.1793	1.1351	1.1782	AveID		1.1781			3.5	35	.0		
Perfluorobutanesulfonic acid (PFBS)	77.125 80.005	75.338 74.458	80.939	77.763	74.861	AveID		77.213			3.3	50	.0		
4:2 FTS	14.861 14.172	13.294 14.456	13.574	13.365	13.533	AveID		13.894			4.4	35	.0		
Perfluorohexanoic acid (PFHxA)	1.1691 1.0364	1.0016 1.0049	1.0117	1.0418	0.9896	AveID		1.0365			5.9	35	.0		
Perfluoroheptanoic acid (PFHpA)	1.0781 1.1040	1.1090 1.0717	1.2181	1.0322	1.0801	AveID		1.0990			5.3	35	.0		
Perfluorohexanesulfonic acid (PFHxS)	1.2907 1.1001	1.1727 1.0631	1.0672	1.0113	1.0892	AveID		1.1135			8.3	35	.0		
6:2FTS	1.8237 1.7817		1.5599	1.5572	1.6409	AveID		1.6551			6.9	35	.0		
Perfluorooctanoic acid (PFOA)	1.3391 1.1097	1.2175 1.1351	1.1389	1.1301	1.1344	AveID		1.1721			6.9	35	.0		
Perfluoroheptanesulfonic Acid (PFHpS)	1.2991 1.4080	1.3017 1.3785	1.3248	1.3329	1.4365	AveID		1.3545			4.0	50	.0		
Perfluorononanoic acid (PFNA)	1.0065 1.0724	0.9779 1.0322	1.0085	1.0513	1.0771	AveID		1.0323			3.6	35	.0		
Perfluorooctanesulfonic acid (PFOS)	1.1888 1.1074	1.1027 1.1406	1.0854	1.0789	1.1321	AveID		1.1194			3.4	35	.0		
Perfluorooctane Sulfonamide (FOSA)	0.9734 1.0164		0.9781	0.9630	1.0326	AveID		0.9823			3.2	35	.0		
8:2FTS	1.1123 1.2810		1.2204	1.1973	1.2254	AveID		1.2170			4.4	35	.0		

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICI	ENT	# M	IIN RRF	%RSD		R^2 OR COD	# MIN R^2
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	TABE	В	M1	M2				%RSD	OR COD	OR COD
Perfluorodecanoic acid (PFDA)	0.9958 1.0058			0.9341	0.9440			0.9702				3.5	35.0		
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.1587 1.0920			1.0520	1.0759	AveID		1.0802				4.4	35.0		
Perfluorodecanesulfonic acid (PFDS)	0.6602 0.6484	0.5989	0.6566	0.6572	0.6784	AveID		0.6549				4.2	50.0		
Perfluoroundecanoic acid (PFUnA)	1.2159	1.0169		0.9503	1.0142	AveID		1.0322				8.2	35.0		
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	1.0073	1.0104		0.9222				0.9739				3.7	35.0		
Perfluorododecanoic acid (PFDoA)	1.0217	1.0415		1.0402				1.0247				4.4	35.0		
Perfluorotridecanoic Acid (PFTriA)	1.3513 1.1017	1.1380		1.1935				1.1612				8.0	50.0		
Perfluorotetradecanoic acid (PFTeA)	0.2670 0.2417	0.2473		0.2343				0.2440				4.9	50.0		
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 0.9569	0.9411		0.9485										0.9990	0.9900
Perfluoro-n-octadecanoic acid (PFODA)	1.0044 1.1214	1.0904		1.0498				1.0536				5.7	50.0		
13C4 PFBA	1.5259 1.5432	1.5278		1.4862		Ave		1.5124				1.4	50.0		
13C5 PFPeA	0.8953 0.9232			0.8952	0.8865	Ave		0.8956				1.6	50.0		
13C3-PFBS	0.0201 0.0200		0.0196	0.0193	0.0207	Ave		0.0198				2.7	50.0		
13C2 PFHxA	0.9582 0.9743			0.9384				0.9649				1.9	50.0		
13C4-PFHpA	0.9403 0.9242		0.9077	0.9173	0.9288	Ave		0.9187				2.1	50.0		
1802 PFHxS	1.1706 1.1114		1.1523	1.1305	1.1042	Ave		1.1311				2.2	50.0		
M2-6:2FTS	0.1667 0.1660			0.1738				0.1699				2.1	50.0		
13C4 PFOA	0.9250 0.9076	0.8635		0.8785	0.9201	Ave		0.9004				2.5	50.0		
13C4 PFOS	0.7222 0.7287	0.7129		0.7109	0.7113	Ave		0.7158				1.7	50.0		
13C5 PFNA				0.7136	0.7096	Ave		0.7300				2.3	50.0		

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE					MIN RRF	%RSD			# MIN R^2
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				%RS	OR COD	OR COD
	LVL 6	LVL 7													
13C8 FOSA	1.0308		1.0156	1.0178	0.9955	Ave		1.0067				2.5	50	. 0	
M2-8:2FTS	0.1862 0.1771		0.1811	0.1727	0.1782	Ave		0.1795				2.3	50	. 0	
13C2 PFDA	0.6444		0.6279	0.6313	0.6343	Ave		0.6306				1.2	50	. 0	
d3-NMeFOSAA	0.3174		0.3169	0.3149	0.3063	Ave		0.3147				1.3	50	. 0	
d5-NEtFOSAA	0.3461		0.3232	0.3158	0.3054	Ave		0.3182				4.9	50	. 0	
13C2 PFUnA	0.4983		0.4836	0.4728	0.4716	Ave		0.4783				3.1	50	. 0	
13C2 PFDoA	0.5470		0.5263	0.4927	0.5060	Ave		0.5192				4.0	50	. 0	
13C2-PFTeDA	0.7322 0.6661	0.7412	0.6868	0.6615	0.6446	Ave		0.6785				6.7	50	. 0	
13C2-PFHxDA	1.2777			1.2154	1.1984	Ave		1.2091				5.6	50	. 0	

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-204375/2	2018.01.17CURVELLA 002.d
Level 2	IC 320-204375/3	2018.01.17CURVELLA 003.d
Level 3	IC 320-204375/4	2018.01.17CURVELLA 004.d
Level 4	IC 320-204375/5	2018.01.17CURVELLA 005.d
Level 5	IC 320-204375/6	2018.01.17CURVELLA 006.d
Level 6	IC 320-204375/7	2018.01.17CURVELLA 007.d
Level 7	IC 320-204375/8	2018.01.17CURVELLA 008.d

ANALYTE	IS CURV			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF TYP	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)	Avel	71970 13027499	134919 24898296	645094	2581287	6694565	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)	Avel	D 56184 9469006	102787 17890417	488305	1934955	4900043	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)	Avel	D 67976 12635108	122306 22970596	656362	2532634	6433939	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS	Avel	13839 2364722	22803 4712009	116305	459884	1228862	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)	Avel	55664 9016831	92376 16747455	466560	1861593	4586272	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanoic acid (PFHpA)	Avel	50371 9111535	99406 16533181	517603	1803022	4706368	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)	Avel	0 68319 9935695	117059 18787887	523793	1981094	5134885	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2FTS	Avel	14322 2504300	23999 4633505	119814	488565	1258940	0.0237 4.74	0.0474	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)	Avel	0 61549 8993265	105297 17167030	484462	1890626	4896648	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)	Avel	0 44381 8721809	84987 15956747	431169	1717801	4563453	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)	Avel	37531 7021740	69666 12938458	352431	1428679	3585870	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)	Avel	39589 6686934	70183 12870491	344328	1355316	3505745	0.0232 4.64	0.0464	0.232	0.928	2.32
Perfluorooctane Sulfonamide (FOSA)	Avel	0 49852 8973330	93805 16389523	464966	1866404	4822749	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
8:2FTS	Avel	9860 1941077	20684 3762460	99090	377296	981168	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)	AveI	31882 5653894	55975 10721843	292799	1122840	2809263	0.0250	0.0500	0.250	1.00	2.50

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

ANALYTE	IS	CURVE			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	18275 3100803	31785 6179313	150110	630879	1546077	0.0250 5.00	0.0500	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	22837 4067427	39594 8022809	216397	857674	2182261	0.0241	0.0482	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	30104 4341065	47415 8080078	227630	855685	2244135	0.0250 5.00	0.0500	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16362 2837873	30312 5261873	142743	554613	1447969	0.0250 5.00	0.0500	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	25166 4798721	54026 9080911	256381	975905	2517800	0.0250 5.00	0.0500	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	36726 5174158	57967 9922216	263708	1119808	2742788	0.0250	0.0500	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	9714 1437735	16612 2672440	75670	295170	754490	0.0250	0.0500	0.250	1.00	2.50
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	+++++ 10121041	164489 17956480	561148	2195395	5582637	++++ 5.00	0.0500	0.250	1.00	2.50
Perfluoro-n-octadecanoic acid (PFODA)		AveID	63769 11861271	119958 20806019	579412	2429777	6281608	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	7581930 6889924	7186789 6689622	6999196	7075449	7104763	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	4448756 4122126	4347864 3854737	4140508	4261723	4159040	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	92724 83073	85395 81139	85313	85658	90418	2.33	2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4761111 4349882	4611605 4166297	4611448	4467394	4634604	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4672251 4126515	4481837 3856924	4249130	4367056	4357423	2.50 2.50	2.50 2.50	2.50	2.50	2.50
1802 PFHxS	13PF OA	Ave	5502563 4694368	5188305 4592963	5102469	5091273	4900649	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	786962 704248	783363 688126	769728	786039	768843	2.38 2.38	2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	4596206 4052198	4324416 3781095	4253926	4182465	4316678	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3430582 3110246	3278250 2906103	3268191	3235344	3190243	2.39	2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3728829 3273972	3562167 3133770	3494654	3397294	3329183	2.50 2.50	2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	5121669 4414446	4978224 4220474	4753896	4845519	4670673	2.50	2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	886480 757639	827776 762870	811941	787775	800715	2.40	2.40	2.40	2.40	2.40

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8 N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N

ANALYTE	IS	CURVE			RESPONSE			CONCENTRATION (NG/ML)					
	REF	TYPE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	
			LVL 6	LVL 7				LVL 6	LVL 7				
13C2 PFDA	13PF	Ave	3201735	3024128	2939305	3005224	2975947	2.50	2.50	2.50	2.50	2.50	
	OA		2810507	2706406				2.50	2.50				
d3-NMeFOSAA	13PF	Ave	1577189	1505517	1483575	1499251	1437020	2.50	2.50	2.50	2.50	2.50	
	OA		1419745	1384778				2.50	2.50				
d5-NEtFOSAA	13PF	Ave	1719534	1560100	1512999	1503508	1432688	2.50	2.50	2.50	2.50	2.50	
	OA		1408625	1301953				2.50	2.50				
13C2 PFUnA	13PF	Ave	2475898	2331330	2263551	2250985	2212774	2.50	2.50	2.50	2.50	2.50	
	OA		2170924	1975688				2.50	2.50				
13C2 PFDoA	13PF	Ave	2717793	2591482	2463501	2345552	2374065	2.50	2.50	2.50	2.50	2.50	
	OA		2348326	2179814				2.50	2.50				
13C2-PFTeDA	13PF	Ave	3638245	3565275	3214801	3148987	3024149	2.50	2.50	2.50	2.50	2.50	
	OA		2973878	2702115				2.50	2.50				
13C2-PFHxDA	13PF	Ave	6348846	6235993	5624728	5786263	5622608	2.50	2.50	2.50	2.50	2.50	
	OA		5288590	4770244				2.50	2.50				

Curve Type Legend:

Ave = Average ISTD

AveID = Average isotope dilution

L2ID = Linear 1/conc^2 IsoDil

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-204375/2	2018.01.17CURVELLA 002.d
Level 2	IC 320-204375/3	2018.01.17CURVELLA 003.d
Level 3	IC 320-204375/4	2018.01.17CURVELLA 004.d
Level 4	IC 320-204375/5	2018.01.17CURVELLA 005.d
Level 5	IC 320-204375/6	2018.01.17CURVELLA 006.d
Level 6	IC 320-204375/7	2018.01.17CURVELLA 007.d
Level 7	IC 320-204375/8	2018.01.17CURVELLA 008.d

ANALYTE			PERCEN'	r error			PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	-0.4	0.5	-1.3	-2.4	0.9	1.2	25	25	25	25	25	25
Perfluoropentanoic acid (PFPeA)	-1.5	0.3	0.1	-3.6	0.0	-2.5	25	25	25	25	25	25
Perfluorobutanesulfonic acid (PFBS)	-3.6	-2.4	4.8	0.7	-3.0	3.6	25	25	25	25	25	25
4:2 FTS	4.0	-4.3	-2.3	-3.8	-2.6	2.0	25	25	25	25	25	25
Perfluorohexanoic acid (PFHxA)	-3.0	-3.4	-2.4	0.5	-4.5	0.0	25	25	25	25	25	25
Perfluoroheptanoic acid (PFHpA)	-2.5	0.9	10.8	-6.1	-1.7	0.5	25	25	25	25	25	25
Perfluorohexanesulfonic acid (PFHxS)	-4.5	5.3	-4.2	-9.2	-2.2	-1.2	25	25	25	25	25	25
6:2FTS	1.9	-7.3	-5.8	-5.9	-0.9	7.7	25	25	25	25	25	25
Perfluorooctanoic acid (PFOA)	-3.2	3.9	-2.8	-3.6	-3.2	-5.3	25	25	25	25	25	25
Perfluoroheptanesulfonic Acid (PFHpS)	1.8	-3.9	-2.2	-1.6	6.1	3.9	25	25	25	25	25	25
Perfluorononanoic acid (PFNA)	0.0	-5.3	-2.3	1.8	4.3	3.9	25	25	25	25	25	25
Perfluorooctanesulfonic acid (PFOS)	1.9	-1.5	-3.0	-3.6	1.1	-1.1	25	25	25	25	25	25
Perfluorooctane Sulfonamide (FOSA)	-1.2	-4.1	-0.4	-2.0	5.1	3.5	25	25	25	25	25	25
8:2FTS	1.3	2.7	0.3	-1.6	0.7	5.3	25	25	25	25	25	25
Perfluorodecanoic acid (PFDA)	2.1	-4.6	2.7	-3.7	-2.7	3.7	25	25	25	25	25	25

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento

SDG No.:

Instrument ID: A8_N

GC Column: GeminiC18 3 ID: 3 (mm)

Calibration Start Date: 01/17/2018 14:19

Calibration End Date: 01/17/2018 15:06

Analy Batch No.: 204375

Heated Purge: (Y/N) N

Calibration ID: 37572

ANALYTE			PERCENT	ERROR			PERCENT ERROR LIMIT						
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.3	-2.3	-6.3	-2.6	-0.4	1.1	25	25	25	25	25	25	
Perfluorodecanesulfonic acid (PFDS)	4.5	-8.6	0.3	0.4	3.6	-1.0	25	25	25	25	25	25	
Perfluoroundecanoic acid (PFUnA)	-0.9	-1.5	-2.6	-7.9	-1.7	-3.1	25	25	25	25	25	25	
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.8	-0.2	-3.1	-5.3	3.8	3.4	25	25	25	25	25	25	
Perfluorododecanoic acid (PFDoA)	1.6	1.7	1.6	1.5	3.5	-0.3	25	25	25	25	25	25	
Perfluorotridecanoic Acid (PFTriA)	-2.0	-3.7	-7.8	2.8	-0.5	-5.1	25	25	25	25	25	25	
Perfluorotetradecanoic acid (PFTeA)	1.3	-4.5	-3.5	-4.0	2.2	-0.9	25	25	25	25	25	25	
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++		-2.4	-1.8	4.0	0.6	25		25	25	25	25	
Perfluoro-n-octadecanoic acid (PFODA)	3.5	-8.7	-2.2	-0.4	6.0	6.4	25	25	25	25	25	25	

Report Date: 18-Jan-2018 08:22:18 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_002.d

Lims ID: IC L1 Full

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 17-Jan-2018 14:19:28 ALS Bottle#: 10 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 08:22:18 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:50:04

First Level Revie	wei. Hai	iriiyana			Date.	l	7-Jan-2016 10.50.0	4		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	١									
217.00 > 172.00		1.411	0.0	0.539	7581930	2.52		101	20935	
2 Perfluorobuty 212.90 > 169.00	•		-0.002	1.000	71970	0.0254		102	8.9	
D 3 13C5-PFPe		1.413	0.002	1.000	71770	0.0254		102	0.7	
267.90 > 223.00		1.659	-0.001	0.633	4448756	2.50		100.0	60885	
4 Perfluoroper										
262.90 > 219.00		1.662	0.005	1.005	56184	0.0268		107	48.5	
D 47 13C3-PFB9 301.90 > 83.00		1.695	-0.001	0.647	92724	2.35		101	3469	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00	1.703	1.697	0.006	1.005	67976	0.0221		99.9	723	
298.90 > 99.00	1.694	1.697	-0.003	1.000	27737		2.45(1.25-3.74)	99.9	281	
61 Sodium 1H,	1H,2H,2	H-perflu	orohexar	ne						
327.00 > 307.00	1.908	1.903	0.005	1.000	13839	0.0250		107	847	
D 60 M2-4:2FTS	5									
329.00 > 81.00	1.908	1.903	0.005	0.729	573139	NC			6642	
D 7 13C2 PFHx										
315.00 > 270.00		1.939	0.0	0.740	4761111	2.48		99.3	38466	
6 Perfluorohex										M
313.00 > 269.00		1.939	0.0	1.000	55664	0.0282	10.44/5.00.45.40\	113	82.9	M
313.00 > 119.00		1.939	0.010	1.005	5323		10.46(5.03-15.10)	113	58.2	
D 9 13C4-PFHp										
367.00 > 322.00		2.267	0.006	0.868	4672251	2.56		102	27332	
10 Perfluorohe	•									
363.00 > 319.00		2.268	0.005	1.000	50371	0.0245	2 22/1 12 2 42\	98.1	90.2	
363.00 > 169.00	2.213	2.268	0.005	1.000	21592		2.33(1.13-3.40)	98.1	179	

 Report Date: 18-Jan-2018 08:22:18
 Chrom Revision: 2.2 08-Dec-2017 11:41:26

 Data File:
 \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_002.d

Data File:	\\Chr	omNa\S	acramen	to\Chrom	Data\A8_N\201	80117-5301	9.b\2018.01.17CUF	RVELLA_	<u>.</u> 002.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohex	anaculfo	onic ocio	1					-		
399.00 > 80.00		2.280	0.006	1.000	68319	0.0264		116	357	
	2.286	2.280	0.006	1.000	22422	0.0204	3.05(1.50-4.49)	116	177	
D 11 1802 PFH		2.200	0.000	1.000	22722		3.03(1.00 4.47)	110	177	
403.00 > 84.00		2.282	0.004	0.873	5502563	2.45		103	34563	
					5502505	2.40		103	34303	
13 Sodium 1H,		•			14222	0.00/1		110	220	
427.00 > 407.00		2.596	-0.004	0.998	14322	0.0261		110	230	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.597	0.001	0.992	786962	2.33		98.2	19002	
D 14 13C4 PFO										
417.00 > 372.00	2.618	2.622	-0.004	1.000	4596206	2.57		103	25049	
* 62 13C2-PFOA	١									
415.00 > 370.00	2.618	2.622	-0.004		4968823	2.50			36344	
15 Perfluorooct	anoic ad	cid								
413.00 > 369.00	2.625	2.623	0.002	1.003	61549	0.0286		114	46.8	
413.00 > 169.00	2.625	2.623	0.002	1.003	31497		1.95(0.84-2.52)	114	341	
16 Perfluorohe	otanesul	lfonic ac	id							
449.00 > 80.00		2.629	-0.004	1.000	44381	0.0228		95.9	1137	
449.00 > 99.00		2.629	0.004	1.003	10990		4.04(1.94-5.82)	95.9	376	
D 19 13C5 PFNA	Δ						,			
468.00 > 423.00		2.992	0.0	1.143	3728829	2.57		103	24545	
17 Perfluorooct					0,2002,	2.07		.00	21010	
499.00 > 80.00		2.992		1.000	39589	0.0246		106	15.5	
499.00 > 99.00		2.992		1.000	8998	0.0240	4.40(2.31-6.93)	106	23.3	
D 18 13C4 PFO		2.772	0.0	1.000	0770		4.40(2.51-0.75)	100	25.5	
503.00 > 80.00		2.992	0.0	1.143	3430582	2.41		101	27205	
			0.0	1.143	3430362	2.41		101	27203	
20 Perfluoronor			0.0	4 000	07504	0.0044		07.5	407	
463.00 > 419.00		2.992		1.000	37531	0.0244	4 00(1 00 F (0)	97.5 07.5	137	
463.00 > 169.00		2.992	0.0	1.000	7669		4.89(1.90-5.69)	97.5	183	
22 Perfluorooct										
498.00 > 78.00	3.338	3.338	0.0	1.000	49852	0.0248		99.1	1336	
D 21 13C8 FOS	4									
506.00 > 78.00	3.338	3.338	0.0	1.275	5121669	2.56		102	26667	
D 26 M2-8:2FTS										
529.00 > 81.00	3.338	3.342	-0.004	1.275	886480	2.48		104	21540	
25 Sodium 1H,	1H.2H.2	H-perflu	orodecar	ne						
527.00 > 507.00		•	-0.004	1.000	9860	0.0219		91.4	410	
D 23 13C2 PFDA										
515.00 > 470.00		3.352	0.002	1.281	3201735	2.55		102	24663	
			0.002	1.201	0201700	2.00		102	2 1000	D
24 Perfluorodeo			0.001	1 000	21002	0.0257		102	147	R
513.00 > 469.00 513.00 > 169.00		3.353 3.353	0.001 -0.007	1.000 0.998	31882 4224	0.0257	7.55(2.36-7.09)	103 103	167 193	R
		5.505	-0.007	0.770	4224		1.00(2.00-1.09)	103	173	
D 27 d3-NMeFO		0.505	0.001	1 000	4577400	0.50		401	00//	
573.00 > 419.00		3.507		1.339	1577189	2.52		101	9864	
28 N-methyl pe										
570.00 > 419.00	3.513	3.513	0.0	1.002	18275	0.0268		107	176	

Report Date: 18-Jan-2018 08:22:18 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File:

Data File.	WOITE	JIIIVa\3	acramen		Data (A0_11/201	00117-0001	7.D(2016.01.17COF	VVLLLA_	.002.u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodeo	rano Sul	lfonic ac	id							
599.00 > 80.00	3.670	3.666	0.004	1.000	22837	0.0243		101	815	
599.00 > 99.00		3.666	-0.004	0.998	7975	0.02.0	2.86(1.39-4.16)	101	416	
D 32 d5-NEtFOS	SAA						,			
589.00 > 419.00		3.672	-0.002	1.402	1719534	2.72		109	5328	
31 Perfluoround	decanoio	c acid								
563.00 > 519.00		3.678	-0.001	1.000	30104	0.0294		118	150	
563.00 > 169.00	3.686	3.678	0.008	1.002	5221		5.77(0.00-0.00)	118	226	
D 30 13C2 PFUr	nΑ									
565.00 > 520.00	3.677	3.679	-0.002	1.404	2475898	2.60		104	26904	
33 N-ethyl perfl	uoroocta	ane sulfo	onamid							
584.00 > 419.00	3.677	3.679	-0.002	1.002	16362	0.0244		97.7	493	
37 Perfluorodoo	decanoio	c acid								
613.00 > 569.00		3.979	-0.001	1.000	25166	0.0226		90.4	107	
613.00 > 169.00	3.978	3.979	-0.001	1.000	7159		3.52(2.13-6.40)	90.4	279	
D 36 13C2 PFD										
615.00 > 570.00	3.978	3.979	-0.001	1.519	2717793	2.63		105	28326	
41 Perfluorotrid										
663.00 > 619.00			-0.002	1.000	36726	0.0291		116	132	
663.00 > 169.00		4.242	-0.002	1.000	10674		3.44(1.25-3.76)	116	402	
42 Perfluorotetr										
713.00 > 169.00		4.483	-0.006	1.000	9714	0.0274	1.0//0.71.0.10)	109	295	
713.00 > 219.00		4.483	-0.017	0.997	5226		1.86(0.71-2.13)	109	161	
D 43 13C2-PFT6		4 400	0.007	1 710	2/20245	2.70		100	21272	
715.00 > 670.00		4.483	-0.006	1.710	3638245	2.70		108	21362	
D 44 13C2-PFH)		4 000	0.004	4 074	(0.400.4)	0 / 1		40/	45507	
815.00 > 770.00			-0.004	1.871	6348846	2.64		106	15507	
45 Perfluorohex			0.004	1 000	440070	0.0004		400	04.0	
813.00 > 769.00 813.00 > 169.00		4.902 4.902	-0.004 -0.004	1.000 1.000	118972 19372	0.0301	6.14(2.86-8.58)	120 120	86.3 275	
			-0.004	1.000	173/2		U.14(Z.00-8.38)	120	2/5	
46 Perfluorooct		5.255	0.004	1.000	63769	0.0220		OF 2	20.1	
913.00 > 869.00 913.00 > 169.00			-0.006 -0.006	1.000	63769 7822	0.0238	8.15(0.00-0.00)	95.3 95.3	20. i 41.5	
/13.00 / 107.00	J. 47	5.233	-0.000	1.000	1022		0.13(0.00-0.00)	73.3	41.5	

QC Flag Legend Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

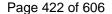
Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00003 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 08-Dec-2017 11:41:26 Report Date: 18-Jan-2018 08:22:18 TestAmerica Sacramento Data File: 17-Jan-2018 14:19:28 **Injection Date:** Instrument ID: A8_N Lims ID: IC L1 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: A8_N Limit Group: LC PFC_DOD ICAL D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x (000001X) X 21 (X100000) 018 0015 X 12 0.9 0.9 1.5 0.9 1.5 1.8 0.3 2.7 0.3 2.1 1.2 2.1 D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 18-24 (0001X) > 0 () () () () () ×₁₆ 12 2.4 1.4 1.7 2.0 0.9 1.2 1.5 1.8 2.1 1.4 1.7 1.1 2.0 2.3 1.1 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA _____Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 80**1** Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x | Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x (000012 X) 70 36 860 ×50 >₄₀ 18 30 12 20 10 01 1.5 1.8 2.1 1.7 2.0 2.3 1.4 1.7 2.0 1.4 2.3 1.1 6 Perfluorohexanoic acid (M) 6 Perfluorohexanoic acid D 9 13C4-PFHpA Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_ Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x 18 0014 000012 X10 0015 ×12 0012 X X 0 0 1.6 1.9 2.2 2.5 1.3 2.5 1.7 2.0 2.3 2.6 2.9 1.3 1.4



2.7

3.0

2.1

2.4

2.7

3.0

2.4

24- 12-

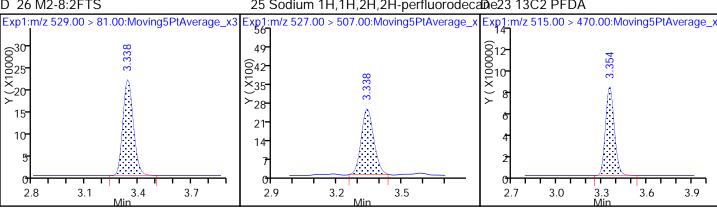
2.1

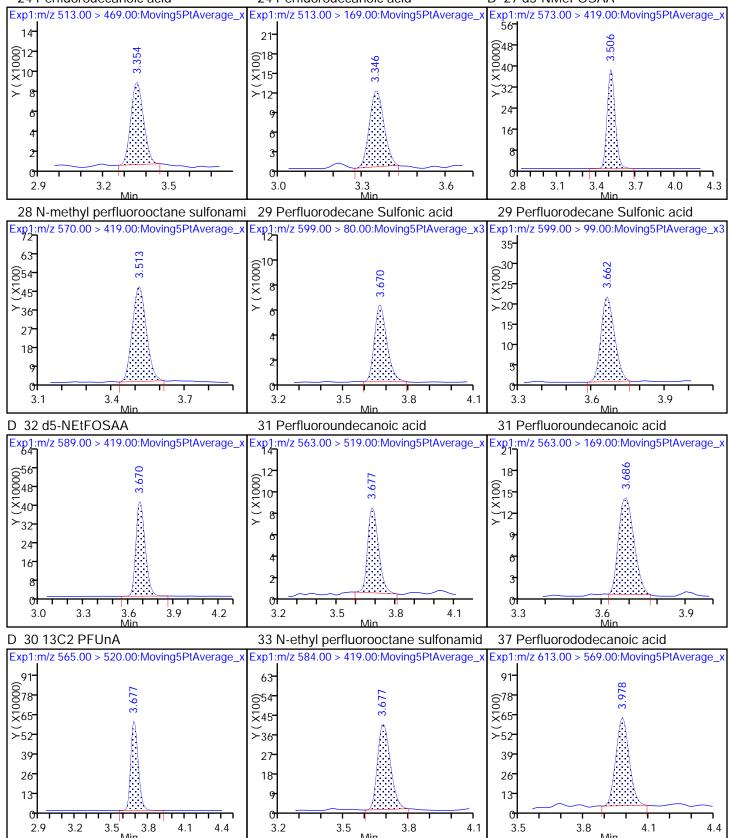
01 2.1

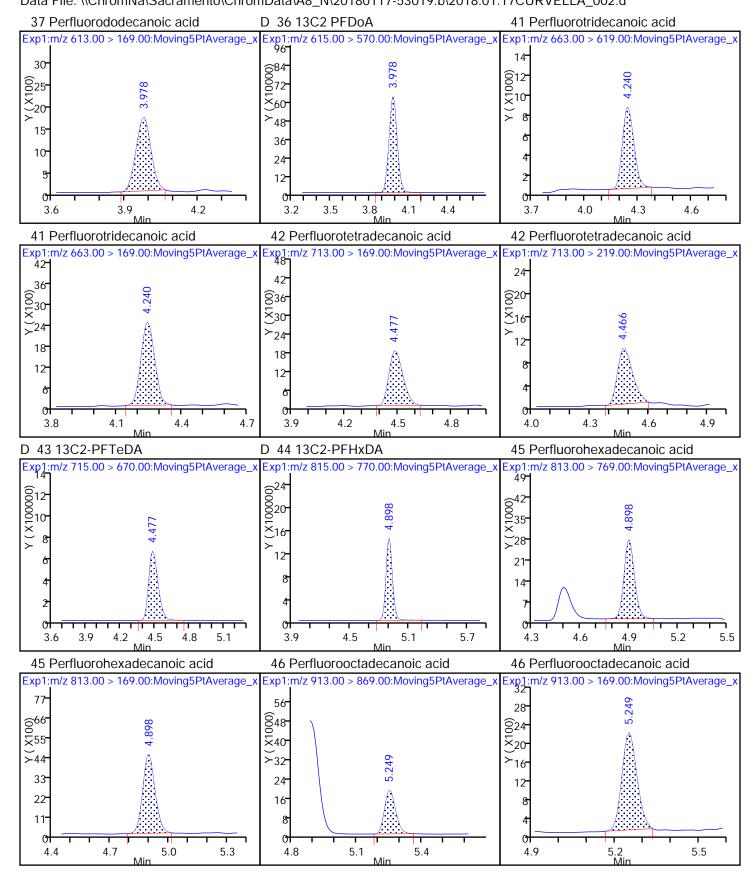
2.4

2.7

3.0







 Report Date: 18-Jan-2018 08:22:19 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\\Sacramento\\ChromData\\A8_N\\20180117-53019.b\\2018.01.17CURVELLA_002.d

Injection Date: 17-Jan-2018 14:19:28 Instrument ID: $A8_N$

Lims ID: IC L1 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

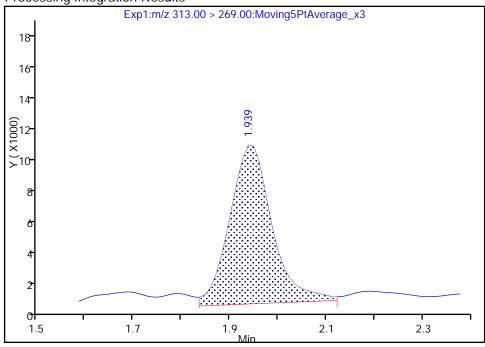
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

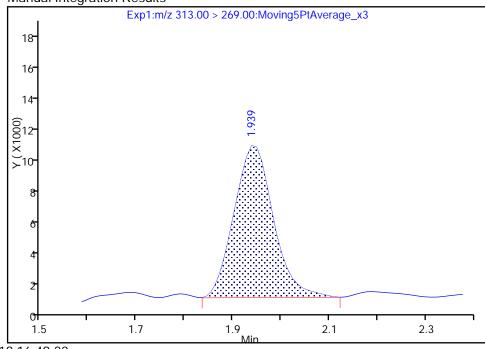
RT: 1.94 Area: 62355 Amount: 0.030336 Amount Units: ng/ml

Processing Integration Results



RT: 1.94 Area: 55664 Amount: 0.028201 Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 17-Jan-2018 16:49:22

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 427 of 606

Report Date: 18-Jan-2018 08:22:21 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_003.d

Lims ID: IC L2 Full

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 17-Jan-2018 14:27:16 ALS Bottle#: 11 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 08:22:21 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:50:56

FIRST Level Revie	wer: nar	ınıgana			Date:	l	7-Jan-2018 16:50:5	6					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags			
D 113C4 PFBA 217.00 > 172.00		1.411	0.001	0.538	7186789	2.47		98.8	22574				
2 Perfluorobut		1.411	0.001	0.336	/100/09	2.47		90.0	22374				
212.90 > 169.00	,	1.413	-0.001	1.000	134919	0.0502		100	15.1				
D 3 13C5-PFPe		4 (50	0.0	0.400	40.4707.4	0.50		404	04047				
267.90 > 223.00 4 Perfluoroper		1.659	0.0	0.632	4347864	2.52		101	81847	М			
262.90 > 219.00		1.662	-0.003	1.000	102787	0.0502		100	93.8	M			
D 47 13C3-PFB		4 (05	0.004	0 (45	05005			04.0	0400				
301.90 > 83.00 5 Perfluorobut	1.694	1.695	-0.001	0.645	85395	2.24		96.3	3100				
298.90 > 80.00	1.694	1.697	-0.003	1.000	122306	0.0431		97.6	1035				
	1.703	1.697	0.006	1.005	53280		2.30(1.25-3.74)	97.6	599				
D 60 M2-4:2FTS 329.00 > 81.00	1.908	1.903	0.005	0.727	547524	NC			4977				
61 Sodium 1H,													
327.00 > 307.00		1.903	0.005	1.000	22803	0.0447		95.7	1430				
6 Perfluorohex 313.00 > 269.00		id 1.939	0.0	1.000	92376	0.0483		96.6	146	M M			
313.00 > 119.00		1.939	0.0	1.000	10049		9.19(5.03-15.10)	96.6	181				
D 7 13C2 PFHx		1 020	0.0	0.720	4/11/OF	2.40		00.4	227/0				
315.00 > 270.00 D 9 13C4-PFHp		1.939	0.0	0.738	4611605	2.48		99.4	33760				
367.00 > 322.00		2.267	0.006	0.866	4481837	2.54		101	24988				
10 Perfluorohe			0.005	1 000	00407	0.0505		101	170				
363.00 > 319.00 363.00 > 169.00		2.268 2.268	0.005 0.005	1.000 1.000	99406 36419	0.0505	2.73(1.13-3.40)	101 101	170 307				
							•						

Report Date: 18-Jan-2018 08:22:21 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_003.d

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	iData\A8_N\201	80117-5301	9.b\2018.01.17CUF	RVELLA_	.003.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
9 Dorfluoroboy	anoculfo	onic acid	ı							
8 Perfluorohex				1 000	117050	0.0479		10E	470	
399.00 > 80.00		2.280	0.006	1.000	117059	0.0479	2 20(1 E0 4 40)	105	672	
399.00 > 99.00		2.280	0.006	1.000	35478		3.30(1.50-4.49)	105	292	
D 11 1802 PFH										
403.00 > 84.00	2.286	2.282	0.004	0.871	5188305	2.38		101	30938	
13 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
427.00 > 407.00	2.598	2.596	0.002	1.000	23999	0.0440		92.7	384	
D 12 M2-6:2FTS	<u>.</u>									
429.00 > 81.00		2.597	0.001	0.990	783363	2.40		101	18764	
* 62 13C2-PFO										
415.00 > 370.00		2.622	0.004		4809954	2.50			29656	
		2.022	0.004		4009934	2.50			29000	
D 14 13C4 PFO										
417.00 > 372.00	2.626	2.622	0.004	1.000	4324416	2.50		99.9	24697	
15 Perfluorooct	anoic ac	cid								
413.00 > 369.00	2.626	2.623	0.003	1.000	105297	0.0519		104	82.6	
413.00 > 169.00	2.626	2.623	0.003	1.000	54228		1.94(0.84-2.52)	104	522	
16 Perfluorohe	otanesul	lfonic ac	id							
449.00 > 80.00	•	2.629	0.004	1.000	84987	0.0457		96.1	2230	
449.00 > 99.00		2.629	0.004	1.000	23208		3.66(1.94-5.82)	96.1	907	
D 18 13C4 PFO							(
		2 002	-0.003	1 120	2270250	2.20		00.4	25618	
503.00 > 80.00			-0.003	1.138	3278250	2.38		99.6	25018	
20 Perfluorono										
463.00 > 419.00			-0.003	1.000	69666	0.0474		94.7	317	
463.00 > 169.00	2.989	2.992	-0.003	1.000	15857		4.39(1.90-5.69)	94.7	303	
D 19 13C5 PFN	Д									
468.00 > 423.00	2.989	2.992	-0.003	1.138	3562167	2.54		101	25415	
17 Perfluorooct	ane sulf	onic aci	d							
499.00 > 80.00			-0.003	1.000	70183	0.0457		98.5	28.7	
499.00 > 99.00			-0.003	1.000	20217	0.0107	3.47(2.31-6.93)	98.5	47.2	
		2.772	-0.003	1.000	20217		3.47 (2.31-0.73)	70.5	77.2	
D 21 13C8 FOS		0.000	0.000	4 070	4070004	0.57		400	04000	
506.00 > 78.00	3.335	3.338	-0.003	1.270	4978224	2.57		103	21232	
22 Perfluorooct	tane Sulf	fonamid	е							
498.00 > 78.00	3.335	3.338	-0.003	1.000	93805	0.0480		95.9	2916	
25 Sodium 1H,	1H,2H,2	H-perflu	orodecar	ne						
527.00 > 507.00		3.342		1.000	20684	0.0492		103	857	
D 26 M2-8:2FTS										
		2 2 4 2	0.001	1 272	027774	2.40		100	22220	
529.00 > 81.00		3.342	0.001	1.273	827776	2.40		100	22220	
D 23 13C2 PFD										
515.00 > 470.00	3.350	3.352	-0.002	1.276	3024128	2.49		99.7	26939	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.350	3.353	-0.003	1.000	55975	0.0477		95.4	299	
513.00 > 169.00			-0.003	1.000	10839		5.16(2.36-7.09)	95.4	473	
D 27 d3-NMeFO							,			
573.00 > 419.00		3.507	0.003	1.337	1505517	2.49		99.5	9842	
				1.337	1303317	2.47		77.0	7042	
28 N-methyl pe										
570.00 > 419.00	3.510	3.513	-0.003	1.000	31785	0.0489		97.7	294	

Report Date: 18-Jan-2018 08:22:21 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File:

<u>Bata Filor</u>	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		<u> </u>		Data 7 10_11 120 1	00117 0001	7.012010.01.17001	· · · · -	,000.u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Dorflyonodo	0000 C	lfonio oo	: d							
29 Perfluorode 599.00 > 80.00		3.666		1.000	39594	0.0441		91.4	1203	
599.00 > 99.00			-0.007	0.998	14282	0.0441	2.77(1.39-4.16)	91.4	1203	
D 32 d5-NEtFOS							(2 2 2 2 2)			
589.00 > 419.00		3.672	0.001	1.399	1560100	2.55		102	4767	
31 Perfluoroun	decanoio	c acid								
563.00 > 519.00		3.678	0.004	1.000	47415	0.0493		98.5	219	
563.00 > 169.00	3.682	3.678	0.004	1.000	11810		4.01(0.00-0.00)	98.5	439	
33 N-ethyl perf	luoroocta	ane sulfo	onamid							
584.00 > 419.00	3.682	3.679	0.003	1.002	30312	0.0499		99.8	886	
D 30 13C2 PFU	nA									
565.00 > 520.00	3.682	3.679	0.003	1.402	2331330	2.53		101	22196	
D 36 13C2 PFD										
615.00 > 570.00	3.983	3.979	0.004	1.517	2591482	2.59		104	18542	
37 Perfluorodo										
613.00 > 569.00		3.979	0.004	1.000	54026	0.0509		102	233	
613.00 > 169.00		3.979	0.004	1.000	12483		4.33(2.13-6.40)	102	556	
41 Perfluorotrio										
663.00 > 619.00		4.242	0.002	1.000	57967	0.0482	2 47/4 25 2 7/1	96.3	190	
663.00 > 169.00		4.242	0.002	1.000	16714		3.47(1.25-3.76)	96.3	633	
D 43 13C2-PFT6		4 402	0.004	1 700	25/5275	2.72		100	1/255	
715.00 > 670.00		4.483	0.004	1.709	3565275	2.73		109	16355	
42 Perfluoroteti			0.004	1.000	1//10	0.0477		05.5	111	
713.00 > 169.00 713.00 > 219.00		4.483 4.483	0.004	0.997	16612 11965	0.0477	1.39(0.71-2.13)	95.5 95.5	414 311	
			-0.010	0.777	11703		1.57(0.71-2.13)	73.3	311	
45 Perfluorohe: 813.00 > 769.00		4.902	0.003	1.000	164489	0.0502		100	103	
813.00 > 169.00		4.902	0.003	1.000	28141	0.0302	5.85(2.86-8.58)	100	527	
D 44 13C2-PFH		1.702	0.000	1.000	20111		0.00(2.00 0.00)	100	027	
815.00 > 770.00		4.902	0.003	1.868	6235993	2.68		107	13127	
46 Perfluorooct			3.000	1.000	0200770	2.00			.0.27	
913.00 > 869.00		5.255	-0.001	1.000	119958	0.0456		91.3	35.9	
913.00 > 169.00		5.255	-0.001	1.000	14488	2.3 100	8.28(0.00-0.00)	91.3	91.9	
							,			

QC Flag Legend Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:21 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 17-Jan-2018 14:27:16 Instrument ID: A8_N Lims ID: IC L2 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 35 (000001X). (0000015 X) > 9 630 8 25 ×25) ≻20 15- 10 8.0 1.2 1.5 0.9 1.4 2.0 0.9 1.8 0.0 1.8 2.7 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid (M) Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 24 30-0 0 25-×16-20 15 10 1.9 2.2 2.2 1.3 1.0 1.3 1.9 1.4 1.7 1.0 1.6 1.1 2.0 2.3 61 Sodium 1H,1H,2H,2H-perfluorohexan& Perfluorohexanoic acid (M) 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x | Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 63 24 (00012 ×) × 654- 845- <u>≻</u>16• _ ≻36- 27 18 1.4 1.7 2.0 2.3 1.3 1.9 2.2 2.5 1.7 2.0 1.6 1.4 2.3 1.1 6 Perfluorohexanoic acid D 7 13C2 PFHxA D 9 13C4-PFHpA Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> 24 (X100000) (X100000) (X100000) 00012 1000010 X ©20 ×16 0 1.4 1.7 2.0 2.3 2.6 2.6 1.7 2.0 2.3 2.6 2.9 3.2 1.1 1.1 1.4

3.0

2.1

2.4

2.7

3.0

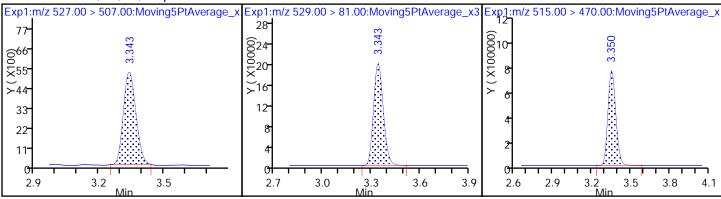
2.4

2.1

2.4

2.7

3.0



3.9

4.2

26-

3.2

3.5

3.8

4.1

4.4

26

13

3.0

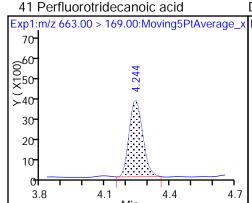
3.3

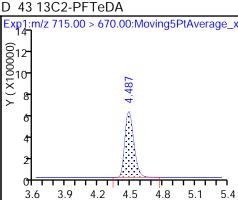
0

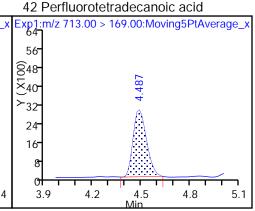
3.2

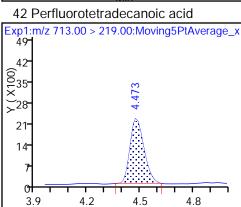
3.5

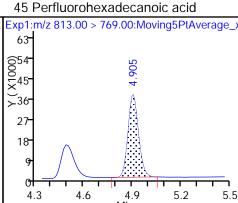
3.8

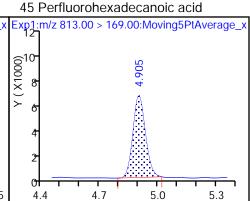








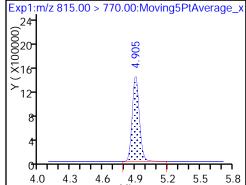


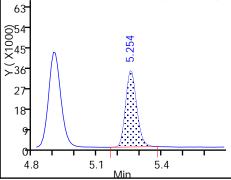


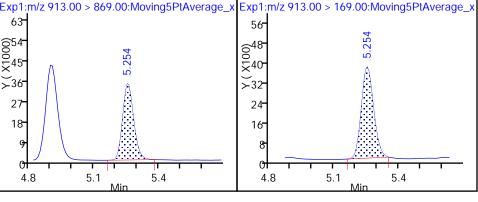
D 44 13C2-PFHxDA

46 Perfluorooctadecanoic acid

46 Perfluorooctadecanoic acid







 Report Date: 18-Jan-2018 08:22:21 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_003.d

Injection Date: 17-Jan-2018 14:27:16 Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

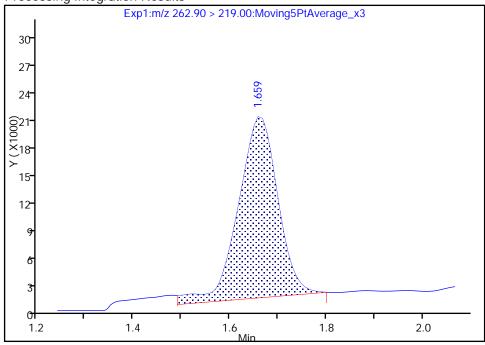
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

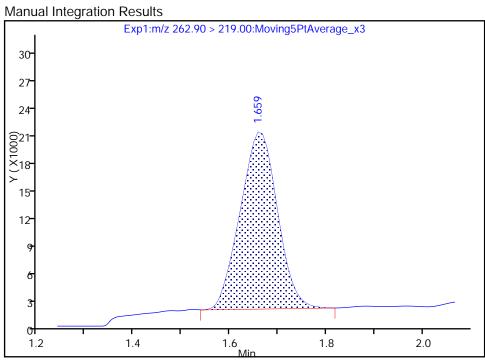
Signal: 1

RT: 1.66
Area: 112194
Amount: 0.054052
Amount Units: ng/ml

Processing Integration Results



RT: 1.66
Area: 102787
Amount: 0.050169
Amount Units: ng/ml



Reviewer: hannigana, 17-Jan-2018 16:50:27

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 437 of 606

Report Date: 18-Jan-2018 08:22:21 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_003.d

Injection Date: 17-Jan-2018 14:27:16 Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

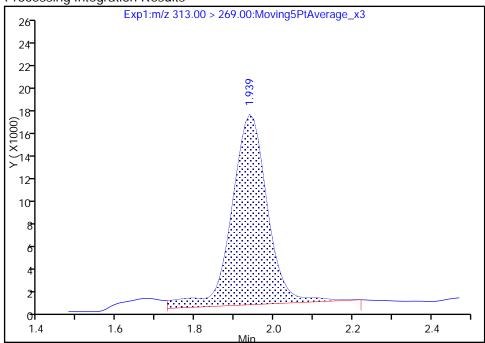
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

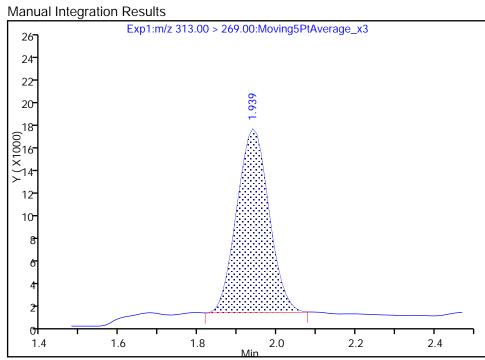
Signal: 1

RT: 1.94
Area: 107080
Amount: 0.054803
Amount Units: ng/ml

Processing Integration Results



RT: 1.94
Area: 92376
Amount: 0.048317
Amount Units: ng/ml



Reviewer: hannigana, 17-Jan-2018 16:50:39

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 438 of 606

Report Date: 18-Jan-2018 08:22:24 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_004.d

Lims ID: IC L3 Full

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 17-Jan-2018 14:35:05 ALS Bottle#: 12 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 08:22:24 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:51:20

riist Level Reviewel. Halliligana					Date.		17-Jan-2016 10.51.2	<u> </u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	1									
217.00 > 172.00	1.413	1.411	0.002	0.539	6999196	2.47		98.9	21409	
2 Perfluorobuty	•	1 410	0.0	1 000	/ 45004	0.24//		00.7	/ 0.7	
212.90 > 169.00 D 3 13C5-PFPe		1.413	0.0	1.000	645094	0.2466		98.7	69.7	
267.90 > 223.00		1.659	0.002	0.633	4140508	2.47		98.8	30360	
4 Perfluoropen	itanoic a	cid								
262.90 > 219.00	1.661	1.662	-0.001	1.000	488305	0.2503		100	434	
D 47 13C3-PFBS		4 (05		0 (17	05040	0.00			0557	
	1.697	1.695	0.002	0.647	85313	2.30		98.9	2557	
5 Perfluorobuta 298.90 > 80.00	anesuiro 1.697	nic acid 1.697	0.0	1.000	656362	0.2317		105	5197	
	1.697	1.697	0.0	1.000	266712	0.2017	2.46(1.25-3.74)	105	2686	
61 Sodium 1H,		•								
327.00 > 307.00		1.903	-0.001	1.000	116305	0.2281		97.7	6855	
D 60 M2-4:2FTS 329.00 > 81.00		1.903	-0.001	0.725	530337	NC			5867	
D 7 13C2 PFHx		1.703	-0.001	0.725	330337	NO			3007	
315.00 > 270.00		1.939	0.004	0.741	4611448	2.55		102	40346	
6 Perfluorohex										
313.00 > 269.00		1.939	0.004	1.000	466560	0.2440	11 01/5 02 15 10)	97.6	991	
313.00 > 119.00		1.939	0.004	1.000	42394		11.01(5.03-15.10)	97.6	597	
D 9 13C4-PFHp 367.00 > 322.00		2.267	-0.003	0.863	4249130	2.47		98.8	31194	
10 Perfluoroher	otanoic a	acid								
363.00 > 319.00		2.268	-0.004	1.000	517603	0.2771		111	847	
363.00 > 169.00	2.264	2.268	-0.004	1.000	193390		2.68(1.13-3.40)	111	1653	

Report Date: 18-Jan-2018 08:22:24 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_004.d

Data File:	\\CIIIC	JIIIVa\S	acrameni		Dala (Ao_IV)20 I	00117-3301	9.D\2018.01.17CUR	VELLA_	004.u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
_	anaculfo	nic acid				3	, ,			J
8 Perfluorohex			-0.002	1.000	E22702	0.2180		95.8	2590	
399.00 > 80.00 399.00 > 99.00				1.000	523793	0.2180	2.99(1.50-4.49)	95.8 95.8		
		2.280	-0.002	1.000	175428		2.99(1.50-4.49)	95.8	1962	
D 11 1802 PFH										
403.00 > 84.00	2.278	2.282	-0.004	0.868	5102469	2.41		102	28027	
13 Sodium 1H,		•								
427.00 > 407.00	2.601	2.596	0.005	1.000	119814	0.2234		94.2	2001	
D 12 M2-6:2FTS										
429.00 > 81.00	2.601	2.597	0.004	0.992	769728	2.42		102	16698	
D 14 13C4 PFO	Д									
417.00 > 372.00		2.622	0.001	1.000	4253926	2.52		101	25316	
* 62 13C2-PFOA										
415.00 > 370.00		2.622	0.001		4681031	2.50			33089	
			0.001		4001031	2.50			33007	
15 Perfluorooct			0.0	1 000	404472	0.2420		07.0	272	
413.00 > 369.00		2.623	0.0	1.000	484462	0.2429	1 02/0 04 2 52)	97.2	373	
413.00 > 169.00			0.0	1.000	250575		1.93(0.84-2.52)	97.2	2345	
16 Perfluorohe										
449.00 > 80.00		2.629	0.001	1.000	431169	0.2328		97.8	7142	
449.00 > 99.00	2.630	2.629	0.001	1.000	127520		3.38(1.94-5.82)	97.8	3310	
D 19 13C5 PFNA	4									
468.00 > 423.00	2.993	2.992	0.001	1.141	3494654	2.56		102	24262	
17 Perfluorooct	ane sulf	onic acid	d							
499.00 > 80.00		2.992	0.001	1.000	344328	0.2249		97.0	139	
499.00 > 99.00		2.992	0.001	1.000	77366		4.45(2.31-6.93)	97.0	213	
D 18 13C4 PFOS							,			
503.00 > 80.00		2.992	0.001	1.141	3268191	2.44		102	26597	
			0.001		0200171	2.11		102	20077	
20 Perfluoronor			0.001	1.000	252421	0.2442		07.7	1227	
463.00 > 419.00		2.992	0.001		352431	0.2442	4 40/1 00 E 40\	97.7		
463.00 > 169.00		2.992	0.001	1.000	78627		4.48(1.90-5.69)	97.7	1695	
22 Perfluorooct										
498.00 > 78.00	3.340	3.338	0.002	1.000	464966	0.2489		99.6	6583	
D 21 13C8 FOSA	Д									
506.00 > 78.00	3.340	3.338	0.002	1.273	4753896	2.52		101	24528	
D 26 M2-8:2FTS										
529.00 > 81.00		3.342	0.005	1.276	811941	2.42		101	16088	
25 Sodium 1H,										
527.00 > 507.00		•		1.000	99090	0.2402		100	4021	
		3.342	0.003	1.000	77070	0.2402		100	4021	
D 23 13C2 PFD/		0.050		4 070	222225	0.40			00457	
515.00 > 470.00	3.355	3.352	0.003	1.279	2939305	2.49		99.6	23157	
24 Perfluorodeo	canoic a	cid								
513.00 > 469.00	3.355	3.353	0.002	1.000	292799	0.2567		103	1518	
513.00 > 169.00	3.355	3.353	0.002	1.000	47430		6.17(2.36-7.09)	103	1255	
D 27 d3-NMeFO	SAA									
573.00 > 419.00		3.507	0.0	1.337	1483575	2.52		101	8558	
28 N-methyl pe										
570.00 > 419.00		3.513	0.001	1.002	150110	0.2342		93.7	1427	
570.00 > 419.00	3.314	3.313	0.001	1.002	150110	0.2342		73.1	1421	

Report Date: 18-Jan-2018 08:22:24 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_004.d

Data File.	\\CIII	Jiliya	acramen		iData (AO_N\201	00117-3301	7.D(2010.01.17COF	VLLLA_	004.u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorode	cano Su	lfonic ac	·id							
599.00 > 80.00	3.671	3.666	0.005	1.000	216397	0.2416		100	7571	
	3.663	3.666	-0.003	0.998	71956	0.2110	3.01(1.39-4.16)	100	2967	
D 32 d5-NEtFOS							,			
589.00 > 419.00		3.672	0.006	1.402	1512999	2.54		102	5661	
31 Perfluoroun	decanoi	c acid								
563.00 > 519.00		3.678	0.0	1.000	227630	0.2436		97.4	1202	
563.00 > 169.00	3.687	3.678	0.009	1.002	47276		4.81(0.00-0.00)	97.4	2503	
D 30 13C2 PFU	nA									
565.00 > 520.00	3.678	3.679	-0.001	1.402	2263551	2.53		101	20649	
33 N-ethyl perf	luoroocta	ane sulfo	onamid							
584.00 > 419.00	3.678	3.679	-0.001	1.000	142743	0.2422		96.9	3005	
37 Perfluorodo	decanoi	c acid								
613.00 > 569.00	3.979	3.979	0.0	1.000	256381	0.2539		102	1243	
613.00 > 169.00	3.979	3.979	0.0	1.000	56420		4.54(2.13-6.40)	102	4395	
D 36 13C2 PFD	οΑ									
615.00 > 570.00	3.979	3.979	0.0	1.517	2463501	2.53		101	26849	
41 Perfluorotrio	decanoic	acid								
663.00 > 619.00	4.241	4.242	-0.001	1.000	263708	0.2305		92.2	792	
663.00 > 169.00	4.241	4.242	-0.001	1.000	87121		3.03(1.25-3.76)	92.2	2810	
42 Perfluorotet	radecan	oic acid								
713.00 > 169.00	4.485	4.483	0.002	1.000	75670	0.2411		96.5	2188	
713.00 > 219.00	4.485	4.483	0.002	1.000	51317		1.47(0.71-2.13)	96.5	1498	
D 43 13C2-PFT	eDA									
715.00 > 670.00	4.485	4.483	0.002	1.710	3214801	2.53		101	15524	
D 44 13C2-PFH	xDA									
815.00 > 770.00	4.904	4.902	0.002	1.870	5624728	2.48		99.4	11541	
45 Perfluorohe	xadecan	oic acid								
813.00 > 769.00	4.904	4.902	0.002	1.000	561148	0.2439		97.6	334	
813.00 > 169.00	4.904	4.902	0.002	1.000	100487		5.58(2.86-8.58)	97.6	1611	
46 Perfluorooc	tadecan	oic acid								
913.00 > 869.00	5.253	5.255	-0.002	1.000	579412	0.2444		97.8	170	
913.00 > 169.00	5.246	5.255	-0.009	0.999	70347		8.24(0.00-0.00)	97.8	401	

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:24 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 17-Jan-2018 14:35:05 Instrument ID: A8_N Lims ID: IC L3 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x | Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x (0000015 X) > 9 (X100000) 8.0 1.4 2.0 1.4 2.0 1.1 1.7 1.0 1.6 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 24 (×10000) (×1 (20² ×16 2.2 1.9 1.3 1.9 0.9 1.2 1.5 2.1 2.4 1.3 2.2 1.0 1.6 1.8 1.0 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexable 7 13C2 PFHxA Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x 70 30 660 ∑50 ≻40 15 30 10 20 10 1.7 2.0 1.9 2.2 2.5 1.9 1.4 2.3 1.3 1.6 1.3 1.6 2.2 1.0 1.1 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid D 9 13C4-PFHpA Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x 000012 1000010 X) (X) (X) (X) (X) (X) (X1000) (X1000) 00 8.0 1.4 2.0 2.6 1.2 1.6 1.9 2.2 2.5 2.8 1.3

2.8

3.1

2.0

2.3

2.6

2.9

3.2

11

1.9

2.2

ol = 2.1

2.4

2.7

3.7

2.7

3.0

3.6

3.9

10

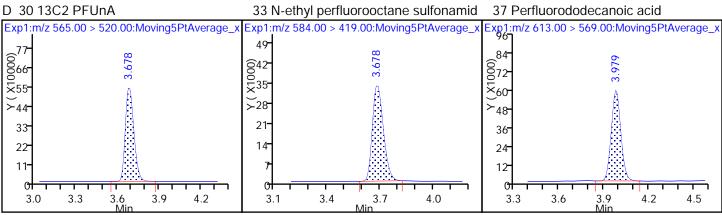
2.8

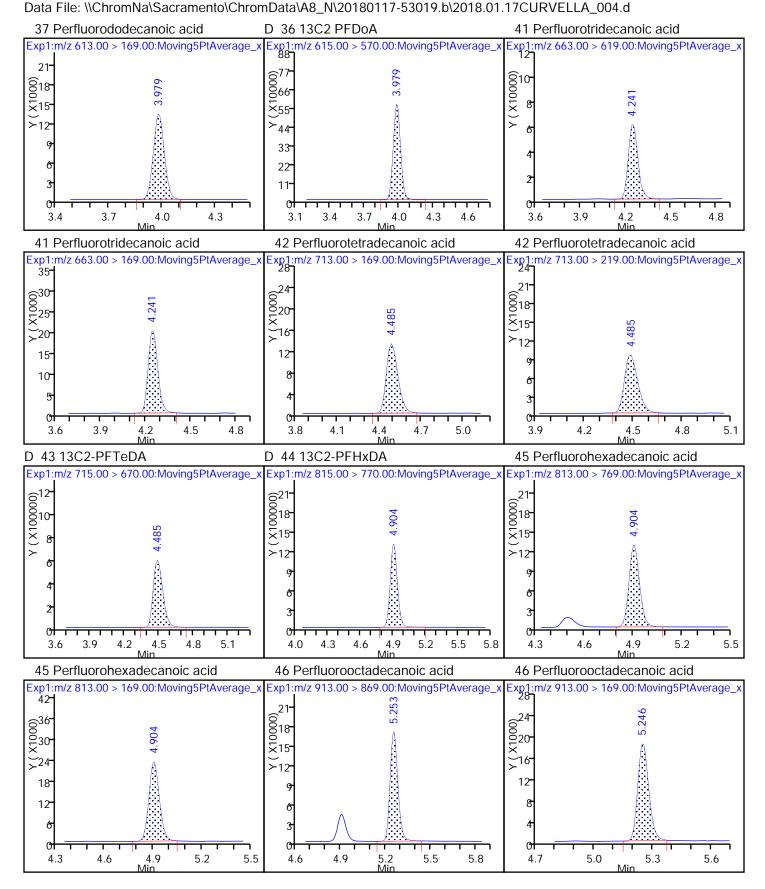
3.1

01 = 2.8

3.1

3.4





Report Date: 18-Jan-2018 08:22:27 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_005.d

Lims ID: IC L4 Full

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 17-Jan-2018 14:42:53 ALS Bottle#: 13 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 08:22:27 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:51:59

FIISt Level Revie	wei. Hai	iriiyaria			Date.	ı	7-Jan-2016 10.51.5	7		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.411	0.0	0.538	7075449	2.46		98.3	22003	
2 Perfluorobuty	yric acid									
212.90 > 169.00	1.418	1.413	0.005	1.004	2581287	0.9762		97.6	317	
D 3 13C5-PFPe										
267.90 > 223.00		1.659	-0.001	0.632	4261723	2.50		100.0	35794	
4 Perfluoropen				4 005	1001055	0.0405		01.1	100/	
262.90 > 219.00		1.662	0.005	1.005	1934955	0.9635		96.4	1826	
D 47 13C3-PFBS		1 4 O E	0.001	0 4 4 5	05450	2 27		07.4	2002	
	1.694	1.695	-0.001	0.645	85658	2.27		97.6	3903	
5 Perfluorobuta 298.90 > 80.00	anesulio 1.703	1.697	0.006	1.005	2532634	0.8903		101	18418	
	1.703	1.697	0.006	1.005	1089273	0.0703	2.33(1.25-3.74)	101	10994	
D 60 M2-4:2FTS	;						,			
329.00 > 81.00	1.908	1.903	0.005	0.727	544574	NC			5492	
61 Sodium 1H,	1H,2H,2	H-perflu	orohexar	ne						
327.00 > 307.00	1.908	1.903	0.005	1.000	459884	0.8984		96.2	20899	
6 Perfluorohex										
313.00 > 269.00		1.939	0.0	1.000	1861593	1.01	44 00/5 00 45 40\	101	4714	
313.00 > 119.00		1.939	0.0	1.000	163514		11.38(5.03-15.10)	101	2185	
D 7 13C2 PFHx. 315.00 > 270.00		1.939	0.0	0.738	4467394	2.43		97.3	35572	
		1.737	0.0	0.736	4407394	2.43		97.3	33372	
D 9 13C4-PFHp 367.00 > 322.00		2.267	0.006	0.866	4367056	2.50		99.8	24480	
10 Perfluoroher			3.000	3.000	1007000	2.00		, ,	21100	
363.00 > 319.00		2.268	0.005	1.000	1803022	0.9392		93.9	3372	
363.00 > 169.00		2.268	0.005	1.000	733365		2.46(1.13-3.40)	93.9	5388	

Report Date: 18-Jan-2018 08:22:27 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_005.d

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	80117-5301	9.b\2018.01.17CUF	₹VELLA_	<u>.</u> 005.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohex	onoculfo	onic ocid	1							
399.00 > 80.00		2.280	0.006	1.000	1981094	0.8265		90.8	6767	
399.00 > 99.00		2.280	0.006	1.000	683021	0.0203	2.90(1.50-4.49)	90.8	4324	
		2.200	0.000	1.000	000021		2.70(1.00 4.47)	70.0	7027	
D 11 1802 PFH		2 202	0.004	0.871	E001272	2.24		00.0	SEEGE	
403.00 > 84.00		2.282			5091273	2.36		99.9	25595	
13 Sodium 1H,		•			400575	0.0010		0.1.1	44770	
427.00 > 407.00	2.598	2.596	0.002	1.000	488565	0.8919		94.1	11772	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.597	0.001	0.990	786039	2.43		102	21117	
* 62 13C2-PFO	4									
415.00 > 370.00	2.625	2.622	0.003		4760693	2.50			29372	
D 14 13C4 PFO	Α									
417.00 > 372.00		2.622	0.003	1.000	4182465	2.44		97.6	33554	
15 Perfluorooc										
413.00 > 369.00		2.623	0.002	1.000	1890626	0.9642		96.4	1371	
413.00 > 367.00		2.623	0.002	1.000	990720	0.7042	1.91(0.84-2.52)	96.4	7524	
				1.000	770720		1.71(0.04-2.32)	70.4	7324	
16 Perfluorohe	•			1 000	1717001	0.0070		00.4	1520/	
449.00 > 80.00		2.629	0.004	1.000	1717801	0.9369	2 (2(1 04 5 02)	98.4	15386	
449.00 > 99.00		2.629	0.004	1.000	474373		3.62(1.94-5.82)	98.4	9136	
D 18 13C4 PFO										
503.00 > 80.00	2.996	2.992	0.004	1.141	3235344	2.37		99.3	23758	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	2.996	2.992	0.004	1.000	1428679	1.02		102	4853	
463.00 > 169.00	2.996	2.992	0.004	1.000	339665		4.21(1.90-5.69)	102	7289	
D 19 13C5 PFN	A									
468.00 > 423.00	2.996	2.992	0.004	1.141	3397294	2.44		97.8	23997	
17 Perfluorooc		onic acid	4							
499.00 > 80.00		2.992	0.004	1.000	1355316	0.8944		96.4	530	
499.00 > 99.00		2.992	0.004	1.000	299471	0.0711	4.53(2.31-6.93)	96.4	769	
		2.772	0.001	1.000	2//1/1		1.00(2.01 0.70)	70.1	707	
D 21 13C8 FOS		2 220	0.005	1 272	404EE10	2.52		101	20475	
506.00 > 78.00		3.338		1.273	4845519	2.53		101	28675	
22 Perfluorooc										
498.00 > 78.00	3.343	3.338	0.005	1.000	1866404	0.9803		98.0	14587	
25 Sodium 1H,	1H,2H,2	H-perflu	orodecar	ne						
527.00 > 507.00	3.343	3.342	0.001	1.000	377296	0.9426		98.4	9990	
D 26 M2-8:2FTS	<u> </u>									
529.00 > 81.00		3.342	0.001	1.273	787775	2.30		96.2	21130	
D 23 13C2 PFD		0.0.2	0.001	1.270	707770	2.00		70.2	21.00	
		2 252	0.004	1 270	2005224	2.50		100	21202	
515.00 > 470.00		3.352	0.006	1.279	3005224	2.50		100	31282	
24 Perfluorode			_							
513.00 > 469.00		3.353	0.005	1.000	1122840	0.9627		96.3	5520	
513.00 > 169.00	3.358	3.353	0.005	1.000	202609		5.54(2.36-7.09)	96.3	1737	
D 27 d3-NMeFC	SAA									
573.00 > 419.00	3.510	3.507	0.003	1.337	1499251	2.50		100	11909	
28 N-methyl pe	rfluoroo	ctane su	lfonami							
570.00 > 419.00		3.513	0.005	1.002	630879	0.9739		97.4	3748	
					-					

Report Date: 18-Jan-2018 08:22:27 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_005.d

Data File:	11CHI	JIIINA\5	acrament	io/Cilion	Data (A8_N\201	80117-5301	9.D\2018.01.17CUF	KVELLA_	0.00.0	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorode	cano Su	lfonic ac	id							
599.00 > 80.00	3.665	3.666	-0.001	1.000	857674	0.9675		100	18976	
599.00 > 99.00	3.665	3.666	-0.001	1.000	292568	0.70.0	2.93(1.39-4.16)	100	10167	
D 32 d5-NEtFOS							,			
589.00 > 419.00		3.672	0.001	1.399	1503508	2.48		99.2	5023	
31 Perfluoround	decanoi	c acid								
563.00 > 519.00	3.682	3.678	0.004	1.000	855685	0.9207		92.1	3773	
563.00 > 169.00	3.682	3.678	0.004	1.000	187060		4.57(0.00-0.00)	92.1	9908	
33 N-ethyl perfl	uoroocta	ane sulfo	onamid							
584.00 > 419.00	3.682	3.679	0.003	1.002	554613	0.9470		94.7	6060	
D 30 13C2 PFUr	nΑ									
565.00 > 520.00	3.682	3.679	0.003	1.402	2250985	2.47		98.8	31522	
D 36 13C2 PFD	οA									
615.00 > 570.00	3.983	3.979	0.004	1.517	2345552	2.37		94.9	23548	
37 Perfluorodo	decanoi	c acid								
613.00 > 569.00		3.979	0.004	1.000	975905	1.02		102	4517	
613.00 > 169.00	3.983	3.979	0.004	1.000	233684		4.18(2.13-6.40)	102	10727	
41 Perfluorotrid										
663.00 > 619.00		4.242	0.002	1.000	1119808	1.03	,	103	4585	
663.00 > 169.00		4.242	0.002	1.000	344544		3.25(1.25-3.76)	103	12891	
D 43 13C2-PFT6										
715.00 > 670.00		4.483	0.004	1.709	3148987	2.44		97.5	16074	
42 Perfluorotetr										
713.00 > 169.00		4.483	0.004	1.000	295170	0.9603		96.0	5686	
713.00 > 219.00		4.483	-0.010	0.997	198743		1.49(0.71-2.13)	96.0	5800	
45 Perfluorohex										
813.00 > 769.00		4.902	0.002	1.000	2195395	0.9818	F 07/2 0/ 0 F0)	98.2	1281	
813.00 > 169.00		4.902	0.002	1.000	373694		5.87(2.86-8.58)	98.2	3967	
D 44 13C2-PFH		4 000	0.000	1.070	F70/0/0	2.51		101	1101/	
815.00 > 770.00		4.902	0.002	1.868	5786263	2.51		101	11016	
46 Perfluorooct			0.007	1 000	0.400777	1.00		00 (F.0.7	
913.00 > 869.00		5.255	0.006	1.000	2429777	1.00	7 00/0 00 0 00\	99.6	587 1247	
913.00 > 169.00	J.∠01	5.255	0.006	1.000	304165		7.99(0.00-0.00)	99.6	1267	

QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:27 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 17-Jan-2018 14:42:53 Instrument ID: A8_N Lims ID: IC L4 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 63 (0000010° X) X (0000015 X) > 9 0654-0654-06545-<u>></u>36 27 18 8.0 1.4 2.0 1.9 0.7 1.0 1.6 1.0 1.6 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 24 (0042 00042 63 0054 (20² ×16 ×35 21 18 1.2 1.3 1.9 2.2 1.8 2.4 1.3 1.9 2.2 0.6 1.0 61 Sodium 1H,1H,2H,2H-perfluorohexan 6 Perfluorohexanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x 28 14 (X10000) X (X10000) X (X10000) 00024 ×20 0042 ×35 -16 >28 21 01 1.9 2.2 1.5 1.8 2.4 1.1 1.7 2.3 2.9 1.0 1.3 1.6 1.2 2.1 0.5 6 Perfluorohexanoic acid 7 13C2 PFHxA 9 13C4-PFHpA Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_> Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> 49 (00012 (00012 (100012 (X100000) (X100000) 042 ×35 21 0 0| 1.5 1.8 2.1 2.4 2.6 1.5 1.8 2.1 2.4 2.7 3.0 1.2 1.1

Report Date: 18-Jan-2018 08:22:27 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_005.d 10 Perfluoroheptanoic acid 10 Perfluoroheptanoic acid 8 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00:Moving5PtAverage_x 21-00018-×15-10042 6 6 36 ∑30 \lesssim 35 ≻28 21 18 12 2.3 1.9 1.7 2.0 2.6 2.9 1.5 1.8 2.1 2.4 2.7 3.0 1.3 2.5 3.1 8 Perfluorohexanesulfonic acid D 11 1802 PFHxS 13 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3 Exp1:m/z 399.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 427.00 > 407.00:Moving5PtAverage_x 014 0012 (000012 X) > 9 (0000 LX) > 9 ∑₁₀ 2.3 2.9 2.9 2.9 2.3 2.6 1.7 2.0 2.6 1.7 2.0 2.3 D 12 M2-6:2FTS 62 13C2-PFOA D 14 13C4 PFOA Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x Exp1:m/z 429.00 > 81.00:Moving5PtAverage_x3 (0012 1000010 X) 0014 0012 00020 <u>×</u>10 0 2.3 2.9 1.9 2.2 2.5 2.8 3.4 2.1 2.4 2.7 3.0 3.3 2.0 2.6 3.2 3.1 1.8 15 Perfluorooctanoic acid 15 Perfluorooctanoic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x 56- 56- (0048 ×40 0048 ×40 ×20 ×32 ≻₁₆-24 12 16 16

2.0

2.3

2.6

2.9

3.2

2.0

2.3

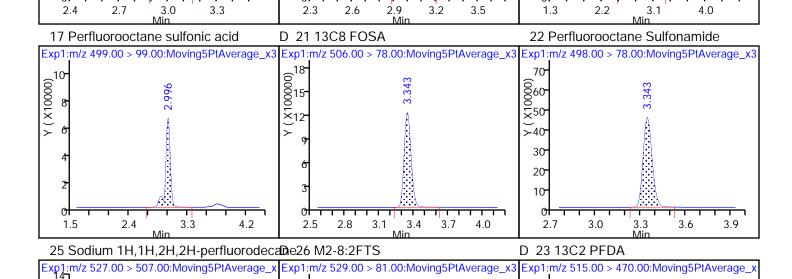
3.2

1.9

2.2

2.8

3.1



×20

12

2.8

3.1

(X10000) X (X10000) X (X10000) 8

ol 2.8

3.1

3.4

3.7

10

Y (X100000)

2.6

2.9

3.2

3.5

3.8

4.1

3.4

Report Date: 18-Jan-2018 08:22:27 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_005.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x 70 ©35 ©30 0 6 42 860 ∑50 ×35 <u>×</u>25 ≻₂₀ ≻40 ≻28 30 21 15 20 14 10 10 3.3 3.9 2.7 3.0 3.6 2.8 3.1 3.4 3.7 2.9 3.2 3.5 3.8 4.1 4.4 2.6 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 V (X10000) 621- 618-3.518 ∑₁₅ 15 10 3.5 3.9 3.2 3.8 3.3 3.6 3.7 4.2 3.4 4.0 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x Exp1:m/z 563.00 > 169.00:Moving5PtAverage_x 70 49 28 3.673 0042 ×35 624**-**660 50 ×50 ×20 ∑40 ≻28 ≻16 30 21 12 20 10 0 3.2 3.5 3.8 3.7 4.0 3.4 3.7 4.0 2.9 4.1 4.4 3.1 3.4 4.3 3.1 33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA D 36 13C2 PFDoA Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x | Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 615.00 > 570.00:Moving5PtAverage_x 84 684 672 (000015⁻ X) 12⁻ ©72 ×60 ×60 **≻**48 ≻₄₈-36

24

12

2.9

3.2

3.5

3.8

4.1

4.4

0 3.0

3.3

3.6

3.9

4.2

36

24

12

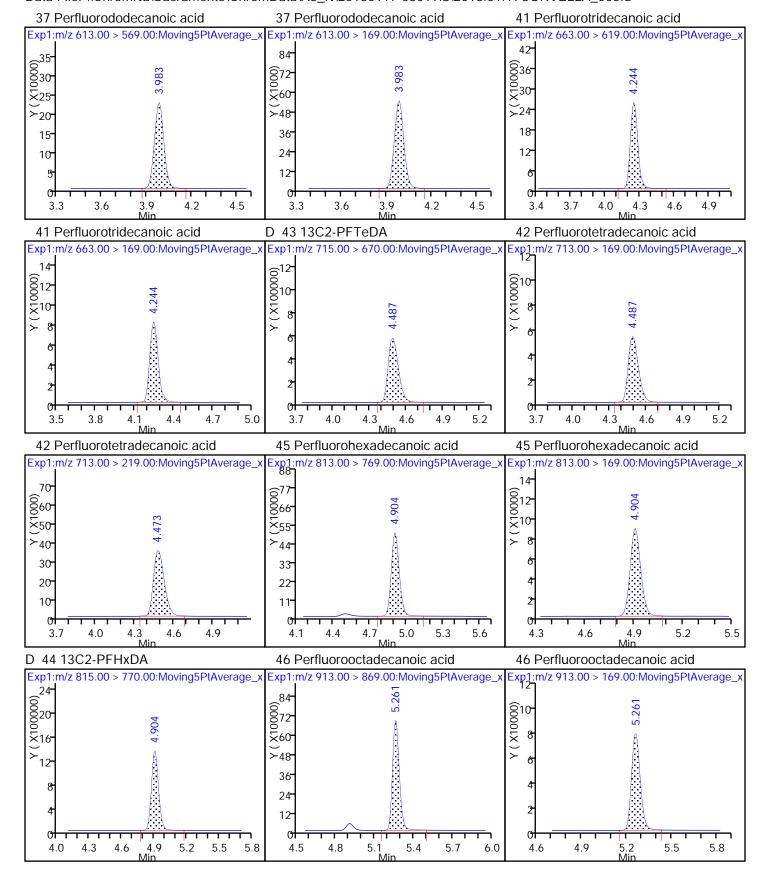
3.2

3.5

3.8

4.1

4.4



 Report Date: 18-Jan-2018 08:22:30 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_006.d

Lims ID: IC L5 Full

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 17-Jan-2018 14:50:40 ALS Bottle#: 14 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 08:22:30 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:52:24

1	First Level Reviewer: nannigana					Date:	l	7-Jan-2018 16:52:2	4		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 113C4 PFBA 217.00 > 172.00		1.411	-0.004	0.537	7104763	2.50		100	23372	
	2 Perfluorobuty 212.90 > 169.00	•	1.413	0.0	1.004	6694565	2.52		101	716	
	O 3 13C5-PFPe 267.90 > 223.00		1.659	0.002	0.633	4159040	2.47		99.0	36968	
	4 Perfluoropen 262.90 > 219.00	1.661		-0.001	1.000	4900043	2.50		100	4378	
		1.697	1.695	0.002	0.647	90418	2.43		105	4203	
		anesulfo 1.697 1.697	1.697 1.697	0.0 0.0	1.000 1.000	6433939 2753698	2.14	2.34(1.25-3.74)	97.0 97.0	38054 24045	
	61 Sodium 1H, 327.00 > 307.00				ne 1.000	1228862	2.27		97.4	44672	
	O 60 M2-4:2FTS 329.00 > 81.00	1.902	1.903	-0.001	0.725	545775	NC			5185	
	7 13C2 PFHx 315.00 > 270.00	1.943	1.939	0.004	0.741	4634604	2.56		102	36923	
	6 Perfluorohex 313.00 > 269.00 313.00 > 119.00	1.943	1.939 1.939	0.004 0.004	1.000 1.000	4586272 427468	2.39	10.73(5.03-15.10)	95.5 95.5	9351 6848	
	O 9 13C4-PFHp 367.00 > 322.00	2.265	2.267	-0.002	0.863	4357423	2.53		101	24387	
	10 Perfluorohe 363.00 > 319.00 363.00 > 169.00	2.265	2.268 2.268	-0.003 -0.003	1.000 1.000	4706368 1827469	2.46	2.58(1.13-3.40)	98.3 98.3	7569 12368	

Report Date: 18-Jan-2018 08:22:30 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_006.d

Data File:	\\Chr	omNa\S	acramen	to\Chrom	Data\A8_N\201	80117-5301	9.b\2018.01.17CUF	RVELLA_	<u>.006.d</u>	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohex	anosulfo	onic acio	ı							
399.00 > 80.00			-0.002	1.000	5134885	2.23		97.8	11137	
399.00 > 99.00		2.280		1.000	1689075	2.23	3.04(1.50-4.49)	97.8	7428	
D 11 1802 PFH:		2.200	0.002	1.000	1007070		0.01(1.00 1.17)	77.0	7 120	
403.00 > 84.00		າ າດາ	-0.004	0.868	4900649	2.31		97.6	24542	
					4700047	2.31		97.0	24342	
13 Sodium 1H,		•			1250040	2.25		00.1	10470	
427.00 > 407.00		2.590	0.0	1.000	1258940	2.35		99.1	18472	
D 12 M2-6:2FTS		0.507	0.004		7/00/0	0.44		100	1.10/5	
429.00 > 81.00		2.597	-0.001	0.990	768843	2.41		102	14965	
D 14 13C4 PFO										
417.00 > 372.00	2.623	2.622	0.001	1.000	4316678	2.55		102	28740	
* 62 13C2-PFO	4									
415.00 > 370.00	2.623	2.622	0.001		4691625	2.50			34097	
15 Perfluorooct	tanoic ad	cid								
413.00 > 369.00	2.623	2.623	0.0	1.000	4896648	2.42		96.8	3583	
413.00 > 169.00	2.623	2.623	0.0	1.000	2496697		1.96(0.84-2.52)	96.8	14913	
16 Perfluorohe	ptanesul	lfonic ac	id							
449.00 > 80.00	•	2.629	0.001	1.000	4563453	2.52		106	39180	
449.00 > 99.00	2.630	2.629	0.001	1.000	1192536		3.83(1.94-5.82)	106	17356	
D 19 13C5 PFN	A									
468.00 > 423.00		2.992	0.001	1.141	3329183	2.43		97.2	19465	
17 Perfluorooct										
499.00 > 80.00		2.992	0.001	1.000	3505745	2.35		101	1395	
499.00 > 99.00		2.992	0.001	1.000	755117	2.00	4.64(2.31-6.93)	101	1932	
D 18 13C4 PFO		,,_	0.00.		, , , , , , , , , , , , , , , , , , , ,				.,,,	
503.00 > 80.00		2.992	0.001	1.141	3190243	2.37		99.4	20975	
			0.001	1.171	3170243	2.57		77.4	20773	
20 Perfluorono 463.00 > 419.00		2.992	0.001	1.000	3585870	2.61		104	11368	
463.00 > 169.00		2.992	0.001	1.000	848001	2.01	4.23(1.90-5.69)	104	11677	
				1.000	040001		4.23(1.70-3.07)	104	11077	
22 Perfluorooct				1 000	4000740	2 (2		105	211/0	
498.00 > 78.00		3.338	0.002	1.000	4822749	2.63		105	31460	
D 21 13C8 FOS										
506.00 > 78.00	3.340	3.338	0.002	1.273	4670673	2.47		98.9	22093	
D 26 M2-8:2FTS										
529.00 > 81.00	3.340	3.342	-0.002	1.273	800715	2.38		99.2	12843	
25 Sodium 1H,	1H,2H,2	H-perflu	orodecar	ne						
527.00 > 507.00	3.340	3.342	-0.002	1.000	981168	2.41		101	23396	
D 23 13C2 PFD	A									
515.00 > 470.00		3.352	-0.005	1.276	2975947	2.51		101	26544	
24 Perfluorode				•		-: ÷ ·				
513.00 > 469.00		3.353	0.002	1.002	2809263	2.43		97.3	11645	
513.00 > 469.00		3.353	0.002	1.002	499275	۷.۲۵	5.63(2.36-7.09)	97.3 97.3	1687	
		0.000	0.002	1.002	7//2/3		J.JJ(2.JU-1.U7)	71.5	1007	
D 27 d3-NMeFO		2 507	0.0	1 227	1427020	2.42		07.2	0404	
573.00 > 419.00		3.507		1.337	1437020	2.43		97.3	9404	
28 N-methyl pe										
570.00 > 419.00	3.514	3.513	0.001	1.002	1546077	2.49		99.6	7151	

Report Date: 18-Jan-2018 08:22:30 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_006.d

Data File.	NOTIF	Jiliya	aciameni	UCHIOH	Data AO_N\201	00117-3301	7.D/2010.01.17CON	VLLLA_	000.u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Danili	C.	· ·	:				•		•	
29 Perfluorodeo 599.00 > 80.00	3.663	3.666	-0.003	1.000	2182261	2.50		104	24456	
599.00 > 99.00	3.663	3.666	-0.003	1.000	732660	2.30	2.98(1.39-4.16)	104	20219	
D 32 d5-NEtFOS		3.000	0.003	1.000	732000		2.70(1.37 4.10)	104	20217	
589.00 > 419.00		3.672	-0.001	1.399	1432688	2.40		96.0	5320	
31 Perfluoround			0.001	1.077	1432000	2.40		70.0	3320	
563.00 > 519.00		3.678	0.0	1.000	2244135	2.46		98.3	10302	
563.00 > 169.00		3.678	0.0	1.000	454077	2.40	4.94(0.00-0.00)	98.3	15259	
D 30 13C2 PFUr		0.070	0.0				, .(0.00 0.00)	70.0	.0207	
565.00 > 520.00		3.679	-0.001	1.402	2212774	2.46		98.6	20353	
33 N-ethyl perfl				11.102	22.277.	2.10		70.0	20000	
584.00 > 419.00		3.679		1.002	1447969	2.59		104	7749	
37 Perfluorodo			0.001	1.002	1117707	2.07		101	,,,,	
613.00 > 569.00		3.979	0.0	1.000	2517800	2.59		103	11349	
613.00 > 169.00		3.979	0.0	1.000	619932	2.07	4.06(2.13-6.40)	103	20447	
D 36 13C2 PFD										
615.00 > 570.00		3.979	0.0	1.517	2374065	2.44		97.5	19498	
41 Perfluorotrid	lecanoic	acid								
663.00 > 619.00		4.242	-0.001	1.000	2742788	2.49		99.5	8424	
663.00 > 169.00	4.241	4.242	-0.001	1.000	872619		3.14(1.25-3.76)	99.5	16274	
42 Perfluorotetr	radecan	oic acid								
713.00 > 169.00		4.483	0.002	1.000	754490	2.56		102	12988	
713.00 > 219.00	4.471	4.483	-0.012	0.997	517531		1.46(0.71-2.13)	102	12896	
D 43 13C2-PFTe	eDA									
715.00 > 670.00	4.485	4.483	0.002	1.710	3024149	2.38		95.0	17363	
D 44 13C2-PFH	xDA									
815.00 > 770.00		4.902	0.001	1.869	5622608	2.48		99.1	13087	
45 Perfluorohe	xadecan	oic acid								
813.00 > 769.00		4.902	0.001	1.000	5582637	2.60		104	2992	
813.00 > 169.00		4.902	0.001	1.000	920324		6.07(2.86-8.58)	104	5818	
46 Perfluorooct	adecano	oic acid								
913.00 > 869.00		5.255	0.004	1.000	6281608	2.65		106	1238	
913.00 > 169.00	5.252	5.255	-0.003	0.999	778273		8.07(0.00-0.00)	106	1952	

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:30 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 17-Jan-2018 14:50:40 Instrument ID: A8_N Lims ID: IC L5 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 6 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x (0000015 X) > 9 (X100000) (X1000000) ∑₁₀ 0.7 1.3 1.9 2.5 0.9 1.5 0.6 1.2 1.8 2.1 1.0 1.6 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 ()18-()00015-24 6 20 ∑₁₆-1.5 1.2 1.5 1.8 2.1 2.4 0.9 1.2 2.1 2.4 0.9 1.2 1.5 1.8 1.8 2.1 2.4 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexable 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x 35 (0012 1000010 8 ©70 960 (0) 30 30 ×25 ×50 ≻₄₀ >2015 30 10 20 10 01 1.8 1.5 1.8 2.1 2.7 2.0 1.2 1.5 2.1 2.4 2.4 1.4 1.7 2.3 2.6 0.9 1.1 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid D 9 13C4-PFHpA Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> (0000010 X) 12 (012 X) 8 (X10000) 8 0 0 0.7 1.3 1.9 2.5 3.1 2.6 1.8 2.1 2.4 2.7 3.0 1.1 1.5

2.8

3.1

3.4

1.9

2.2

2.8

3.1

11

1.9

2.2

1.9

2.2

2.5

2.8

3.1

Page 462 of 606

3.7

2.9

2.6

3.2

3.5

3.8

4.1

2.8

3.1

3.4

3.7

2.8

3.3

3.0

3.6

3.9

4.2

3.0

3.3

3.9

4.2

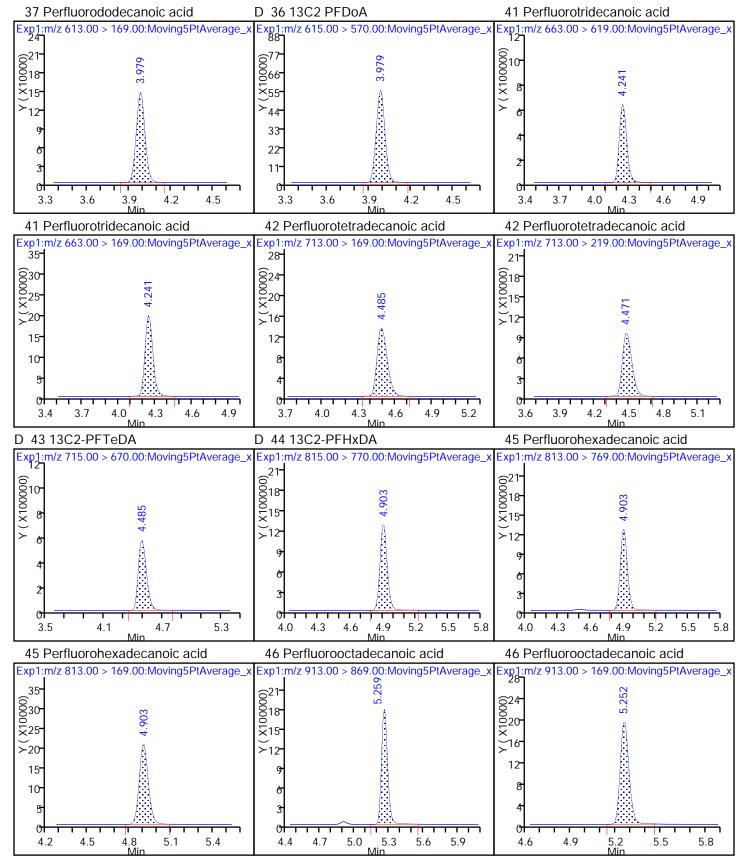
13

3.2

3.5

3.8

4.1



 Report Date: 18-Jan-2018 08:22:33 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_007.d

Lims ID: IC L6 Full

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 17-Jan-2018 14:58:30 ALS Bottle#: 15 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 08:22:33 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:52:45

Til St Ecvel Neviewel. Harlingaria					Date.		7 3di1 2010 10.32.4	<u> </u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.411	-0.003	0.538	6889924	2.55		102	24860	
2 Perfluorobuty 212.90 > 169.00		1 /113	-0.005	1.000	13027499	5.06		101	1333	
D 3 13C5-PFPe		1.410	0.000	1.000	10021477	0.00		101	1000	
267.90 > 223.00		1.659	-0.005	0.632	4122126	2.58		103	37017	
4 Perfluoropen										
262.90 > 219.00		1.662	-0.008	1.000	9469006	4.87		97.5	8856	
D 47 13C3-PFB9 301.90 > 83.00		1.695	-0.006	0.646	83073	2.35		101	3063	
5 Perfluorobuta										
298.90 > 80.00		1.697	-0.008	1.000	12635108	4.58		104	67166	
	1.689	1.697	-0.008	1.000	5216403		2.42(1.25-3.74)	104	38944	
D 60 M2-4:2FTS 329.00 > 81.00		1.903	-0.010	0.724	532209	NC			5682	
61 Sodium 1H,					002207	110			0002	
327.00 > 307.00		1.903		1.000	2364722	4.76		102	71307	
6 Perfluorohex										
313.00 > 269.00 313.00 > 119.00		1.939 1.939		1.000 1.000	9016831 798066	5.00	11.30(5.03-15.10)	100 100	14315 11593	
D 7 13C2 PFHx		1.737	-0.003	1.000	7 70000		11.30(3.03-13.10)	100	11373	
315.00 > 270.00		1.939	-0.005	0.739	4349882	2.52		101	38212	
D 913C4-PFHp										
367.00 > 322.00		2.267	-0.014	0.861	4126515	2.52		101	26743	
10 Perfluoroher 363.00 > 319.00		acid 2.268	-0.002	1.006	9111535	5.02		100	12281	
363.00 > 319.00 363.00 > 169.00		2.268	-0.002	1.006	3471916	3.02	2.62(1.13-3.40)	100	17588	
					D 400 (•			

Report Date: 18-Jan-2018 08:22:33 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_007.d

Data File:	\\CIIIC	JIIIVa	cramen		Dala (Ao_IV)20 I	00117-3301	9.b\2018.01.17CUR	VELLA_	007.u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohex	anoculfo	nic acid								
399.00 > 80.00			-0.014	0.994	9935695	4.50		98.8	14608	
399.00 > 99.00		2.280		1.000	3253974	4.50	3.05(1.50-4.49)	98.8	12936	
D 11 1802 PFH		2.200	0.001	1.000	0200771		0.00(1.00 1.17)	70.0	12700	
403.00 > 84.00		2 282	-0.003	0.871	4694368	2.32		98.3	28847	
13 Sodium 1H,					4074300	2.02		70.0	20047	
427.00 > 407.00		-		1.000	2504300	5.10		108	26755	
D 12 M2-6:2FTS		2.570	-0.007	1.000	2304300	5.10		100	20733	
429.00 > 81.00		2 507	-0.008	0.990	704248	2.32		97.7	16529	
		2.571	-0.000	0.770	704240	2.32		71.1	10327	
* 62 13C2-PFOA 415.00 > 370.00		2 622	-0.006		4464823	2.50			30070	
		2.022	-0.000		4404623	2.30			30070	
D 14 13C4 PFO		2 / 22	0.007	1 000	4050100	2.52		101	2072/	
417.00 > 372.00		2.622	-0.006	1.000	4052198	2.52		101	28726	
15 Perfluorooct			0.007	1 000	0000075	4.70		047	(104	
413.00 > 369.00		2.623	-0.007	1.000	8993265	4.73	1 04/0 04 2 52)	94.7	6194	
413.00 > 169.00		2.623		1.000	4880817		1.84(0.84-2.52)	94.7	18906	
16 Perfluoroher				4 000	0704000	4.05		101	05054	
449.00 > 80.00			-0.005	1.000	8721809	4.95	2.01/1.04.5.02\	104	25354	
449.00 > 99.00		2.629	-0.005	1.000	2290639		3.81(1.94-5.82)	104	21828	
D 18 13C4 PFOS		0.000	0.007		244224/	0.40		100	10110	
503.00 > 80.00			-0.006	1.141	3110246	2.43		102	18449	
20 Perfluoronor										
463.00 > 419.00		2.992		1.000	7021740	5.19		104	19758	
463.00 > 169.00	2.986	2.992	-0.006	1.000	1682836		4.17(1.90-5.69)	104	21808	
D 19 13C5 PFNA										
468.00 > 423.00	2.986	2.992	-0.006	1.141	3273972	2.51		100	27377	
17 Perfluorooct	ane sulf	onic acid	t							
499.00 > 80.00			-0.006	1.000	6686934	4.59		98.9	2518	
499.00 > 99.00	2.986	2.992	-0.006	1.000	1482649		4.51(2.31-6.93)	98.9	3691	
D 21 13C8 FOSA	4									
506.00 > 78.00	3.333	3.338	-0.005	1.274	4414446	2.46		98.2	16915	
22 Perfluorooct	ane Sulf	fonamide	9							
498.00 > 78.00	3.333	3.338	-0.005	1.000	8973330	5.17		103	25588	
25 Sodium 1H,	1H,2H,2	H-perflu	orodecar	ne						
527.00 > 507.00		-		1.000	1941077	5.04		105	31201	
D 26 M2-8:2FTS										
529.00 > 81.00		3.342	-0.002	1.277	757639	2.36		98.7	14043	
D 23 13C2 PFDA		0.0.2	0.002	,	, 6 , 6 6 7	2.00		,		
515.00 > 470.00		3 352	-0.004	1.280	2810507	2.50		99.8	24290	
			-0.004	1.200	2010307	2.50		77.0	24270	
24 Perfluorodeo 513.00 > 469.00			0.005	1 000	5452004	E 10		104	20440	
513.00 > 469.00 513.00 > 169.00		3.353 3.353	-0.005 -0.005	1.000 1.000	5653894 970543	5.18	5.83(2.36-7.09)	104 104	20649 1919	
		ა.ააა	-0.003	1.000	770043		5.65(2.50-7.09)	104	1717	
D 27 d3-NMeFO		2 507	0.007	1 222	1410745	0.50		101	0104	
573.00 > 419.00			-0.007	1.338	1419745	2.53		101	8194	
28 N-methyl pe										
570.00 > 419.00	3.507	3.513	-0.006	1.002	3100803	5.05		101	11526	

Report Date: 18-Jan-2018 08:22:33 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_007.d

Data File.	WCIIIC	Jiliva	acramen	OCHION	Data A6_N\201	00117-3301	9.D(2010.01.17COK	VLLLA_	007.u	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
00 D (I)			. ,	•						
29 Perfluorode				1 000	40/7407	4 77		00.0	2001/	
599.00 > 80.00 599.00 > 99.00	3.664 3.657	3.666 3.666	-0.002 -0.009	1.000 0.998	4067427 1370708	4.77	2.97(1.39-4.16)	99.0 99.0	30816 20723	
		3.000	-0.009	0.990	13/0/06		2.97(1.39-4.10)	99.0	20723	
D 32 d5-NEtFOS		2 / 72	0.001	1 400	1400/05	2.40		00.1	F020	
589.00 > 419.00		3.672	-0.001	1.403	1408625	2.48		99.1	5938	
31 Perfluoroun										
563.00 > 519.00		3.678	-0.007	0.998	4341065	4.84	4.00(0.00.0.00)	96.9	15505	
563.00 > 169.00		3.678	0.002	1.000	889588		4.88(0.00-0.00)	96.9	13858	
33 N-ethyl perf										
584.00 > 419.00	3.680	3.679	0.001	1.002	2837873	5.17		103	11626	
D 30 13C2 PFU										
565.00 > 520.00	3.680	3.679	0.001	1.406	2170924	2.54		102	19601	
D 36 13C2 PFD	οA									
615.00 > 570.00	3.972	3.979	-0.007	1.518	2348326	2.53		101	28264	
37 Perfluorodo	decanoio	c acid								
613.00 > 569.00	3.972	3.979	-0.007	1.000	4798721	4.99		99.7	23913	
613.00 > 169.00	3.972	3.979	-0.007	1.000	1181505		4.06(2.13-6.40)	99.7	19366	
41 Perfluorotrio	decanoic	acid								
663.00 > 619.00		4.242	0.0	1.000	5174158	4.74		94.9	17194	
663.00 > 169.00	4.242	4.242	0.0	1.000	1578141		3.28(1.25-3.76)	94.9	31724	
D 43 13C2-PFT	eDA						, ,			
715.00 > 670.00		4.483	-0.011	1.709	2973878	2.45		98.2	17211	
42 Perfluoroteti										
713.00 > 169.00		4.483	-0.011	1.000	1437735	4.95		99.1	17780	
713.00 > 107.00		4.483	-0.011	1.000	975811	4.73	1.47(0.71-2.13)	99.1	21440	
			0.011	1.000	773011		1.47(0.71 2.10)	77.1	21440	
45 Perfluorohe: 813.00 > 769.00		4.902	-0.008	1.000	10121041	5.03		101	6096	
813.00 > 769.00 813.00 > 169.00		4.902	-0.008	1.000	1702289	5.03	5.95(2.86-8.58)	101	9837	
		4.902	-0.006	1.000	1702209		5.95(2.60-6.56)	101	9037	
D 44 13C2-PFH:		4.000	0.000	1 071	F200F22	0.45		00.0	10100	
815.00 > 770.00		4.902	-0.008	1.871	5288590	2.45		98.0	10188	
46 Perfluorooct										
913.00 > 869.00		5.255	-0.003	1.000	11861271	5.32		106	1851	
913.00 > 169.00	5.245	5.255	-0.010	0.999	1442835		8.22(0.00-0.00)	106	2232	

QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00004 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:33 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 17-Jan-2018 14:58:30 Instrument ID: A8_N Lims ID: IC L6 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 15 Worklist Smp#: 7 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x (0000010° X) X (0000012 (0000012) > 9 **≻**16 0.9 1.5 0.0 1.8 2.4 1.2 1.8 1.0 1.6 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 24 00024 00024 ×20 (35⁻ (30) (30) (30) (25⁻ (20² ×16 _ ≻20 15 2.3 1.7 2.0 0.9 1.2 1.5 2.1 2.4 8.0 1.7 1.1 1.4 1.8 1.1 1.4 2.0 2.3 61 Sodium 1H,1H,2H,2H-perfluorohexan Perfluorohexanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x (0000012 X) > 8 63 00054 ×45 (00020 ×16 **≻**36 27 18 1.2 1.5 1.8 1.7 2.0 0.9 1.5 2.7 2.1 2.4 1.4 2.3 2.6 2.1 1.1 6 Perfluorohexanoic acid 7 13C2 PFHxA 9 13C4-PFHpA Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_> Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> (X100000) (X100000) (X100000) (21- (000018-(215-(000018-(0000018-(0000018-(0000018-(0000018-(000 00012 1000010 X 0 1.3 1.6 1.9 2.2 2.5 2.6 1.7 2.0 2.3 2.6 2.9 1.0 1.1 1.4

2.5

2.8

3.1

3.4

1.8

2.1

2.4

2.7

3.0

3.3

0

1.9

2.2

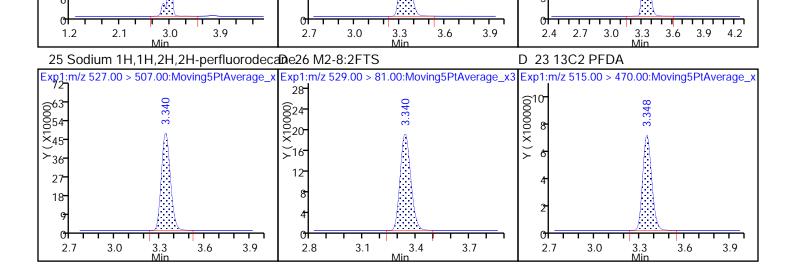
1.8

2.1

2.4

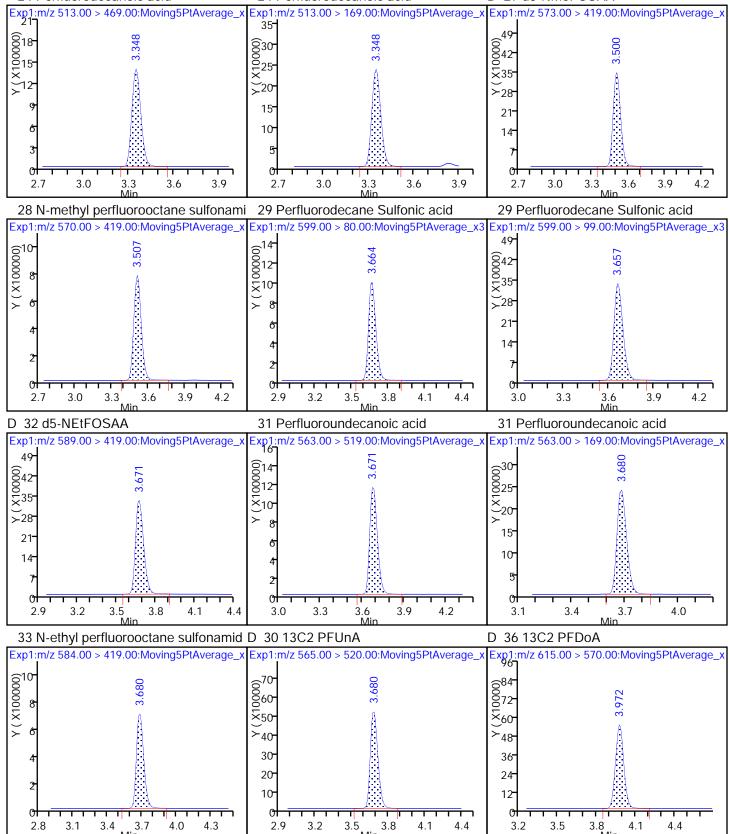
2.7

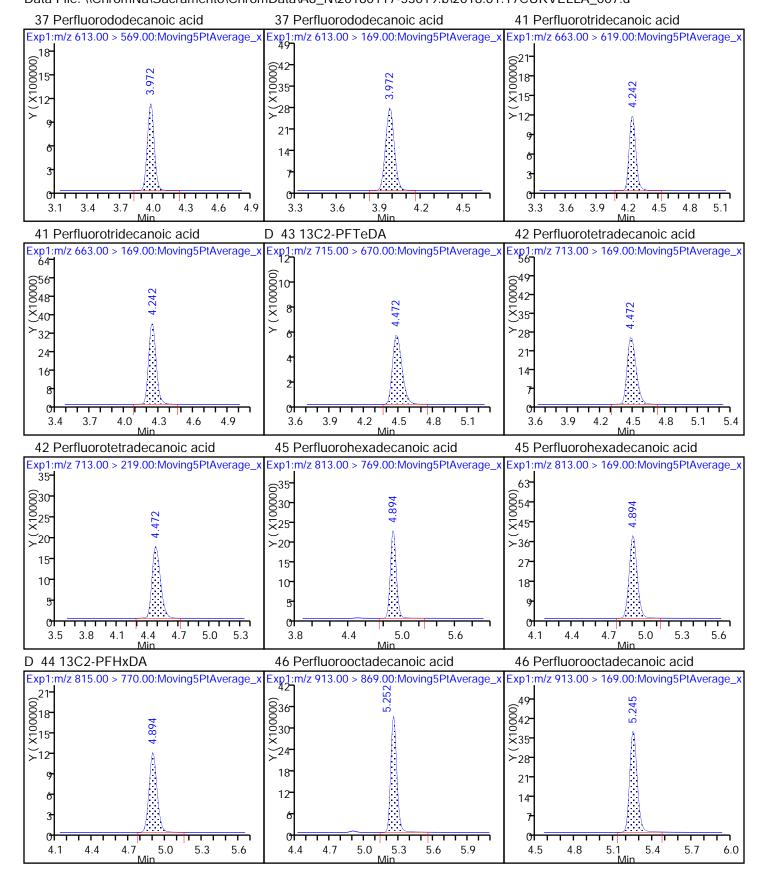
3.0



10

18





Report Date: 18-Jan-2018 08:22:36 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Lims ID: IC L7 Full

Client ID:

Sample Type: IC Calib Level: 7

Inject. Date: 17-Jan-2018 15:06:20 ALS Bottle#: 16 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L7-FULL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 08:22:36 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:53:09

First Level Reviewer. Harringaria						Date.	ı	17-Jan-2016 10.55.0	7		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D .	1 13C4 PFBA										
	7.00 > 172.00		1.411	0.003	0.539	6689622	2.53		101	25243	
2	Perfluorobuty	vric acid									
	2.90 > 169.00	•	1.413	0.001	1.000	24898296	9.96		99.6	2914	
D :	3 13C5-PFPe	Α									
267	7.90 > 223.00	1.663	1.659	0.004	0.634	3854737	2.46		98.3	39369	
4	Perfluoropen	tanoic a	cid								
262	2.90 > 219.00	1.663	1.662	0.001	1.000	17890417	9.85		98.5	15819	
	17 13C3-PFB										
		1.698	1.695	0.003	0.647	81139	2.34		101	2879	
	Perfluorobuta			0.004	4 000	0007050/	0.50		0/.4	04000	
		1.698 1.698	1.697 1.697	0.001 0.001	1.000 1.000	22970596 10302278	8.52	2.23(1.25-3.74)	96.4 96.4	91802 71598	
	1 Sodium 1H,					10302276		2.23(1.23-3.74)	70.4	71370	
	7.00 > 307.00		1.903		1.000	4712009	9.72		104	105462	
	60 M2-4:2FTS		, 00	0.0			7=			.00.02	
	9.00 > 81.00		1.903	0.0	0.725	503558	NC			7017	
D .	7 13C2 PFHx	A									
315	5.00 > 270.00	1.934	1.939	-0.005	0.737	4166297	2.47		98.6	28614	
6	Perfluorohex	anoic ac	cid								
	3.00 > 269.00		1.939	-0.005	1.000	16747455	9.70		97.0	32785	
313	3.00 > 119.00	1.945	1.939	0.006	1.005	1577842		10.61(5.03-15.10)	97.0	24719	
	9 13C4-PFHp										
	7.00 > 322.00		2.267	-0.001	0.864	3856924	2.40		95.9	28210	
) Perfluorohe			0.000	1 000	1/522424	0.75		07.5	0.400.4	
	3.00 > 319.00 3.00 > 169.00		2.268 2.268	-0.002 -0.002	1.000 1.000	16533181 6765479	9.75	2.44(1.13-3.40)	97.5 97.5	24994 26540	
303	7.00 / 107.00	2.200	2.200	-0.002	1.000	0703477		2.44(1.13-3.40)	71.5	20040	

 Report Date: 18-Jan-2018 08:22:36
 Chrom Revision: 2.2 08-Dec-2017 11:41:26

 Data File:
 \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Data File:	\\Cnrc	minasa	acramen		Data A8_N\201	80117-5301	9.b\2018.01.17CUF	KVELLA_	.008.0	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexa	nesulfo	nic acid								
399.00 > 80.00		2.280	-0.001	1.000	18787887	8.69		95.5	22477	
399.00 > 99.00			-0.001	1.000	6654127		2.82(1.50-4.49)	95.5	17895	
D 11 18O2 PFHx	S									
403.00 > 84.00		2.282	-0.003	0.869	4592963	2.32		98.0	23679	
13 Sodium 1H,1	H.2H.2	H-perflu	orooctan	е						
427.00 > 407.00				1.000	4633505	9.66		102	36218	
D 12 M2-6:2FTS										
429.00 > 81.00	2.596	2.597	-0.001	0.990	688126	2.31		97.4	16159	
D 14 13C4 PFOA										
417.00 > 372.00		2.622	0.002	1.000	3781095	2.40		95.9	27005	
* 62 13C2-PFOA	2.02 .	LIGEL	0.002	1.000	0,0,0,0	2.10		70.7	2,000	
415.00 > 370.00	2 624	2.622	0.002		4378689	2.50			31205	
			0.002		4370007	2.30			31203	
15 Perfluoroocta 413.00 > 369.00		2.623	0.001	1.000	17167030	9.68		96.8	11755	
413.00 > 369.00		2.623	0.001	1.000	9348745	9.00	1.84(0.84-2.52)	96.8	27736	
				1.000	7340743		1.04(0.04-2.32)	70.0	27730	
16 Perfluorohep				1 000	1505/747	0.70		100	27702	
449.00 > 80.00 449.00 > 99.00		2.629 2.629	0.002 0.002	1.000 1.000	15956747 4445483	9.69	3.59(1.94-5.82)	102 102	37702 31035	
		2.029	0.002	1.000	4445465		3.39(1.94-3.02)	102	31033	
D 19 13C5 PFNA		2.002	0.001	1 1 1 1	2422770	2.45		00.0	25020	
468.00 > 423.00		2.992	0.001	1.141	3133770	2.45		98.0	25028	
17 Perfluoroocta										
499.00 > 80.00		2.992	0.001	1.000	12870491	9.46	4 40/0 04 / 00)	102	4516	
499.00 > 99.00		2.992	0.001	1.000	2908185		4.43(2.31-6.93)	102	6965	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.141	2906103	2.32		97.0	17739	
20 Perfluoronon	anoic a	cid								
463.00 > 419.00	2.993	2.992	0.001	1.000	12938458	10.0		100	24000	
463.00 > 169.00	2.993	2.992	0.001	1.000	3160977		4.09(1.90-5.69)	100	28300	
22 Perfluoroocta	ne Sulf	onamide	Э							
498.00 > 78.00	3.340	3.338	0.002	1.000	16389523	9.88		98.8	56175	
D 21 13C8 FOSA										
506.00 > 78.00	3.340	3.338	0.002	1.273	4220474	2.39		95.7	28811	
D 26 M2-8:2FTS										
529.00 > 81.00	3.340	3.342	-0.002	1.273	762870	2.43		101	15297	
25 Sodium 1H,1										
527.00 > 507.00		•		1.000	3762460	9.71		101	32197	
D 23 13C2 PFDA		J.J42	0.002	1.000	3702400	7.71		101	32177	
		2 252	0.002	1 270	2704404	2.45		00.0	21712	
515.00 > 470.00		3.352	0.003	1.279	2706406	2.45		98.0	21712	
24 Perfluorodec			0.000	1 000	10701010	40.0		100	05070	
513.00 > 469.00		3.353	0.002	1.000	10721843	10.2	F F2/2 2/ 7 20\	102	25870	
513.00 > 169.00		3.353	0.002	1.000	1943855		5.52(2.36-7.09)	102	1786	
D 27 d3-NMeFOS										
573.00 > 419.00	3.507	3.507	0.0	1.337	1384778	2.51		100	9371	
28 N-methyl per										
570.00 > 419.00	3.515	3.513	0.002	1.002	6179313	10.3		103	14700	

Report Date: 18-Jan-2018 08:22:36 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File:

Data File:	\\Cnrc	mina\5	acrament	.o\Cnrom	Data\A8_N\201	80117-5301	9.D\2018.01.17CUR	VELLA_	.008.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorode	cano Cul	lfonic oc	id							
599.00 > 80.00	3.664	3.666	-0.002	1.000	8022809	10.1		105	36965	
599.00 > 80.00 599.00 > 99.00	3.664	3.666	-0.002	1.000	2594517	10.1	3.09(1.39-4.16)	105	24126	
		3.000	-0.002	1.000	2374317		3.07(1.37-4.10)	103	24120	
D 32 d5-NEtFOS		0 (70	0.001	1 200	1201052	0.04		00.4	2000	
589.00 > 419.00		3.672	-0.001	1.399	1301953	2.34		93.4	3892	
31 Perfluoround										
563.00 > 519.00		3.678	0.002	1.000	8080078	9.91		99.1	27169	
563.00 > 169.00		3.678	0.002	1.000	1670202		4.84(0.00-0.00)	99.1	30795	
D 30 13C2 PFUr										
565.00 > 520.00	3.680	3.679	0.001	1.403	1975688	2.36		94.3	17015	
33 N-ethyl perfl	uoroocta	ane sulfo	onamid							
584.00 > 419.00	3.680	3.679	0.001	1.002	5261873	10.4		104	12712	
37 Perfluorodo	decanoio	c acid								
613.00 > 569.00		3.979	0.002	1.000	9080911	10.2		102	31434	
613.00 > 169.00		3.979	0.002	1.000	2315217		3.92(2.13-6.40)	102	31384	
D 36 13C2 PFD	ηΔ						,			
615.00 > 570.00		3.979	0.002	1.517	2179814	2.40		95.9	17254	
41 Perfluorotrid			0.002		,	2		,	.,_0.	
663.00 > 619.00		4.242	0.0	1.000	9922216	9.80		98.0	37825	
663.00 > 169.00		4.242	0.0	1.000	3182480	7.00	3.12(1.25-3.76)	98.0	41814	
			0.0	1.000	3102400		3.12(1.23-3.70)	70.0	41014	
42 Perfluorotetr			0.002	1 000	2/72440	10.1		101	22000	
713.00 > 169.00		4.483	0.003	1.000	2672440	10.1	1 4/(0 71 0 10)	101	22980	
713.00 > 219.00		4.483	-0.011	0.997	1833873		1.46(0.71-2.13)	101	21207	
D 43 13C2-PFT										
715.00 > 670.00	4.486	4.483	0.003	1.710	2702115	2.27		91.0	11943	
D 44 13C2-PFH	хDА									
815.00 > 770.00	4.903	4.902	0.001	1.869	4770244	2.25		90.1	13892	
45 Perfluorohex	kadecan	oic acid								
813.00 > 769.00	4.903	4.902	0.001	1.000	17956480	9.91		99.1	9344	
813.00 > 169.00	4.903	4.902	0.001	1.000	3254432		5.52(2.86-8.58)	99.1	11679	
46 Perfluorooct	adecano	oic acid								
913.00 > 869.00		5.255	0.005	1.000	20806019	10.3		103	3261	
913.00 > 169.00		5.255	-0.003	0.999	2748135		7.57(0.00-0.00)	103	2966	
							,			

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:36 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 17-Jan-2018 15:06:20 Instrument ID: A8_N Lims ID: IC L7 Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x (0000012 (0000012) (0000012) (X100000) ×35 ≻28 14 1.5 1.2 0.0 0.6 1.8 2.4 0.3 0.9 2.1 0.6 1.8 2.4 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid D 47 13C3-PFBS Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 21 656 6048 042 000 035 618 0015 ×15 ∑₂₈-×40 21 16 1.9 1.6 1.9 2.2 0.9 1.2 1.5 2.1 2.4 1.3 2.5 1.0 1.3 1.8 0.7 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexable 7 13C2 PFHxA Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 28 (X100000) 6 24 _ __16 01 1.7 2.3 1.4 1.7 2.0 2.0 1.1 1.4 2.0 2.3 2.6 1.4 1.7 2.3 2.6 1.1 1.1 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 9 13C4-PFHpA Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> (42⁻ (00036⁻ (×30⁻ 42 (X100000) X30-18 18 12 12 0 0 1.1 1.7 2.3 2.9 0.6 3.0 1.7 2.0 2.3 2.6 2.9 0.5 1.4

Report Date: 18-Jan-2018 08:22:36 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d 10 Perfluoroheptanoic acid 10 Perfluoroheptanoic acid 8 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00:Moving5PtAverage_x Exp1:m/z 363.00 > 169.00:Moving5PtAverage_x Exp1:m/z 399.00 > 80.00:Moving5PtAverage_x3 (42 (00036 ×30 ×30 618 1000015 (00036-30-30-18 18 12 2.2 2.3 2.9 1.0 1.6 2.8 3.4 1.4 1.7 2.0 2.3 2.6 2.9 1.7 3.5 1.1 8 Perfluorohexanesulfonic acid D 11 1802 PFHxS 13 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 399.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3 Exp1:m/z 427.00 > 407.00:Moving5PtAverage_> (0000015 X12 (000012-10-10-10-(00012⁻ 10-10-10-2.4 2.5 1.8 3.0 2.0 2.3 2.9 2.8 1.7 2.6 1.9 3.1 D 12 M2-6:2FTS D 14 13C4 PFOA 62 13C2-PFOA Exp1:m/z 417.00 > 372.00:Moving5PtAverage_) Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x Exp1:m/z 429.00 > 81.00:Moving5PtAverage_x3 21 (X100000) (0012 1000010 X) 0018 ×15 ×12 0 0 2.3 2.9 1.9 2.2 2.5 2.8 2.1 2.4 2.7 3.0 3.3 2.0 2.6 3.2 3.1 3.4 1.8 15 Perfluorooctanoic acid 15 Perfluorooctanoic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x 28 00042 0005 00042 042 036 ×30 ∑16- ∑28- 21 12 18 12

2.6

2.9

3.2

2.2

1.6

2.8

3.4

1.9

2.2

2.8

3.1

3.4

1.7

2.0

3.3

3.6

0

2.7

3.0

2.8

3.1

3.4

3.7

12

2.7

3.0

3.3

3.6

3.9

Report Date: 18-Jan-2018 08:22:36 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x 63 (35⁻ 00030 6⁴² 0054 ×45 ×25 ×30) ≻36 **≻**20 24 27 15 18 18 10 12 3.4 2.5 2.8 3.1 3.7 4.0 2.8 3.1 3.4 3.7 2.7 3.0 3.3 3.6 3.9 4.2 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 (21-(000001x) (21-(00001x) 28 684 672 ×60 ∑16- ≻₄₈ 36 24 12 2.9 3.5 3.7 3.3 3.9 4.2 3.8 3.4 4.0 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_> Exp1:m/z 563.00 > 169.00:Moving5PtAverage_> 42 56 628 6024 6024 X 30 36 0 0 48 ×40 ∑20 ≻16 18 24 12 16 12 0 3.3 3.6 3.9 4.2 3.7 4.3 3.0 2.8 3.1 3.4 4.0 4.6 2.8 3.1 3.4 3.7 4.0 4.3 4.6 D 30 13C2 PFUnA 33 N-ethyl perfluorooctane sulfonamid 37 Perfluorododecanoic acid Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x (000015-X12 030 025 ©60 X50 **≻**40 15 30

20 10

3.0

3.3

3.6

3.9

4.2

2.8

3.1

3.4

3.7

4.0

4.3

4.6

10

3.1

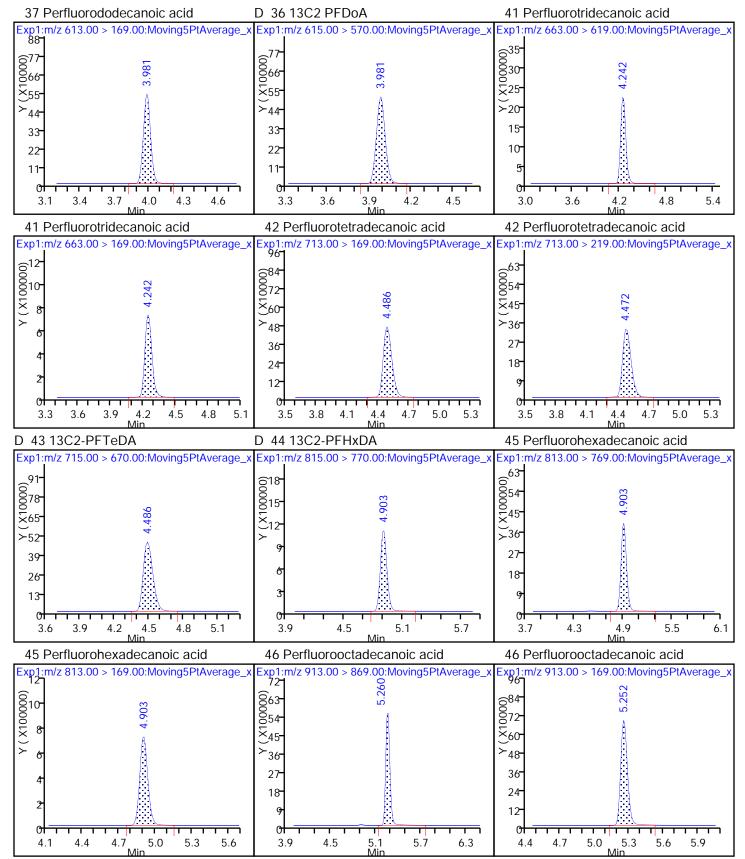
3.4

3.7

4.0

4.3

4.6



FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: ICV 320-204375/10 Calibration Date: 01/17/2018 15:22

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.17CURVELLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9126		2.44	2.50	-2.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.142		2.42	2.50	-3.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	77.17		2.21	2.21	-0.0	25.0
4:2 FTS	AveID	13.89	13.58		2.28	2.34	-2.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9860		2.38	2.50	-4.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.048		2.38	2.50	-4.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.050		2.15	2.28	-5.7	25.0
6:2FTS	AveID	1.655	1.696		2.43	2.38	2.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.068		2.28	2.50	-8.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.417		2.48	2.38	4.6	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	0.9807		2.38	2.50	-5.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.080		2.23	2.31	-3.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9902		2.52	2.50	0.8	25.0
8:2FTS	AveID	1.217	1.281		2.53	2.40	5.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9547		2.46	2.50	-1.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.060		2.45	2.50	-1.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6815		2.51	2.41	4.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9448		2.29	2.50	-8.5	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9541		2.45	2.50	-2.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.024		2.50	2.50	-0.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.075		2.31	2.50	-7.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2434		2.49	2.50	-0.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8997		2.35	2.50	-5.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.176		2.79	2.50	11.6	25.0
13C4 PFBA	Ave	1.512	1.595		2.64	2.50	5.4	50.0
13C5 PFPeA	Ave	0.8956	0.9288		2.59	2.50	3.7	50.0
13C3-PFBS	Ave	0.0198	0.0205		2.40	2.33	3.3	50.0
13C2 PFHxA	Ave	0.9649	1.003		2.60	2.50	3.9	50.0
13C4-PFHpA	Ave	0.9187	0.9576		2.61	2.50	4.2	50.0
1802 PFHxS	Ave	1.131	1.197		2.50	2.37	5.8	50.0
M2-6:2FTS	Ave	0.1699	0.1786		2.50	2.38	5.1	50.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>ICV 320-204375/10</u> Calibration Date: <u>01/17/2018 15:22</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.17CURVELLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9552		2.65	2.50	6.1	50.0
13C4 PFOS	Ave	0.7158	0.7476		2.50	2.39	4.4	50.0
13C5 PFNA	Ave	0.7300	0.7759		2.66	2.50	6.3	50.0
13C8 FOSA	Ave	1.007	1.031		2.56	2.50	2.4	50.0
M2-8:2FTS	Ave	0.1795	0.1774		2.37	2.40	-1.2	50.0
13C2 PFDA	Ave	0.6306	0.6405		2.54	2.50	1.6	50.0
d3-NMeFOSAA	Ave	0.3147	0.3234		2.57	2.50	2.8	50.0
13C2 PFUnA	Ave	0.4783	0.5040		2.63	2.50	5.4	50.0
d5-NEtFOSAA	Ave	0.3182	0.3385		2.66	2.50	6.4	50.0
13C2 PFDoA	Ave	0.5192	0.5336		2.57	2.50	2.8	50.0
13C2-PFTeDA	Ave	0.6785	0.6646		2.45	2.50	-2.0	50.0
13C2-PFHxDA	Ave	1.209	1.217		2.52	2.50	0.7	50.0

Report Date: 18-Jan-2018 08:23:31 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_010.d

Lims ID: ICV Full

Client ID:

Sample Type: ICV

Inject. Date: 17-Jan-2018 15:22:01 ALS Bottle#: 18 Worklist Smp#: 10

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: ICV

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist:

Method: \ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 08:23:30 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:51:39

First Level Reviewer: nannigana					Date:	l	7-Jan-2018 16:51:3	9		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00		1.411	0.003	0.540	7421777	2.64		105	23515	
2 Perfluorobuty 212.90 > 169.00	•	1.413	0.001	1.000	6773367	2.44			794	
D 3 13C5-PFPe										
267.90 > 223.00	1.663	1.659	0.004	0.635	4322669	2.59		104	113476	
4 Perfluoropen			0.001	1 000	4020202	0.40			4007	
262.90 > 219.00 D 47 13C3-PFBS		1.662	0.001	1.000	4938303	2.42			4287	
	1.698	1.695	0.003	0.649	88661	2.40		103	2674	
5 Perfluorobuta	anesulfo	nic acid								
	1.698 1.698	1.697 1.697	0.001 0.001	1.000 1.000	6510885 2658603	2.21	2 45(1 25 2 74)		47787 20037	
D 60 M2-4:2FTS		1.097	0.001	1.000	2008003		2.45(1.25-3.74)		20037	
	1.903	1.903	0.0	0.727	555125	NC			6666	
61 Sodium 1H,										
327.00 > 307.00		1.903	0.0	1.000	1210129	2.28			43190	
6 Perfluorohex 313.00 > 269.00		id 1.939	0.005	1.000	4601877	2.38			10910	
313.00 > 119.00		1.939	0.005	1.000	426995	2.00	10.78(5.03-15.10)		6641	
D 7 13C2 PFHx										
315.00 > 270.00		1.939	0.005	0.743	4667197	2.60		104	38991	
D 9 13C4-PFHp 367.00 > 322.00		2.267	-0.001	0.866	4456653	2.61		104	25881	
10 Perfluoroher			0.001	0.000	440000	2.01		104	25001	
363.00 > 319.00	2.266	2.268	-0.002	1.000	4669591	2.38			10337	
363.00 > 169.00	2.266	2.268	-0.002	1.000	1879500		2.48(1.13-3.40)		13339	

Report Date: 18-Jan-2018 08:23:31 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_010.d

Data File:	\\Chr	omNa\S	acrament	to\Chrom	iData\A8_N\201	80117-5301	9.b\2018.01.17CUF	RVELLA_	<u>.</u> 010.d	
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohex	anosulfo	onic acio	ı							
399.00 > 80.00			ı -0.001	1.000	5333976	2.15			12311	
399.00 > 99.00		2.280		1.000	1743366	2.13	3.06(1.50-4.49)		8734	
		2.200	0.001	1.000	1743300		3.00(1.00 4.47)		0754	
D 11 18O2 PFH: 403.00 > 84.00		2 202	-0.003	0.871	5269906	2.50		106	31626	
					3209900	2.50		100	31020	
13 Sodium 1H,		•			1220025	0.40			10477	
427.00 > 407.00		2.596	0.0	1.000	1338935	2.43			18477	
D 12 M2-6:2FTS										
429.00 > 81.00	2.596	2.597	-0.001	0.992	789680	2.50		105	18411	
* 62 13C2-PFOA	4									
415.00 > 370.00	2.616	2.622	-0.006		4654102	2.50			23149	
D 14 13C4 PFO	Α									
417.00 > 372.00	2.616	2.622	-0.006	1.000	4445719	2.65		106	34079	
15 Perfluorooct	anoic ac	cid								
413.00 > 369.00		2.623	-0.007	1.000	4746472	2.28			3473	
413.00 > 169.00			-0.007	1.000	2488390		1.91(0.84-2.52)		11918	
16 Perfluorohe							,			
449.00 > 80.00	•	2.629		1.000	4682456	2.48			25730	
449.00 > 99.00			-0.005	1.000	1243527	2.40	3.77(1.94-5.82)		18997	
		2.027	0.000	1.000	12 10027		0.77(1.71 0.02)		10777	
D 18 13C4 PFO: 503.00 > 80.00		2 002	-0.006	1 1 1 1	3326395	2.50		104	21730	
			-0.006	1.141	3320393	2.50		104	21/30	
20 Perfluorono			0.007	4 000	0544405	0.00			44500	
463.00 > 419.00			-0.006	1.000	3541195	2.38	4.40(4.00 5.40)		11503	
463.00 > 169.00		2.992	-0.006	1.000	857998		4.13(1.90-5.69)		14234	
D 19 13C5 PFN										
468.00 > 423.00	2.986	2.992	-0.006	1.141	3610875	2.66		106	30265	
17 Perfluorooct	ane sulf	onic aci	d							
499.00 > 80.00	2.986	2.992	-0.006	1.000	3478480	2.23			1303	
499.00 > 99.00	2.986	2.992	-0.006	1.000	776619		4.48(2.31-6.93)		1713	
D 21 13C8 FOS	A									
506.00 > 78.00		3.338	-0.005	1.274	4798887	2.56		102	18825	
22 Perfluorooct										
498.00 > 78.00		3.338		1.000	4751952	2.52			20022	
					4731732	2.52			20022	
25 Sodium 1H,		•			1015315	2.52			20240	
527.00 > 507.00		3.342	-0.002	1.000	1015315	2.53			30248	
D 26 M2-8:2FTS										
529.00 > 81.00	3.340	3.342	-0.002	1.277	791062	2.37		98.8	19021	
D 23 13C2 PFD	Д									
515.00 > 470.00	3.348	3.352	-0.004	1.279	2981067	2.54		102	25621	
24 Perfluorode	canoic a	cid								
513.00 > 469.00		3.353	-0.005	1.000	2846152	2.46			9690	
513.00 > 169.00			-0.005	1.000	478669		5.95(2.36-7.09)		11554	
D 27 d3-NMeFO							, , ,			
573.00 > 419.00		3 507	-0.007	1.338	1505033	2.57		103	10745	
				1.330	1000000	2.01		103	10743	
28 N-methyl pe				1 000	1504/04	0.45			(000	
570.00 > 419.00	3.507	3.513	-0.006	1.002	1594621	2.45			6933	

Report Date: 18-Jan-2018 08:23:31 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_010.d

Data File. //Ciliotiliva/Saciamento/Cilio					Data Ao_N\201	00117-3301	7.D/2010.01.17COK	VLLLA_	010.u	
		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodeo	cane Sul	lfonic ac	id							
599.00 > 80.00	3.664	3.666	-0.002	1.000	2288360	2.51			17426	
599.00 > 99.00	3.657	3.666	-0.009	0.998	746470		3.07(1.39-4.16)		13014	
D 32 d5-NEtFOS										
589.00 > 419.00		3.672	-0.001	1.403	1575202	2.66		106	6109	
31 Perfluoround										
563.00 > 519.00 563.00 > 169.00		3.678 3.678	-0.007 0.002	1.000 1.002	2216145 476831	2.29	4.65(0.00-0.00)		8195 10543	
				1.002	4/0831		4.65(0.00-0.00)		10543	
33 N-ethyl perfl 584.00 > 419.00		3.679	0.001	1.002	1502830	2.45			13272	
D 30 13C2 PFUr		3.077	0.001	1.002	1302030	2.40			13272	
565.00 > 520.00		3.679	-0.008	1.403	2345720	2.63		105	21260	
D 36 13C2 PFD										
615.00 > 570.00		3.979	-0.007	1.518	2483513	2.57		103	22479	
37 Perfluorodo	decanoio	c acid								
613.00 > 569.00		3.979	0.002	1.002	2542144	2.50			11937	
613.00 > 169.00	3.972	3.979	-0.007	1.000	627983		4.05(2.13-6.40)		12905	
41 Perfluorotrid										
663.00 > 619.00		4.242	0.0	1.000	2670293	2.31			9715	
663.00 > 169.00		4.242	0.0	1.000	815601		3.27(1.25-3.76)		15155	
D 43 13C2-PFT6		4 400	0.000	1 715	2002101	0.45		00.0	15/00	
715.00 > 670.00		4.483	0.003	1.715	3093191	2.45		98.0	15682	
42 Perfluorotetr			0.002	1 000	752725	2.40			100/0	
713.00 > 169.00 713.00 > 219.00		4.483 4.483	0.003	1.000 0.997	752735 479119	2.49	1.57(0.71-2.13)		10868 10469	
45 Perfluorohe			-0.011	0.777	477117		1.37(0.71-2.13)		10407	
813.00 > 769.00		4.902	0.001	1.000	5096341	2.35			2824	
813.00 > 169.00		4.902	0.001	1.000	877298	2.00	5.81(2.86-8.58)		6676	
D 44 13C2-PFH)							,			
815.00 > 770.00		4.902	0.001	1.874	5664702	2.52		101	13090	
46 Perfluorooct	adecano	oic acid								
913.00 > 869.00		5.255	-0.003	1.000	6663291	2.79			1323	
913.00 > 169.00	5.252	5.255	-0.003	1.000	773529		8.61(0.00-0.00)		1859	

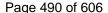
QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00009 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 08-Dec-2017 11:41:26 Report Date: 18-Jan-2018 08:23:31 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_010.d Data File: **Injection Date:** 17-Jan-2018 15:22:01 Instrument ID: A8_N Lims ID: ICV Full Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 10 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x (18⁻ (0000015⁻ X12⁻ (0000012 X) X (X100000) 0.7 1.3 1.9 2.5 1.0 1.9 0.0 0.9 0.7 1.3 1.6 1.8 2.7 D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 (18-(0000015-(12-24 (0000012 X) X <u>8</u>20 ×16-2.4 1.2 1.5 1.8 2.1 2.4 0.9 1.2 1.5 2.1 8.0 1.1 1.7 2.3 1.8 1.4 2.0 61 Sodium 1H,1H,2H,2H-perfluorohexan 6 Perfluorohexanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x (X100000) (0060 X50 >40 30 10 20 1.2 1.5 1.8 2.1 1.7 2.0 1.2 1.8 2.4 2.4 1.4 2.3 2.6 0.6 3.0 1.1 6 Perfluorohexanoic acid 7 13C2 PFHxA 9 13C4-PFHpA Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_> Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> Y (X10000) (X100000) (X100000) (X100000) (X100000) (X100000) (X100000) 1.3 1.6 1.9 2.2 2.5 1.0 1.3 1.6 1.9 2.2 Page 489hof 606 1.7 2.0 2.3 2.6 2.9 1.0 2.5 1.4



11

1.8

2.1

2.4

2.7

3.0

3.3

1.8

2.1

2.4

2.7

3.0

3.3

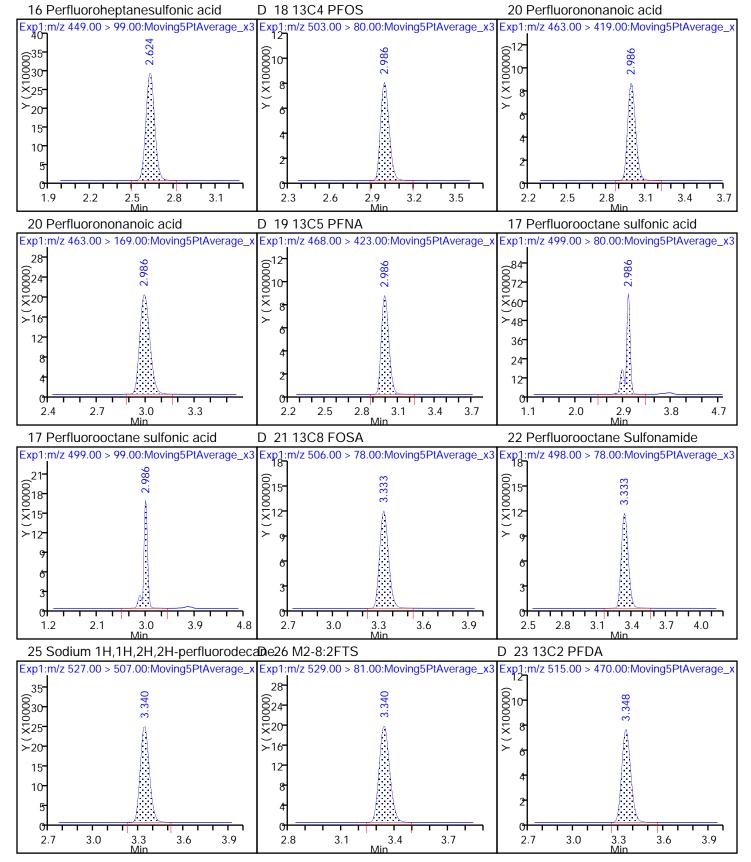
1.8

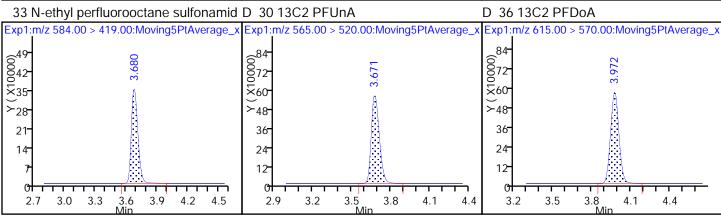
2.1

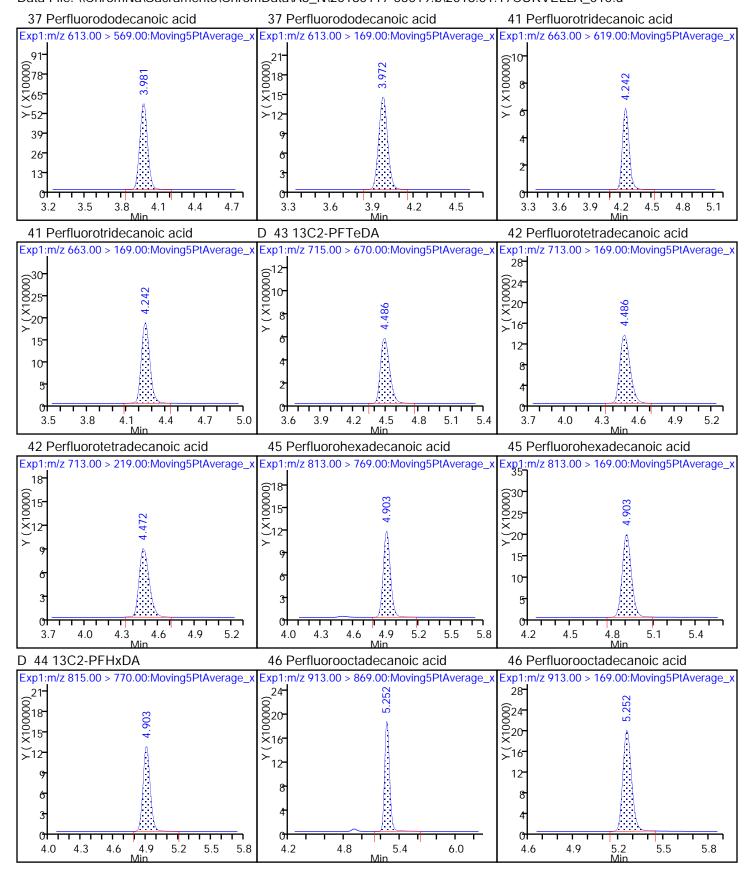
2.4

2.7

3.0







FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCVL 320-204504/1</u> Calibration Date: <u>01/18/2018</u> 10:35

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLC_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9343	0.8680		0.0465	0.0500	-7.1	50.0
(PFBA) Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.222		0.0519	0.0500	3.7	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	74.95		0.0429	0.0442	-2.9	50.0
4:2 FTS	AveID	13.89	11.20		0.377	0.467	-19.4	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9268		0.0447	0.0500	-10.6	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.051		0.0478	0.0500	-4.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.174		0.0480	0.0455	5.5	50.0
6:2FTS	AveID	1.655	2.071		0.593	0.474	25.1	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.097		0.0468	0.0500	-6.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.210		0.0425	0.0476	-10.7	50.0
Perfluorononanoic acid (PFNA)	AveID	1.032	0.9026		0.0437	0.0500	-12.6	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.101		0.0456	0.0464	-1.7	50.0
8:2FTS	AveID	1.217	1.092		0.430	0.479	-10.3	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9336		0.0475	0.0500	-5.0	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9508		0.0490	0.0500	-2.0	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	0.999		0.462	0.500	-7.6	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6052		0.0445	0.0482	-7.6	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.8778		0.451	0.500	-9.9	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	1.065		0.0516	0.0500	3.2	50.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.080		0.0527	0.0500	5.4	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.176		0.0506	0.0500	1.3	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2516		0.0516	0.0500	3.1	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.286		0.0485	0.0500	-2.9	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.060		0.0503	0.0500	0.6	50.0
13C4 PFBA	Ave	1.512	1.533		2.53	2.50	1.4	50.0
13C5 PFPeA	Ave	0.8956	0.9106		2.54	2.50	1.7	50.0
13C3-PFBS	Ave	0.0198	0.0203		2.38	2.33	2.5	50.0
13C2 PFHxA	Ave	0.9649	0.9886		2.56	2.50	2.5	50.0
13C4-PFHpA	Ave	0.9187	0.9411		2.56	2.50	2.4	50.0
1802 PFHxS	Ave	1.131	1.139		2.38	2.37	0.7	50.0
M2-6:2FTS	Ave	0.1699	0.1579		2.21	2.38	-7.0	50.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCVL 320-204504/1</u> Calibration Date: <u>01/18/2018</u> 10:35

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLC_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9370		2.60	2.50	4.1	50.0
13C4 PFOS	Ave	0.7158	0.7233		2.42	2.39	1.1	50.0
13C5 PFNA	Ave	0.7300	0.7351		2.52	2.50	0.7	50.0
M2-8:2FTS	Ave	0.1795	0.1584		2.11	2.40	-11.8	50.0
13C2 PFDA	Ave	0.6306	0.6236		2.47	2.50	-1.1	50.0
13C8 FOSA	Ave	1.007	1.020		2.53	2.50	1.4	50.0
d3-NMeFOSAA	Ave	0.3147	0.2736		2.17	2.50	-13.0	50.0
d5-NEtFOSAA	Ave	0.3182	0.3117		2.45	2.50	-2.1	50.0
13C2 PFUnA	Ave	0.4783	0.5095		2.66	2.50	6.5	50.0
13C2 PFDoA	Ave	0.5192	0.4589		2.21	2.50	-11.6	50.0
13C2-PFTeDA	Ave	0.6785	0.5997		2.21	2.50	-11.6	50.0
13C2-PFHxDA	Ave	1.209	1.028		2.13	2.50	-15.0	50.0

Report Date: 18-Jan-2018 12:27:57 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d

Lims ID: CCVL

Client ID:

Sample Type: CCVL

Inject. Date: 18-Jan-2018 10:35:15 ALS Bottle#: 21 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCVL

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Jan-2018 12:27:57 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK005

First Level Reviewer: roycea Date: 18-Jan-2018 12:26:54

First Level Reviewer: roycea					Date:	l	8-Jan-2018 12:26:5	4		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA										
217.00 > 172.00 2 Perfluorobut		1.411	-0.003	0.539	7360257	2.53		101	21443	
212.90 > 169.00	,	1.413	-0.005	1.000	127770	0.0465		92.9	13.0	
D 3 13C5-PFPe 267.90 > 223.00		1.659	-0.005	0.634	4371376	2.54		102	35500	
4 Perfluoroper			-0.003	0.034	4371370	2.54		102	33300	
262.90 > 219.00		1.662	-0.008	1.000	106841	0.0519		104	165	
D 47 13C3-PFB3 301.90 > 83.00	S 1.689	1.695	-0.006	0.647	90722	2.38		103	4197	
5 Perfluorobut										
	1.689 1.689	1.697 1.697	-0.008 -0.008	1.000 1.000	129264 55275	0.0429	2.34(1.25-3.74)	97.1	1056 591	
61 Sodium 1H,	1H,2H,2	•	orohexar				,			
327.00 > 307.00 D 60 M2-4:2FTS		1.903	-0.010	1.000	204164	0.3766		80.6	9274	
329.00 > 81.00		1.903	-0.010	0.726	478409	NC			5453	
D 7 13C2 PFHx		1 020	0.005	0.741	474/044	2.57		100	20000	
315.00 > 270.00 6 Perfluorohex		1.939 cid	-0.005	0.741	4746044	2.56		102	30099	M
313.00 > 269.00	1.934	1.939	-0.005	1.000	87975	0.0447	0 (7/5 00 45 40)	89.4	132	M
313.00 > 119.00 D 9 13C4-PFHp		1.939	-0.015	0.995	10152		8.67(5.03-15.10)		134	
367.00 > 322.00		2.267	-0.014	0.863	4517918	2.56		102	26618	
10 Perfluorohe 363.00 > 319.00		acid 2.268	-0.015	1.000	94986	0.0478		95.7	209	
363.00 > 314.00 363.00 > 169.00		2.268	-0.015	1.000	32992	0.0470	2.88(1.13-3.40)	75.1	260	

 Report Date: 18-Jan-2018 12:27:57
 Chrom Revision: 2.2 08-Dec-2017 11:41:26

 Data File:
 \\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d

Data File:	\\Cnrc	mivassa	acrament	.o\Cnrom	Data\A8_IN\201	80118-5305	6.D\2018.01.18LLC	_004.a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00		2.280	0.014	1.000	116896	0.0480		105	572	
399.00 > 99.00		2.280		1.000	38946	0.0460	3.00(1.50-4.49)	103	380	
		2.200	-0.014	1.000	30740		3.00(1.30-4.47)		300	
D 11 18O2 PFHx		2 202	0.017	0.070	F172022	2.20		101	2/22/	
403.00 > 84.00		2.282		0.868	5173832	2.38		101	36326	
13 Sodium 1H,1		•			007700	0.5004		405	(075	
427.00 > 407.00	2.582	2.596	-0.014	1.000	297720	0.5931		125	6375	
D 12 M2-6:2FTS										
429.00 > 81.00	2.582	2.597	-0.015	0.990	720315	2.21		93.0	16655	
D 14 13C4 PFOA	١									
417.00 > 372.00	2.609	2.622	-0.013	1.000	4498527	2.60		104	22701	
* 62 13C2-PFOA										
415.00 > 370.00	2.609	2.622	-0.013		4800773	2.50			26842	
15 Perfluoroocta										
413.00 > 369.00			-0.014	1.000	98655	0.0468		93.6	255	
413.00 > 169.00		2.623		1.000	50917	0.0100	1.94(0.84-2.52)	70.0	455	
				1.000	00717		1.71(0.012.02)		100	
16 Perfluorohep 449.00 > 80.00		2.629		1.000	79990	0.0425		89.3	1712	
449.00 > 80.00 449.00 > 99.00		2.629		1.000	24126	0.0423	3.32(1.94-5.82)	09.3	963	
		2.027	-0.013	1.000	24120		3.32(1.74-3.02)		703	
D 19 13C5 PFNA		0.000	0.014	1 1 1 1	252222	0.50		101	20005	
468.00 > 423.00		2.992		1.141	3528888	2.52		101	28005	
17 Perfluoroocta										M
499.00 > 80.00			-0.014	1.000	70946	0.0456		98.3	23.4	M
499.00 > 99.00	2.978	2.992	-0.014	1.000	14423		4.92(2.31-6.93)		26.5	
D 18 13C4 PFOS	•									
503.00 > 80.00	2.978	2.992	-0.014	1.141	3319726	2.42		101	22735	
20 Perfluoronon	anoic a	cid								
463.00 > 419.00		2.992	-0.014	1.000	63705	0.0437		87.4	424	
463.00 > 169.00			-0.014	1.000	15917		4.00(1.90-5.69)		395	
22 Perfluoroocta			2				,			
498.00 > 78.00		3.338		1.000	91471	0.0475		95.0	2488	
		5.550	0.000	1.000	71771	0.0470		75.0	2 100	
D 21 13C8 FOSA		2 220	0.007	1 277	4000070	2 52		101	22357	
506.00 > 78.00	3.332	3.338	-0.006	1.277	4898879	2.53		101	22357	
D 26 M2-8:2FTS										
529.00 > 81.00	3.325	3.342	-0.017	1.274	728368	2.11		88.2	13690	
25 Sodium 1H,1	H,2H,2	H-perflu	orodecar	ne						
527.00 > 507.00	3.325	3.342	-0.017	1.000	159107	0.4299		89.7	6383	
D 23 13C2 PFDA										
515.00 > 470.00		3.352	-0.020	1.277	2993725	2.47		98.9	21979	
24 Perfluorodec			-			•			-	
513.00 > 469.00			-0.013	1.002	56931	0.0490		98.0	603	
513.00 > 469.00			-0.013	1.002	9996	0.0470	5.70(2.36-7.09)	70.0	414	
		5.555	-0.013	1.002	7770		J. 10(2.JU-1.U7)		714	
D 27 d3-NMeFOS		0.507	0.045	1 000	1010/00	0.47		07.0	04.04	
573.00 > 419.00		3.507		1.338	1313632	2.17		87.0	9131	
28 N-methyl per										
570.00 > 419.00	3.500	3.513	-0.013	1.002	262367	0.4622		92.4	1939	

Report Date: 18-Jan-2018 12:27:57 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File:	\\ChromNa\Sacramento\ChromData	3_N\2	20180118-530	56.b\2	2018.01	.18LLC_	004.d

Bata i no.	110111	OIIII Va IOI	doramon		Bata (10_1120 1	00110 0000	0.612010:01:10220_	_00a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.650 3.666 -0.016 1.000 40519 0.0445 92.4 1728										
599.00 > 80.00			-0.016	1.000	12575	0.0443	3.22(1.39-4.16)	92.4	1038	
D 32 d5-NEtF		3.000	0.010	1.000	12373		3.22(1.37 4.10)		1000	
589.00 > 419.0		3.672	-0.015	1.402	1496378	2.45		97.9	4895	
31 Perfluoroundecanoic acid										
563.00 > 519.0		3.678	-0.015	1.000	52088	0.0516		103	536	
563.00 > 169.0	3.663	3.678	-0.015	1.000	9676		5.38(0.00-0.00)		544	
	D 30 13C2 PFUnA									
565.00 > 520.0	3.663	3.679	-0.016	1.404	2445844	2.66		107	31426	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.0	00 3.663	3.679	-0.016	1.002	262691	0.4507		90.1	4887	
37 Perfluoro										
613.00 > 569.0		3.979		1.000	47586	0.0527	4.04/0.40 (40)	105	374	
613.00 > 169.0		3.979	-0.015	1.000	11040		4.31(2.13-6.40)		620	
D 36 13C2 PF		2.070	0.015	1 510	2202122	2.21		00.4	01447	
615.00 > 570.0		3.979	-0.015	1.519	2203122	2.21		88.4	21446	
41 Perfluorotridecanoic acid 663.00 > 619.00 4.224 4.242 -0.018 1.000 51826 0.0506 101 508										
663.00 > 619.0			-0.018	1.000 1.000	51826 16421	0.0506	3.16(1.25-3.76)	101	508 913	
			-0.016	1.000	10421		3.10(1.25-3.70)		913	
42 Perfluorotetradecanoic acid 713.00 > 169.00 4.461 4.483 -0.022 1.000 14488 0.0516 103 657										
713.00 > 107.0			-0.022	1.000	9083	0.0310	1.60(0.71-2.13)	103	425	
D 43 13C2-PF			0.022	1.000	7000		1.00(0.71 2.10)		120	
715.00 > 670.0		4.483	-0.022	1.710	2879132	2.21		88.4	21511	
D 44 13C2-PF										
815.00 > 770.0		4.902	-0.025	1.869	4935395	2.13		85.0	11935	
45 Perfluorohexadecanoic acid										
813.00 > 769.0			-0.025	1.000	126962	0.0485		97.1	227	
813.00 > 169.0		4.902	-0.025	1.000	22719		5.59(2.86-8.58)		817	
46 Perfluorooctadecanoic acid										
913.00 > 869.		5.255	-0.024	1.000	104619	0.0503		101	44.2	
913.00 > 169.0	00 5.231	5.255	-0.024	1.000	12490		8.38(0.00-0.00)		292	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_CCVL_00002 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 12:27:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 18-Jan-2018 10:35:15 Instrument ID: A8_N Lims ID: **CCVL** Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: A8_N Limit Group: LC PFC_DOD ICAL D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 35 (0000010° X) X (0000015 X) > 9 (30⁻ 0025-× ∑20⁻ 15- 10 0.7 1.3 1.9 2.5 0.9 1.2 1.5 1.8 0.5 1.1 1.7 2.3 4 Perfluoropentanoic acid D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 35 24 6 24 630 ×25 ∑₁₆-12 15 10 1.2 2.4 1.4 1.7 2.0 0.9 1.5 1.8 2.1 1.7 1.1 1.4 2.0 2.3 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x 56**1** Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 15 (00040 × ×)32 (00012 ×) × 24 16 1.4 1.7 2.0 1.5 1.8 0.9 1.5 2.1 2.7 1.2 2.1 2.4 1.1 6 Perfluorohexanoic acid (M) 6 Perfluorohexanoic acid 9 13C4-PFHpA Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_3 Exp1:m/z 313.00 > 119.00:Moving5PtAverage_ 28 24 0014 000012 X10 <u>8</u>20 6 20 × ∑₁₆ _ _16- 12 0 0 2.5 1.3 1.6 1.9 2.2 Page 500hof 606 1.6 1.9 2.2 1.0 2.5 1.7 2.0 2.3 2.6 2.9 1.3 1.4

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 18-Jan-2018 12:27:58

3.4

3.7

2.6

2.9

3.5

3.8

2.8

3.1

3.4

3.7

2.8

Report Date: 18-Jan-2018 12:27:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 169.00:Moving5PtAverage_x Exp1:m/z 573.00 > 419.00:Moving5PtAverage_x Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x (000LX) X) 12-≻20 15 18 10 12 2.9 3.2 3.5 2.9 3.2 3.5 2.8 3.1 3.4 3.7 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 7 (X10000) 49 (000 LX) × (000 LX) 6 8 35 <u></u>∠28 21 14 3.5 3.5 3.5 3.2 3.8 3.8 3.2 3.8 4.1 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x Exp1:m/z 563.00 > 169.00:Moving5PtAverage_> 49 18 36**-**0042 ×35 © 15 <u>§</u>30 ≻28 18 21 12 0 3.2 3.8 3.2 3.5 3.8 3.5 3.5 4.1 4.4 4.1 3.2 3.8 4.1 D 30 13C2 PFUnA 37 Perfluorododecanoic acid 33 N-ethyl perfluorooctane sulfonamid Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x 91 ©72 ×60 65-65-€ (00015 12 12 (00015) -52 ≻48 39 36 26 24 12 13

3.7

4.0

3.4

3.7

4.0

4.3

3.4

3.1

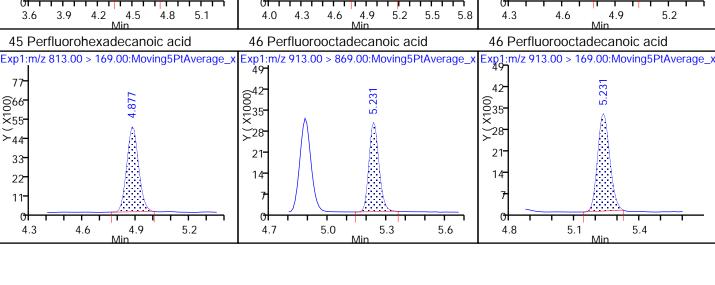
3.1

2.8

3.4

3.7

4.0



Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 18-Jan-2018 12:27:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d

Injection Date: 18-Jan-2018 10:35:15 Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

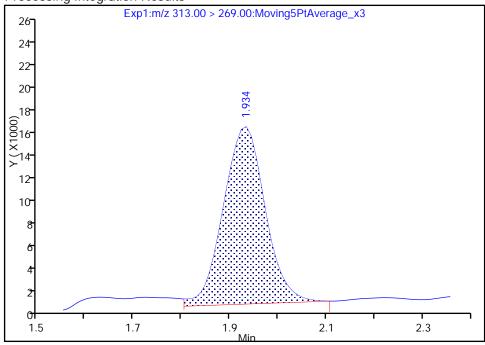
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

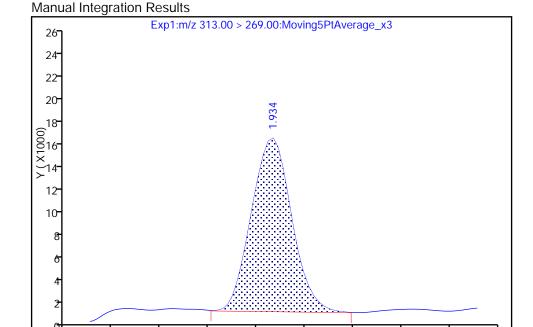
6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

RT: 1.93 Area: 93115 Amount: 0.047324 Amount Units: ng/ml **Processing Integration Results**



RT: 1.93
Area: 87975
Amount: 0.044711
Amount Units: ng/ml



Reviewer: roycea, 18-Jan-2018 12:26:12

Audit Action: Manually Integrated

Audit Reason: Baseline

1.9

2.1

2.3

Page 506 of 606

1.7

Report Date: 18-Jan-2018 12:27:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d

Injection Date: 18-Jan-2018 10:35:15 Instrument ID: $A8_N$

Lims ID: **CCVL**

Client ID:

SACINSTLCMS01 ALS Bottle#: Worklist Smp#: Operator ID: 21 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

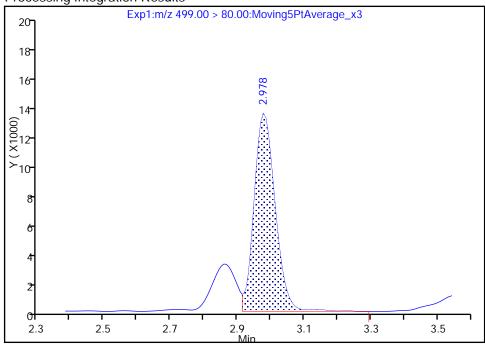
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

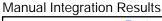
Signal: 1

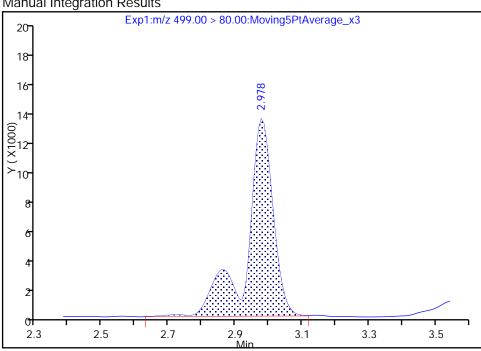
RT: 2.98 Area: 56780 Amount: 0.036518 Amount Units: ng/ml

Processing Integration Results



RT: 2.98 Area: 70946 Amount: 0.045628 Amount Units: ng/ml





Reviewer: roycea, 18-Jan-2018 12:25:43

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 507 of 606

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCV 320-204556/1</u> Calibration Date: <u>01/18/2018 17:29</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9343	0.9484		2.54	2.50	1.5	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.174		2.49	2.50	-0.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	79.55		2.28	2.21	3.0	25.0
4:2 FTS	AveID	13.89	14.13		2.37	2.34	1.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	1.012		2.44	2.50	-2.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.077		2.45	2.50	-2.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.061		2.17	2.28	-4.7	25.0
6:2FTS	AveID	1.655	1.894		2.71	2.37	14.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.128		2.41	2.50	-3.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.385		2.43	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.067		2.59	2.50	3.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.085		2.25	2.32	-3.1	25.0
8:2FTS	AveID	1.217	1.220		2.40	2.40	0.3	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.032		2.63	2.50	5.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	1.040		2.68	2.50	7.2	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.072		2.48	2.50	-0.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.7010		2.58	2.41	7.0	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9922		2.55	2.50	1.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9827		2.38	2.50	-4.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.068		2.61	2.50	4.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.061		2.28	2.50	-8.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2430		2.49	2.50	-0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.997		2.61	2.50	4.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.138		2.70	2.50	8.0	25.0
13C4 PFBA	Ave	1.512	1.473		2.43	2.50	-2.6	50.0
13C5 PFPeA	Ave	0.8956	0.8673		2.42	2.50	-3.2	50.0
13C3-PFBS	Ave	0.0198	0.0190		2.23	2.33	-4.1	50.0
13C2 PFHxA	Ave	0.9649	0.9571		2.48	2.50	-0.8	50.0
13C4-PFHpA	Ave	0.9187	0.8903		2.42	2.50	-3.1	50.0
1802 PFHxS	Ave	1.131	1.094		2.29	2.37	-3.2	50.0
M2-6:2FTS	Ave	0.1699	0.1631		2.28	2.38	-4.0	50.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/1 Calibration Date: 01/18/2018 17:29

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8903		2.47	2.50	-1.1	50.0
13C4 PFOS	Ave	0.7158	0.7093		2.37	2.39	-0.9	50.0
13C5 PFNA	Ave	0.7300	0.7224		2.47	2.50	-1.0	50.0
13C8 FOSA	Ave	1.007	0.9258		2.30	2.50	-8.0	50.0
M2-8:2FTS	Ave	0.1795	0.1776		2.37	2.40	-1.1	50.0
13C2 PFDA	Ave	0.6306	0.5911		2.34	2.50	-6.3	50.0
d3-NMeFOSAA	Ave	0.3147	0.3029		2.41	2.50	-3.7	50.0
d5-NEtFOSAA	Ave	0.3182	0.3070		2.41	2.50	-3.5	50.0
13C2 PFUnA	Ave	0.4783	0.4751		2.48	2.50	-0.7	50.0
13C2 PFDoA	Ave	0.5192	0.4848		2.33	2.50	-6.6	50.0
13C2-PFTeDA	Ave	0.6785	0.6259		2.31	2.50	-7.8	50.0
13C2-PFHxDA	Ave	1.209	0.9925		2.05	2.50	-17.9	50.0

Report Date: 19-Jan-2018 15:50:54 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_001.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 18-Jan-2018 17:29:51 ALS Bottle#: 14 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:46:02

<u> </u>	First Level Reviewer: roycea					Date:	9-Jan-2018 15:46:0	Jan-2018 15:46:02			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 113C4 PFBA 217.00 > 172.00		1.411	-0.003	0.539	7215270	2.43		97.4	16546	
•	2 Perfluorobut			-0.003	0.557	7213270	2.43		77.4	10340	
2	212.90 > 169.00	,	1.413	0.001	1.004	6842720	2.54		102	899	
	0 3 13C5-PFPe 267.90 > 223.00		1.659	0.002	0.636	4248720	2.42		96.8	52251	
	207.90 > 223.00 4 Perfluoropen			0.002	0.030	4240720	2.42		90.0	32231	
:	262.90 > 219.00			-0.001	1.000	4987158	2.49		99.6	5051	
	0 47 13C3-PFB		1 / 05	0.000	0 / 10	0//47	2.22		05.0	4045	
•	301.90 > 83.00 5 Perfluorobuta	1.697 anesulfo	1.695 nic acid	0.002	0.649	86647	2.23		95.9	4045	
	298.90 > 80.00	1.697	1.697	0.0	1.000	6552217	2.28		103	29162	
2		1.697	1.697	0.0	1.000	2698619		2.43(1.25-3.74)		16604	
	61 Sodium 1H, 327.00 > 307.00				1.000	1229206	2.37		102	44553	
	0 60 M2-4:2FTS										
	329.00 > 81.00		1.903	-0.001	0.728	545344	NC			5812	
	7 13C2 PFHx 315.00 > 270.00		1.939	-0.006	0.740	4688409	2.48		99.2	39512	
	6 Perfluorohex		cid								
	313.00 > 269.00 313.00 > 119.00		1.939 1.939	-0.006 -0.006	1.000 1.000	4745811 418418	2.44	11.34(5.03-15.10)	97.7	15295 7308	
	o 13.00 > 119.00 O 9 13C4-PFHp		1.737	-0.000	1.000	410410		11.34(3.03-13.10)		7300	
	367.00 > 322.00		2.267	-0.002	0.866	4361422	2.42		96.9	26376	
	10 Perfluorohe			0.002	1 000	4/00153	2.45		00.0	7507	
	363.00 > 319.00 363.00 > 169.00		2.268 2.268	-0.003 -0.003	1.000 1.000	4699153 1806065	2.45	2.60(1.13-3.40)	98.0	7527 10901	
								,			

 Report Date: 19-Jan-2018 15:50:54
 Chrom Revision: 2.2 08-Dec-2017 11:41:26

 Data File:
 \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_001.d

Data File.	WCITE	Jiliva	cramen	UCHIOH	Dala (Ao_IN 20 I	100110-3300	0.D\2016.U1.16LLA_	_001.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexa	anesulfo	nic acid								
	2.278	2.280	-0.002	1.000	5175244	2.17		95.3	15029	
399.00 > 99.00		2.280		1.000	1680949	2.17	3.08(1.50-4.49)	70.0	8694	
D 11 1802 PFHx		2.200	0.002	1.000	1000717		0.00(1.00 1.17)		0071	
403.00 > 84.00		2.282	0.004	0.871	5071806	2.29		96.8	24265	
					3071000	2.27		70.0	24203	
13 Sodium 1H,1		•			1.10.10.40	0.74		444	47/55	
427.00 > 407.00	2.595	2.596	-0.001	1.000	1434962	2.71		114	17655	
D 12 M2-6:2FTS										
429.00 > 81.00	2.595	2.597	-0.002	0.993	759132	2.28		96.0	14904	
D 14 13C4 PFOA	١.									
417.00 > 372.00	2.614	2.622	-0.008	1.000	4361309	2.47		98.9	28981	
* 62 13C2-PFOA										
415.00 > 370.00		2.622	-0.008		4898760	2.50			25865	
15 Perfluoroocta										
413.00 > 369.00		2.623	-0.009	1.000	4919220	2.41		96.2	4009	
413.00 > 369.00			-0.009	1.000	2539137	2.41	1.94(0.84-2.52)	70.2	12556	
				1.000	2337137		1.74(0.04-2.32)		12330	
16 Perfluorohep				1 000	4500540	0.40		400	00504	
449.00 > 80.00		2.629		1.000	4582568	2.43	0.70/4.04.5.00	102	23594	
449.00 > 99.00		2.629	-0.008	1.000	1238595		3.70(1.94-5.82)		13160	
D 19 13C5 PFNA	١									
468.00 > 423.00	2.991	2.992	-0.001	1.144	3538605	2.47		99.0	23156	
17 Perfluoroocta	ane sulf	onic acid	d							
499.00 > 80.00	2.991	2.992	-0.001	1.000	3497746	2.25		96.9	862	
499.00 > 99.00	2.991	2.992	-0.001	1.000	756115		4.63(2.31-6.93)		1096	
D 18 13C4 PFOS	3									
503.00 > 80.00		2.992	-0.001	1.144	3321611	2.37		99.1	21066	
			0.001		0021011	2.07		, , , ,	21000	
20 Perfluoronon			0.001	1 000	2777052	2.50		102	12240	
463.00 > 419.00		2.992	-0.001	1.000	3777052	2.59	4 24/1 00 F (0)	103	12269	
463.00 > 169.00			-0.001	1.000	890521		4.24(1.90-5.69)		12359	
22 Perfluoroocta										
498.00 > 78.00	3.338	3.338	0.0	1.000	4679339	2.63		105	16475	
D 21 13C8 FOSA	٨									
506.00 > 78.00	3.338	3.338	0.0	1.277	4535428	2.30		92.0	19996	
D 26 M2-8:2FTS										
529.00 > 81.00	3 338	3.342	-0 004	1.277	833328	2.37		98.9	18246	
					000020	2.07		70.7	10210	
25 Sodium 1H,1		•			101/002	2.40		100	1/ /25	
527.00 > 507.00		3.342	-0.004	1.000	1016882	2.40		100	16435	
D 23 13C2 PFDA										
515.00 > 470.00	3.346	3.352	-0.006	1.280	2895567	2.34		93.7	25924	
24 Perfluorodec	anoic a	cid								
513.00 > 469.00	3.353	3.353	0.0	1.002	3012112	2.68		107	11931	
513.00 > 169.00	3.346	3.353	-0.007	1.000	506237		5.95(2.36-7.09)		1810	
D 27 d3-NMeFOS							•			
573.00 > 419.00		3.507	-0 002	1.341	1483872	2.41		96.3	9769	
				1.041	1703072	۷.۲۱		70.3	7107	
28 N-methyl per				4 00-	4500500	2.45		00.5	7000	
570.00 > 419.00	3.505	3.513	-0.008	1.000	1590588	2.48		99.2	7983	

Report Date: 19-Jan-2018 15:50:54 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Roport Bato. 17 3a	2010 10.00.01	31113111 1 (31) 31	
Data File:	\\ChromNa\Sacramento\ChromData	a\A8_N\20180118-53066.b\2018.01.18LLA_001.	d

Data Filo.				-	.0 (0111 0111	Data (/ 10_11/201	00110 0000		_001.0		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	Signal	KI	KI	KI	KI	Response	TI9/IIII	Ratio(Limits)	70 KeC	3/11	riays
	29 Perfluorode	cane Su	lfonic ac	id							
	599.00 > 80.00	3.662	3.666	-0.004	1.000	2347759	2.58		107	29289	
	599.00 > 99.00	3.662	3.666	-0.004	1.000	750002		3.13(1.39-4.16)		12396	
	D 32 d5-NEtFOS	SAA									
	589.00 > 419.00	3.669	3.672	-0.003	1.404	1503861	2.41		96.5	5472	
	31 Perfluoround	decanoid	c acid								
	563.00 > 519.00		3.678	-0.001	1.000	2287099	2.38		95.2	9754	
	563.00 > 169.00	3.677	3.678	-0.001	1.000	482949		4.74(0.00-0.00)		12937	
	D 30 13C2 PFU										
	565.00 > 520.00	3.677	3.679	-0.002	1.407	2327454	2.48		99.3	19255	
	33 N-ethyl perfl										
	584.00 > 419.00	3.677	3.679	-0.002	1.002	1492193	2.55		102	11175	
	37 Perfluorodo	decanoid	c acid								
	613.00 > 569.00		3.979	-0.010	1.000	2535993	2.61		104	9827	
	613.00 > 169.00	3.969	3.979	-0.010	1.000	590567		4.29(2.13-6.40)		16632	
	D 36 13C2 PFD										
	615.00 > 570.00	3.969	3.979	-0.010	1.519	2374768	2.33		93.4	16734	
	41 Perfluorotrio										
	663.00 > 619.00		4.242		1.000	2519820	2.28		91.4	9701	
	663.00 > 169.00	4.240	4.242	-0.002	1.000	816734		3.09(1.25-3.76)		20215	
	42 Perfluoroteti										
	713.00 > 169.00		4.483	-0.006	1.000	744915	2.49		99.6	18589	
	713.00 > 219.00		4.483	-0.018	0.997	488336		1.53(0.71-2.13)		10727	
	D 43 13C2-PFT										
	715.00 > 670.00		4.483	-0.006	1.713	3065951	2.31		92.2	18645	
	D 44 13C2-PFH										
	815.00 > 770.00	4.897	4.902	-0.005	1.874	4861756	2.05		82.1	11056	
	45 Perfluorohe										
	813.00 > 769.00		4.902		1.000	4844753	2.61		104	3543	
	813.00 > 169.00		4.902	-0.005	1.000	826030		5.87(2.86-8.58)		6841	
	46 Perfluorooct										
	913.00 > 869.00		5.255	-0.002	1.000	5534270	2.70	0.44/0.00.0.05	108	1115	
	913.00 > 169.00	5.246	5.255	-0.009	0.999	682047		8.11(0.00-0.00)		2086	

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00003 Amount Added: 1.00 Units: mL

Report Date: 19-Jan-2018 15:50:54 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_001.d 18-Jan-2018 17:29:51 **Injection Date:** Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x | Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x (0000012 (0000012) (0000012) (X100000) 8 0.9 1.0 2.2 0.9 1.5 0.3 1.5 0.4 1.6 0.6 1.2 1.8 2.1 2.7 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 (18-(0000015-(12-24- 020-∑ ∑16**-**1.2 1.5 1.8 2.1 2.4 0.9 1.2 2.1 2.4 8.0 2.3 1.5 1.8 1.1 1.4 1.7 2.0 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexable 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 801 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x 35 (0012 1000010 8 ©70 960 (0) 30 30 ×25 ×50 ≻₄₀ >2015 30 10 20 10 1.9 2.2 2.0 1.3 1.9 2.2 2.5 1.3 1.6 1.4 1.7 2.3 2.6 1.6 1.0 1.0 1.1 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 9 13C4-PFHpA Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> (0000012 X) (0000010 X) (X10000) 8 0 0 1.1 1.7 2.3 2.9 8.0 1.7 2.0 2.3 2.6 2.9 3.2 0.5 1.4 Page 5M3 of 606 2.6 1.4

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:50:54

2.8

3.1

3.4

3.7

2.7

3.0

3.9

2.6

2.9

3.2

3.5

3.8

4.1

Report Date: 19-Jan-2018 15:50:54 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_001.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x 18 49 Y (X100000) 0042 ×35 00 15 00 15 ∑12 -28⁻ 21 3.3 3.9 2.7 3.0 3.6 2.8 3.1 3.4 3.7 2.7 3.0 3.3 3.6 3.9 4.2 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x | Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 649 642 ()24 ()20 ()20 ()20 ()20 Σ_{35} ×60 ≻₄₈-12 36 21 24 12 3.7 3.2 3.3 3.9 4.2 3.1 3.4 4.0 3.5 3.8 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 563.00 > 169.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_> (49° 00042° 677<u>-</u> 0015 0015 12 12 ×35 ×55 ≻₂₈ 21 33 22 3.2 3.8 3.2 3.5 3.8 3.4 4.0 3.5 4.1 4.4 2.9 4.1 3.1 3.7 D 30 13C2 PFUnA 33 N-ethyl perfluorooctane sulfonamid 37 Perfluorododecanoic acid Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x 84 Y (X100000) 649 642 642 ©72-×60-×35- -48 ≻₂₈-36 21 24 14

2.9

3.2

3.5

3.8

4.1

4.4

2.8

3.1

3.4

3.7

4.0

4.3

4.6

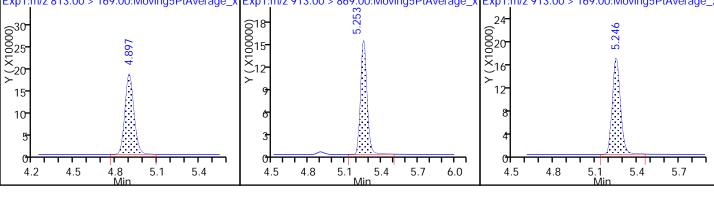
3.2

3.5

3.8

4.1

4.4



Chrom Revision: 2.2 08-Dec-2017 11:41:26

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/10 Calibration Date: 01/18/2018 18:40

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>01/17/2018 15:06</u>

Lab File ID: 2018.01.18LLD_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9122		0.976	1.00	-2.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.107		0.939	1.00	-6.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	77.33		0.885	0.884	0.1	25.0
4:2 FTS	AveID	13.89	14.34		0.964	0.934	3.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9735		0.939	1.00	-6.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.054		0.959	1.00	-4.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.015		0.830	0.910	-8.8	25.0
6:2FTS	AveID	1.655	1.968		1.13	0.948	18.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.102		0.940	1.00	-6.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.373		0.965	0.952	1.4	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.073		1.04	1.00	3.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.102		0.914	0.928	-1.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9705		0.988	1.00	-1.2	25.0
8:2FTS	AveID	1.217	1.307		1.03	0.958	7.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.8965		0.924	1.00	-7.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.081		1.00	1.00	0.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6568		0.967	0.964	0.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9267		0.898	1.00	-10.2	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9608		0.987	1.00	-1.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.004		0.980	1.00	-2.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.057		0.910	1.00	-9.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2430		0.996	1.00	-0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9423		0.975	1.00	-2.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.105		1.05	1.00	4.9	25.0
13C4 PFBA	Ave	1.512	1.509		2.49	2.50	-0.2	50.0
13C5 PFPeA	Ave	0.8956	0.9029		2.52	2.50	0.8	50.0
13C3-PFBS	Ave	0.0198	0.0194		2.28	2.33	-2.0	50.0
13C2 PFHxA	Ave	0.9649	0.9473		2.45	2.50	-1.8	50.0
13C4-PFHpA	Ave	0.9187	0.8834		2.40	2.50	-3.8	50.0
1802 PFHxS	Ave	1.131	1.156		2.42	2.37	2.2	50.0
M2-6:2FTS	Ave	0.1699	0.1826		2.55	2.38	7.5	50.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/10 Calibration Date: 01/18/2018 18:40

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLD_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8813		2.45	2.50	-2.1	50.0
13C4 PFOS	Ave	0.7158	0.7113		2.38	2.39	-0.6	50.0
13C5 PFNA	Ave	0.7300	0.7119		2.44	2.50	-2.5	50.0
13C8 FOSA	Ave	1.007	0.9891		2.46	2.50	-1.8	50.0
M2-8:2FTS	Ave	0.1795	0.1814		2.42	2.40	1.0	50.0
13C2 PFDA	Ave	0.6306	0.6663		2.64	2.50	5.7	50.0
d3-NMeFOSAA	Ave	0.3147	0.3181		2.53	2.50	1.1	50.0
d5-NEtFOSAA	Ave	0.3182	0.3252		2.55	2.50	2.2	50.0
13C2 PFUnA	Ave	0.4783	0.4955		2.59	2.50	3.6	50.0
13C2 PFDoA	Ave	0.5192	0.5079		2.45	2.50	-2.2	50.0
13C2-PFTeDA	Ave	0.6785	0.6420		2.37	2.50	-5.4	50.0
13C2-PFH×DA	Ave	1.209	1.076		2.22	2.50	-11.0	50.0

Report Date: 19-Jan-2018 16:34:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLD_001.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 18-Jan-2018 18:40:07 ALS Bottle#: 30 Worklist Smp#: 10

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 16:34:55 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 16:33:51

<u> </u>	First Level Reviewer: roycea					Date:	19-Jan-2018 16:33:51				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
) 1 13C4 PFBA 217.00 > 172.00		1.411	0.0	0.539	7200443	2.49		99.8	20441	
2	2 Perfluorobuty 212.90 > 169.00	•	1.413	-0.002	1.000	2627190	0.9764		97.6	368	
	3 13C5-PFPe 267.90 > 223.00	1.658	1.659	-0.001	0.633	4307255	2.52		101	40563	
	4 Perfluoropen 262.90 > 219.00	1.658		-0.004	1.000	1906673	0.9394		93.9	1819	
	0 47 13C3-PFB3 301.90 > 83.00 5 Perfluorobuta	1.694	1.695	-0.001	0.647	86186	2.28		98.0	4041	
	298.90 > 80.00		1.697 1.697	-0.003 -0.003	1.000 1.000	2533955 1060532	0.8853	2.39(1.25-3.74)	100	11800 7352	
	61 Sodium 1H, 327.00 > 307.00	1.908	H-perflu 1.903	orohexar 0.005	ne 1.000	496548	0.9641		103	22116	
3	0 60 M2-4:2FTS 329.00 > 81.00	1.908	1.903	0.005	0.729	576496	NC			5143	
	7 13C2 PFHx 315.00 > 270.00 6 Perfluorohex	1.939	1.939	0.0	0.740	4519315	2.45		98.2	35719	
	313.00 > 269.00 313.00 > 119.00	1.939	1.939 1.939	0.0 0.0	1.000 1.000	1759763 164697	0.9392	10.68(5.03-15.10)	93.9	3715 2868	
	9 13C4-PFHp 367.00 > 322.00	2.259	2.267	-0.008	0.863	4214456	2.40		96.2	21966	
	10 Perfluorohe 363.00 > 319.00 363.00 > 169.00	2.259	2.268 2.268	-0.009 -0.009	1.000 1.000	1776113 733848	0.9587	2.42(1.13-3.40)	95.9	3225 5393	

 Data File:
 \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLD_001.d

Data File.	WCITT	Jiliva	iciameni		iDaiaiA6_ini20 i	100110-3300	0.D/2016.01.16LLD	_001.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexa	anesulfo	onic acid								
	2.273	2.280	-0.007	0.994	2037314	0.8298		91.2	9734	
399.00 > 99.00		2.280		0.994	660960		3.08(1.50-4.49)		5339	
D 11 18O2 PFHx	:S									
403.00 > 84.00		2.282	0.004	0.873	5215075	2.42		102	26154	
13 Sodium 1H,1			orooctan	e						
427.00 > 407.00		2.596	0.002	1.000	650297	1.13		119	10342	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.597	0.001	0.992	827723	2.55		108	16459	
D 14 13C4 PFOA		2.077	0.00.	0.772	027720	2.00				
417.00 > 372.00		2 622	-0.004	1.000	4204168	2.45		97.9	38935	
		2.022	0.004	1.000	4204100	2.40		77.7	30733	
* 62 13C2-PFOA 415.00 > 370.00		2.622	0.004		4770595	2.50			35155	
			-0.004		4770393	2.50			33133	
15 Perfluoroocta			0.005	1 000	1052000	0.0400		04.0	1040	
413.00 > 369.00 413.00 > 169.00		2.623	-0.005	1.000 1.000	1852809	0.9400	1 00/0 04 2 52)	94.0	1043	
			-0.005	1.000	987759		1.88(0.84-2.52)		6876	
16 Perfluorohep				4 000	4774404	0.0450		404	47054	
449.00 > 80.00		2.629		1.000	1774481	0.9652	2 72/1 04 5 02)	101	17854	
449.00 > 99.00		2.629	-0.004	1.000	476672		3.72(1.94-5.82)		8481	
D 19 13C5 PFNA										
468.00 > 423.00		2.992		1.141	3396174	2.44		97.5	24035	
17 Perfluoroocta										
499.00 > 80.00		2.992		1.000	1388670	0.9139		98.5	353	
499.00 > 99.00	2.988	2.992	-0.004	1.000	296828		4.68(2.31-6.93)		457	
D 18 13C4 PFOS	3									
503.00 > 80.00	2.988	2.992	-0.004	1.141	3244108	2.38		99.4	20071	
20 Perfluoronor	nanoic a	cid								
463.00 > 419.00	2.988	2.992	-0.004	1.000	1457119	1.04		104	4479	
463.00 > 169.00	2.988	2.992	-0.004	1.000	334844		4.35(1.90-5.69)		5556	
22 Perfluoroocta	ane Sulf	fonamide	9							
498.00 > 78.00	3.335	3.338	-0.003	1.000	1831674	0.9879		98.8	11240	
D 21 13C8 FOSA	1									
506.00 > 78.00		3.338	-0.003	1.274	4718627	2.46		98.2	19626	
D 26 M2-8:2FTS	0.000	0.000	0.000		.,	20		70.2	.,020	
529.00 > 81.00	3 3/12	3.342	0.0	1.277	828834	2.42		101	14238	
					020034	2.72		101	14230	
25 Sodium 1H,1		•			422411	1.02		107	10240	
527.00 > 507.00		3.342	0.0	1.000	433411	1.03		107	10368	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.352	-0.002	1.280	3178404	2.64		106	18256	
24 Perfluorodeo										
513.00 > 469.00		3.353	-0.003	1.000	1139727	0.9240		92.4	5563	
513.00 > 169.00	3.350	3.353	-0.003	1.000	204288		5.58(2.36-7.09)		1451	
D 27 d3-NMeFO	SAA									
573.00 > 419.00	3.503	3.507	-0.004	1.338	1517452	2.53		101	9233	
28 N-methyl per	fluoroo	ctane su	lfonami							
570.00 > 419.00		3.513		1.002	656322	1.00		100	3007	

Report Date: 19-Jan-2018 16:34:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File:	\\ChromNa\Sacramento\ChromData	\A8_	_N\20180	0118-53	3066.b\	2018.0	01.18LLD	_001.d

Bata File:	************				Bata (, 10_11201		0:012010:01:10222	_001.0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
J						J	, ,			J
29 Perfluorode				1 000	050007	0.0770		100	1/0/0	
	3.665 3.665	3.666 3.666	-0.001 -0.001	1.000 1.000	859386 299261	0.9668	2.87(1.39-4.16)	100	16242 10384	
D 32 d5-NEtFO		3.000	-0.001	1.000	277201		2.07(1.39-4.10)		10304	
589.00 > 419.00		3.672	0.001	1.403	1551155	2.55		102	6692	
31 Perfluoroun			0.001	1.100	1001100	2.00		102	0072	
563.00 > 519.00		3.678	-0.005	0.998	876276	0.8978		89.8	3732	
563.00 > 169.00		3.678	0.003	1.000	186631	0.07.0	4.70(0.00-0.00)	07.0	7014	
D 30 13C2 PFU	nA						,			
565.00 > 520.00		3.679	0.002	1.406	2363989	2.59		104	25384	
33 N-ethyl perf	luorooct	ane sulfo	onamid							
584.00 > 419.00		3.679	0.002	1.002	596164	0.9866		98.7	6901	
37 Perfluorodo	decanoi	c acid								
613.00 > 569.00	3.974	3.979	-0.005	1.000	972854	0.9796		98.0	3975	
613.00 > 169.00	3.974	3.979	-0.005	1.000	224821		4.33(2.13-6.40)		5685	
D 36 13C2 PFD										
615.00 > 570.00	3.974	3.979	-0.005	1.518	2422897	2.45		97.8	22267	
41 Perfluorotrio										
663.00 > 619.00		4.242	0.002	1.000	1024253	0.9101		91.0	3497	
663.00 > 169.00		4.242	0.002	1.000	331855		3.09(1.25-3.76)		9256	
42 Perfluorotet			0.010	1 000	007/05	4.00		00 /		
713.00 > 169.00		4.483	-0.010	1.000	297635	1.00	1 54/0 71 0 10)	99.6	6402	
713.00 > 219.00		4.483	-0.010	1.000	192833		1.54(0.71-2.13)		8444	
D 43 13C2-PFT		4 400	0.010	1 700	20/27/2	2.27		04.7	10000	
715.00 > 670.00		4.483	-0.010	1.709	3062762	2.37		94.6	18993	
D 44 13C2-PFH		4 002	0.004	1.870	E10111E	2.22		89.0	14402	
815.00 > 770.00			-0.006	1.870	5131115	2.22		89.0	16403	
45 Perfluorohe 813.00 > 769.00		4.902	0.003	1.002	1934055	0.9752		97.5	1194	
813.00 > 769.00 813.00 > 169.00		4.902	0.003	1.002	345350	0.9732	5.60(2.86-8.58)	97.5	3629	
46 Perfluorooc			0.000	1.002	373330		0.00(2.00 0.00)		3027	
913.00 > 869.00		5.255	-0.001	1.000	2268538	1.05		105	495	
913.00 > 169.00		5.255	-0.001	1.000	273496	1.00	8.29(0.00-0.00)	103	1184	
							()			

QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00003 Amount Added: 1.00 Units: mL

Report Date: 19-Jan-2018 16:34:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLD_001.d **Injection Date:** 18-Jan-2018 18:40:07 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 30 Worklist Smp#: 10 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 63 (000001X). (0000015 X) > 9 0054 1000 ×45 -36 27 18 0.9 1.5 1.9 0.3 2.1 0.7 1.0 1.6 0.6 1.2 1.8 2.4 D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 24 (00042 ×35 6 20 ∑₁₆-12 21 27 18 1.9 1.2 2.4 1.0 1.3 2.2 2.0 2.3 1.5 1.8 2.1 8.0 1.1 1.4 1.7 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexabe 7 13C2 PFHxA Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x 14 28 00024 ×20 (X100000) (X10000) X (X100000) 8 12 01 1.9 2.2 1.5 1.8 2.1 2.7 1.6 1.9 1.0 1.3 1.6 1.2 2.4 1.3 2.2 2.5 1.0 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid D 9 13C4-PFHpA Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x 42 000012 X 0042 0001 X ×30-C₂₈ ≻²⁸ 21 18 12 0 0 0 1.4 1.7 2.0 2.3 2.6 1.0 2.5 1.7 2.0 2.3 2.6 2.9 1.4 1.1

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 16:34:55

3.4

3.7

2.7

3.0

3.6

3.9

2.8

3.1

3.4

3.7

2.8

Report Date: 19-Jan-2018 16:34:56 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLD_001.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x 56 63 (00001×)>24 0648- 0648- 0640-0640-©54**-**×45 ≻36- 18 24 27 12 16 18 3.3 3.9 2.7 3.0 3.6 2.8 3.1 3.4 3.7 2.7 3.0 3.3 3.6 3.9 4.2 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 630 60 825 621- 618-(00001X) X \S_{20} ∑₁₅ 15- 10 3.5 3.2 3.8 3.3 3.9 4.2 3.4 3.7 4.0 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 563.00 > 169.00:Moving5PtAverage_x 72¶ Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_> 35 3.673 (0049 0042 1 3.673 63 654 030 025 ×35 ×45 **_**20 ≻₂₈ 36 15- 21 27 10 18 0 4.0 4.3 3.0 3.3 3.9 4.2 3.4 4.0 3.1 3.4 3.7 4.6 3.6 3.1 3.7 D 30 13C2 PFUnA 33 N-ethyl perfluorooctane sulfonamid 37 Perfluorododecanoic acid Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x 21 35 ()77 ()0066 0018 ×15 ×12 ©30-×25- Σ_{55} <u></u>20 >₄₄-15 33 10 22 0

3.5

3.8

4.1

4.4

3.3

3.6

4.2

4.5

2.9

3.2

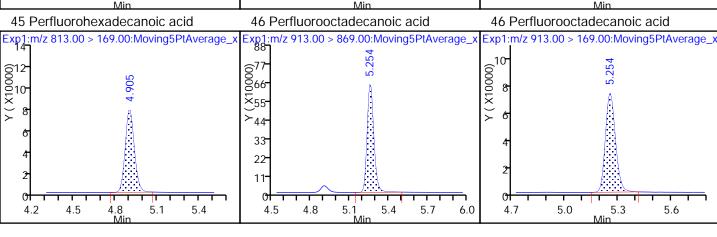
3.5

3.8

4.1

4.4

2.9



Chrom Revision: 2.2 08-Dec-2017 11:41:26

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/1 Calibration Date: 01/19/2018 16:50

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>01/17/2018 15:06</u>

Lab File ID: 2018.01.19LLC_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9343	0.9541		2.55	2.50	2.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.165		2.47	2.50	-1.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	83.66		2.39	2.21	8.4	25.0
4:2 FTS	AveID	13.89	17.30		2.91	2.34	24.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	1.026		2.47	2.50	-1.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.095		2.49	2.50	-0.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.086		2.22	2.28	-2.5	25.0
6:2FTS	AveID	1.655	1.803		2.58	2.37	9.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.164		2.48	2.50	-0.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.386		2.43	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.093		2.65	2.50	5.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.105		2.29	2.32	-1.3	25.0
8:2FTS	AveID	1.217	1.142		2.25	2.40	-6.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.033		2.63	2.50	5.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	1.027		2.65	2.50	5.8	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.078		2.49	2.50	-0.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6815		2.51	2.41	4.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9513		2.44	2.50	-2.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	1.072		2.60	2.50	3.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.090		2.66	2.50	6.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.145		2.46	2.50	-1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2381		2.44	2.50	-2.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9352		2.45	2.50	-2.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.093		2.59	2.50	3.7	25.0
13C4 PFBA	Ave	1.512	1.482		2.45	2.50	-2.0	50.0
13C5 PFPeA	Ave	0.8956	0.8970		2.50	2.50	0.2	50.0
13C3-PFBS	Ave	0.0198	0.0189		2.21	2.33	-4.9	50.0
13C2 PFHxA	Ave	0.9649	0.9676		2.51	2.50	0.3	50.0
13C4-PFHpA	Ave	0.9187	0.9002		2.45	2.50	-2.0	50.0
1802 PFHxS	Ave	1.131	1.101		2.30	2.37	-2.7	50.0
M2-6:2FTS	Ave	0.1699	0.1972		2.76	2.38	16.1	50.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/1 Calibration Date: 01/19/2018 16:50

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8985		2.49	2.50	-0.2	50.0
13C4 PFOS	Ave	0.7158	0.7403		2.47	2.39	3.4	50.0
13C5 PFNA	Ave	0.7300	0.7346		2.52	2.50	0.6	50.0
13C8 FOSA	Ave	1.007	0.999		2.48	2.50	-0.8	50.0
M2-8:2FTS	Ave	0.1795	0.2287		3.05	2.40	27.4	50.0
13C2 PFDA	Ave	0.6306	0.6203		2.46	2.50	-1.6	50.0
d3-NMeFOSAA	Ave	0.3147	0.3523		2.80	2.50	12.0	50.0
d5-NEtFOSAA	Ave	0.3182	0.3602		2.83	2.50	13.2	50.0
13C2 PFUnA	Ave	0.4783	0.4916		2.57	2.50	2.8	50.0
13C2 PFDoA	Ave	0.5192	0.4895		2.36	2.50	-5.7	50.0
13C2-PFTeDA	Ave	0.6785	0.6797		2.50	2.50	0.2	50.0
13C2-PFHxDA	Ave	1.209	1.092		2.26	2.50	-9.7	50.0

Report Date: 22-Jan-2018 09:49:05 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_009.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 19-Jan-2018 16:50:30 ALS Bottle#: 14 Worklist Smp#: 1

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 22-Jan-2018 09:49:04 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 20-Jan-2018 11:06:11

First Level Reviewer: pnomsopnat					Date:		20-Jan-2018 11:06:1	<u> </u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA 217.00 > 172.00		1.411	-0.003	0.538	7179978	2.45		98.0	28389	
2 Perfluorobuty	yric acid									
212.90 > 169.00 D 3 13C5-PFPe		1.413	-0.005	1.000	6850527	2.55		102	1075	
267.90 > 223.00 4 Perfluoropen		1.659	-0.005	0.632	4344856	2.50		100	62327	
262.90 > 219.00	1.663	1.662	0.001	1.005	5061742	2.47		98.9	3459	
D 47 13C3-PFB9 301.90 > 83.00	S 1.690	1.695	-0.005	0.646	84918	2.21		95.1	2208	
5 Perfluorobuta 298.90 > 80.00	anesulfo 1.699	nic acid 1.697	0.002	1.005	6753212	2.39		108	25654	
298.90 > 99.00	1.699	1.697	0.002	1.005	2809879		2.40(1.25-3.74)		18079	
61 Sodium 1H, 327.00 > 307.00	1.904	1.903	0.001	1.000	1475122	2.91		124	67147	
D 60 M2-4:2FTS 329.00 > 81.00		1.903	0.001	0.728	655220	NC			6294	
D 7 13C2 PFHx 315.00 > 270.00		1.939	-0.004	0.740	4686939	2.51		100	45586	
6 Perfluorohex	anoic ac	cid								
313.00 > 269.00 313.00 > 119.00		1.939 1.939	-0.004 -0.004	1.000 1.000	4809083 453492	2.47	10.60(5.03-15.10)	99.0	14382 7967	
D 9 13C4-PFHp 367.00 > 322.00		2.267	-0.014	0.861	4360392	2.45		98.0	26179	
10 Perfluorohe	otanoic a	acid								
363.00 > 319.00 363.00 > 169.00		2.2682.268	-0.002 -0.002	1.006 1.006	4773602 1984940	2.49	2.40(1.13-3.40)	99.6	7064 14655	

 Report Date: 22-Jan-2018 09:49:05
 Chrom Revision: 2.2 08-Dec-2017 11:41:26

 Data File:
 \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_009.d

Data File:	\\Cnrc	omiva\5a	acrameni	O/Chrom	Data\A8_N\201	80119-5312	1.b\2018.01.19LLC	_009.a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohex	anesulfo	nic acid								
399.00 > 80.00			-0.014	0.994	5266956	2.22		97.5	14067	
399.00 > 99.00			-0.014	0.994	1791386	2.22	2.94(1.50-4.49)	77.5	9645	
D 11 1802 PFH		2.200	0.011	0.771	1771000		2.71(1.00 1.17)		7010	
403.00 > 84.00		າ າຊາ	-0.002	0.872	5043338	2.30		97.3	21385	
					3043330	2.30		77.5	21303	
13 Sodium 1H,		•			1/22150	2.50		100	10000	
427.00 > 407.00		2.596	0.0	1.000	1633150	2.58		109	19802	
D 12 M2-6:2FTS		0.507	0.004		007.474	0.77			17/04	
429.00 > 81.00		2.597	-0.001	0.992	907471	2.76		116	17694	
D 14 13C4 PFO										
417.00 > 372.00	2.616	2.622	-0.006	1.000	4352452	2.49		99.8	32628	
* 62 13C2-PFOA	L									
415.00 > 370.00	2.616	2.622	-0.006		4844000	2.50			37778	
15 Perfluorooct	anoic ac	cid								
413.00 > 369.00		2.623	-0.007	1.000	5065773	2.48		99.3	1912	
413.00 > 169.00		2.623		1.000	2630592		1.93(0.84-2.52)		14379	
16 Perfluoroher							,			
449.00 > 80.00			-0.006	1.000	4730181	2.43		102	29894	
449.00 > 99.00			-0.006	1.000	1249060	2.40	3.79(1.94-5.82)	102	12046	
		2.027	0.000	1.000	1247000		3.77(1.74 3.02)		12040	
D 19 13C5 PFNA		2 002	0.007	1 1 1 1	2550201	2.52		101	21/17	
468.00 > 423.00			-0.007	1.141	3558301	2.52		101	21617	
17 Perfluorooct										
499.00 > 80.00			-0.007	1.000	3678370	2.29		98.7	1545	
499.00 > 99.00	2.985	2.992	-0.007	1.000	788927		4.66(2.31-6.93)		1739	
D 18 13C4 PFOS	5									
503.00 > 80.00	2.985	2.992	-0.007	1.141	3428226	2.47		103	17116	
20 Perfluoronor	nanoic a	cid								
463.00 > 419.00	2.985	2.992	-0.007	1.000	3890886	2.65		106	10833	
463.00 > 169.00	2.985	2.992	-0.007	1.000	932874		4.17(1.90-5.69)		14592	
22 Perfluorooct			2				,			
498.00 > 78.00			-0.006	1.000	4997673	2.63		105	17649	
		0.000	0.000	1.000	1777070	2.00		100	17017	
D 21 13C8 FOSA		2 220	0.004	1 274	4020002	2.40		00.2	200E1	
506.00 > 78.00		3.338	-0.006	1.274	4838893	2.48		99.2	20051	
D 26 M2-8:2FTS										
529.00 > 81.00	3.332	3.342	-0.010	1.274	1061500	3.05		127	16312	
25 Sodium 1H, ²	1H,2H,2	H-perflu	orodecar	ne						
527.00 > 507.00	3.332	3.342	-0.010	1.000	1211917	2.25		93.8	16958	
D 23 13C2 PFDA	Ą									
515.00 > 470.00		3.352	-0.005	1.280	3004624	2.46		98.4	17768	
24 Perfluorodeo					 -					
513.00 > 469.00		3.353	-0.006	1.000	3085543	2.65		106	10801	
513.00 > 469.00 513.00 > 169.00		3.353	-0.006	1.000	527536	2.00	5.85(2.36-7.09)	100	1938	
		ა.ააა	-0.000	1.000	527550		J.05(2.30-7.0 7)		1730	
D 27 d3-NMeFO		0 = 5 =	0.55	4	4				40	
573.00 > 419.00	3.499	3.507	-0.008	1.338	1706690	2.80		112	12050	
28 N-methyl per	rfluoroo	ctane su	lfonami							
570.00 > 419.00	3.507	3.513	-0.006	1.002	1839826	2.49		99.8	9944	

Report Date: 22-Jan-2018 09:49:05 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Roport Bato. 22 3a	2010 07.17.00	5111 6111 11 61151 611 212 66 26 26 17 1 11 11 12 6
Data File:	\\ChromNa\Sacramento\ChromData\A	8_N\20180119-53121.b\2018.01.19LLC_009.d

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorode	cane Su	Ifonic ac	id							
599.00 > 80.00	3.656	3.666	-0.010	1.000	2355743	2.51		104	25807	
599.00 > 99.00	3.656	3.666	-0.010	1.000	760971		3.10(1.39-4.16)		17283	
D 32 d5-NEtFO		2 / 72	0.000	1 400	174470/	2.02		110	(004	
589.00 > 419.00 31 Perfluoroun		3.672	-0.009	1.400	1744726	2.83		113	6994	
563.00 > 519.00		3.678	-0.007	1.000	2552871	2.60		104	10853	
563.00 > 169.00		3.678	-0.007	1.000	468606		5.45(0.00-0.00)		14019	
D 30 13C2 PFU										
565.00 > 520.00		3.679	-0.008	1.403	2381231	2.57		103	16747	
33 N-ethyl perf				1 000	1/50750	0.44		07.7	45/44	
584.00 > 419.00		3.679	-0.008	1.002	1659759	2.44		97.7	15614	
37 Perfluorodo 613.00 > 569.00		3.979	-0.008	1.000	2583214	2.66		106	11052	
613.00 > 169.00		3.979	-0.008	1.000	615772	2.00	4.20(2.13-6.40)	100	13854	
D 36 13C2 PFD	οΑ									
615.00 > 570.00	3.971	3.979	-0.008	1.518	2370973	2.36		94.3	13407	
41 Perfluorotrio										
663.00 > 619.00 663.00 > 169.00		4.242 4.242	-0.010 -0.010	1.000 1.000	2713975 873592	2.46	3.11(1.25-3.76)	98.6	6350 27893	
42 Perfluorotet			-0.010	1.000	0/3392		3.11(1.25-3.76)		27093	
713.00 > 169.00		4.483	-0.012	1.000	783943	2.44		97.6	19788	
713.00 > 219.00		4.483	-0.023	0.997	543919		1.44(0.71-2.13)		12016	
D 43 13C2-PFT										
715.00 > 670.00		4.483	-0.012	1.709	3292516	2.50		100	22453	
D 44 13C2-PFH		4.000	0.017	1.0/0	F2007F7	2.27		00.0	14000	
815.00 > 770.00		4.902	-0.017	1.868	5289757	2.26		90.3	14998	
45 Perfluorohe 813.00 > 769.00		4.902	-0.017	1.000	4946777	2.45		97.9	2945	
813.00 > 169.00		4.902	-0.017	1.000	890775	2.10	5.55(2.86-8.58)	,,,,	6962	
46 Perfluorooc	tadecan	oic acid								
913.00 > 869.00		5.255	-0.017	1.000	5780831	2.59		104	1026	
913.00 > 169.00	5.238	5.255	-0.017	1.000	716381		8.07(0.00-0.00)		2148	

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00003 Amount Added: 1.00 Units: mL

Report Date: 22-Jan-2018 09:49:05 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_009.d **Injection Date:** 19-Jan-2018 16:50:30 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x | Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_> (0000015 X) > 9 Y (X100000) 0.9 1.5 0.9 1.5 0.3 2.1 0.6 1.2 1.8 0.6 1.2 1.8 2.4 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x (0000012-X) > 8 00018-00015-21- 0 0 18-1.5 1.2 1.5 1.8 2.1 2.4 0.9 1.2 1.5 2.1 2.4 0.9 1.2 2.4 1.8 1.8 2.1 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexable 7 13C2 PFHxA Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x | Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 (X100000) ()60 ()60 ×50 636 030 030 ≻40 18 30 12 20 1.9 2.2 2.0 2.0 1.3 1.6 1.4 1.7 2.3 2.6 1.4 1.7 2.3 2.6 1.0 1.1 1.1 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 9 13C4-PFHpA Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_ (0000012 X) 0| 0 1.6 1.9 2.2 Page 585 of 606 1.2 1.8 2.4 3.0 1.0 1.3 2.5 1.7 2.0 2.3 2.6 2.9 0.6 1.4

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_009.d 10 Perfluoroheptanoic acid 10 Perfluoroheptanoic acid 8 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00:Moving5PtAverage_x (0000012 (0000012 (0000012) (0000012) 56- (X100000) (X100000) (X100000) 0048- 0048- 0048-040-<u></u>32⁻ 24 16 2.3 1.7 2.0 2.6 2.9 1.4 1.7 2.0 2.3 2.6 2.9 1.2 1.8 2.4 3.0 1.4 8 Perfluorohexanesulfonic acid D 11 1802 PFHxS 13 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 403.00 > 84.00:Moving5PtAverage_x3 Exp1:m/z 399.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 427.00 > 407.00:Moving5PtAverage_> 49 (42 (00) (00) (10) 014 0012 0642 0642 ×35 **∑**30 ∑₁₀ >28 21 18 12 2.2 2.9 2.3 2.9 2.6 1.6 2.5 2.8 1.7 2.0 2.6 2.3 D 14 13C4 PFOA D 12 M2-6:2FTS 62 13C2-PFOA Exp1:m/z 417.00 > 372.00:Moving5PtAverage_x Exp1:m/z 429.00 > 81.00:Moving5PtAverage_x3 Exp1:m/z 415.00 > 370.00:Moving5PtAverage_x 28 ()000012 X) 0015 12 X 00024 X20 ≻16 0 2.3 2.9 2.0 2.3 2.6 2.9 3.2 2.1 2.7 3.3 2.0 2.6 3.2 1.8 2.4 3.0 15 Perfluorooctanoic acid 15 Perfluorooctanoic acid 16 Perfluoroheptanesulfonic acid Exp1:m/z 413.00 > 169.00:Moving5PtAverage_x Exp1:m/z 449.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 413.00 > 369.00:Moving5PtAverage_x (0000012⁻ ×) > 9 014 0012 677<u>-</u> ×55->₄₄-33 22 11 1.8 2.1 2.4 2.7 3.0 3.3 1.9 2.2 2.5 2.8 3.1 1.8 2.1 2.4 2.7 3.0 3.3

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 22-Jan-2018 09:49:05

3.3

3.6

3.9

2.7

3.0

3.3

3.6

3.9

2.8

3.1

3.4

3.7

2.7

Report Date: 22-Jan-2018 09:49:05 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_009.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x (X100000) X 656 0048 ×40 24 16 3.3 3.9 2.7 3.0 3.6 2.8 3.1 3.4 3.7 2.7 3.0 3.3 3.6 3.9 4.2 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x | Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 | Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 28 84 ©56 00 00 48 ©24 00 20 × 0672-1560-1560- Σ_{40} **≻**48⁻ 36 24 16 12 3.9 3.2 3.3 3.9 4.2 3.0 3.3 3.6 3.5 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 589.00 > 419.00:Moving5PtAverage_> Exp1:m/z 563.00 > 519.00:Moving5PtAverage_> Exp1:m/z 563.00 > 169.00:Moving5PtAverage_> (X100000) 18 63 (00054- X) 000 15 ×12 -36 27 18 0 3.2 3.8 3.0 3.3 3.6 3.9 4.2 3.4 3.7 4.0 2.9 3.5 4.1 4.4 3.1 4.3 D 30 13C2 PFUnA 33 N-ethyl perfluorooctane sulfonamid 37 Perfluorododecanoic acid Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x 961 64-6072-684 672 ×60 ×60 ×35-≻48 ≻28-48 36 21 36 24 14 24 12 12

3.3

3.0

3.6

3.9

4.2

2.8

3.1

3.4

3.7

4.0

4.3

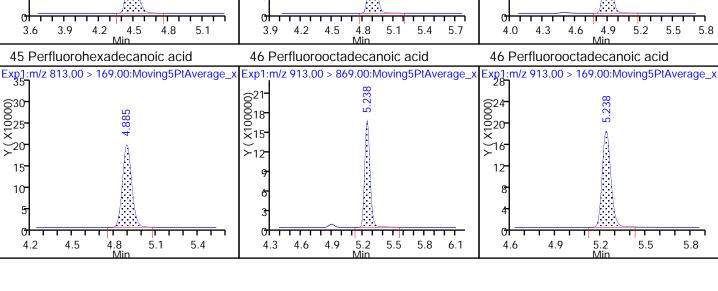
3.3

3.6

3.9

4.2

4.5



Report Date: 22-Jan-2018 09:49:05 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_009.d

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCV 320-204757/4</u> Calibration Date: <u>01/19/2018 17:13</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9181		0.983	1.00	-1.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.096		0.930	1.00	-7.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	79.38		0.909	0.884	2.8	25.0
4:2 FTS	AveID	13.89	15.58		1.05	0.934	12.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9706		0.936	1.00	-6.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.086		0.988	1.00	-1.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.095		0.895	0.910	-1.6	25.0
6:2FTS	AveID	1.655	1.739		0.996	0.948	5.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.098		0.937	1.00	-6.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.400		0.984	0.952	3.4	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.030		0.998	1.00	-0.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.091		0.904	0.928	-2.6	25.0
8:2FTS	AveID	1.217	1.100		0.866	0.958	-9.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.011		1.03	1.00	3.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9368		0.965	1.00	-3.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	0.9785		0.906	1.00	-9.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6870		1.01	0.964	4.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9616		0.932	1.00	-6.8	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9028		0.927	1.00	-7.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.029		1.00	1.00	0.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.095		0.943	1.00	-5.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2410		0.988	1.00	-1.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9328		0.965	1.00	-3.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.026		0.974	1.00	-2.6	25.0
13C4 PFBA	Ave	1.512	1.464		2.42	2.50	-3.2	50.0
13C5 PFPeA	Ave	0.8956	0.8847		2.47	2.50	-1.2	50.0
13C3-PFBS	Ave	0.0198	0.0193		2.26	2.33	-2.7	50.0
13C2 PFHxA	Ave	0.9649	0.9644		2.50	2.50	-0.0	50.0
13C4-PFHpA	Ave	0.9187	0.9102		2.48	2.50	-0.9	50.0
1802 PFHxS	Ave	1.131	1.098		2.30	2.37	-2.9	50.0
M2-6:2FTS	Ave	0.1699	0.2028		2.83	2.38	19.4	50.0

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCV 320-204757/4</u> Calibration Date: <u>01/19/2018 17:13</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9031		2.51	2.50	0.3	50.0
13C4 PFOS	Ave	0.7158	0.7027		2.35	2.39	-1.8	50.0
13C5 PFNA	Ave	0.7300	0.7264		2.49	2.50	-0.5	50.0
13C8 FOSA	Ave	1.007	0.9702		2.41	2.50	-3.6	50.0
M2-8:2FTS	Ave	0.1795	0.2206		2.94	2.40	22.8	50.0
13C2 PFDA	Ave	0.6306	0.6162		2.44	2.50	-2.3	50.0
d3-NMeFOSAA	Ave	0.3147	0.3480		2.76	2.50	10.6	50.0
d5-NEtFOSAA	Ave	0.3182	0.3620		2.84	2.50	13.8	50.0
13C2 PFUnA	Ave	0.4783	0.5040		2.63	2.50	5.4	50.0
13C2 PFDoA	Ave	0.5192	0.4992		2.40	2.50	-3.9	50.0
13C2-PFTeDA	Ave	0.6785	0.6407		2.36	2.50	-5.6	50.0
13C2-PFHxDA	Ave	1.209	1.092		2.26	2.50	-9.7	50.0

Report Date: 22-Jan-2018 09:48:52 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_012.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 19-Jan-2018 17:13:58 ALS Bottle#: 13 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Sublist: chrom-A8_N*sub30

Method: \ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 22-Jan-2018 09:48:51 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 20-Jan-2018 11:06:44

First Level Revie	wer: pnc	omsopna	It		Date: 20-Jan-2018 11:06:44					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA 217.00 > 172.00		1.411	0.001	0.540	7285808	2.42		96.8	42498	
2 Perfluorobuty 212.90 > 169.00	,	1.413	-0.001	1.000	2675738	0.9827		98.3	495	
D 3 13C5-PFPe 267.90 > 223.00	1.660	1.659	0.001	0.635	4401836	2.47		98.8	82403	
4 Perfluoropen 262.90 > 219.00	1.660		-0.002	1.000	1929983	0.9305		93.0	1207	
	1.696	1.695	0.001	0.649	89257	2.26		97.3	2683	
	anesuiro 1.696 1.696	1.697 1.697	-0.001 -0.001	1.000 1.000	2693821 1093391	0.9088	2.46(1.25-3.74)	103	12402 7113	
61 Sodium 1H, 327.00 > 307.00	1.900			ne 1.000	558599	1.05		112	20641	
D 60 M2-4:2FTS 329.00 > 81.00	1.900	1.903	-0.003	0.727	680984	NC			6891	
D 7 13C2 PFHx 315.00 > 270.00 6 Perfluorohex	1.940	1.939	0.001	0.742	4798480	2.50		99.9	44420	
313.00 > 269.00 313.00 > 119.00	1.930	1.939 1.939	-0.009 0.001	0.995 1.000	1862864 175823	0.9364	10.60(5.03-15.10)	93.6	5024 3092	
D 9 13C4-PFHp 367.00 > 322.00	2.262	2.267	-0.005	0.866	4528781	2.48		99.1	25535	
10 Perfluorohe 363.00 > 319.00 363.00 > 169.00	2.262	2.268 2.268	-0.006 -0.006	1.000 1.000	1967286 742882	0.9881	2.65(1.13-3.40)	98.8	3560 4825	

Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	<u>80119-531</u> 2	1.b\2018.01.19LLC	_012.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohex	anesulfo	nnic acid								
399.00 > 80.00	2.275	2.280	-0.005	1.000	2178074	0.8953		98.4	8537	
399.00 > 99.00		2.280	-0.005	1.000	673051	0.0700	3.24(1.50-4.49)	70	5399	
D 11 18O2 PFH							,			
403.00 > 84.00		2.282	-0.007	0.871	5167408	2.30		97.1	24628	
13 Sodium 1H,										
427.00 > 407.00		•		1.000	665385	1.00		105	17359	
D 12 M2-6:2FTS		2.070	0.000	1.000	000000	1.00			1,00,	
429.00 > 81.00		2 5 9 7	-0.009	0.990	958387	2.83		119	22303	
		2.571	-0.007	0.770	730307	2.03		117	22303	
D 14 13C4 PFO		2 4 2 2	0.000	1 000	4402720	2 51		100	25217	
417.00 > 372.00		2.022	-0.009	1.000	4493738	2.51		100	35317	
* 62 13C2-PFOA		0.400	0.000		4075745	0.50			00/10	
415.00 > 370.00			-0.009		4975745	2.50			32619	
15 Perfluorooct										
413.00 > 369.00		2.623		1.000	1974081	0.9370		93.7	702	
413.00 > 169.00	2.613	2.623	-0.010	1.000	1009153		1.96(0.84-2.52)		7912	
16 Perfluorohe	ptanesul	lfonic ac	id							
449.00 > 80.00	2.621	2.629	-0.008	1.000	1864206	0.9841		103	17884	
449.00 > 99.00	2.621	2.629	-0.008	1.000	506488		3.68(1.94-5.82)		9863	
D 19 13C5 PFN	4									
468.00 > 423.00		2.992	-0.016	1.139	3614522	2.49		99.5	30940	
17 Perfluorooct	ane sulf	onic acid	4							
499.00 > 80.00			-0.016	1.000	1415631	0.9042		97.4	564	
499.00 > 99.00			-0.016	1.000	313646	0.70.12	4.51(2.31-6.93)	,,,,	712	
D 18 13C4 PFO									–	
503.00 > 80.00		2.992	-0.016	1.139	3342601	2.35		98.2	18743	
			-0.010	1.137	3342001	2.33		70.2	10743	
20 Perfluoronoi			0.017	1 000	1400145	1.00		00.0	2070	
463.00 > 419.00 463.00 > 169.00			-0.016	1.000	1489145	1.00	4 20/1 00 E 40\	99.8	3878	
				1.000	354736		4.20(1.90-5.69)		7407	
22 Perfluorooct				4 225	4050055	4.05		400	40.45-	
498.00 > 78.00		3.338	-0.003	1.002	1953008	1.03		103	13420	
D 21 13C8 FOS										
506.00 > 78.00	3.327	3.338	-0.011	1.273	4827202	2.41		96.4	17059	
D 26 M2-8:2FTS	;									
529.00 > 81.00		3.342	-0.015	1.273	1051298	2.94		123	16034	
25 Sodium 1H,										
527.00 > 507.00				1.000	462617	0.8660		90.4	9971	
		J.J7Z	0.013	1.000	702017	0.0000		70.4	/// 1	
D 23 13C2 PFD/		2 252	0.000	1 070	20/502/	0.44		07.7	1/701	
515.00 > 470.00		3.352	-0.009	1.279	3065986	2.44		97.7	16701	
24 Perfluorodeo										
513.00 > 469.00		3.353		1.000	1148845	0.9655		96.5	5344	
513.00 > 169.00	3.343	3.353	-0.010	1.000	219314		5.24(2.36-7.09)		1665	
D 27 d3-NMeFO	SAA									
573.00 > 419.00	3.495	3.507	-0.012	1.337	1731681	2.76		111	12421	
28 N-methyl pe	rfluoroo	ctane su	lfonami							
570.00 > 419.00				1.002	677806	0.9059		90.6	4202	

Report Date: 22-Jan-2018 09:48:52 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Roport Bato. 22 3a	2010 07.10.02	5111 6111 11 611 6111 212 66 26 26 17 111 11126
Data File:	\\ChromNa\Sacramento\ChromData\A	8_N\20180119-53121.b\2018.01.19LLC_012.d

Bata Filot	110111	3111111111101	a01 a111011	.0 ,0111 0111	Bata # 10_111201	00117 0012	1.012010.01.17220_	_0 12.0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
J						J	, ,			3
29 Perfluorode				1 000	02/102	1 01		105	1/400	
599.00 > 80.00 599.00 > 99.00			-0.014 -0.014	1.000 1.000	926182 317351	1.01	2.92(1.39-4.16)	105	16499 13177	
D 32 d5-NEtFO		5.000	0.014	1.000	317331		2.72(1.07 4.10)		13177	
589.00 > 419.00		3.672	-0.007	1.403	1801296	2.84		114	7198	
31 Perfluoroun										
563.00 > 519.00		3.678	-0.013	0.998	964546	0.9316		93.2	4510	
563.00 > 169.00	3.673	3.678	-0.005	1.000	200156		4.82(0.00-0.00)		10768	
D 30 13C2 PFU	nA									
565.00 > 520.00	3.673	3.679	-0.006	1.405	2507711	2.63		105	24134	
33 N-ethyl perf										
584.00 > 419.00			-0.006	1.002	650504	0.9271		92.7	5417	
37 Perfluorodo										
613.00 > 569.00		3.979	-0.005	1.002	1022592	1.00	4 1 4 (2 1 2 7 4 0)	100	3742	
613.00 > 169.00		3.979	-0.013	1.000	246803		4.14(2.13-6.40)		10886	
D 36 13C2 PFD 615.00 > 570.00		3.979	-0.013	1.517	2483937	2.40		96.1	16037	
			-0.013	1.517	2403937	2.40		90.1	10037	
41 Perfluorotrio 663.00 > 619.00		4.242	-0.007	1.000	1087621	0.9427		94.3	2441	
663.00 > 169.00		4.242		1.000	331948	0.7427	3.28(1.25-3.76)	74.5	10737	
42 Perfluorotet							(,			
713.00 > 169.00		4.483	-0.010	1.000	307356	0.9878		98.8	9035	
713.00 > 219.00	4.462	4.483	-0.021	0.997	208975		1.47(0.71-2.13)		6198	
D 43 13C2-PFT	eDA									
715.00 > 670.00	4.473	4.483	-0.010	1.712	3187877	2.36		94.4	16656	
D 44 13C2-PFH	xDA									
815.00 > 770.00	4.887	4.902	-0.015	1.870	5435423	2.26		90.3	11425	
45 Perfluorohe	xadecan	oic acid								
813.00 > 769.00			-0.015	1.000	2028147	0.9652		96.5	1438	
813.00 > 169.00		4.902	-0.015	1.000	363020		5.59(2.86-8.58)		5379	
46 Perfluorooc										
913.00 > 869.00		5.255 5.255	-0.016	1.000	2231372	0.9741	7 92/0 00 0 00	97.4	453 1540	
913.00 > 169.00	5.232	5.255	-0.023	0.999	284821		7.83(0.00-0.00)		1548	

OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00003 Amount Added: 1.00 Units: mL

Report Date: 22-Jan-2018 09:48:52 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: **Injection Date:** 19-Jan-2018 17:13:58 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 172.00:Moving5PtAverage_x (0000010° X) X (0000015⁻¹) × 9 656⁻ 648⁻ 24 16 0.9 1.8 2.7 1.9 1.9 0.0 0.7 1.0 1.6 0.1 1.0 2.8 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 77 0066 24 0049 0042 ∑₁₆-×35 ≻₂₈ 12 33 21 22 2.2 2.4 1.3 1.6 1.9 0.9 1.2 1.5 2.1 2.0 2.3 1.8 8.0 1.1 1.4 1.7 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexable 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x (000012 X) 8 (000012 X) > 9 ©28 024 ×20 ≻₁₆-1.9 2.2 1.5 1.8 2.0 1.0 1.3 1.6 1.2 2.1 2.4 1.4 1.7 2.3 2.6 1.1 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid D 9 13C4-PFHpA Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> 49 49 000012 X 0642 0842 X35 042 ×35 ∑28- ∑28- 21 21 14 0 0 1.3 1.9 2.5 3.1 2.6 1.7 2.0 2.3 2.6 2.9 0.7 1.4

3.3

3.6

3.9

2.7

2.7

3.0

3.3

3.6

3.9

2.7

3.0

3.3 /lin 3.6

3.9

3.0

Report Date: 22-Jan-2018 09:48:52 Chrom Revision: 2.2 08-Dec-2017 11:41:26 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_012.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x 56 3.343 (70 (60 00036 ×30 ×24 0 0 48 \ 40 ×50 >32 ≻₄₀-18 24 30 12 16 20 10 3.3 2.7 3.0 3.6 3.9 2.8 3.1 3.4 3.7 2.7 3.0 3.3 3.6 3.9 4.2 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 24 (000010 X) 3.503 ©20 ∑16• **∑**25 ≻20 15- 10 3.7 3.3 3.9 4.2 3.7 3.1 3.4 4.0 3.4 4.0 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_) 3.673 63 63-654**-**0036 0030 <u>8</u>54 8 ×45 ×45 >36 36 18 27 27 12 18 18 0 2.9 3.2 3.8 3.4 3.7 4.0 3.4 4.0 3.5 4.1 4.4 3.1 4.3 3.1 3.7 D 30 13C2 PFUnA 33 N-ethyl perfluorooctane sulfonamid 37 Perfluorododecanoic acid Exp1:m/z 613.00 > 569.00:Moving5PtAverage_x Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x 3.673 621- 6218-(036⁻ 00001×)24⁻ ©72 ×60 ≻48 18 36 12

3.9

4.2

3.3

3.6

3.9

4.2

4.5

0

3.0

3.3

2.9

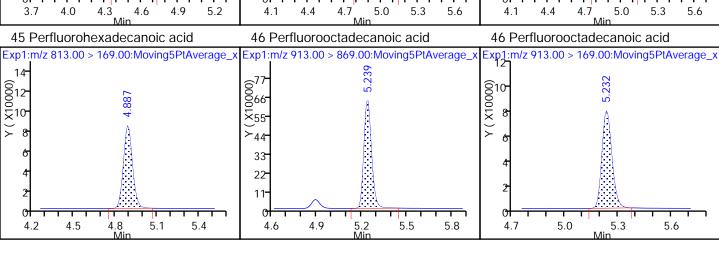
3.2

3.5

3.8

4.1

4.4



Chrom Revision: 2.2 08-Dec-2017 11:41:26

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-204105/1-A
Matrix: Water	Lab File ID: 2018.01.18LLA_002.d
Analysis Method: 537 (modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 01/16/2018 09:18
Sample wt/vol: 250(mL)	Date Analyzed: 01/18/2018 17:37
Con. Extract Vol.: 10.0(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 204556	Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.0	U	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	2.0	U	4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.0	Ū	2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.0	Ū	2.0	1.0	0.35

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-204105/1-A
Matrix: Water	Lab File ID: 2018.01.18LLA_002.d
Analysis Method: 537 (modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 01/16/2018 09:18
Sample wt/vol: 250(mL)	Date Analyzed: 01/18/2018 17:37
Con. Extract Vol.: 10.0(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 204556	Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	102		25-150
STL00990	13C4 PFOA	102		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	100		25-150
STL00997	13C2 PFUnA	107		25-150
STL00998	13C2 PFDoA	96		25-150
STL00994	1802 PFHxS	104		25-150
STL00991	13C4 PFOS	104		25-150
STL02116	13C2-PFTeDA	98		25-150
STL01892	13C4-PFHpA	101		25-150
STL01893	13C5 PFPeA	108		25-150
STL02337	13C3-PFBS	101		25-150

Report Date: 19-Jan-2018 15:50:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File:

Lims ID: MB 320-204105/1-A

Client ID:

Sample Type: MB

Inject. Date: 18-Jan-2018 17:37:41 ALS Bottle#: 41 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: mb 320-204105/1-a Misc. Info.: Plate: 1 Rack: 5

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m Method:

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution **Initial Calibration** Quant By:

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Lovel Davious 10 Jan 2010 15:44:E1

First Level Revie	wer: roy	cea			Date: 19-Jan-2018 15:46:51					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA	١									
217.00 > 172.00	1.405	1.411	-0.006	0.537	8068189	2.60		104	23833	
2 Perfluorobut	•									
212.90 > 169.00		1.413	-0.008	1.000	6929	0.002298			1.1	
D 3 13C5-PFPe 267.90 > 223.00		1 650	-0.002	0.633	4952911	2.70		108	41040	
4 Perfluoroper			-0.002	0.033	4952911	2.70		100	41040	
262.90 > 219.00			-0.013	0.995	8935	0.003828			8.5	
D 47 13C3-PFB	S									
301.90 > 83.00	1.684	1.695	-0.011	0.643	95661	2.35		101	4863	
D 7 13C2 PFHx										
315.00 > 270.00		1.939	-0.001	0.740	5033677	2.54		102	37665	
6 Perfluorohex			0.040	0.005	0074	0.000040			45.0	
313.00 > 269.00 313.00 > 119.00		1.939 1.939	-0.012 0.009	0.995 1.005	8071 1137	0.003868	7.10(5.03-15.10)		15.8 17.5	
D 9 13C4-PFH _E		1.737	0.009	1.003	1137		7.10(3.03-13.10)		17.5	
367.00 > 322.00		2.267	0.004	0.868	4749565	2.52		101	33521	
8 Perfluorohex	canesulfo	onic acid	I							
399.00 > 80.00		2.280	0.004	1.000	17700	0.006585			96.4	
399.00 > 99.00		2.280	0.004	1.000	6158		2.87(1.50-4.49)		58.4	
D 11 1802 PFH		2 202	0.000	0.072	F700201	2.47		104	42507	
403.00 > 84.00		2.282	0.002	0.873	5709381	2.46		104	42506	
13 Sodium 1H, 427.00 > 407.00		•	0.001	e 1.000	100967	0.1526			1949	
D 12 M2-6:2FTS		0,0	3.001		.00,0,	0.1020			,,,,	
429.00 > 81.00		2.597	0.0	0.992	949595	2.73		115	20089	
D 14 13C4 PFO	A									
417.00 > 372.00	2.617	2.622	-0.005	1.000	4721642	2.56		102	39115	
					Dogo EE / of /	206				

Report Date: 19-Jan-2018 15:50:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26

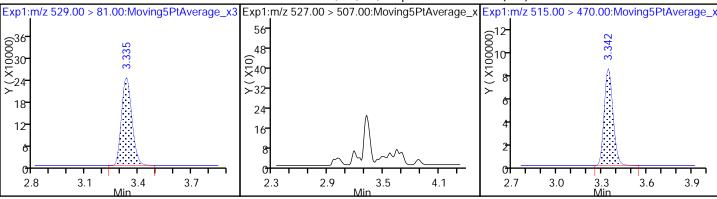
Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_002.d

Data File.	WCIIIC	JIIIVa\3	acramen	COCHION	Dalakko_N\201	00110-33000	3.0\2016.01.16LLA_	_002.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
* /2.12C2 DEOA										
* 62 13C2-PFOA 415.00 > 370.00		2 622	-0.005		5128534	2.50			30972	
15 Perfluorooct			-0.003		3120334	2.50			30772	
413.00 > 369.00		2.623	0.001	1.003	16152	0.007296			12.8	
413.00 > 169.00			-0.006	1.000	5374	0.007270	3.01(0.84-2.52)		46.9	
D 19 13C5 PFN/	Д						, ,			
468.00 > 423.00		2.992	-0.005	1.141	3978558	2.66		106	32289	
D 18 13C4 PFO	S									
503.00 > 80.00	2.987	2.992	-0.005	1.141	3651397	2.49		104	23790	
22 Perfluorooct	ane Sulf	fonamid	е							
498.00 > 78.00	3.335	3.338	-0.003	1.002	3241	0.001750			77.6	
D 21 13C8 FOS	A									
506.00 > 78.00	3.327	3.338	-0.011	1.271	4713458	2.28		91.3	22435	
D 26 M2-8:2FTS										
529.00 > 81.00	3.335	3.342	-0.007	1.274	970530	2.64		110	17090	
D 23 13C2 PFD/										
515.00 > 470.00		3.352	-0.010	1.277	3223387	2.49		99.7	24933	
D 27 d3-NMeFO		0.507	0.005	1 000	150000	0.45		00.0	10171	
573.00 > 419.00		3.507		1.338	1582220	2.45		98.0	10174	
28 N-methyl pe				1 000	E 4 E O	0.007000			44.4	
570.00 > 419.00		3.513	-0.004	1.002	5458	0.007983			44.4	
D 32 d5-NEtFOS 589.00 > 419.00		2 472	-0.006	1.401	1706450	2.61		105	7034	
			-0.006	1.401	1700430	2.01		103	7034	
31 Perfluoround 563.00 > 519.00			-0.012	0.998	9020	0.008315			44.8	
563.00 > 169.00			-0.012	1.000	1788	0.000313	5.04(0.00-0.00)		89.0	
D 30 13C2 PFUr							,			
565.00 > 520.00		3.679	-0.006	1.404	2627387	2.68		107	18459	
33 N-ethyl perfl										
584.00 > 419.00			-0.006	1.002	7069	0.0106			128	
D 36 13C2 PFD	οΑ									
615.00 > 570.00		3.979	-0.004	1.519	2557236	2.40		96.0	25236	
D 43 13C2-PFTe	eDA									
715.00 > 670.00	4.473	4.483	-0.010	1.709	3424042	2.46		98.4	24169	
D 44 13C2-PFH	xDA									
815.00 > 770.00	4.887	4.902	-0.015	1.868	6050479	2.44		97.6	15246	
45 Perfluorohex	xadecan	oic acid								
813.00 > 769.00			-0.015	1.000	56512	0.005293			46.2	
813.00 > 169.00	4.887	4.902	-0.015	1.000	9486		5.96(2.86-8.58)		240	

Report Date: 19-Jan-2018 15:50:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_002.d **Injection Date:** 18-Jan-2018 17:37:41 Instrument ID: A8_N Lims ID: MB 320-204105/1-A Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 41 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: A8_N Limit Group: LC PFC_DOD ICAL 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 60 (000015 X) 12 0014 0012 ©46-<u>~</u>39 32 25 18 8.0 1.4 1.4 2.0 1.7 0.5 1.1 2.3 D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid (ND) 4 Perfluoropentanoic acid Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x 28 <u>24</u> 0 35 ∑20 _28 ≻16⁻ 21 12 14 1.9 2.2 1.5 1.8 1.0 1.3 1.2 1.8 0.6 2.4 5 Perfluorobutanesulfonic acid (ND) 61 Sodium 1H,1H,2H,2H-perfluorohexaDe (NID)C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x Exp1:m/z 315.00 > 270.00:Moving5PtAverage_x 91 24 (0000012 X) > ° 78 265 ∑₁₆-≻52 39 26 13 1.2 1.8 0.9 1.5 2.1 2.7 1.4 1.7 2.0 2.4 2.3 2.6 0.6 1.1 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 9 13C4-PFHpA Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_> Exp1:m/z 367.00 > 322.00:Moving5PtAverage_> (000012 X) 36 66- 555-0030 × × >24 **≻**44 18 33 12 22 11 0 0 2.3 1.7 2.0 2.3 1.7 Page 55/60 of 606 1.6 1.9 2.2 2.5 2.8 1.4 1.4 1.3

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:50:55

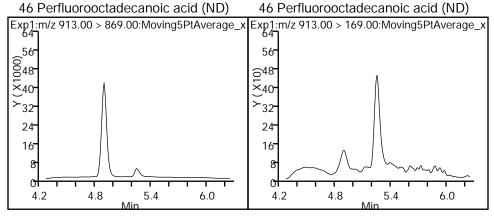


Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:50:55

Report Date: 19-Jan-2018 15:50:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_002.d



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
SDG No.:	
Client Sample ID:	Lab Sample ID: LCS 320-204105/2-A
Matrix: Water	Lab File ID: 2018.01.18LLA_003.d
Analysis Method: 537 (modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 01/16/2018 09:18
Sample wt/vol: 250(mL)	Date Analyzed: 01/18/2018 17:45
Con. Extract Vol.: 10.0(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 204556	Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	39.2		2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	36.2		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	36.9		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	38.0		2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	36.9		4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	38.8		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	40.0		2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	34.4		4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	40.3		4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	39.4		4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	40.7		2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.9		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	34.8		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	38.0		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	36.0		4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	40.0		2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	39.5		2.0	1.0	0.35

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: <u>320-35042-1</u>
SDG No.:	
Client Sample ID:	Lab Sample ID: LCS 320-204105/2-A
Matrix: Water	Lab File ID: 2018.01.18LLA_003.d
Analysis Method: 537 (modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 01/16/2018 09:18
Sample wt/vol: 250(mL)	Date Analyzed: 01/18/2018 17:45
Con. Extract Vol.: 10.0(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 204556	Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	84		25-150
STL00992	13C4 PFBA	98		25-150
STL00993	13C2 PFHxA	97		25-150
STL00990	13C4 PFOA	100		25-150
STL00995	13C5 PFNA	95		25-150
STL00996	13C2 PFDA	94		25-150
STL00997	13C2 PFUnA	100		25-150
STL00998	13C2 PFDoA	91		25-150
STL00994	1802 PFHxS	94		25-150
STL00991	13C4 PFOS	93		25-150
STL02116	13C2-PFTeDA	92		25-150
STL01892	13C4-PFHpA	97		25-150
STL01893	13C5 PFPeA	101		25-150
STL02337	13C3-PFBS	96		25-150

Report Date: 19-Jan-2018 15:50:57 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_003.d

Lims ID: LCS 320-204105/2-A

Client ID:

Sample Type: LCS

Inject. Date: 18-Jan-2018 17:45:29 ALS Bottle#: 42 Worklist Smp#: 3

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-204105/2-a Misc. Info.: Plate: 1 Rack: 5

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:47:43

First Level Revie	irst Level Reviewer: roycea				Date:	Date: 19-Jan-2018 15:47:43				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA 217.00 > 172.00		1.411	-0.003	0.538	7755854	2.46		98.4	19219	
2 Perfluorobut 212.90 > 169.00	,		-0.005	1.000	2838911	0.9795		97.9	341	
D 3 13C5-PFP6 267.90 > 223.00		1.659	-0.005	0.632	4730292	2.53		101	37700	
4 Perfluoroper 262.90 > 219.00			-0.008	1.000	2016482	0.9047		90.5	2049	
D 47 13C3-PFB 301.90 > 83.00		1.695	-0.005	0.646	92378	2.23		96.1	4757	
	anesulfo 1.699 1.699	nic acid 1.697 1.697	0.002	1.005 1.005	2676753 1108508	0.8725	2 41/1 25 2 74)	98.7	14845 8706	
61 Sodium 1H, 327.00 > 307.00	1H,2H,2				552520	1.00	2.41(1.25-3.74)	107	27813	
D 7 13C2 PFHx 315.00 > 270.00	A	1.939		0.739	4872768	2.42		96.9	52494	
6 Perfluorohex 313.00 > 269.00	anoic ac		-0.004	1.000	1865552	0.9235		92.3	3481	
313.00 > 119.00 D 9 13C4-PFHp	1.935	1.939	-0.004	1.000	174320		10.70(5.03-15.10)		4251	
367.00 > 322.00 10 Perfluorohe	2.267	2.267 acid	0.0	0.866	4666892	2.44		97.4	29869	
363.00 > 319.00 363.00 > 169.00		2.268 2.268	-0.001 -0.001	1.000 1.000	1947832 779704	0.9494	2.50(1.13-3.40)	94.9	4261 7100	
8 Perfluorohex 399.00 > 80.00 399.00 > 99.00	anesulfo 2.280 2.280	onic acid 2.280 2.280	0.0 0.0	1.000 1.000	2150040 717561	0.8699	3.00(1.50-4.49)	95.6	7656 6998	
2	00	00							0.70	

Chrom Revision: 2.2 08-Dec-2017 11:41:26 Report Date: 19-Jan-2018 15:50:57

Data File:

Name	Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_003.d										
403 00 84 00 2,280 2,282 0,002 0,871 5249709 2,23 94.1 39047 13 Sodium 1H,1H,2H,2H-perituroscenter (27.00 407.00 2,597 2,596 0,001 1,000 649463 1,06 112 13602 12400 8100 2,597 2,596 0,001 1,000 4692080 2,47 104 27241 1,000 2,000 2,000 2,627 2,622 0,005 1,000 4692080 2,50 9,9 38195 2,621302-PF0A 413.00 3,309.00 2,617 2,622 0,005 1,000 1,002 2,00730 0,9227 1,95(0,84-2,52) 7504 13,000 3,09,00 2,617 2,623 0,006 1,000 1,002 1,002 1,002 1,000 1,002 1,000	Signal	RT				Response		Ratio(Limits)	%Rec	S/N	Flags
403 00 84 00 2,280 2,282 0,002 0,871 5249709 2,23 94.1 39047 13 Sodium 1H,1H,2H,2H-perituroscenter (27.00 407.00 2,597 2,596 0,001 1,000 649463 1,06 112 13602 12400 8100 2,597 2,596 0,001 1,000 4692080 2,47 104 27241 1,000 2,000 2,000 2,627 2,622 0,005 1,000 4692080 2,50 9,9 38195 2,621302-PF0A 413.00 3,309.00 2,617 2,622 0,005 1,000 1,002 2,00730 0,9227 1,95(0,84-2,52) 7504 13,000 3,09,00 2,617 2,623 0,006 1,000 1,002 1,002 1,002 1,000 1,002 1,000	D 11 18O2 PEH	/ S									
	403.00 > 84.00	2.280				5249709	2.23		94.1	39047	
D 12 M2-6-2FTS											
A29.00 81.00 2.597 2.597 0.0 0.992 876.396 2.47 10.4 27241 10.4 17.00 372.00 2.617 3.622 0.005 1.000 4692080 2.50 99.9 38195 34190 3415.00 3370.00 2.617 2.622 0.005 1.000 3492080 2.50 99.9 38195 3415.00 3370.00 2.617 2.623 0.006 1.000 2029730 0.9227 1.95(0.842.52) 7504 16.900 2.617 2.623 0.005 1.000 1043219 1.95(0.842.52) 7504 16.900 2.624 2.629 0.005 1.000 1043219 1.95(0.842.52) 7504 16.9010 2.627 0.005 1.000 1043219 1.95(0.842.52) 7504 16.9010 2.627 0.005 1.000 1033219 1.95(0.842.52) 7504 1.95(0.842.5			2.596	0.001	1.000	649463	1.06		112	13602	
D 14 13C4 PFOA											
*************************************	429.00 > 81.00	2.597	2.597	0.0	0.992	876396	2.47		104	27241	
62 13C2-PFOA 13 10 10 10 10 10 10 1	D 14 13C4 PFO	4									
415.00 > 370.00	417.00 > 372.00	2.617	2.622	-0.005	1.000	4692080	2.50		99.9	38195	
15 Perfluorootaroita roll 413 00 3 69,00 2 cl17 2 c623	* 62 13C2-PFOA	١									
A13.00 > 369.00 2.617 2.623 0.006 1.000 1043219 1.95(0.84-2.52) 7504 1.7504 1.95(0.84-2.52) 7504	415.00 > 370.00	2.617	2.622	-0.005		5214087	2.50			34790	
A13.00 > 369.00 2.617 2.623 0.006 1.000 1043219 1.95(0.84-2.52) 7504 1.7504 1.95(0.84-2.52) 7504	15 Perfluorooct	anoic ac	cid								
16 PerfluorocheptanesulForlic acid 449,00 > 80.00				-0.006	1.000	2029730	0.9227		92.3	1733	
A49,00 > 80.00	413.00 > 169.00	2.617	2.623	-0.006	1.000	1043219		1.95(0.84-2.52)		7504	
A49,00 > 80.00	16 Perfluoroher	ntanesul	fonic ac	id							
A49,00 > 99.00	•				1.000	1793085	0.9509		99.9	18790	
D							0.7007	3.56(1.94-5.82)	,,,,		
468.00 > 423.00 2.987 2.992 0.005 1.141 3608573 2.37 94.8 27258 17 Perfluorooctane sulforic acid 499.00 > 80.00 2.987 2.992 0.005 1.000 300616 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 486 4.67(2.31-6.93) 4.67(2.31-6.9			2.027	0.000				0.00(, 0.02)			
17 Perfluorooctanus sulformation 499.00 > 80.00			2 002	0.005	1 1/1	3609573	2 27		04.8	27250	
499.00 > 80.00					1.141	3000373	2.37		94.0	27230	
A99.00 > 99.00 2.987 2.992 0.005 1.000 300616					4 000	4.400000	0.0000		07.0	050	
D 18 13C4 PFOS 503.00 2.987 2.992 0.005 1.141 3327335 2.23 93.3 26395 20 20 20 20 20 20 20 2							0.9002	4 (7/0 04 (00)	97.0		
S03.00			2.992	-0.005	1.000	300616		4.67(2.31-6.93)		486	
20 Perfluoronononononononononononononononononono											
463.00 > 419.00	503.00 > 80.00	2.987	2.992	-0.005	1.141	3327335	2.23		93.3	26395	
463.00 > 169.00 2.987	20 Perfluoronor	nanoic a	cid								
22 Perfluorooctane Sulfonamide 498.00 > 78.00	463.00 > 419.00	2.987	2.992	-0.005	1.000	1444056	0.9692		96.9	4571	
498.00 > 78.00	463.00 > 169.00	2.987	2.992	-0.005	1.000	353124		4.09(1.90-5.69)		8556	
D 21 13C8 FOSA S 3.335 3.338 -0.003 1.274 4390673 2.09 83.6 23114 D 26 M2-8:2FTS S 529.00 > 81.00 3.342 3.342 0.0 1.277 915480 2.44 102 16147 25 Sodium 1H,1H,2H,2H-perfluorodecome S 527.00 > 507.00 3.342 3.342 0.0 1.000 449847 0.9670 101 10985 D 23 13C2 PFDA S 515.00 > 470.00 3.350 3.352 -0.002 1.280 3086625 2.35 93.9 21121 24 Perfluorodecomoic comoic	22 Perfluorooct	ane Sulf	fonamid	е							
506.00 > 78.00 3.335 3.338 0.003 1.274 4390673 2.09 83.6 23114 D 26 M2-8:2FTS 529.00 > 81.00 3.342 0.0 1.277 915480 2.44 102 16147 25 Sodium 1H,1H,2H,2H-perfluorodecarus 527.00 > 507.00 3.342 3.342 0.0 1.000 449847 0.9670 101 10985 D 23 13C2 PFDA 515.00 > 470.00 3.350 3.352 0.002 1.280 3086625 2.35 93.9 21121 24 Perfluorodecaroic acid 513.00 > 469.00 3.353 0.003 1.000 1199181 1.00 100 5865 513.00 > 169.00 3.350 3.533 0.003 1.000 212576 5.64(2.36-7.09) 2121 D 27 d3-NMeFOSAA 573.00 > 419.00 3.509 3.513 -0.005 1.338 1613196 2.46 98.3 13386 28 N-methyl perfluoroctaric sulforiacid 599.00 > 80.00 3.666 3.666 0.0 1.000 91136 1.00 90.924 93.2 4404 599.00 > 99.0	498.00 > 78.00	3.335	3.338	-0.003	1.000	1702510	0.9868		98.7	14344	
506.00 > 78.00 3.335 3.338 0.003 1.274 4390673 2.09 83.6 23114 D 26 M2-8:2FTS 529.00 > 81.00 3.342 0.0 1.277 915480 2.44 102 16147 25 Sodium 1H,1H,2H,2H-perfluorodecarus 527.00 > 507.00 3.342 3.342 0.0 1.000 449847 0.9670 101 10985 D 23 13C2 PFDA 515.00 > 470.00 3.350 3.352 0.002 1.280 3086625 2.35 93.9 21121 24 Perfluorodecaroic acid 513.00 > 469.00 3.353 0.003 1.000 1199181 1.00 100 5865 513.00 > 169.00 3.350 3.533 0.003 1.000 212576 5.64(2.36-7.09) 2121 D 27 d3-NMeFOSAA 573.00 > 419.00 3.509 3.513 -0.005 1.338 1613196 2.46 98.3 13386 28 N-methyl perfluoroctaric sulforiacid 599.00 > 80.00 3.666 3.666 0.0 1.000 91136 1.00 90.924 93.2 4404 599.00 > 99.0	D 21 13C8 FOSA	Δ									
D 26 M2-8:2FTS 529.00 > 81.00			3.338	-0.003	1.274	4390673	2.09		83.6	23114	
529.00 > 81.00 3.342 3.342 0.0 1.277 915480 2.44 102 16147 25 Sodium 1H, 1H, 2H, 2H-perflurodecame 527.00 > 507.00 3.342 3.342 0.0 1.000 449847 0.9670 101 10985 D 23 13C2 PFDA 515.00 > 470.00 3.350 3.352 -0.002 1.280 3086625 2.35 93.9 21121 24 Perfluorodecanoic acid 513.00 > 469.00 3.350 3.353 -0.003 1.000 1199181 1.00 100 5865 513.00 > 169.00 3.350 3.503 -0.003 1.000 212576 5.64(2.36-7.09) 2121 D 27 d3-NMeFOSAA 573.00 > 419.00 3.502 3.507 -0.005 1.338 1613196 2.46 98.3 13386 28 N-methyl perfluorodecane sulfonic 570.00 > 419.00 3.509 3.513 -0.004 1.002 649935 0.9324 93.2 4404 599.00 > 80.00 3.666 3.666 0.0 1.000 911136 1.00 2.96(1.39-4.16) 10997											

Report Date: 19-Jan-2018 15:50:57 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date. 17-3a	11-2010 13.30.31	CI	III OIII INGVISIOII.	2.2	0-DCC-20	/	.20
Data File:	\\ChromNa\Sacramento\ChromData	\A8	_N\20180118-5	3066	.b\2018.0	1.18LLA	_003.d

		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroun	decanoio	c acid								
563.00 > 519.00		3.678	0.004	1.000	882042	0.8608		86.1	3899	
563.00 > 169.00	3.682	3.678	0.004	1.000	181576		4.86(0.00-0.00)		5393	
D 30 13C2 PFU										
565.00 > 520.00		3.679	0.003	1.407	2481720	2.49		99.5	24842	
33 N-ethyl perf										
584.00 > 419.00	3.682	3.679	0.003	1.002	591326	0.9863		98.6	8680	
35 MeFOSA	2 027	2.075	0.020		40F/11	ND		0.0	2/00	
512.00 > 169.00		3.875	-0.038		405611	NR		0.0	2688	
37 Perfluorodo 613.00 > 569.00		3.979	-0.004	1.000	1013815	1.01		101	3920	
613.00 > 169.00		3.979	-0.004	1.000	241525	1.01	4.20(2.13-6.40)	101	9239	
D 36 13C2 PFD							,			
615.00 > 570.00		3.979	-0.004	1.519	2453962	2.27		90.6	33119	
39 N-ethylperflu	uoro-1-o	ctanesul	fonami							
526.00 > 169.00	4.030	4.066	-0.036		401757	NR		0.0	2649	
41 Perfluorotric	lecanoic	acid								
663.00 > 619.00		4.242	-0.007	1.000	1123414	0.9856		98.6	3969	
663.00 > 169.00		4.242	-0.007	1.000	357171		3.15(1.25-3.76)		13449	
42 Perfluoroteti			0.040	4 000	001000	4.00		400	000/	
713.00 > 169.00 713.00 > 219.00		4.483 4.483	-0.010 -0.010	1.000 1.000	321390 225259	1.02	1.43(0.71-2.13)	102	8036 6644	
D 43 13C2-PFT		4.403	-0.010	1.000	223239		1.43(0.71-2.13)		0044	
715.00 > 670.00		4.483	-0.010	1.709	3237319	2.29		91.5	17740	
D 44 13C2-PFH		4.405	-0.010	1.707	3237317	2.27		71.5	17740	
815.00 > 770.00		4.902	-0.006	1.871	5453522	2.16		86.5	11544	
45 Perfluorohe										
813.00 > 769.00		4.902	-0.006	1.000	2037554	0.9665		96.7	1342	
813.00 > 169.00	4.896	4.902	-0.006	1.000	343377		5.93(2.86-8.58)		4499	
46 Perfluorooct	tadecand	oic acid								
913.00 > 869.00		5.255	-0.008	1.000	2426552	1.06		106	530	
913.00 > 169.00	5.240	5.255	-0.015	0.999	292966		8.28(0.00-0.00)		1601	

OC Flag Legend Processing Flags

NR - Missing Quant Standard

Report Date: 19-Jan-2018 15:50:57 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_003.d **Injection Date:** 18-Jan-2018 17:45:29 Instrument ID: A8_N Lims ID: LCS 320-204105/2-A Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 42 Worklist Smp#: 3 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL $A8_N$ D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x 70 (000015 X) 12 660 **≻**40 30 20 10 1.0 2.2 1.9 1.6 1.0 1.6 D 47 13C3-PFBS 5 Perfluorobutanesulfonic acid 4 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 28 (56⁻ (00048⁻ (77° (0066° <u>8</u>24 ∑20 ×40 ≻16⁻ 12 33 22 16 2.2 1.9 1.3 1.6 1.9 1.0 1.3 2.2 1.9 2.2 1.3 1.0 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexable 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 (015 (0000012 (X) > 9 (00015⁻ (00001x12-(00001x12-830 Ö₂₅-× × × 15 1.7 2.0 1.5 1.8 1.9 1.4 1.2 2.1 2.4 1.3 1.6 2.2 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 9 13C4-PFHpA Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_ 63 56- (000012 X) 00054 X45 <u>6</u>48 \ 40 **≻**32 27 24 18 16 0 0|- 1.6 1.9 2.2 Page 567nof 606 1.5 1.8 2.1 2.4 2.7 1.7 2.0 2.3 2.6 2.9 1.2 1.4

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:50:57

3.4

3.7

2.7

3.0

3.3

3.6

3.9

ol - 2.8

3.1

3.4

3.7

2.8

3.1

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_003.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x 56 X) 30-36-3.502 0 0 48 666 ×55 ×40 ∑44**⁻** >32 33 18 24 22 12 16 11 3.3 3.2 2.7 3.0 3.6 3.9 2.9 3.5 2.9 3.2 3.5 3.8 4.4 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 24 (30° (25° (000010° ×) × , ©20 ∑16**-**15 10 3.5 3.3 3.7 3.2 3.8 3.9 4.2 3.4 4.0 4.3 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_x Exp1:m/z 563.00 > 169.00:Moving5PtAverage_x 49 (30 (25 (25 63 0042 X35 6 54 ×45 _28 ≻₃₆-15 21 27 10 18 3.7 3.2 3.5 3.8 4.1 3.5 3.8 2.8 3.1 3.4 4.0 4.3 3.2 4.1 D 30 13C2 PFUnA 33 N-ethyl perfluorooctane sulfonamid 35 MeFOSA Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x Exp1:m/z 512.00 > 169.00:Moving5PtAverage_> (000018-(00001X) Y (X100000) (000012 X) X 0 2.9 3.2 3.5 3.8 4.1 4.4 3.0 3.3 3.6 3.9 4.2 3.2 3.5 3.8 4.1 4.4

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:50:57

22- 11-

4.1

4.4

4.7

5.0

5.3

5.6

4.3

4.6

4.9

5.2

5.5

4.0

4.3

4.6

4.9

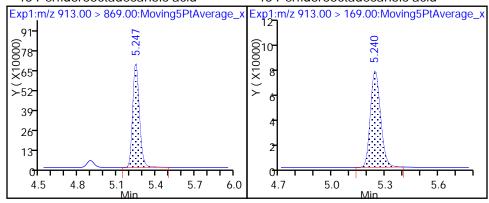
5.2

5.5

5.8

46 Perfluorooctadecanoic acid

46 Perfluorooctadecanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
SDG No.:	
Client Sample ID:	Lab Sample ID: LCSD 320-204105/3-A
Matrix: Water	Lab File ID: 2018.01.18LLA_004.d
Analysis Method: 537 (modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 01/16/2018 09:18
Sample wt/vol: 250(mL)	Date Analyzed: 01/18/2018 17:53
Con. Extract Vol.: 10.0(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No · 204556	Ilnits: na/I.

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	38.1		2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	35.9		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	35.7		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	37.2		2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	37.8		4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	37.5		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	37.9		2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	37.2		4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	39.8		4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	38.6		4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	40.7		2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33.8		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	33.8		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	37.5		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34.3		4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	36.9		2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	36.6		2.0	1.0	0.35

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	JOD NO.: 32U-35U4Z-1
SDG No.:	
Client Sample ID:	Lab Sample ID: LCSD 320-204105/3-A
Matrix: Water	Lab File ID: 2018.01.18LLA_004.d
Analysis Method: 537 (modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 01/16/2018 09:18
Sample wt/vol: 250(mL)	Date Analyzed: 01/18/2018 17:53
Con. Extract Vol.: 10.0(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup: (Y/N) N
Analysis Batch No.: 204556	Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	92		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	104		25-150
STL00995	13C5 PFNA	103		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	94		25-150
STL00994	1802 PFHxS	100		25-150
STL00991	13C4 PFOS	101		25-150
STL02116	13C2-PFTeDA	99		25-150
STL01892	13C4-PFHpA	104		25-150
STL01893	13C5 PFPeA	106		25-150
STL02337	13C3-PFBS	105		25-150

Report Date: 19-Jan-2018 15:50:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_004.d

Lims ID: LCSD 320-204105/3-A

Client ID:

Sample Type: LCSD

Inject. Date: 18-Jan-2018 17:53:18 ALS Bottle#: 43 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcsd 320-204105/3-a Misc. Info.: Plate: 1 Rack: 5

Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1: Det: EXP1

Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:48:26

First Level Reviewer: roycea					Date:	Date: 19-Jan-2018 15:48:26				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFBA 217.00 > 172.00		1.411	-0.004	0.537	7845450	2.61		104	18191	
2 Perfluorobut 212.90 > 169.00	•	1.413	-0.006	1.000	2789122	0.9513		95.1	386	
D 3 13C5-PFPe 267.90 > 223.00		1.659	0.002	0.633	4702258	2.64		106	53008	
4 Perfluoroper 262.90 > 219.00	1.661		-0.001	1.000	1987582	0.8970		89.7	2033	
D 47 13C3-PFB 301.90 > 83.00	1.688	1.695	-0.007	0.643	96441	2.45		105	4909	
	anesulfo 1.696 1.696	nic acid 1.697 1.697	-0.001 -0.001	1.005 1.005	2707707 1126078	0.8454	2.40(1.25-3.74)	95.6	12594 9515	
61 Sodium 1H, 327.00 > 307.00	1H,2H,2		orohexar		533292	0.9254	,	99.1	26470	
D 7 13C2 PFHx 315.00 > 270.00		1.939	0.004	0.741	5174775	2.70		108	38476	
6 Perfluorohex 313.00 > 269.00 313.00 > 119.00	1.943	1.939 1.939	0.004	1.000 1.000	1913305 181769	0.8918	10.53(5.03-15.10)	89.2	4837 3175	
D 9 13C4-PFH _p 367.00 > 322.00	А	2.267	-0.003	0.863	4746132	2.60		104	28099	
10 Perfluorohe 363.00 > 319.00 363.00 > 169.00	2.264	acid 2.268 2.268	-0.004 -0.004	1.000 1.000	1940679 729010	0.9301	2.66(1.13-3.40)	93.0	3970 6565	
8 Perfluorohex 399.00 > 80.00 399.00 > 99.00	anesulfo 2.277 2.277	onic acid 2.280 2.280	-0.003 -0.003	1.000 1.000	2116894 689054	0.8440	3.07(1.50-4.49)	92.7	8622 5857	

Report Date: 19-Jan-2018 15:50:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-2 Data File:				to\Chrom			08-Dec-2017 11:41 6.b\2018.01.18LLA			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHx 403.00 > 84.00		2.282	-0.005	0.868	5327402	2.37		100	50201	
13 Sodium 1H,1 427.00 > 407.00	2.595	•		e 1.000	670262	1.06		112	8995	
D 12 M2-6:2FTS 429.00 > 81.00	2.595	2.597	-0.002	0.990	907665	2.69		113	25717	
D 14 13C4 PFOA 417.00 > 372.00 * 62 13C2-PFOA	2.623	2.622	0.001	1.000	4668901	2.61		104	36318	
415.00 > 370.00 15 Perfluorooct	2.623	2.622	0.001		4965525	2.50			31608	
413.00 > 369.00 413.00 > 169.00	2.623	2.623 2.623		1.000 1.000	2066479 1011023	0.9441	2.04(0.84-2.52)	94.4	1555 7611	
16 Perfluoroher 449.00 > 80.00 449.00 > 99.00	2.630	fonic ac 2.629 2.629	id 0.001 0.001	1.000 1.000	1825523 510307	0.9363	3.58(1.94-5.82)	98.4	20104 12725	
D 19 13C5 PFNA 468.00 > 423.00		2.992	0.001	1.141	3725676	2.57		103	23212	
17 Perfluorooct 499.00 > 80.00 499.00 > 99.00	2.993	onic acio 2.992 2.992	0.001 0.001	1.000 1.000	1383490 303294	0.8586	4.56(2.31-6.93)	92.5	352 478	
D 18 13C4 PFOS 503.00 > 80.00		2.992	0.001	1.141	3440172	2.42		101	29250	
20 Perfluoronor 463.00 > 419.00 463.00 > 169.00	2.993	cid 2.992 2.992	0.001 0.001	1.000 1.000	1442224 345437	0.9375	4.18(1.90-5.69)	93.8	3875 5171	
22 Perfluoroocta 498.00 > 78.00	3.339			1.000	1654943	0.9153		91.5	9939	
D 21 13C8 FOSA 506.00 > 78.00	3.339	3.338	0.001	1.273	4601425	2.30		92.0	23110	
D 26 M2-8:2FTS 529.00 > 81.00	3.339			1.273	912391	2.56		107	15904	
25 Sodium 1H,1 527.00 > 507.00 D 23 13C2 PFDA	3.339	•		1.000	435273	0.9389		98.0	11892	
515.00 > 470.00 24 Perfluorodeo	3.347		-0.005	1.276	3206271	2.56		102	26221	
513.00 > 469.00 513.00 > 169.00	3.355	3.353 3.353	0.002 0.002	1.002 1.002	1178381 202358	0.9470	5.82(2.36-7.09)	94.7	6034 1845	
D 27 d3-NMeFO	3.507	3.507		1.337	1512298	2.42		96.8	9053	
28 N-methyl per 570.00 > 419.00	3.514	3.513	0.001	1.002	632440	0.9678		96.8	4135	
599.00 > 99.00	3.663 3.663	3.666	id -0.003 -0.003	1.000 1.000	870026 289862	0.9230	3.00(1.39-4.16)	95.7	15505 6566	
D 32 d5-NEtFOS 589.00 > 419.00		3.672	-0.002	1.399	1585894 Page 576 of 6	2.51		100	7195	

Page 576 of 606

Report Date: 19-Jan-2018 15:50:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26

report Bate. 17 3t	2010 10.00.00	On On Novision 2.2 00 Dec 2017 11.11.20	O
Data File:	\\ChromNa\Sacramento\ChromData	ta\A8_N\20180118-53066.b\2018.01.18LLA_0	04.d

		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroun	decanoio	r acid								
563.00 > 519.00		3.678	0.0	1.000	899044	0.9305		93.1	3823	
563.00 > 169.00	3.678	3.678	0.0	1.000	176705		5.09(0.00-0.00)		8023	
D 30 13C2 PFU										
565.00 > 520.00	3.678	3.679	-0.001	1.402	2340146	2.46		98.5	24761	
33 N-ethyl perf										
584.00 > 419.00	3.678	3.679	-0.001	1.002	596021	0.9648		96.5	7436	
35 MeFOSA	0.040	0.075	0.000		100001	ND		0.0	00.40	
512.00 > 169.00		3.875	-0.032		420394	NR		0.0	2343	
37 Perfluorodo 613.00 > 569.00		3.979	0.0	1.000	992087	1.00		99.6	4871	
613.00 > 169.00		3.979		1.000	247387	1.00	4.01(2.13-6.40)	99.0	9393	
D 36 13C2 PFD		0.,,,	0.0		2,,,,,,		(=		7070	
615.00 > 570.00		3.979	0.0	1.517	2430069	2.36		94.3	22274	
39 N-ethylperfl	uoro-1-o	ctanesu	lfonami							
526.00 > 169.00			-0.031		418933	NR		0.0	2497	
41 Perfluorotrio	decanoic	acid								
663.00 > 619.00		4.242	-0.001	1.000	1090051	0.9657		96.6	3949	
663.00 > 169.00		4.242	-0.001	1.000	342828		3.18(1.25-3.76)		9584	
42 Perfluorotet			0.010	1 000	000010	4.00		100	7011	
713.00 > 169.00		4.483 4.483	-0.012 -0.012	1.000 1.000	330043	1.02	1 55/0 71 2 12)	102	7214 6332	
713.00 > 219.00		4.463	-0.012	1.000	213570		1.55(0.71-2.13)		0332	
D 43 13C2-PFT 715.00 > 670.00		4.483	-0.012	1.705	3320329	2.46		98.6	23350	
D 44 13C2-PFH		4.403	-0.012	1.703	3320327	2.40		70.0	23330	
815.00 > 770.00		4.902	-0.008	1.866	5411847	2.25		90.1	13622	
45 Perfluorohe										
813.00 > 769.00		4.902	-0.008	1.000	1941175	0.9271		92.7	1325	
813.00 > 169.00	4.894	4.902	-0.008	1.000	314724		6.17(2.86-8.58)		4112	
46 Perfluorooc	tadecand	oic acid								
913.00 > 869.00		5.255	-0.010	1.000	2255124	0.9888		98.9	487	
913.00 > 169.00	5.245	5.255	-0.010	1.000	279921		8.06(0.00-0.00)		1549	

QC Flag Legend Processing Flags

NR - Missing Quant Standard

Report Date: 19-Jan-2018 15:50:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_004.d **Injection Date:** 18-Jan-2018 17:53:18 Instrument ID: A8_N Lims ID: LCSD 320-204105/3-A Client ID: Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: A8_N Limit Group: LC PFC_DOD ICAL D 113C4 PFBA 2 Perfluorobutyric acid D 313C5-PFPeA Exp1:m/z 212.90 > 169.00:Moving5PtAverage_x | Exp1:m/z 267.90 > 223.00:Moving5PtAverage_x Exp1:m/z 217.00 > 172.00:Moving5PtAverage_x (000012 10 10 (000015 X) 12 27 18 0.9 1.0 2.2 0.3 2.7 1.6 8.0 1.1 1.4 1.7 2.1 5 Perfluorobutanesulfonic acid D 47 13C3-PFBS 4 Perfluoropentanoic acid Exp1:m/z 301.90 > 83.00:Moving5PtAverage_x3 Exp1:m/z 262.90 > 219.00:Moving5PtAverage_x Exp1:m/z 298.90 > 80.00:Moving5PtAverage_x3 56- 84 0048 ×10001 ×10001 6072 ×60 >-48 36 12 16 24 12 1.9 1.2 1.5 1.8 2.1 2.4 1.0 1.3 2.2 1.9 2.2 1.3 1.0 5 Perfluorobutanesulfonic acid 61 Sodium 1H,1H,2H,2H-perfluorohexaDe 7 13C2 PFHxA Exp1:m/z 298.90 > 99.00:Moving5PtAverage_x3 Exp1:m/z 327.00 > 307.00:Moving5PtAverage_x 18 00015 X 12 00015 X12 830) 25 × 20 15 1.3 1.6 1.9 2.2 1.5 1.8 1.7 2.0 1.0 1.2 2.1 2.4 1.4 2.3 1.1 6 Perfluorohexanoic acid 6 Perfluorohexanoic acid 9 13C4-PFHpA Exp1:m/z 313.00 > 269.00:Moving5PtAverage_x Exp1:m/z 313.00 > 119.00:Moving5PtAverage_x Exp1:m/z 367.00 > 322.00:Moving5PtAverage_x 56- (000012 X) 56 0048 0048 X40 ×40 ×32 24 24 16 16 00 8.0 1.4 2.0 2.6 1.6 1.9 2.2 2.5 2.8 1.2 1.3

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:50:58

3.4

3.7

2.7

2.7

3.0

3.6

3.9

2.8

3.1

3.3

3.6

3.9

3.0

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_004.d 24 Perfluorodecanoic acid 24 Perfluorodecanoic acid D 27 d3-NMeFOSAA Exp1:m/z 513.00 > 469.00:Moving5PtAverage_x (042 00035 × × >28 0 0 42 <u>666</u> ∑55<u>-</u> **∑**35 ≻28 21 33 21 14 22 14 3.4 2.8 2.8 3.1 3.7 3.1 3.4 3.7 2.7 3.0 3.3 3.6 3.9 4.2 28 N-methyl perfluorooctane sulfonami 29 Perfluorodecane Sulfonic acid 29 Perfluorodecane Sulfonic acid Exp1:m/z 570.00 > 419.00:Moving5PtAverage_x Exp1:m/z 599.00 > 99.00:Moving5PtAverage_x3 Exp1:m/z 599.00 > 80.00:Moving5PtAverage_x3 630 60 825 621- 618-× (×10000) \S_{20} ∑₁₅ 15- 10 3.5 3.3 3.2 3.8 3.9 4.2 3.4 3.7 4.0 D 32 d5-NEtFOSAA 31 Perfluoroundecanoic acid 31 Perfluoroundecanoic acid Exp1:m/z 563.00 > 169.00:Moving5PtAverage_x Exp1:m/z 589.00 > 419.00:Moving5PtAverage_x Exp1:m/z 563.00 > 519.00:Moving5PtAverage_> 635<u>-</u> 63 00 54 (0049 0042 1 ×25 ×35 ×45 ≻₂₈ ≻20 15 21 27 10 18 0 3.2 3.8 3.4 3.7 4.0 3.4 3.7 4.0 3.5 4.1 4.4 3.1 3.1 D 30 13C2 PFUnA 33 N-ethyl perfluorooctane sulfonamid 35 MeFOSA Exp1:m/z 584.00 > 419.00:Moving5PtAverage_x Exp1:m/z 512.00 > 169.00:Moving5PtAverage_> Exp1:m/z 565.00 > 520.00:Moving5PtAverage_x 91 (000012 ×) > 9 ©78 ×65 -52 39 26 13 0 2.9 3.2 3.5 3.8 4.1 4.4 2.9 3.2 3.5 3.8 4.1 4.4 3.4 3.7 4.0 4.3 4.6 3.1

Chrom Revision: 2.2 08-Dec-2017 11:41:26

Report Date: 19-Jan-2018 15:50:58

10

4.1

4.4

4.7

5.0

5.3

5.6

4.3

4.6

4.9

5.2

5.5

4.0

4.3

4.6

4.9

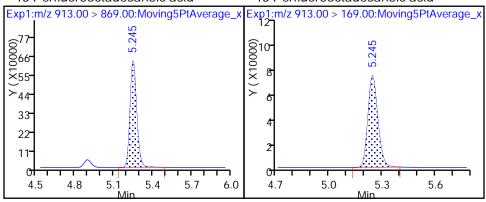
5.2

5.5

5.8

46 Perfluorooctadecanoic acid

46 Perfluorooctadecanoic acid



Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1				
SDG No.:					
Instrument ID: A8_N	Start Date: 01/17/2018 14:19				
Analysis Batch Number: 204375	End Date: 01/17/2018 15:22				

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-204375/2		01/17/2018 14:19	1	2018.01.17CURVE LLA 002.d	GeminiC18 3x100 3(mm)
IC 320-204375/3		01/17/2018 14:27	1	2018.01.17CURVE LLA 003.d	GeminiC18 3x100 3 (mm)
IC 320-204375/4		01/17/2018 14:35	1	2018.01.17CURVE LLA 004.d	GeminiC18 3x100 3(mm)
IC 320-204375/5		01/17/2018 14:42	1	2018.01.17CURVE LLA 005.d	GeminiC18 3x100 3 (mm)
IC 320-204375/6		01/17/2018 14:50	1	2018.01.17CURVE LLA 006.d	GeminiC18 3x100 3(mm)
IC 320-204375/7		01/17/2018 14:58	1	2018.01.17CURVE LLA 007.d	GeminiC18 3x100 3(mm)
IC 320-204375/8		01/17/2018 15:06	1	2018.01.17CURVE LLA 008.d	GeminiC18 3x100 3 (mm)
ICB 320-204375/9		01/17/2018 15:14	1		GeminiC18 3x100 3(mm)
ICV 320-204375/10		01/17/2018 15:22	1	2018.01.17CURVE LLA 010.d	GeminiC18 3x100 3(mm)

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1				
SDG No.:					
Instrument ID: A8_N	Start Date: 01/18/2018 10:35				
Analysis Batch Number: 204504	End Date: 01/18/2018 15:01				

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
CCVL 320-204504/1		01/18/2018 10:35	1	2018.01.18LLC_0 04.d	GeminiC18 3x100 3(mm)
CCV 320-204504/2		01/18/2018 10:43	1		GeminiC18 3x100 3(mm)
ZZZZZ		01/18/2018 10:50	1		GeminiC18 3x100 3(mm)
CCV 320-204504/14		01/18/2018 12:17	1		GeminiC18 3x100 3(mm)
CCV 320-204504/25		01/18/2018 13:43	1		GeminiC18 3x100 3(mm)
CCV 320-204504/35		01/18/2018 15:01	1		GeminiC18 3x100 3(mm)

Lab Name: TestAmerica Sacramento		Job No.: <u>320-35042-1</u>				
SDG No.:						
Instrument I	D: <u>A8_</u> N	Start Date: 01/18/2018 17:29				
Analysis Bat	ch Number: 204556	End Date: 01/18/2018 18:40				

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
CCV 320-204556/1		01/18/2018 17:29	1	2018.01.18LLA_0 01.d	GeminiC18 3x100 3(mm)
MB 320-204105/1-A		01/18/2018 17:37	1	2018.01.18LLA_0 02.d	GeminiC18 3x100 3(mm)
LCS 320-204105/2-A		01/18/2018 17:45	1	2018.01.18LLA_0 03.d	GeminiC18 3x100 3(mm)
LCSD 320-204105/3-A		01/18/2018 17:53	1	2018.01.18LLA_0 04.d	GeminiC18 3x100 3(mm)
320-35042-1		01/18/2018 18:01	1	2018.01.18LLA_0 05.d	GeminiC18 3x100 3(mm)
320-35042-2		01/18/2018 18:08	1	2018.01.18LLA_0 06.d	GeminiC18 3x100 3(mm)
320-35042-3		01/18/2018 18:16	1	2018.01.18LLA_0 07.d	GeminiC18 3x100 3(mm)
320-35042-4		01/18/2018 18:24	1	2018.01.18LLA_0 08.d	GeminiC18 3x100 3(mm)
CCV 320-204556/10		01/18/2018 18:40	1	2018.01.18LLD_0 01.d	GeminiC18 3x100 3(mm)

Lab Name: TestAmerica Sacramento	Job No.: <u>320-35042-1</u>				
SDG No.:					
Instrument ID: A8_N	Start Date: 01/19/2018 16:50				
Analysis Batch Number: 204757	End Date: 01/19/2018 17:13				

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
CCV 320-204757/1		01/19/2018 16:50	1	2018.01.19LLC_0 09.d	GeminiC18 3x100 3(mm)
320-35042-1 DL		01/19/2018 16:58	10	2018.01.19LLC_0 10.d	GeminiC18 3x100 3(mm)
ZZZZZ		01/19/2018 17:06	1		GeminiC18 3x100 3(mm)
CCV 320-204757/4		01/19/2018 17:13	1	2018.01.19LLC_0 12.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Batch Number: 204105 Batch Start Date: 01/16/18 09:18 Batch Analyst: Branscum, Cassie

Batch Method: 3535 Batch End Date: 01/16/18 14:28

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00031	LCPFC-IS 00020
MB 320-204105/1		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
LCS 320-204105/2		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
LCSD 320-204105/3		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
320-35042-A-1	TP-PFC-025-TPI	3535, 537 (modified)	Т	283.44 g	27.22 g	256.2 mL	10.0 mL	500 uL	500 uL
320-35042-A-2	TP-PFC-025-MID-C ARBON	3535, 537 (modified)	Т	280.89 g	27.04 g	253.9 mL	10.0 mL	500 uL	500 uL
320-35042-A-3	TP-PFC-025-TPE	3535, 537 (modified)	Т	284.26 g	27.55 g	256.7 mL	10.0 mL	500 uL	500 uL
320-35042-A-4	TP-PFC-025-TPE-D	3535, 537 (modified)	Т	280.26 g	27.26 g	253 mL	10.0 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00119			
MB 320-204105/1		3535, 537					
		(modified)					
LCS		3535 , 537		500 uL			
320-204105/2		(modified)					
LCSD		3535 , 537		500 uL			
320-204105/3		(modified)					
320-35042-A-1	TP-PFC-025-TPI	3535 , 537	T				
		(modified)					
320-35042-A-2	TP-PFC-025-MID-C	3535 , 537	T				
	ARBON	(modified)					
320-35042-A-3	TP-PFC-025-TPE	3535 , 537	T				
		(modified)					
320-35042-A-4	TP-PFC-025-TPE-D	3535 , 537	T				
		(modified)					

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

537 (modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Batch Number: 204105 Batch Start Date: 01/16/18 09:18 Batch Analyst: Branscum, Cassie

Batch Method: 3535 Batch End Date: 01/16/18 14:28

Batch	Notes
Analyst ID - Aliquot Step	skd
Balance ID	QA-070
Batch Comment	Sample labels match client IDs: ccb 1/16/18
Analyst ID - Final Volume Step	ccb
H2O ID	1/11/17
Hexane ID	1095480
Internal Standard ID#	1125650
Manifold ID	8
Methanol ID	1127833
Sodium Hydroxide ID	1132905
Pipette ID	I46370G
Analyst ID - Reagent Drop	ССВ
Analyst ID - IS Reagent Drop	ccb
Analyst ID - IS Reagent Drop Witness	kmk
Analyst ID - SU Reagent Drop	ССВ
Analyst ID - SU Reagent Drop Witness	НЈА
Solvent Lot #	1131945
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337172A

Basis	Basis Description
Т	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.



West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): <u>35097</u>	Work List ID(s): 530	36666	3121		
Extraction Batch: 204105	Analysis Batch(es):	204550	5,204	157	
Delivery Rank	Due Date: 1/22/1	8			
A. Calibration/Instrument Run QC	· - · · · · · · · · · · · · · · · · · ·	1 st Level	2 nd Level	N/A	
1. ICAL locked in Chrom and TALS? ICAL Batch# 20	4275	~	1		
2. ICAL, CCV Frequency & Criteria met.	1510		1/		
RF _{average} criteria appropriate for the method.		~			
Linear Regression criteria appropriate if required in the include in the inc	(r > 0.005)				
 Quadratic fit criteria appropriate if required (r² > 0. 					
For Linear Regression and Quadratic fit – Does th					
½ the reporting limit as described in CA-Q-S-005?			- *,		
All curve points show calculated concentrations.					
Peaks correctly ID'd by data system.		-			
5. Tune check frequency & criteria met and Tune check re	eport attached.				
B QA/QC					
Are all QC samples properly linked in TALS?					
2. Method blank, LCS/LCSD and MS/SD frequencies met			-		
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.					
4. Are MS/MSD recoveries and RPD within control limits?					
Holding Times were met for prep and analytical.	,	/			
IS/Surrogate recoveries meet criteria or properly noted.					
C Sample Analysis					
1. Was correct analysis performed and were project instru	ctions followed?				
2. If required, are compounds within RT windows?			V		
If required, are positive hits confirmed and >40% RPD f	lagged?				
 Manual Integrations reviewed and appropriate. 			3/		
5. All analytes correctly reported. (Primary, secondary, ac	ceptable status)	/			
6. Correct reporting limits used. (based on client request,	prep factors, and		/		
dilutions)					
D. Documentation					
1. Are all non-conformances documented/attached? NCM	# 114124,114188	/			
2. Do results make sense (e.g. dilutions, etc.)?					
3. Have all flags been reviewed for appropriateness?			1		
4. For level 3 and 4 reports, have forms and raw data bee	n reviewed?		V		
5. Was QC Checker run for this job?			~		
*Upon completion of this checklist, the reviewer must scan	and attach the checklist	to the TALS	iob.		
1 st Level (Analyst):	Date: 1/27	2/18			
2nd Level Reviewer:	Date: 1/22	12018			

Report Date: 19-Jan-2018 16:34:14 Chrom Revision: 2.2 08-Dec-2017 11:41:24

Page: 1

TestAmerica Laboratories Worklist QC Batch Report

Worklist Name: 18JAN2018NCC_PFC Worklist Number: 53066
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b

QC Batching: Disabled Limit Group Batching: Enabled

QC Batch. 1	LC PFC_DOD ICAL Raw Batch: 204556
#1 CCV L5	#1 CCV L5
# 2 MB 320-204105/1-A	# 2 MB 320-204105/1-A
# 3 LCS 320-204105/2-A	# 3 LCS 320-204105/2-A
# 4 LCSD 320-204105/3-A	# 4 LCSD 320-204105/3-A
# 5 320-35042-A-1-A	# 5 320-35042-A-1-A
# 6 320-35042-A-2-A	# 6 320-35042-A-2-A
# 7 320-35042-A-3-A	# 7 320-35042-A-3-A
# 8 320-35042-A-4-A	# 8 320-35042-A-4-A
#9 QCL6	# 9 QC L6
#10 CCV L4	#10_CCV L4

ICAL: 204375 CCVL: 204504 Report Date: 22-Jan-2018 09:49:08

Chrom Revision: 2.2 08-Dec-2017 11:41:24

Page: 1

TestAmerica Laboratories Worklist QC Batch Report

Worklist Name:

19JAN2018NCE_PFC

Worklist Number: 53121

Instrument Name: A8_N

Chrom Method: A8_N

Data Directory:

\\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b

QC Batching:

Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC ICAL Raw Batch: 204756	LC PFC_DOD ICAL Raw Batch: 204757
# 1 CCV L5 # 2 320-35042-A-1-A	#1 CCV L5	# 1 CCV L5 # 2 320-35042-A-1-A
# 3 320-35042-A-1-A		# 2 320-35042-A-1-A # 3 320-35042-A-2-A
#4 CCV L4	#4 CCV L4	# 4 CCV L4

CCVL: 204655 ICAL: 204375

Chrom Revision: 2.2 08-Dec-2017 11:41:24

Page: 1

TestAmerica Laboratories Worklist Run Log Report

Worklist Name: 18JAN2018NCA_PFC

Worklist Num: 53056

Instrument: **A8 N** Method: **A8 N**

Batch Directory: \ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b

Creator: Royce, Amani A

Anaylysis Type: SemiVOA Ini Volume: 2.00

Inj Vol Units:

Sample Dil Vial Client ID Worklist ID File Name Factor Fract Lab ID Туре Inj Date/Time 2018.01.18LLC 004.d 21 CCVL 320-0053056-001 **CCVL** 18-Jan-2018 10:35:15 1.0 s٧ 2018.01.18LLC_005.d 30 CCV L4 320-0053056-002 CCV 18-Jan-2018 10:43:07 1.0 sv 20 1.0 RB 320-0053056-003 RB 18-Jan-2018 10:50:56 2018.01.18LLC_006.d S۷ 2018.01.18LLC 007.d 13 1.0 MB 320-204033/1-A 320-0053056-004 MB 18-Jan-2018 10:58:44 S۷ LCS 14 1.0 LCS 320-204033/2-A 320-0053056-005 18-Jan-2018 11:06:33 2018.01.18LLC_008.d sv CSSRM 320-204033/3-A 320-0053056-006 CSSRM 18-Jan-2018 11:14:21 2018.01.18LLC_009.d 15 1.0 S٧ Client 18-Jan-2018 11:22:12 2018.01.18LLC_010.d 16 1.0 BG-CR008-B S۷ 320-34271-A-21-B 320-0053056-007 17 BG-CR008-C 2018.01.18LLC_011.d 1.0 320-34271-A-22-B 320-0053056-008 Client 18-Jan-2018 11:30:00 sv 2018.01.18LLC 012.d 18 1.0 BG-CR008-D 320-34271-A-23-B 320-0053056-009 Client 18-Jan-2018 11:37:51 sv 19 1.0 BG-CR008-E 320-34271-A-24-B 320-0053056-010 Client 18-Jan-2018 11:45:41 2018.01.18LLC_013.d sv 20 BG-CR008-F 320-34271-A-25-B 320-0053056-011 Client 18-Jan-2018 11:53:33 2018.01.18LLC_014.d 1.0 sv 18-Jan-2018 12:01:25 2018.01.18LLC_015.d 21 1.0 BG-CR008-G S۷ 320-34271-A-26-B 320-0053056-012 Client 20 1.0 2018.01.18LLC_016.d RB 320-0053056-013 RB 18-Jan-2018 12:09:17 S٧ 2018.01.18LLC_017.d 31 1.0 CCV L5 320-0053056-014 CCV 18-Jan-2018 12:17:05 SV 22 1.0 BG-CR008-H 320-34271-A-27-B 320-0053056-015 Client 18-Jan-2018 12:24:52 2018.01.18LLC_018.d SV 23 320-34271-A-28-B 320-0053056-016 Client 18-Jan-2018 12:32:41 2018.01.18LLC_019.d 1.0 BG-CR008-I S٧ 320-34271-A-29-B 320-0053056-017 18-Jan-2018 12:40:29 2018.01.18LLC_020.d 24 1.0 BG-CR008-J S٧ Client 25 1.0 AE-CR008-A 2018.01.18LLC_021.d 320-34271-A-30-B 320-0053056-018 Client 18-Jan-2018 12:48:18 SV 18-Jan-2018 12:56:06 2018.01.18LLC_022.d 26 1.0 AE-CR008-B 320-34271-A-31-B 320-0053056-019 Client sv 320-34271-A-32-B 320-0053056-020 Client 18-Jan-2018 13:03:56 2018.01.18LLC_023.d 27 1.0 AE-CR008-C SV 28 1.0 AE-CR008-D 320-34271-A-33-D 320-0053056-021 Client 18-Jan-2018 13:11:47 2018.01.18LLC_024.d sv 29 MS 18-Jan-2018 13:19:38 2018.01.18LLC_025.d 1.0 AE-CR008-D s۷ 320-34271-A-33-E MS 320-0053056-022 30 1.0 AE-CR008-D MSD 320-34271-A-33-F MSD 320-0053056-023 18-Jan-2018 13:27:29 2018.01.18LLC_026.d S٧ 2018.01.18LLC_027.d 20 1.0 RB 320-0053056-024 RB 18-Jan-2018 13:35:18 S۷ CCV 30 1.0 CCV L4 320-0053056-025 18-Jan-2018 13:43:06 2018.01.18LLC 028.d SV 320-34271-A-34-B 320-0053056-026 Client 18-Jan-2018 13:50:54 2018.01.18LLC_029.d 31 1.0 AE-CR008-E 57 320-0053056-027 Client 18-Jan-2018 13:58:43 2018.01.18LLC_030.d 32 1.0 AE-CR008-F S۷ 320-34271-A-35-C 33 1.0 AE-CR008-F 320-34271-A-35-D DU 320-0053056-028 DU 18-Jan-2018 14:06:33 2018.01.18LLC_031.d sv 320-34271-A-36-B 320-0053056-029 Client 18-Jan-2018 14:14:21 2018.01.18LLC 032.d 34 1.0 AE-CR008-G sv 320-0053056-030 35 1.0 AE-CR008-H 320-34271-A-37-B Client 18-Jan-2018 14:22:08 2018.01.18LLC_033.d SV 36 1.0 AE-CR008-I 320-0053056-031 Client 18-Jan-2018 14:29:59 2018.01.18LLC_034.d 320-34271-A-38-B SV 37 320-34271-A-39-B 18-Jan-2018 14:37:51 2018.01.18LLC_035.d 1.0 AE-CR008-J s٧ 320-0053056-032 Client 38 1.0 WP-CR001-A 320-34271-A-40-B 320-0053056-033 Client 18-Jan-2018 14:45:41 2018.01.18LLC_036.d sv 20 1.0 RB 320-0053056-034 RB 18-Jan-2018 14:53:33 2018.01.18LLC_037.d sv 1.0 31 CCV L5 320-0053056-035 CCV 18-Jan-2018 15:01:25 2018.01.18LLC_038.d SV

Report Date: 19-Jan-2018 16:34:14

Chrom Revision: 2.2 08-Dec-2017 11:41:24

Page: 1

TestAmerica Laboratories Worklist Run Log Report

Worklist Name: 18JAN2018NCC_PFC

Worklist Num: 53066

Instrument: A8_N Method: N_8A

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b

Anaylysis Type: SemiVOA

Creator: Hannigan, Alyssa B

inj Volume: 2.00 Inj Vol Units:

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L5	320-0053066-001	CCV	18-Jan-2018 17:29:51	2018.01.18LLA_001.d	14	1.0		sv
MB 320-204105/1-A	320-0053066-002	MB	18-Jan-2018 17:37:41	2018.01.18LLA_002.d	41	1.0		sv
LCS 320-204105/2-A	320-0053066-003	LCS	18-Jan-2018 17:45:29	2018.01.18LLA_003.d	42	1.0		sv
LCSD 320-204105/3-A	320-0053066-004	LCSD	18-Jan-2018 17:53:18	2018.01.18LLA_004.d	43	1.0		sv
320-35042-A-1-A	320-0053066-005	Client	18-Jan-2018 18:01:06	2018.01.18LLA_005.d	44	1.0	TP-PFC-025-TPI	sv
320-35042-A-2-A	320-0053066-006	Client	18-Jan-2018 18:08:54	2018.01.18LLA_006.d	45	1.0	TP-PFC-025-MID-CARBON	sv
320-35042-A-3-A	320-0053066-007	Client	18-Jan-2018 18:16:42	2018.01.18LLA_007.d	46	1.0	TP-PFC-025-TPE	sv
320-35042-A-4-A	320-0053066-008	Client	18-Jan-2018 18:24:31	2018.01.18LLA_008.d	47	1.0	TP-PFC-025-TPE-D	sv
QC L6	320-0053066-009	QC	18-Jan-2018 18:32:19	2018.01.18LLA_009.d	15	1.0		sv
CCV L4	320-0053066-010	CCV	18-Jan-2018 18:40:07	2018.01.18LLD_001.d	30	1.0		sv

Report Date: 22-Jan-2018 09:49:41

Chrom Revision: 2.2 08-Dec-2017 11:41:24

Page: 1

TestAmerica Laboratories Worklist Run Log Report

Worklist Name: 19JAN2018NCA_PFC

Worklist Num: 53092

Instrument:

A8_N

Method: A8_N

Batch Directory: \ChromNa\Sacramento\ChromData\A8_N\20180119-53092.b

Anaylysis Type: SemiVOA

Creator:

Royce, Amani A

Inj Volume: 2.00 Inj Vol Units:

ul

- Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Fract
CCVL	320-0053092-001	CCVL	19-Jan-2018 09:58:51	2018.01.19LLA_005.d	21	1.0	sv
CCV L4	320-0053092-002	CCV	19-Jan-2018 10:06:40	2018.01.19LLA_006.d	32	1.0	SV
RB	320-0053092-003	RB	19-Jan-2018 10:14:30	2018.01.19LLA_007.d	20	1.0	sv
TOPS MANIFOLD QC PORT 1	320-0053092-004	Client	19-Jan-2018 10:22:22	2018.01.19LLA_029.d	45	1.0	sv
CCV L5	320-0053092-005	CCV	19-Jan-2018 10:30:13	2018.01.19LLA_030.d	33	1.0	SV

Report Date: 22-Jan-2018 09:49:08

Chrom Revision: 2.2 08-Dec-2017 11:41:24

Page: 1

TestAmerica Laboratories Worklist Run Log Report

Worklist Name: 19JAN2018NCE_PFC

Worklist Num: 53121

Instrument: **A8_N** Method:

A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b

Anaylysis Type: SemiVOA

Creator:

Royce, Amani A

Inj Volume: 2.00

Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L5	320-0053121-001	CCV	19-Jan-2018 16:50:30	2018.01.19LLC_009.d	14	1.0		sv
320-35042-A-1-A	320-0053121-002	Client	19-Jan-2018 16:58:19	2018.01.19LLC_010.d	4	10.0	TP-PFC-025-TPI	SV
320-35042-A-2-A	320-0053121-003	Client	19-Jan-2018 17:06:08	2018.01.19LLC_011.d	5	1.0	TP-PFC-025-MID-CARBON	SV
CCV L4	320-0053121-004	CCV	19-Jan-2018 17:13:58	2018.01.19LLC_012.d	13	1.0		sv

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

Test America - Sacramento

Sample Dilution Record

Method ID PFC - IDA	Lot# See Below
Analyst (Print Name) Amani Rayce	Analyst Initials Cleuk
Date 1/19/18	

<u>Job #</u>	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V.	Dilution Factor
480-130086	1	10,000	30	300	IOX
-	NS				
✓	IMSD				
320 - 35042				<u> </u>	
320 - 34937	3		ΙŚ	1500	100%
370-34936	1		15	300	20X
320 - 34922	2		60	300	5X
	ZMS				
V	ZMSD		*	1	
320-34922	2		30	300	1000
			,		
		-01/19	118		
		QC 1/19			

Comments:	
	A a a
	1119/18
	7.0

(To Accompany Samples to Instruments)

Analyst: Branscum, Cassie

HIGHE

Batch End: 1/16/2018 2:28:00PM

Solid-Phase Extraction (SPE)

	n "1/22	* 1/22										
Г	Due: 1/22											
	input Sample Lab ID (Analytical Method)	SDG (Job #)		InitAmnt FinAmnt		PHs Adj1	Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-204105/1 N/A	N/A		250 mL	na			N/A	N/A	N/A		
				10.0 mL								
2	LCS~320-204105/2 N/A	N/A		250 mL	na			N/A	N/A	N/A		
				10.0 mL	1	i i	i					
3	LCSD~320-204105/3 N/A	N/A		250 mL	па	_		N/A	N/A	N/A		
ᇻ	,			10.0 mL	1							
Pagę 598	320-35042-A-1 (PFC_IDA_DOD5)	N/A (320-35042-1)	283.44 g	256.2 mL	na			1/20/18	8_Days	4	10 %	320-35042.4-1-4
98			27.22 g	10.0 mL	1					i l		
of 606	320-35042-A-2 (PFC_IDA_DOD5)	N/A (320-35042-1)	280.89 g	253.9 mL	na			1/20/18	8_Days	4	RI	
ိ			27.04 g	10.0 mL	1							
6	320-35042-A-3 (PFC_IDA_DOD5)	N/A (320-35042-1)	284.26 g	256.7 mL	na			1/20/18	8_Days	4		
		!	27.55 g	10.0 mL	1							
7	320-35042-A-4 (PFC_IDA_DOD5)	N/A (320-35042-1)	280.26 g	253 mL	na			1/20/18	8_Days	4		
			27.26 g	10.0 mL	1							
						<u> </u>					<u> </u>	

Printed: 1/16/2018

Batch Number: 320-204105

Method Code: 320-3535_PFC-320

(To Accompany Samples to Instruments)

Analyst: Branscum, Cassie

Batch Number: 320-204105

Method Code: 320-3535_PFC-320

Batch Open: 1/16/2018 9:18:00AM Batch End: 1/16/2018 2:28:00PM

		Batch Notes								
	Manifold ID	8								
	Methanol ID	1127833								
	Hexane ID	1095480								
	Sodium Hydroxide ID	1132905								
	First Start time	NA								
	First End time	NA								
	SPE Cartridge Type	WAX 500mg								
Page 599 of 606	Solid Phase Extraction Disk ID	003337172A								
599	Balance ID	QA-070								
of 60	H2O ID	1/11/17								
8	Pipette ID	146370G								
	Solvent Name	0.3% NH4OH/MeOH								
	Solvent Lot #	1131945								
	Analyst ID - Reagent Drop	ССВ								
	Analyst ID - SU Reagent Drop	ССВ								
	Analyst ID - SU Reagent Drop Witness									
	Acid Name									
	Acid ID	NA								
	Reagent ID	NA								
	Reagent Lot Number	NA								
	Analyst ID - IS Reagent Drop	ccb								

(To Accompany Samples to Instruments)

Batch Number: 320-204105 Analyst: Branscum, Cassie

Method Code: 320-3535_PFC-320

Batch Open: 1/16/2018 9:18:00AM

Batch End: 1/16/2018 2:28:00PM

Analyst ID - IS Reagent Drop Witness	
Internal Standard ID#	
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	skd
Analyst ID - Final Volume Step	ccb
SOP Number	WS-LC-0025
Batch Comment	Sample labels match client IDs: ccb 1/16/18

Comments

Page 600 of 606

(To Accompany Samples to Instruments)

Analyst: Branscum, Cassie

Batch Open: 1/16/2018 9:18:00AM

Batch End: 1/16/18 2:28 Pm

Batch Number: 320-204105

Method Code: 320-3535_PFC-320

Reagent Additions Worksheet

	Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
	MB 320-204105/1	LCMPFC_ALL_SU_00031	500 uL	10.0 mL	08 1-16-18	H34 1-16=18
	LCS 320-204105/2	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		1
	LCS 320-204105/2	LCPFCSP_00119	500 uL	10.0 mL		
	LCSD 320-204105/3	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		
	LCSD 320-204105/3	LCPFCSP_00119	500 uL	10.0 mL		
] ټ	320-35042-A-1	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		
Page (320-35042-A-2	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		
601 of	320-35042-A-3	LCMPFC_ALL_SU_00031	500 uL	10.0 mL	\/	
of 606	320-35042-A-4	LCMPFC_ALL_SU_00031	500 uL	10.0 mL	V	ł

Other Reagents:						
Reagent	Amount/Units	Lot#:				

Printed: 1/16/2018



Sacramento Preparation Data Review Checklist

Preparation Batch Number(s) 520 204 (05 Test 5555-Y		
Earliest Holding Time 1-24-18		
	1	
	1 st Level	2 nd Level
Batch Information	Reviewer	Reviewer
Date and time accurate and entered into TALS correctly		/
All necessary batch information complete and entered into TALS correctly	/	/
BD, FV, and AL initials are transcribed into the batch comment	/	
24 14 14 14 14 14 14 14 14 14 14 14 14 14	1 st Level	2 nd Level
Sample List Tab	Reviewer	Reviewer
Samples identified to the correct method	/_	/
Holding time violation NCM filed	NH	NA
MS/MSD or MS/DU NCM filed	1	V
NCM for any anomalies filed	NA	NA
All NCMs include method code, matrix, and prep batch	/.	V
Method/sample/login/QAS checked and correct	/	
Batch contains no more than 20 live samples		
· · · · · · · · · · · · · · · · · · ·	1 st Leve!	2 nd Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved		
Weights in anticipated range and not targeted		
All additional test requirements performed, documented, and uploaded to TALS		
correctly (e.g. final amount, initial amount, turbidity, and CI Check)		5-1h-
The pH is transcribed properly in TALS	NA.	NH
All additional information is transcribed into TALS and is correct and raw data is attached		
Comments/Observations are transcribed correctly in TALS		
	1 st Level	2 nd Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and checked into TALS		V
All spike amounts correct and added to necessary samples and QC		
Internal Standard is added to the reagents		
All units are correctly transcribed into TALS		
.et		
St Level Reviewer: Date:	16-18	
P nd Level Reviewer: VPIII Date:	1/10/1	8
Comments:		5

Shipping and Receiving Documents

TestAmerica Sacramento 886 Riverside Parkuag

Mest Sacramento, CA 95605

Phone: 916.373.5600 Fax:

Chain to Custody Record 242315

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA TAL-8210 (0713) **Client Contact** Project Manager: Jeff Ovicat COC No: 741315 Site Contact: Date: Company Name: Teta Tech Tel/Fax: (412)921-8650 Lab Contact: Carrier: of COCs Address: 33\ **Analysis Turnaround Time** Anderson Dr Foster Plaza 7 Sampler: V City/State/Zip: P. H. bys PA 015226-2700 CALENDAR DAYS WORKING DAYS For Lab Use Only: Phone: (412) 921-8650 TAT if different from Below Walk-in Client: Perform MS / MSD (Y / N) Fax: Lab Sampling: 2 weeks Sample (Y/N) Project Name: Brushick GLASTS 1 week Former NAS Brungwick GLIETS 2 days Job / SDG No. 112/208005-WEZI 1 day Sample Type Sample Sample (C=Comp, Sample Identification Date Time Matrix G=Grab) Cont. Sample Specific Notes: TP-PFC-025- TPI 1/11/10 1900 10- PFC-025-MID-CARBON 0905 - PFL-025- TRE 0910 PF(-625-TPE-KOL Preservation Used: 1= ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Possible Hazard Identification: Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample Non-Hazard Flammable Skin Irritant Poison B Unknown Disposal by Lab Return to Client Special Instructions/QC Requirements & Comments: said not sign Relignor original version, signed on 1/15/2018 at 1400 Custody Seals Intact: Cooler Temp. (°C): Obs'd: Therm ID No. Custody Seal No. Corr'd: Relinquished by: Date/Time: Company Received by: Company: Date/Time: Relinguished by Company: Date/Time: Received by: Date/Time: Company: Relinquished by: Company: Date/Time: Received in Laboratory by: Company: Date/Time:

TestAmerica Sacramento 880 Riverside Parkway

West Sacramento, CA 95605 Phone: 916.373.5600 Fax:

Chain of Custody Record 242315

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other: TAL-8210 (0713)

Client Contact	Project M	anager:	Jeff &	Drient		Site				evin	Las		Da		1/	11	201	ô			COC No: 242315	5
Company Name: Tety Tech	Tel/Fax: (412)921-8650							ntact	Davi	d A	ch to	«Ke	Ca	rrier:	6	ed	57					Os
Address: 881 Anderson Dr Foste/ Plaza 7		Analysis T				П	T	1													Sampler: K . Lane.	tack
City/State/Zip: P: Hby PA 015216-2700 CALENDAR DAYS WORKING DAYS Phone: (412) 921-8650 TAT if different from Below							13)	1												For Lab Use Only:	٥
Phone: (412) 921-8650	-	F if different fr	om Below			2	2	5													Walk-in Client:	
Fax:	~	2	weeks			z	- 3				1	1	1					1 1			Lab Sampling:	
Project Name: Brusnick GWETS			week			2 3	12						10	404				1 1				
Site: Former NAS Brunswick GWESS PO# 112G08005-W621			days			e e	2 3	5							\						Job / SDG No.;	
12608005-4621		1	day			E a	2									1		1 1				
			Sample Type			Filtered Sample (Y/N	OCC / C WILLIAM (TIN)	1		1	1			1 1				1				
	Sample	Sample	(C=Comp,		# of	tere		2											/			
Sample Identification	Date	Time	G=Grab)	Matrix	Cont.		10	-					_			_	_		_		Sample Specific N	otes:
TP-PFC-025-TPI	1/11/18	0900	9	W	4	NA	VH	-														
TO- PFC-025-MID-CARBON		0905			4	NA	47	-														
TR-PFL-075-MID-CARBON TR-PFL-075- TRE		0910			4	NA	4	t														
78- PFC-625-70E-D	上	0000	7	1	لر	MA	VIT	-														
ge '						П																
60				1		++	+	+	+	+		-	-	+	-	+	+	+	-	-		
й						Ш																
of 6006				La		11																
0						H	+	-	$\pm \pm$	+	+	+	+	+		+	-	1				-
0)						\sqcup	_			-		4	-			4		Ш				
						11						1	-				U		Ш			
						\dagger	\top		\Box						7	1		Ш	Ш			1
				+		+	+	+	-	+	-	-	-	-	-	-	1	20.35	11111	Ch	hain of Custody	_
						11												20-33	7042	2 01	lan or ouslody	
						П											1	1 1	1	1	1	
Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3;	5=NaOH:	6= Other	-			4	+		++			-						1 2 3	100			
Possible Hazard Identification:	o naon,	o other_				15	Sam	ple D	Dispos	al (A	fee	may	be as	sess	ed if	sam	ples	are r	reta	inec	d longer than 1 month)	
Are any samples from a listed EPA Hazardous Waste? Plea	se List any	EPA Waste	Codes for	the sam	ple in ti	ne																
Comments Section if the lab is to dispose of the sample.						_	100						,				-	_				
Non-Hazard Flammable Skin Irritant	Poisor	n B	Unkr	nown			Ĺ.	Retu	rn to CI	ent		V	Dispo	sal by	Lab		Ĺ	Archi	ive fo	or	Months	
Special Instructions/QC Requirements & Comments:																						
														_								
Custody Seals Intact: Yes No	Custody S	Seal No.:							Cool	er Te	mp. (°C): C	bs'd	9	.2	_ Co	orr'd:	J	•	_	Therm ID No.: Au-	3
Relinquished by:	Company	•		Date/T	ime:	F	Rece	eived	by:	1					1	npan					Date/Time:	
									6 May	1	1.	>					SA	C			01/12/18 1	320
Relinquished by:	Company			Date/T	ime:	F	Rece	eived	by:	-)				Company:					Date/Time:		
						_																
Relinquished by:	Company	-		Date/T	ime:	F	Rece	eived	in Lat	orato	ry by	-			Con	npan	y:				Date/Time:	

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-35042-1

Login Number: 35042 List Source: TestAmerica Sacramento

List Number: 1

Creator: Turpen, Troy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	COC not relinquished by client.
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

```
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)","340","ng/L","D","5.3","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","20",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)","29","ng/L","U","11","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","29",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)","200","ng/L","D","4.8","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)","350","ng/L","D","5.7","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","20",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)","20","ng/L","U","5.4","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","20",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1800","ng/L","D M","8.3","DL","","TRG","","","39","LOQ","YES","-99","","256.2","10.0","20","" "TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","9.8","ng/L","U","3.0","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)","9.8","ng/L","U","3.1","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)","410","ng/L","D","2.9","DL","","TRG","","","20","LOQ","YES","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","74","ng/L","D","3.4","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)","41","ng/L","D","2.9","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)","75","ng/L","D","2.4","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid
(PFHpS)","8.7","ng/L","J D","2.9","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)","9.8","ng/L","U","2.6","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)","9.8","ng/L","U","2.8","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)","29","ng/L","U","13","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","29",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide"
(FOSA)","9.8","ng/L","U","3.4","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00990", "13C4
PFOA","100","ng/L","","-99","DL","","TRG","103","","-99","LOQ","YES","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00991", "13C4
PFOS","94","ng/L","","-99","DL","","TRG","101","","-99","LOQ","NO","93.3","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00992", "13C4
PFBA","99","ng/L","","-99","DL","","TRG","101","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00993", "13C2
PFHxA","98","ng/L","","-99","DL","","TRG","101","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00994", "1802
PFHxS","91","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","92.3","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00995", "13C5
PFNA", "98", "ng/L", "", "-99", "DL", "", "TRG", "100", "", "-99", "LOQ", "NO", "97.6", "", "256.2", "10.0", "980", ""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00996", "13C2
PFDA","99","ng/L","","-99","DL","","TRG","102","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00997", "13C2
PFUnA","100","ng/L","","-99","DL","","TRG","106","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL00998", "13C2
PFDoA","92","ng/L","","-99","DL","","TRG","94","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL01056", "13C8
```

```
FOSA", "93", "ng/L", "", "-99", "DL", "", "TRG", "95", "", "-99", "LOQ", "NO", "97.6", "", "256.2", "10.0", "980", ""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL01892", "13C4-
PFHpA","94","ng/L","","-99","DL","","TRG","96","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL01893", "13C5
PFPeA","100","ng/L","","-99","DL","","TRG","104","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL02116", "13C2-
PFTeDA", "93", "ng/L", "", "-99", "DL", "", "TRG", "95", "", "-99", "LOQ", "NO", "97.6", "", "256.2", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "10.0", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", "980", 
"TP-PFC-025-TPI", "537 (modified)", "DL", "320-35042-1", "TALSAC", "STL02337", "13C3-
PFBS","110","ng/L","","-99","DL","","TRG","118","","-99","LOQ","NO","90.7","","256.2","10.0","980",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)","340","ng/L","","0.53","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.0",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)","2.9","ng/L","U","1.1","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.9",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)","190","ng/L","","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)","340","ng/L","","0.57","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.0",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)","2.0","ng/L","U","0.54","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.0",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)","1300","ng/L","M E","0.83","DL","","TRG","","","3.9","LOQ","NO","-99","","256.2","10.0","2.0",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)","0.89","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)","0.98","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)","360","ng/L","E","0.29","DL","","TRG","","","2.0","LOQ","NO","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","73","ng/L","","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)","51","ng/L","","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)","67","ng/L","","0.24","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid
(PFHpS)","7.1","ng/L","","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)","2.4","ng/L","","0.26","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)","0.98","ng/L","U","0.28","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)","2.9","ng/L","U","1.3","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.9",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide"
(FOSA)","0.98","ng/L","U","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00990", "13C4
PFOA","100","ng/L","","-99","DL","","TRG","103","","-99","LOQ","NO","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00991", "13C4
PFOS","120","ng/L","","-99","DL","","TRG","124","","-99","LOQ","YES","93.3","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00992", "13C4
PFBA","110","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00993", "13C2
PFHxA","120","ng/L","","-99","DL","","TRG","118","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00994", "1802
PFHxS","110","ng/L","","-99","DL","","TRG","122","","-99","LOQ","NO","92.3","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00995", "13C5
```

```
PFNA","120","ng/L","","-99","DL","","TRG","124","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00996", "13C2
PFDA","120","ng/L","","-99","DL","","TRG","125","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00997", "13C2
PFUnA","130","ng/L","","-99","DL","","TRG","128","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL00998", "13C2
PFDoA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL01056", "13C8
FOSA","110","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL01892", "13C4-
PFHpA","120","ng/L","","-99","DL","","TRG","121","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL01893", "13C5
PFPeA", "140", "ng/L", "", "-99", "DL", "", "TRG", "141", "", "-99", "LOQ", "YES", "97.6", "", "256.2", "10.0", "98", ""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL02116", "13C2-
PFTeDA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI", "537 (modified)", "RES", "320-35042-1", "TALSAC", "STL02337", "13C3-
PFBS","110","ng/L","","-99","DL","","TRG","123","","-99","LOQ","YES","90.7","","256.2","10.0","98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)", "2.0", "ng/L", "U", "0.53", "DL", "", "TRG", "", "", "3.9", "LOQ", "YES", "-99", "", "253.9", "10.0", "2.0", "", "10.0", "2.0", "", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0",
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "2058-94-8", "Perfluoroundecanoic
acid (PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","3.0",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "2706-90-3", "Perfluoropentanoic"
acid (PFPeA)","170","ng/L","","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "307-24-4", "Perfluorohexanoic
acid (PFHxA)","72","ng/L","","0.57","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","2.0",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "307-55-1", "Perfluorododecanoic
acid (PFDoA)","2.0","ng/L","U","0.54","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","2.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","13","ng/L","M","0.84","DL","","TRG","","3.9","LOQ","YES","-99","","253.9","10.0","2.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","0.98","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","0.98","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","355-46-
4"."Perfluorohexanesulfonic acid
(PFHxS)","1.0","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "375-22-4", "Perfluorobutanoic
acid (PFBA)","130","ng/L","","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "375-73-
5"."Perfluorobutanesulfonic acid
(PFBS)","1.6","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "375-85-9", "Perfluoroheptanoic
acid (PFHpA)","2.3","ng/L","M","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "375-92-
8", "Perfluoroheptanesulfonic Acid
(PFHpS)", "0.98", "ng/L", "U", "0.30", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "253.9", "10.0", "0.98", ""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","0.98","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","376-06-
7", "Perfluorotetradecanoic acid
(PFTeA)","0.98","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "72629-94-
```

```
(PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","3.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","0.98","ng/L","U","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00990","13C4
PFOA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00991","13C4
PFOS","94","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","94.1","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "STL00992", "13C4
PFBA","100","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "STL00993", "13C2
PFHxA","96","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00994","18O2
PFHxS","92","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","93.1","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00995","13C5
PFNA","100","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00996","13C2
PFDA", "95", "ng/L", "", "-99", "DL", "", "TRG", "97", "", "-99", "LOQ", "YES", "98.5", "", "253.9", "10.0", "98", ""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00997","13C2
PFUnA", "98", "ng/L", "", "-99", "DL", "", "TRG", "100", "", "-99", "LOQ", "YES", "98.5", "", "253.9", "10.0", "98", ""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00998","13C2
PFDoA","88","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL01056","13C8
FOSA","90","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL01892","13C4-
PFHpA","98","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "STL01893", "13C5"
PFPeA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "STL02116", "13C2-
PFTeDA","92","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON", "537 (modified)", "RES", "320-35042-2", "TALSAC", "STL02337", "13C3-
PFBS","90","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","91.6","","253.9","10.0","98",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)","1.9","ng/L","U","0.53","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","1.9",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)","2.9","ng/L","U","1.1","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","2.9",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)","110","ng/L","","0.48","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)","25","ng/L","","0.56","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","1.9",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)","1.9","ng/L","U","0.54","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","1.9",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)","1.1","ng/L","J M","0.83","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","1.9",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)","0.97","ng/L","U","0.30","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)","0.97","ng/L","U","0.31","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)","0.38","ng/L","J","0.29","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","130","ng/L","","0.34","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
```

8", "Perfluorotridecanoic Acid

```
(PFBS)","0.38","ng/L","J","0.29","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)","0.43","ng/L","J M","0.24","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.97","ng/L","U","0.29","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.97","ng/L","U","0.26","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.97","ng/L","U","0.28","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)","2.9","ng/L","U","1.3","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","2.9",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide"
(FOSA)","0.97","ng/L","Ù","0.34","DL","","TRG","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL00990", "13C4
PFOA","100","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL00991", "13C4
PFOS","93","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","93.1","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00992","13C4 PFBA","100","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL00993", "13C2
PFHxA","98","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL00994", "18O2
PFHxS","94","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","92.1","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL00995", "13C5
PFNA","100","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00996","13C2
PFDA", "87", "ng/L", "", "-99", "DL", "", "TRG", "89", "", "-99", "LOQ", "YES", "97.4", "", "256.7", "10.0", "97", ""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00997","13C2
PFUnA","97","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL00998", "13C2
PFDoA","90","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL01056", "13C8
FOSA", "85", "ng/L", "", "-99", "DL", "", "TRG", "87", "", "-99", "LOQ", "YES", "97.4", "", "256.7", "10.0", "97", ""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL01892", "13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL01893", "13C5
PFPeA","100","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL02116", "13C2-
PFTeDA","91","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE", "537 (modified)", "RES", "320-35042-3", "TALSAC", "STL02337", "13C3-
PFBS","90","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","90.6","","256.7","10.0","97",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.53","DL","","TRG","","14.0","LOQ","YES","-99","","253","10.0","2.0",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","4.0","LOQ","YES","-99","","253","10.0","3.0",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)","110","ng/L","","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)","25","ng/L","","0.57","DL","","TRG","","14.0","LOQ","YES","-99","","253","10.0","2.0",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)","2.0","ng/L","U","0.54","DL","","TRG","","","4.0","LOQ","YES","-99","","253","10.0","2.0",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)","1.1","ng/L","J M","0.84","DL","","TRG","","","4.0","LOQ","YES","-99","","253","10.0","2.0",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "335-76-2", "Perfluorodecanoic acid
```

```
(PFDA)","0.99","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)","0.99","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)","0.32","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","130","ng/L","","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "0.45", "ng/L", "J", "0.30", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "253", "10.0", "0.99", "", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "1
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "0.43", "ng/L", "J\ M", "0.25", "DL", "", "TRG", "", "", "2.0", "LOQ", "YES", "-99", "", "253", "10.0", "0.99", "", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0", "10.0"
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid
(PFHpS)","0.99","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)","0.99","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)","0.99","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)", "3.0", "ng/L", "U", "1.3", "DL", "", "TRG", "", "4.0", "LOQ", "YES", "-99", "", "253", "10.0", "3.0", ""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide
(FOSA)","0.99","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00990","13C4
PFOA","110","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00991","13C4
PFOS","100","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","94.5","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL00992", "13C4
PFBA", "100", "ng/L", "", "-99", "DL", "", "TRG", "105", "", "-99", "LOQ", "YES", "98.8", "", "253", "10.0", "99", "", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "10.0", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99", "99",
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL00993", "13C2
PFHxA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL00994", "1802
PFHxS","97","ng/L","","-99","DL","","TRG","103","","-99","LOQ","YES","93.5","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL00995", "13C5
PFNA","110","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL00996", "13C2
PFDA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL00997", "13C2
PFUnA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL00998", "13C2
PFDoA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL01056","13C8
FOSA", "97", "ng/L", "", "-99", "DL", "", "TRG", "98", "", "-99", "LOQ", "YES", "98.8", "", "253", "10.0", "99", ""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL01892", "13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL01893", "13C5
PFPeA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL02116", "13C2-
PFTeDA","98","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D", "537 (modified)", "RES", "320-35042-4", "TALSAC", "STL02337", "13C3-
PFBS","91","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","91.9","","253","10.0","99",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "1763-23-
1", "Perfluorooctanesulfonic acid
(PFOS)","36.0","ng/L","","0.54","DL","","SPK","97","","4.0","LOQ","YES","37.1","","250","10.0","2.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "2058-94-
8", "Perfluoroundecanoic acid
```

```
(PFUnA)","34.4","ng/L","","1.1","DL","","SPK","86","","4.0","LOQ","YES","40.0","","250","10.0","3.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "2706-90-3", "Perfluoropentanoic
acid (PFPeA)","36.2","ng/L","","0.49","DL","","SPK","90","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "307-24-4", "Perfluorohexanoic
acid (PFHxA)","36.9","ng/L","","0.58","DL","","SPK","92","","4.0","LOQ","YES","40.0","","250","10.0","2.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "307-55-1", "Perfluorododecanoic
acid (PFDoA)","40.3","ng/L","","0.55","DL","","SPK","101","","4.0","LOQ","YES","40.0","","250","10.0","2.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "335-67-1", "Perfluorooctanoic
acid (PFOA)", "36.9", "ng/L", "", "0.85", "DL", "", "SPK", "92", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10.0", "2.0", ""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","40.0","ng/L","","0.31","DL","","SPK","100","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "335-77-
3"."Perfluorodecanesulfonic acid
(PFDS)","40.0","ng/L","","0.32","DL","","SPK","104","","2.0","LOQ","YES","38.6","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "355-46-
4"."Perfluorohexanesulfonic acid
(PFHxS)","34.8","ng/L","","0.30","DL","","SPK","96","","2.0","LOQ","YES","36.4","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "375-22-4", "Perfluorobutanoic
acid (PFBA)","39.2","ng/L","","0.35","DL","","SPK","98","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","34.9","ng/L","","0.30","DL","","SPK","99","","2.0","LOQ","YES","35.4","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "375-85-9", "Perfluoroheptanoic
acid (PFHpA)", "38.0", "ng/L", "", "0.25", "DL", "", "SPK", "95", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.0", "1.0", ""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "375-92-
8"."Perfluoroheptanesulfonic Acid
(PFHpS)","38.0","ng/L","","0.30","DL","","SPK","100","","2.0","LOQ","YES","38.1","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "375-95-1", "Perfluorononanoic
acid (PFNA)","38.8","ng/L","","0.27","DL","","SPK","97","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "376-06-
7"."Perfluorotetradecanoic acid
(PFTeA)","40.7","ng/L","","0.29","DL","","SPK","102","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "72629-94-
8"."Perfluorotridecanoic Acid
(PFTriA)", "39.4", "ng/L", "", "1.3", "DL", "", "SPK", "99", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10.0", "3.0", ""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "754-91-6", "Perfluorooctane"
Sulfonamide
(FOSA)","39.5","ng/L","","0.35","DL","","SPK","99","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00990", "13C4
PFOA","99.9","ng/L","","-99","DL","","SPK","100","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00991", "13C4
PFOS", "89.2", "ng/L", "", "-99", "DL", "", "SPK", "93", "", "-99", "LOQ", "YES", "95.6", "", "250", "10.0", "100", ""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00992", "13C4
PFBA", "98.4", "ng/L", "", "-99", "DL", "", "SPK", "98", "", "-99", "LOQ", "YES", "100", "", "250", "10.0", "100", ""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00993", "13C2
PFHxA","96.9","ng/L","","-99","DL","","SPK","97","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00994", "18O2
PFHxS", "89.0", "ng/L", "", "-99", "DL", "", "SPK", "94", "", "-99", "LOQ", "YES", "94.6", "", "250", "10.0", "100", ""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00995", "13C5
PFNA","94.8","ng/L","","-99","DL","","SPK","95","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00996", "13C2
PFDA","93.9","ng/L","","-99","DL","","SPK","94","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00997", "13C2
PFUnA","99.5","ng/L","","-99","DL","","SPK","100","","-99","LOQ","YES","100","","250","10.0","100",""
```

```
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL00998", "13C2
PFDoA","90.6","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL01056", "13C8
FOSA","83.6","ng/L","","-99","DL","","SPK","84","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL01892", "13C4-
PFHpA","97.4","ng/L","","-99","DL","","SPK","97","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL01893", "13C5
PFPeA","101","ng/L","","-99","DL","","SPK","101","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL02116", "13C2-
PFTeDA", "91.5", "ng/L", "", "-99", "DL", "", "SPK", "92", "", "-99", "LOQ", "YES", "100", "", "250", "10.0", "100", ""
"LCS 320-204105/2-A", "537 (modified)", "RES", "LCS 320-204105/2-A", "TALSAC", "STL02337", "13C3-
PFBS","89.4","ng/L","","-99","DL","","SPK","96","","-99","LOQ","YES","93.0","","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","1763-23-
1", "Perfluorooctanesulfonic acid
(PFOS)","34.3","ng/L","","0.54","DL","","SPK","93","5","4.0","LOQ","YES","37.1","LCS 320-204105/2-
A","250","10.0","2.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "2058-94-
8", "Perfluoroundecanoic acid
(PFUnA)","37.2","ng/L","","1.1","DL","","SPK","93","8","4.0","LOQ","YES","40.0","LCS 320-204105/2-
A","250","10.0","3.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","2706-90-
3","Perfluoropentanoic acid
(PFPeA)","35.9","ng/L","","0.49","DL","","SPK","90","1","2.0","LOO","YES","40.0","LCS 320-204105/2-
A","250","10.0","1.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "307-24-
4"."Perfluorohexanoic acid
(PFHxA)", "35.7", "ng/L", "", "0.58", "DL", "", "SPK", "89", "3", "4.0", "LOQ", "YES", "40.0", "LCS 320-204105/2-
A","250","10.0","2.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "307-55-
1", "Perfluorododecanoic acid
(PFDoA)","39.8","ng/L","","0.55","DL","","SPK","100","1","4.0","LOQ","YES","40.0","LCS 320-204105/2-
A","250","10.0","2.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "335-67-
1","Perfluorooctanoic acid (PFOA)","37.8","ng/L","","0.85","DL","","SPK","94","2","4.0","LOQ","YES","40.0","LCS
320-204105/2-A","250","10.0","2.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "335-76-
2", "Perfluorodecanoic acid (PFDA)", "37.9", "ng/L", "", "0.31", "DL", "", "SPK", "95", "6", "2.0", "LOQ", "YES", "40.0", "LCS"
320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "335-77-
3"."Perfluorodecanesulfonic acid
(PFDS)", "36.9", "ng/L", "", "0.32", "DL", "", "SPK", "96", "8", "2.0", "LOQ", "YES", "38.6", "LCS 320-204105/2-
A","250","10.0","1.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "355-46-
4", "Perfluorohexanesulfonic acid
(PFHxS)","33.8","ng/L","","0.30","DL","","SPK","93","3","2.0","LOQ","YES","36.4","LCS 320-204105/2-
A","250","10.0","1.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "375-22-
4", "Perfluorobutanoic acid (PFBA)", "38.1", "ng/L", "", "0.35", "DL", "", "SPK", "95", "3", "2.0", "LOQ", "YES", "40.0", "LCS"
320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "375-73-
5", "Perfluorobutanesulfonic acid
(PFBS)", "33.8", "ng/L", "", "0.30", "DL", "", "SPK", "96", "3", "2.0", "LOQ", "YES", "35.4", "LCS 320-204105/2-
A","250","10.0","1.0",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "375-85-
```

- 9","Perfluoroheptanoic acid (PFHpA)","37.2","ng/L","","0.25","DL","","SPK","93","2","2.0","LOQ","YES","40.0","LCS 320-204105/2-
- A","250","10.0","1.0",""
 "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","375-92-
- 8","Perfluoroheptanesulfonic Acid (PFHpS)","37.5","ng/L","","0.30","DL","","SPK","98","2","2.0","LOQ","YES","38.1","LCS 320-204105/2-A","250","10.0","1.0",""
- "LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "375-95-
- 1","Perfluorononanoic acid (PFNA)","37.5","ng/L","","0.27","DL","","SPK","94","3","2.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","1.0",""
- "LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
- (PFTeA)","40.7","ng/L","","0.29","DL","","SPK","102","0","2.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","1.0",""
- "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid
- (PFTriA)", "38.6", "ng/L", "", "1.3", "DL", "", "SPK", "97", "2", "4.0", "LOQ", "YES", "40.0", "LCS 320-204105/2-A", "250", "10.0", "3.0", ""
- "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","36.6","ng/L","","0.35","DL","","SPK","92","8","2.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","1.0",""
- "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00990","13C4 PFOA","104","ng/L","","-99","DL","","SPK","104","","-99","LOQ","YES","100","LCS 320-204105/2-A","250","10.0","100",""
- "LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "STL00991", "13C4 PFOS", "96.8", "ng/L", "", "-99", "DL", "", "SPK", "101", "", "-99", "LOQ", "YES", "95.6", "LCS 320-204105/2-A", "250", "10.0", "100", ""
- "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00992","13C4 PFBA","104","ng/L","","-99","DL","","SPK","104","","-99","LOQ","YES","100","LCS 320-204105/2-A","250","10.0","100",""
- "LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "STL00993", "13C2 PFHxA", "108", "ng/L", "", "-99", "DL", "", "SPK", "108", "", "-99", "LOQ", "YES", "100", "LCS 320-204105/2-A", "250", "10.0", "100", ""
- "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00994","18O2 PFHxS","94.8","ng/L","","-99","DL","","SPK","100","","-99","LOQ","YES","94.6","LCS 320-204105/2-A","250","10.0","100",""
- "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00995","13C5 PFNA","103","ng/L","","-99","DL","","SPK","103","","-99","LOQ","YES","100","LCS 320-204105/2-A","250","10.0","100",""
- "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00996","13C2 PFDA","102","ng/L","","-99","DL","","SPK","102","","-99","LOQ","YES","100","LCS 320-204105/2-A","250","10.0","100",""
- "LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "STL00997", "13C2 PFUnA", "98.5", "ng/L", "", "-99", "DL", "", "SPK", "99", "", "-99", "LOQ", "YES", "100", "LCS 320-204105/2-A", "250", "10.0", "100", ""
- "LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00998","13C2 PFDoA","94.3","ng/L","","-99","DL","","SPK","94","","-99","LOQ","YES","100","LCS 320-204105/2-A","250","10.0","100",""
- "LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "STL01056", "13C8 FOSA", "92.0", "ng/L", "", "-99", "DL", "", "SPK", "92", "", "-99", "LOQ", "YES", "100", "LCS 320-204105/2-A", "250", "10.0", "100", ""
- "LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "STL01892", "13C4-PFHpA", "104", "ng/L", "", "-99", "DL", "", "SPK", "104", "", "-99", "LOQ", "YES", "100", "LCS 320-204105/2-A", "250", "10.0", "100", ""

```
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "STL01893", "13C5"
PFPeA","106","ng/L","","-99","DL","","SPK","106","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "STL02116", "13C2-
PFTeDA", "98.6", "ng/L", "", "-99", "DL", "", "SPK", "99", "", "-99", "LOQ", "YES", "100", "LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A", "537 (modified)", "RES", "LCSD 320-204105/3-A", "TALSAC", "STL02337", "13C3-
PFBS", "98.0", "ng/L", "", "-99", "DL", "", "SPK", "105", "", "-99", "LOO", "YES", "93.0", "LCS 320-204105/2-
A","250","10.0","100",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "1763-23-
1"."Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.54","DL","","TRG","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "2058-94-8", "Perfluoroundecanoic
acid (PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","4.0","LOQ","YES","-99","","250","10.0","3.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","1.0","ng/L","U","0.49","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","2.0","ng/L","U","0.58","DL","","TRG","","14.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "307-55-1", "Perfluorododecanoic
acid (PFDoA)","2.0","ng/L","U","0.55","DL","","TRG","","14.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)","2.0","ng/L","U","0.85","DL","","TRG","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "335-76-2", "Perfluorodecanoic
acid (PFDA)","1.0","ng/L","Ù","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "335-77-
3"."Perfluorodecanesulfonic acid
(PFDS)","1.0","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "355-46-
4", "Perfluorohexanesulfonic acid
(PFHxS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "375-73-
5"."Perfluorobutanesulfonic acid
(PFBS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","1.0","ng/L","U","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "375-92-
8"."Perfluoroheptanesulfonic Acid
(PFHpS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "375-95-1", "Perfluorononanoic
acid (PFNA)","1.0","ng/L","Ù","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "376-06-7", "Perfluorotetradecanoic
acid (PFTeA)","1.0","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "72629-94-
8"."Perfluorotridecanoic Acid
(PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","4.0","LOQ","YES","-99","","250","10.0","3.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "754-91-6", "Perfluorooctane
Sulfonamide (FOSA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL00990", "13C4
PFOA","102","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL00991", "13C4
PFOS","99.5","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","95.6","","250","10.0","100",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL00992", "13C4
```

```
PFBA","104","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","100","","250","10.0","100",""
 "MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL00993", "13C2
PFHxA","102","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL00994", "18O2
PFHxS","98.4","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","94.6","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00995","13C5
PFNA","106","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL00996", "13C2
PFDA", "99.7", "ng/L", "", "-99", "DL", "", "TRG", "100", "", "-99", "LOQ", "YES", "100", "", "250", "10.0", "100", ""
 "MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL00997", "13C2
PFUnA","107","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","100","","250","10.0","100",""
 "MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL00998", "13C2
PFDoA","96.0","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","100","","250","10.0","100",""
 "MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL01056", "13C8
FOSA","91.3","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","100","","250","10.0","100",""
 "MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL01892", "13C4-
PFHpA","101","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL01893", "13C5
PFPeA","108","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","100","","250","10.0","100",""
 "MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL02116", "13C2-
PFTeDA", "98.4", "ng/L", "", "-99", "DL", "", "TRG", "98", "", "-99", "LOQ", "YES", "100", "", "250", "10.0", "100", ""
"MB 320-204105/1-A", "537 (modified)", "RES", "MB 320-204105/1-A", "TALSAC", "STL02337", "13C3-
PFBS","94.1","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","93.0","","250","10.0","100",""
 "Unknown","Unknown","TP-PFC-025-TPI","01/11/2018 09:00","AQ","320-35042-1","NM","","5.20","537
 (modified)","3535","RES","01/16/2018 09:18","01/18/2018
 18:01", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "1, "100", "320-204105", "320-204105", "NA", "N
 204556","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
 "Unknown", "Unknown", "TP-PFC-025-TPI", "01/11/2018 09:00", "AQ", "320-35042-1", "NM", "", "5.20", "537"
 (modified)","3535","DL","01/16/2018 09:18","01/19/2018
 16:58", "TALSAC", "COA", "WET", "NA", "10", "NA", "NA", "10", "320-204105", "320-204105", "320-204105", "NA", "320-204105", "320-204105", "NA", "320-204105", "NA", "320-204105", "NA", "320-204105", "NA", 
 204757","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
 "Unknown", "Unknown", "TP-PFC-025-MID-CARBON", "01/11/2018 09:05", "AQ", "320-35042-
2","NM","","5.20","537 (modified)","3535","RES","01/16/2018 09:18","01/18/2018
 18:08", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "100", "320-204105", "320-204105", "NA", 
 204556","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
 "Unknown","Unknown","TP-PFC-025-TPE","01/11/2018 09:10","AQ","320-35042-3","NM","","5.20","537
(modified)","3535","RES","01/16/2018 09:18","01/18/2018
 18:16","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
 204556", "320-35042-1", "01/12/2018 13:20", "01/12/2018 17:30", ""
"Unknown", "Unknown", "TP-PFC-025-TPE-D", "01/11/2018 00:00", "AQ", "320-35042-4", "FD", "", "5.20", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537", "537",
 (modified)", "3535", "RES", "01/16/2018 09:18", "01/18/2018
18:24","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
 204556","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
 "Unknown", "Unknown", "LCS 320-204105/2-A", "", "AQ", "LCS 320-204105/2-A", "LCS", "", "-99", "537"
 (modified)","3535","RES","01/16/2018 09:18","01/18/2018
 17:45", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "100", "320-204105", "320-204105", "NA", 
204556", "320-35042-1", "01/16/2018 09:18", "01/12/2018 17:30", ""
 "Unknown", "Unknown", "LCSD 320-204105/3-A", ", "AQ", "LCSD 320-204105/3-A", "LCSD", ", ", "-99", "537"
 (modified)","3535","RES","01/16/2018 09:18","01/18/2018
17:53","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
204556","320-35042-1","01/16/2018 09:18","01/12/2018 17:30",""
"Unknown","Unknown","MB 320-204105/1-A","","AQ","MB 320-204105/1-A","MB","","-99","537
 (modified)","3535","RES","01/16/2018 09:18","01/18/2018
17:37","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
```





INTERNAL CORRESPONDENCE

TO: J. ORIENT DATE: FEBRUARY 8, 2018

FROM: MICHELLE L. WOEBER COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - POLYFLUOROALKYL SUBSTANCES (PFAS)

FORMER NAVAL AIR STATION (NAS) BRUNSWICK, BRUNSWICK, ME

CTO WE21 PFC ASSESSMENT

SAMPLE DELIVERY GROUP (SDG) 320-35042-1

SAMPLES: 4/Aqueous/PFAS

TP-PFC-025-MID-CARBON TP-PFC-025-TPE TP-PFC-025-TPE-D

TP-PFC-025-TPI

Overview

The sample set for former NAS Brunswick, SDG 320-35042-1 consisted of four (4) aqueous environmental samples. All four (4) aqueous samples were analyzed for Polyfluoroalkyl Substances (PFAS). One field duplicate pair was included in this SDG: TP-PFC-025-TPE/TP-PFC-025-TPE-D.

The samples were collected by Tetra Tech, Inc. on January 11, 2018 and analyzed by Test America, Inc. The analyses were conducted using EPA Method 537 (Modified) analytical and reporting protocols. The data was evaluated based on the following parameters:

- Data Completeness
- Holding Times/Sample Preservation
- LC/MS Tuning
- Initial and Continuing Calibration Results
 - Laboratory Method Blank Results
- Surrogate Spike Recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate Results
- Field Duplicate Precision
- Detection Limits
- Compound Identification and Quantification

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B, and Appendix C contains the documentation to support the findings as discussed in this data validation report. An EPA Region 1 tier II validation was performed on the data in this SDG. The text of this report has been formulated to address only those areas affecting data quality.

NOTES

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentrations of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)) and perfluorohexanesulfonic acid (PFHxS) exceeded the instrument calibration range in sample TP-PFC-025-TPI. The sample was reanalyzed at a 10X dilution. The result for this compound from the dilution was used in the data validation.

TO: J. ORIENT PAGE 2

SDGs: 320-35042-1

Detected results reported below the LOQ but above the Detection Limit (DL) were qualified as estimated, (J). Non-detected results are reported to the Limit of Detection (LOD).

EXECUTIVE SUMMARY

Laboratory Performance: None.

Other Factors Affecting Data Quality: One sample was further diluted. Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the EPA New England Environmental Data Review Supplement for Regional Data Review Elements Superfund Guidance/Procedures (April 2013), National Functional Guidelines for Organic Data Validation (January 2017), and the Department of Defense (DoD) document entitled, "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013). The text of this report has been formulated to address only those areas affecting data quality.

Tetra Tech. Inc.

Wichell Fr. Walter

Michelle L. Woeber
Environmental Chemist

Tetra Tech, Inc. Joseph A. Samchuck Data Validation Manager

Attachments:

Appendix A - Qualified Analytical Results

Appendix B - Results as reported by the Laboratory

Appendix C - Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

APPENDIX A QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination

B = Field Blank Contamination

C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)

C01 = GC/MS Tuning Noncompliance

D = MS/MSD Recovery Noncompliance

E = LCS/LCSD Recovery Noncompliance

F = Lab Duplicate Imprecision

G = Field Duplicate Imprecision

H = Holding Time Exceedance

I = ICP Serial Dilution Noncompliance

J = ICP PDS Recovery Noncompliance; MSA's r < 0.995

K = ICP Interference - includes ICS % R Noncompliance

L = Instrument Calibration Range Exceedance

M = Sample Preservation Noncompliance

N = Internal Standard Noncompliance

N01 = Internal Standard Recovery Noncompliance Dioxins

N02 = Recovery Standard Noncompliance Dioxins

N03 = Clean-up Standard Noncompliance Dioxins

O = Poor Instrument Performance (i.e., base-time drifting)

P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)

Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)

R = Surrogates Recovery Noncompliance

S = Pesticide/PCB Resolution

T = % Breakdown Noncompliance for DDT and Endrin

U = RPD between columns/detectors >40% for positive results determined via GC/HPLC

V = Non-linear calibrations; correlation coefficient r < 0.995

W = EMPC result

X = Signal to noise response drop

Y = Percent solids <30%

Z = Uncertainty at 2 standard deviations is greater than sample activity

Z1 = Tentatively Identified Compound considered presumptively present

Z2 = Tentatively Identified Compound column bleed

Z3 = Tentatively Identified Compound aldol condensate

Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC

Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-025-M	IID-CAR	RBON	TP-PFC-025-1	PE		TP-PFC-025-T	PE-D		TP-PFC-025-T	PI	
SDG: 320-35042-1	LAB_ID	320-35042-2	320-35042-2		320-35042-3			320-35042-4	320-35042-4		320-35042-1		
FRACTION: PFAS	SAMP_DATE	1/11/2018			1/11/2018			1/11/2018			1/11/2018		
MEDIA: WATER	QC_TYPE	NM			NM			FD			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							TP-PFC-025-T	PE				
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCT	ANOIC ACID	13			1.1	J	Р	1.1	J	Р			
PERFLUOROBUTANESUL	FONIC ACID	1.6	J	Р	0.38	J	Р	0.45	J	Р	51		
PERFLUOROBUTANOIC A	CID	130			130			130			73		
PERFLUORODECANE SUI	LFONIC ACID	0.98	U		0.97	U		0.99	U		0.98	U	
PERFLUORODECANOIC A	CID	0.98	U		0.97	U		0.99	U		0.89	J	Р
PERFLUORODODECANOI	C ACID	2	U		1.9	U		2	U		2	U	
PERFLUOROHEPTANESU	LFONIC ACID	0.98	U		0.97	U		0.99	U		7.1		
PERFLUOROHEPTANOIC	ACID	2.3			0.43	J	Р	0.43	J	Р	67		
PERFLUOROHEXANESUL	FONIC ACID		J	Р	0.38	J	Р	0.32	J	Р			
PERFLUOROHEXANOIC A	CID	72			25			25			340		
PERFLUORONONANOIC A	ACID	0.98	U		0.97	U		0.99	U		2.4		
PERFLUOROOCTANE SUI	LFONAMIDE	0.98	U		0.97	U		0.99	U		0.98	U	
PERFLUOROOCTANE SUI	LFONIC ACID	2	U		1.9	U		2	U		340		
PERFLUOROPENTANOIC	ACID	170			110			110			190		
PERFLUOROTETRADECA	NOIC ACID	0.98			0.97	U		0.99	U		0.98	U	
PERFLUOROTRIDECANO	IC ACID		U		2.9				U		2.9		
PERFLUOROUNDECANOI	C ACID	3	U		2.9	U		3	U		2.9	U	

1 of 2 2/8/2018

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-025-T	PI-DL				
SDG: 320-35042-1	LAB_ID	320-35042-1					
FRACTION: PFAS	SAMP_DATE	1/11/2018					
MEDIA: WATER	QC_TYPE	NM					
	UNITS	NG/L					
	PCT_SOLIDS	0.0					
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD			
PENTADECAFLUOROOCT	ANOIC ACID	1800					
PERFLUOROBUTANESULI	FONIC ACID						
PERFLUOROBUTANOIC A	CID						
PERFLUORODECANE SUL	FONIC ACID						
PERFLUORODECANOIC A	CID						
PERFLUORODODECANOI	C ACID						
PERFLUOROHEPTANESU	LFONIC ACID						
PERFLUOROHEPTANOIC .	ACID						
PERFLUOROHEXANESUL	FONIC ACID	410					
PERFLUOROHEXANOIC A	CID						
PERFLUORONONANOIC A	CID						
PERFLUOROOCTANE SUL	FONAMIDE						
PERFLUOROOCTANE SUL	FONIC ACID						
PERFLUOROPENTANOIC	ACID						
PERFLUOROTETRADECA	NOIC ACID						
PERFLUOROTRIDECANOI	C ACID						
PERFLUOROUNDECANOI	CACID						

2 of 2 2/8/2018

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI Lab Sample ID: 320-35042-1

Matrix: Water Lab File ID: 2018.01.18LLA_005.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) Date Analyzed: 01/18/2018 18:01

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
CAS NO.	COMPOUND NAME	KESULI	<u> </u>	ТОО	ТОР	υш
375-22-4	Perfluorobutanoic acid (PFBA)	73		2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	340		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	67		2.0	0.98	0.24
335-67-1	Perfluorooctanoic acid (PFOA)	1300	M E	3.9	2.0	0.83
375-95-1	Perfluorononanoic acid (PFNA)	2.4		2.0	0.98	0.26
335-76-2	Perfluorodecanoic acid (PFDA)	0.89	J	2.0	0.98	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.98	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	51		2.0	0.98	0.29
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	360	E	2.0	0.98	0.29
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.1		2.0	0.98	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	340		3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.98	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	Ū	2.0	0.98	0.34

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI Lab Sample ID: 320-35042-1

Matrix: Water Lab File ID: 2018.01.18LLA_005.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) Date Analyzed: 01/18/2018 18:01

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	112		25-150
STL00992	13C4 PFBA	114		25-150
STL00993	13C2 PFHxA	118		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	124		25-150
STL00996	13C2 PFDA	125		25-150
STL00997	13C2 PFUnA	128		25-150
STL00998	13C2 PFDoA	109		25-150
STL00994	1802 PFHxS	122		25-150
STL00991	13C4 PFOS	124		25-150
STL02116	13C2-PFTeDA	108		25-150
STL01892	13C4-PFHpA	121		25-150
STL01893	13C5 PFPeA	141		25-150
STL02337	13C3-PFBS	123		25-150

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI DL Lab Sample ID: 320-35042-1 DL

Matrix: Water Lab File ID: 2018.01.19LLC_010.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) Date Analyzed: 01/19/2018 16:58

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 10

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	74	D	20	9.8	3.4
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	D	20	9.8	4.8
307-24-4	Perfluorohexanoic acid (PFHxA)	350	D	39	20	5.7
375-85-9	Perfluoroheptanoic acid (PFHpA)	75	D	20	9.8	2.4
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D M	39	20	8.3
375-95-1	Perfluorononanoic acid (PFNA)	9.8	U	20	9.8	2.6
335-76-2	Perfluorodecanoic acid (PFDA)	9.8	U	20	9.8	3.0
2058-94-8	Perfluoroundecanoic acid (PFUnA)	29	U	39	29	11
307-55-1	Perfluorododecanoic acid (PFDoA)	20	U	39	20	5.4
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	29	U	39	29	13
376-06-7	Perfluorotetradecanoic acid (PFTeA)	9.8	U	20	9.8	2.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	41	D	20	9.8	2.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	410	D	20	9.8	2.9
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	8.7	JD	20	9.8	2.9
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	340	D	39	20	5.3
335-77-3	Perfluorodecanesulfonic acid (PFDS)	9.8	U	20	9.8	3.1
754-91-6	Perfluorooctane Sulfonamide (FOSA)	9.8	U	20	9.8	3.4

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI DL Lab Sample ID: 320-35042-1 DL

Matrix: Water Lab File ID: 2018.01.19LLC_010.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) Date Analyzed: 01/19/2018 16:58

Con. Extract Vol.: 10.0(mL) Dilution Factor: 10

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup: (Y/N) N

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	95		25-150
STL00992	13C4 PFBA	101		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	100		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	106		25-150
STL00998	13C2 PFDoA	94		25-150
STL00994	1802 PFHxS	99		25-150
STL00991	13C4 PFOS	101		25-150
STL02116	13C2-PFTeDA	95		25-150
STL01892	13C4-PFHpA	96		25-150
STL01893	13C5 PFPeA	104		25-150
STL02337	13C3-PFBS	118		25-150

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-MID-CARBON Lab Sample ID: 320-35042-2

Matrix: Water Lab File ID: 2018.01.18LLA_006.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:05

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253.9(mL) Date Analyzed: 01/18/2018 18:08

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	170		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	72		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.3	М	2.0	0.98	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	13	М	3.9	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.98	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.98	Ū	2.0	0.98	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	Ū	3.9	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	Ū	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	Ū	3.9	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	Ū	2.0	0.98	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.0	0.98	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	J	2.0	0.98	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.98	Ū	2.0	0.98	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	Ū	3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	Ū	2.0	0.98	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	Ū	2.0	0.98	0.34

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-MID-CARBON Lab Sample ID: 320-35042-2

Matrix: Water Lab File ID: 2018.01.18LLA_006.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:05

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253.9(mL) Date Analyzed: 01/18/2018 18:08

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	92		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	98		25-150
STL00990	13C4 PFOA	102		25-150
STL00995	13C5 PFNA	104		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	100		25-150
STL00998	13C2 PFDoA	90		25-150
STL00994	1802 PFHxS	99		25-150
STL00991	13C4 PFOS	100		25-150
STL02116	13C2-PFTeDA	94		25-150
STL01892	13C4-PFHpA	100		25-150
STL01893	13C5 PFPeA	102		25-150
STL02337	13C3-PFBS	98		25-150

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE Lab Sample ID: 320-35042-3

Matrix: Water Lab File ID: 2018.01.18LLA_007.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:10

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.7(mL) Date Analyzed: 01/18/2018 18:16

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.9	0.97	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	110		1.9	0.97	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	25		3.9	1.9	0.56
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.43	JМ	1.9	0.97	0.24
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	JМ	3.9	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	0.97	U	1.9	0.97	0.26
335-76-2	Perfluorodecanoic acid (PFDA)	0.97	U	1.9	0.97	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	3.9	1.9	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	Ū	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.97	Ū	1.9	0.97	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.38	J	1.9	0.97	0.29
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.38	J	1.9	0.97	0.29
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.97	Ū	1.9	0.97	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.9	U	3.9	1.9	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.97	U	1.9	0.97	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.97	Ū	1.9	0.97	0.34

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE Lab Sample ID: 320-35042-3

Matrix: Water Lab File ID: 2018.01.18LLA_007.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 09:10

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.7 (mL) Date Analyzed: 01/18/2018 18:16

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	87		25-150
STL00992	13C4 PFBA	105		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	107		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	89		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	93		25-150
STL00994	1802 PFHxS	102		25-150
STL00991	13C4 PFOS	100		25-150
STL02116	13C2-PFTeDA	94		25-150
STL01892	13C4-PFHpA	110		25-150
STL01893	13C5 PFPeA	107		25-150
STL02337	13C3-PFBS	99		25-150

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE-D Lab Sample ID: 320-35042-4

Matrix: Water Lab File ID: 2018.01.18LLA_008.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 00:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253(mL) Date Analyzed: 01/18/2018 18:24

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	COMPOUND NAME	RESULT	0	LOO	LOD	DL
CIID NO.	COIII COND WHILE	RECOLI	ν	LOQ		
375-22-4	Perfluorobutanoic acid (PFBA)	130		2.0	0.99	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	110		2.0	0.99	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	25		4.0	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.43	JM	2.0	0.99	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	JM	4.0	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.99	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.99	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.99	U	2.0	0.99	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.45	J	2.0	0.99	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.32	J	2.0	0.99	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.99	Ū	2.0	0.99	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.99	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.99	Ū	2.0	0.99	0.35

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE-D Lab Sample ID: 320-35042-4

Matrix: Water Lab File ID: 2018.01.18LLA_008.d

Analysis Method: 537 (modified) Date Collected: 01/11/2018 00:00

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253(mL) Date Analyzed: 01/18/2018 18:24

Con. Extract Vol.: 10.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	98		25-150
STL00992	13C4 PFBA	105		25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	107		25-150
STL00995	13C5 PFNA	107		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	108		25-150
STL00998	13C2 PFDoA	102		25-150
STL00994	1802 PFHxS	103		25-150
STL00991	13C4 PFOS	108		25-150
STL02116	13C2-PFTeDA	99		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	109		25-150
STL02337	13C3-PFBS	99		25-150

APPENDIX C SUPPORT DOCUMENTATION

TestAmerica Sacramento 886 Riverside Parkuau

Mest Sacramento, CA 95605

Phone: 916.373.5600 Fax:

Chain to Custody Record 242315

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA TAL-8210 (0713) **Client Contact** Project Manager: Jeff Ovicat COC No: 741315 Site Contact: Date: Company Name: Teta Tech Tel/Fax: (412)921-8650 Lab Contact: Carrier: of COCs Address: 33\ **Analysis Turnaround Time** Anderson Dr Foster Plaza 7 Sampler: V City/State/Zip: P. H. bys PA 015226-2700 CALENDAR DAYS WORKING DAYS For Lab Use Only: Phone: (412) 921-8650 TAT if different from Below Walk-in Client: Perform MS / MSD (Y / N) Fax: Lab Sampling: 2 weeks Sample (Y/N) Project Name: Brushick GLASTS 1 week Former NAS Brunguick GLIETS 2 days Job / SDG No. 112/208005-WEZI 1 day Sample Type Sample Sample (C=Comp, Sample Identification Date Time Matrix G=Grab) Cont. Sample Specific Notes: TP-PFC-025- TPI 1/11/10 1900 10- PFC-025-MID-CARBON 0905 - PFL-025- TRE 0910 PF(-625-TPE-KOL Preservation Used: 1= ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Possible Hazard Identification: Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample Non-Hazard Flammable Skin Irritant Poison B Unknown Disposal by Lab Return to Client Special Instructions/QC Requirements & Comments: said not sign Relignor original version, signed on 1/15/2018 at 1400 Custody Seals Intact: Cooler Temp. (°C): Obs'd: Therm ID No. Custody Seal No. Corr'd: Relinquished by: Date/Time: Company Received by: Company: Date/Time: Relinguished by Company: Date/Time: Received by: Date/Time: Company: Relinquished by: Company: Date/Time: Received in Laboratory by: Company: Date/Time:

TestAmerica Sacramento 880 Riverside Parkway

West Sacramento, CA 95605 Phone: 916.373.5600 Fax:

Chain of Custody Record 242315

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA Other: TAL-8210 (0713)

Client Contact	Project M	anager:	Jeff &	Drient	_			ntact		evin	Las		Da		1/	11	201	ô		COC No: 243	1315	
Company Name: Tety Tech	Tel/Fax: (412)92	1-8650)		Lab	Cor	ntact	Davi	d A	ch to	n Ve	Ca	rrier:	6	ed	5-				COCs	
Address: 881 Anderson Dr Foste/ Plaza 7		Analysis T				П	T	1								T		T	T	STATE OF THE PERSON NAMED IN COLUMN 2 IS NOT THE OWNER, THE PERSON NAMED	anostrial	
City/State/Zip: P: Hb by PA 015226-2700 Phone: (412) 921-8650	CALEN	DAR DAYS	WOF	RKING DAY	'S	11	13)	1											For Lab Use Only	: 3	
Phone: (412) 921-8650	-	F if different fr	om Below			2	2	5											- 1	Walk-in Client:		
Fax:	~	2	weeks			z	- 3				1	1	1					1 1		Lab Sampling:		_
Project Name: Brusnick GWETS			week			2	12						10	404				11				
Site: Former NAS Brunswick GWESS PO# 112G08005-W621			days			e e	2 3	5							\			1		Job / SDG No.;		
12608005-4621		1	day			am a	2				1					1						_
			Sample Type			Filtered Sample (Y/N	OCC / C WILLIAM (TIN)	1		1	1			1 1			1	1				
	Sample	Sample	(C=Comp,		# of	tere		2										1				
Sample Identification	Date	Time	G=Grab)	Matrix	Cont.		10	-					_			_	_			Sample Sp	ecific Notes:	
TP-PFC-025-TPI	1/11/18	0900	9	W	4	NA	VH	-														
TO- PFC-025-MID-CARBON		0905			4	NA	47	-														
TR-PFL-075-MID-CARBON TR-PFL-075- TRE		0910			4	NA	4	t														
78- PFC-625-70E-D	上	0000	7	1	4	wh	VIT	-														
ge '						П																
60				1		++	+	+	+	+		-	-	+	-	+	+	+	-			_
й						Ш																
of 6006				La		11																
0						+	+	-	$\pm \pm$	+	+	+	+	+		+	+	1			-	-
0)						\sqcup	_			-		4	-			_			Ш			
						11						1	-				II.	uu ii	Ш		i illi illi	
						$\dagger \dagger$	\top		\Box						1	1			Ш			
				+	-	++	+	+	-	+	-	-	-	-	-	-	11	20.35	042	Chain of Custody	(1011)111	_
						11												20-33	042	Chair of Gustouy		
						П											1	1 1	1	T		
Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3;	5=NaOH:	6= Other	-			4	+		++			-					+					
Possible Hazard Identification:	o naon,	o other_				15	Sam	ple D	Dispos	al (A	fee	may	be as	sess	ed if	sam	ples	are r	etair	ned longer than 1 mo	onth)	_
Are any samples from a listed EPA Hazardous Waste? Plea	se List any	EPA Waste	Codes for	the sam	ple in ti	he											•					
Comments Section if the lab is to dispose of the sample.							100						,					_				
Non-Hazard Flammable Skin Irritant	Poisor	n B	Unkr	nown			Ĺ.	Retu	rn to CI	ent		V	Dispo	sal by	Lab		L	Archi	ve for	Months		
Special Instructions/QC Requirements & Comments:																						
														_						- V		
Custody Seals Intact: Yes No	Custody S	Seal No.:							Cool	er Te	mp. (°C): C	bs'd	9	.7	_ Cc	orr'd:_	J		_ Therm ID No.: A	11-3	
Relinquished by:	Company	*		Date/T	ime:	1	Rece	eived	by:	100					1177	pan				Date/Time:		
									Chap	1	1.	>				4-				01/12/18	1320	
Relinquished by:	Company			Date/T	ime:	F	Rece	eived	by:	-					Com	npany	y :			Date/Time:		
	-					_																
Relinquished by:	Company	*		Date/T	ime:	1	Rece	eived	in Lat	orato	ry by	•			Con	npan	y:			Date/Time:		

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-35042-1

Login Number: 35042 List Source: TestAmerica Sacramento

List Number: 1

Creator: Turpen, Troy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	COC not relinquished by client.
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative 320-35042-1

Receipt

The samples were received on 1/12/2018 1:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.2° C.

Receipt Exceptions

The Chain-of-Custody (COC) was not reliquished. A revised CoC was received from the client and both will be included in the report.

LCMS

Method(s) 537 (modified): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) and Perfluorohexanesulfonic acid (PFHxS) within the calibration range: TP-PFC-025-TPI (320-35042-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-204105.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Tetra Tech, Inc.

TestAmerica Job ID: 320-35042-1

Project/Site: TT: PFAS, Brunswick, Discharge

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
E	Result exceeded calibration range.
M	Manual integrated compound.
D	The reported value is from a dilution.
D	

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Tetra Tech, Inc.

Project/Site: TT: PFAS, Brunswick, Discharge

Lab Sample ID Client Sample ID Matrix Collected Received 320-35042-1 01/11/18 09:00 01/12/18 13:20 TP-PFC-025-TPI Water 320-35042-2 TP-PFC-025-MID-CARBON Water 01/11/18 09:05 01/12/18 13:20 320-35042-3 TP-PFC-025-TPE Water 01/11/18 09:10 01/12/18 13:20 Water 320-35042-4 TP-PFC-025-TPE-D 01/11/18 00:00 01/12/18 13:20

TestAmerica Job ID: 320-35042-1

Method Summary

Client: Tetra Tech, Inc.

Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-35042-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

FORM II LCMS SURROGATE RECOVERY

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-35042-1
-----	-------	-------------	------------	----------	-------------

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

	Ι								
Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-025-TPI	320-35042-1	114	141	123	118	121	122	103	124
TP-PFC-025-TPI DL	320-35042-1 DL	101	104	118	101	96	99	103	100
TP-PFC-025-MID-CAR BON	320-35042-2	104	102	98	98	100	99	102	104
TP-PFC-025-TPE	320-35042-3	105	107	99	101	110	102	107	106
TP-PFC-025-TPE-D	320-35042-4	105	109	99	108	108	103	107	107
	MB 320-204105/1-A	104	108	101	102	101	104	102	106
	LCS 320-204105/2-A	98	101	96	97	97	94	100	95
	LCSD 320-204105/3-A	104	106	105	108	104	100	104	103

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 1802 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

FORM II 537 (modified)

FORM II LCMS SURROGATE RECOVERY

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-35042-1
-----	-------	-------------	------------	----------	-------------

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-025-TPI	320-35042-1	124	112	125	128	109	108
TP-PFC-025-TPI DL	320-35042-1 DL	101	95	102	106	94	95
TP-PFC-025-MID-CAR BON	320-35042-2	100	92	97	100	90	94
TP-PFC-025-TPE	320-35042-3	100	87	89	99	93	94
TP-PFC-025-TPE-D	320-35042-4	108	98	102	108	102	99
	MB 320-204105/1-A	104	91	100	107	96	98
	LCS 320-204105/2-A	93	84	94	100	91	92
	LCSD 320-204105/3-A	101	92	102	99	94	99

	QC LIMITS
PFOS = 13C4 PFOS	25-150
PFOSA = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

FORM II 537 (modified)

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1	
SDG No.:		
Lab File ID: 2018.01.18LLA_002.d	Lab Sample ID: MB 320-204105/1-A	
Matrix: Water	Date Extracted: 01/16/2018 09:18	
Instrument ID: A8_N	Date Analyzed: 01/18/2018 17:37	
Level: (Low/Med) Low		

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
	LCS 320-204105/2-A	2018.01.18L	01/18/2018 17:45
		LA 003.d	
	LCSD 320-204105/3-A	2018.01.18L	01/18/2018 17:53
		LA 004.d	
TP-PFC-025-TPI	320-35042-1	2018.01.18L	01/18/2018 18:01
		LA 005.d	
TP-PFC-025-MID-CARBON	320-35042-2	2018.01.18L	01/18/2018 18:08
		LA 006.d	
TP-PFC-025-TPE	320-35042-3	2018.01.18L	01/18/2018 18:16
		LA 007.d	
TP-PFC-025-TPE-D	320-35042-4	2018.01.18L	01/18/2018 18:24
		LA 008.d	
TP-PFC-025-TPI DL	320-35042-1 DL	2018.01.19L	01/19/2018 16:58
		LC_010.d	

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	JOD NO.: 32U-35U4Z-1							
SDG No.:								
Client Sample ID:	Lab Sample ID: MB 320-204105/1-A							
Matrix: Water	Lab File ID: 2018.01.18LLA_002.d							
Analysis Method: 537 (modified)	Date Collected:							
Extraction Method: 3535	Date Extracted: 01/16/2018 09:18							
Sample wt/vol: 250(mL)	Date Analyzed: 01/18/2018 17:37							
Con. Extract Vol.: 10.0(mL)	Dilution Factor: 1							
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)							
% Moisture:	GPC Cleanup: (Y/N) N							
Analysis Batch No.: 204556	Units: ng/L							

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.0	U	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	2.0	Ū	4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.0	Ū	2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	Ū	4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	1.0	Ū	2.0	1.0	0.2
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.33
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	Ū	4.0	3.0	1.
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	Ū	4.0	2.0	0.5
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	Ū	4.0	3.0	1.
376-06-7	Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	1.0	0.2
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	Ū	2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	Ū	2.0	1.0	0.3
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	2.0	0.5
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	1.0	0.3
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	1.0	0.3

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	JOD NO.: 320-35042-1
SDG No.:	
Client Sample ID:	Lab Sample ID: MB 320-204105/1-A
Matrix: Water	Lab File ID: 2018.01.18LLA_002.d
Analysis Method: 537 (modified)	Date Collected:
Extraction Method: 3535	Date Extracted: 01/16/2018 09:18
Sample wt/vol: 250(mL)	Date Analyzed: 01/18/2018 17:37
Con. Extract Vol.: 10.0(mL)	Dilution Factor: 1
Injection Volume: 2(uL)	GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture:	GPC Cleanup:(Y/N) N
Analysis Batch No.: 204556	Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	102		25-150
STL00990	13C4 PFOA	102		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	100		25-150
STL00997	13C2 PFUnA	107		25-150
STL00998	13C2 PFDoA	96		25-150
STL00994	1802 PFHxS	104		25-150
STL00991	13C4 PFOS	104		25-150
STL02116	13C2-PFTeDA	98		25-150
STL01892	13C4-PFHpA	101		25-150
STL01893	13C5 PFPeA	108		25-150
STL02337	13C3-PFBS	101		25-150

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name	e: TestAmerica Sacr	amento	Job No.: 3	320-35042-1
SDG No.	: <u></u>			
Matrix:	Water	Level: Low	Lab File 1	ID: 2018.01.18LLA_003.d
Lab ID:	LCS 320-204105/2-A		Client ID:	:

	SPIKE	LCS	LCS	QC	
	ADDED	CONCENTRATION	િ	LIMITS	#
COMPOUND	(ng/L)	(ng/L)	REC	REC	
Perfluorobutanoic acid (PFBA)	40.0	39.2	98	89-128	
Perfluoropentanoic acid	40.0	36.2	90	66-136	
(PFPeA)					
Perfluorohexanoic acid (PFHxA)	40.0	36.9	92	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	38.0	95	89-127	
Perfluorooctanoic acid (PFOA)	40.0	36.9	92	80-120	
Perfluorononanoic acid (PFNA)	40.0	38.8	97	77-137	
Perfluorodecanoic acid (PFDA)	40.0	40.0	100	84-123	
Perfluoroundecanoic acid	40.0	34.4	86		
(PFUnA)					
Perfluorododecanoic acid	40.0	40.3	101	82-122	
(PFDoA)					
Perfluorotridecanoic Acid	40.0	39.4	99	56-163	
(PFTriA)					
Perfluorotetradecanoic acid	40.0	40.7	102	66-120	
(PFTeA)	25.4	24.0	0.0	00 100	
Perfluorobutanesulfonic acid	35.4	34.9	99	88-130	
(PFBS) Perfluorohexanesulfonic acid	36.4	34.8	96	87-126	
(PFHxS)	30.4	34.0	90	07-120	
Perfluoroheptanesulfonic Acid	38.1	38.0	100	92-135	
(PFHpS)		33.]]]	
Perfluorooctanesulfonic acid	37.1	36.0	97	83-126	
(PFOS)					
Perfluorodecanesulfonic acid	38.6	40.0	104	80-129	
(PFDS)					
Perfluorooctane Sulfonamide	40.0	39.5	99	91-133	
(FOSA)					
13C8 FOSA	100	83.6	84		
13C4 PFBA	100	98.4	98		
13C2 PFHxA	100	96.9	97		
13C4 PFOA	100	99.9	100	l	
13C5 PFNA	100	94.8	95	l I	
13C2 PFDA	100	93.9	94	25-150	
13C2 PFUnA	100	99.5	100	25-150	
13C2 PFDoA	100	90.6	91	25-150	
1802 PFHxS	94.6	89.0	94		
13C4 PFOS	95.6	89.2	93		
13C2-PFTeDA	100	91.5	92		
13C4-PFHpA	100	97.4	97		
13C5 PFPeA	100	101	101		
13C3-PFBS	93.0	89.4	96		
1303 1100	23.0			23 130	

[#] Column to be used to flag recovery and RPD values FORM III 537 (modified)

FORM III LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name	e: <u>TestAmerica Sacr</u>	ramento	Job No.:	320-	-35042-1
SDG No.	:				
Matrix:	Water	Level: Low	Lab File	ID:	2018.01.18LLA_004.d

Lab ID: LCSD 320-204105/3-A Client ID:

	SPIKE ADDED	LCSD CONCENTRATION	LCSD	96	QC LI	IMITS	#
COMPOUND	(ng/L)	(ng/L)	REC	RPD	RPD	REC	#
Perfluorobutanoic acid (PFBA)	40.0	38.1	95	3	30	89-128	
Perfluoropentanoic acid (PFPeA)	40.0	35.9	90	1	30	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	35.7	89	3	30	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	37.2	93	2	30	89-127	
Perfluorooctanoic acid (PFOA)	40.0	37.8	94		30	80-120	
Perfluorononanoic acid (PFNA)	40.0	37.5	94	3	30	77-137	
Perfluorodecanoic acid (PFDA)	40.0	37.9	95	6	30	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	37.2	93	8	30	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	39.8	100	1	30	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	38.6	97	2	30	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7	102		30	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	33.8	96		30	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.8	93	3	30	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.5	98	2	30	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3	93	5	30	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	36.9	96	8	30	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	36.6	92	8	30	91-133	
13C8 FOSA	100	92.0	92			25-150	
13C4 PFBA	100	104	104			25-150	
13C2 PFHxA	100	108	108			25-150	
13C4 PFOA	100	104	104			25-150	
13C5 PFNA	100	103	103			25-150	
13C2 PFDA	100	102	102			25-150	
13C2 PFUnA	100	98.5	99			25-150	
13C2 PFDoA	100	94.3	94			25-150	
1802 PFHxS	94.6	94.8	100			25-150	
13C4 PFOS	95.6	96.8	101			25-150	
13C2-PFTeDA	100	98.6	99			25-150	
13C4-PFHpA	100	104	104			25-150	
13C5 PFPeA	100	106	106			25-150	
13C3-PFBS	93.0	98.0	105			25-150	

[#] Column to be used to flag recovery and RPD values
FORM III 537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: 320-35042-1
SDG No.:	
Instrument ID: A8_N	Start Date: 01/17/2018 14:19
Analysis Batch Number: 204375	End Date: 01/17/2018 15:22

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-204375/2		01/17/2018 14:19	1	2018.01.17CURVE LLA 002.d	GeminiC18 3x100 3(mm)
IC 320-204375/3		01/17/2018 14:27	1	2018.01.17CURVE LLA 003.d	GeminiC18 3x100 3(mm)
IC 320-204375/4		01/17/2018 14:35	1	2018.01.17CURVE LLA 004.d	GeminiC18 3x100 3(mm)
IC 320-204375/5		01/17/2018 14:42	1	2018.01.17CURVE LLA 005.d	GeminiC18 3x100 3(mm)
IC 320-204375/6		01/17/2018 14:50	1	2018.01.17CURVE LLA 006.d	GeminiC18 3x100 3(mm)
IC 320-204375/7		01/17/2018 14:58	1	2018.01.17CURVE LLA 007.d	GeminiC18 3x100 3(mm)
IC 320-204375/8		01/17/2018 15:06	1	2018.01.17CURVE LLA 008.d	GeminiC18 3x100 3(mm)
ICB 320-204375/9		01/17/2018 15:14	1		GeminiC18 3x100 3(mm)
ICV 320-204375/10		01/17/2018 15:22	1	2018.01.17CURVE LLA 010.d	GeminiC18 3x100 3 (mm)

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-204375/2	2018.01.17CURVELLA 002.d	
Level 2	IC 320-204375/3	2018.01.17CURVELLA 003.d	
Level 3	IC 320-204375/4	2018.01.17CURVELLA 004.d	
Level 4	IC 320-204375/5	2018.01.17CURVELLA 005.d	
Level 5	IC 320-204375/6	2018.01.17CURVELLA 006.d	
Level 6	IC 320-204375/7	2018.01.17CURVELLA 007.d	
Level 7	IC 320-204375/8	2018.01.17CURVELLA 008.d	

ANALYTE		RRF				CURVE	COEFFICIENT			# MIN RRF	%RSD	 MAX	R^2	#	MIN R^2
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2			%RSD	OR COD		OR COD
Perfluorobutanoic acid (PFBA)	0.9492 0.9454	0.9387 0.9305	0.9217	0.9121	0.9423	AveID		0.9343			1.4	35.0			
Perfluoropentanoic acid (PFPeA)	1.2629 1.1486	1.1820 1.1603	1.1793	1.1351	1.1782	AveID		1.1781			3.5	35.0			
Perfluorobutanesulfonic acid (PFBS)	77.125 80.005	75.338 74.458			74.861	AveID		77.213			3.3	50.0			
4:2 FTS	14.861 14.172	13.294 14.456	13.574	13.365	13.533	AveID		13.894			4.4	35.0			
Perfluorohexanoic acid (PFHxA)	1.1691 1.0364	1.0016 1.0049	1.0117	1.0418				1.0365			5.9	35.0			
Perfluoroheptanoic acid (PFHpA)	1.0781 1.1040	1.1090 1.0717	1.2181	1.0322	1.0801	AveID		1.0990			5.3	35.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2907 1.1001	1.1727 1.0631	1.0672	1.0113	1.0892	AveID		1.1135			8.3	35.0			
6:2FTS	1.8237 1.7817		1.5599	1.5572	1.6409	AveID		1.6551			6.9	35.0			
Perfluorooctanoic acid (PFOA)	1.3391 1.1097	1.2175 1.1351	1.1389	1.1301	1.1344	AveID		1.1721			6.9	35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2991 1.4080	1.3017 1.3785	1.3248	1.3329	1.4365	AveID		1.3545			4.0	50.0			
Perfluorononanoic acid (PFNA)	1.0065 1.0724	0.9779 1.0322	1.0085	1.0513	1.0771	AveID		1.0323			3.6	35.0			
Perfluorooctanesulfonic acid (PFOS)	1.1888 1.1074	1.1027 1.1406	1.0854	1.0789	1.1321	AveID		1.1194			3.4	35.0			
Perfluorooctane Sulfonamide (FOSA)	0.9734 1.0164	0.9422 0.9708	0.9781	0.9630	1.0326	AveID		0.9823			3.2	35.0			
8:2FTS	1.1123 1.2810	1.2494 1.2330	1.2204	1.1973	1.2254	AveID		1.2170			4.4	35.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICIE	ENT	# MIN RRF	%RSD	 MAX %RSD	R^2 OR COD		MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	TIPE	В	M1	M2			*KSD	OR COD		OR COD
				0 0011		1						 		_	
Perfluorodecanoic acid (PFDA)	0.9958 1.0058		0.9962	0.9341	0.9440	AvelD		0.9702			3.5	35.0			
N-methyl perfluorooctane	1.1587		1.0118	1.0520	1.0759	AveTD		1.0802			4.4	35.0			
sulfonamidoacetic acid (NMeFOSAA)	1.0920														
Perfluorodecanesulfonic acid (PFDS)	0.6602 0.6484		0.6566	0.6572	0.6784	AveID		0.6549			4.2	50.0			
Perfluoroundecanoic acid (PFUnA)	1.2159		1.0056	0 9503	1.0142	AveTD		1.0322			8.2	35.0			
refractional defa (from)	0.9998			0.3303	1.0112	1110010		1.0022			0.2	33.0			
N-ethyl perfluorooctane	0.9515			0.9222	1.0107	AveID		0.9739			3.7	35.0			-
sulfonamidoacetic acid (NEtFOSAA)	1.0073														
Perfluorododecanoic acid (PFDoA)	0.9260		1.0407	1.0402	1.0605	AveID		1.0247			4.4	35.0			
	1.0217														
Perfluorotridecanoic Acid (PFTriA)	1.3513			1.1935	1.1553	AveID		1.1612			8.0	50.0			
	1.1017														
Perfluorotetradecanoic acid (PFTeA)	0.2670		0.2354	0.2343	0.2495	AveID		0.2440			4.9	50.0			
	0.2417														
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 0.9569		0.9976	0.9485	0.9929	L2ID	0.0183	0.9474					0.9990		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	1.0044		1.0301	1.0498	1.1172	AveID		1.0536			5.7	50.0			
	1.1214	1.0904													
13C4 PFBA	1.5259		1.4952	1.4862	1.5144	Ave		1.5124			1.4	50.0			
	1.5432														
13C5 PFPeA	0.8953		0.8845	0.8952	0.8865	Ave		0.8956			1.6	50.0			
	0.9232														
13C3-PFBS	0.0201			0.0193	0.0207	Ave		0.0198			2.7	50.0			
1000	0.0200			0 0001	0.0000	_		0.0610			1 0				
13C2 PFHxA	0.9582			0.9384	0.9878	Ave		0.9649			1.9	50.0			
1204 PRIL 3	0.9743			0.9173	0.9288	7		0.9187			0 1	50.0			
13C4-PFHpA	0.9403		0.9077	0.91/3	0.9288	Ave		0.918/			2.1	50.0			
1802 PFHxS	1.1706		1.1523	1.1305	1.1042	7110		1.1311			2.2	50.0			
1002 FFRAS	1.1114		1.1323	1.1303	1.1042	Ave		1.1311			2.2	30.0			
M2-6:2FTS	0.1667		0.1731	0.1738	0.1725	Ave		0.1699			2.1	50.0			-
	0.1660			3.1,30	0.1,20	1110		""				50.0			
13C4 PFOA	0.9250			0.8785	0.9201	Ave		0.9004			2.5	50.0			
	0.9076														
13C4 PFOS	0.7222	0.7129	0.7303	0.7109	0.7113	Ave		0.7158			1.7	50.0			
	0.7287														
13C5 PFNA	0.7504		0.7466	0.7136	0.7096	Ave		0.7300			2.3	50.0			
	0.7333	0.7157													

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICI	ENT	#	MIN RRF	%RSD			# MIN R^2
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				%RS	OR COD	OR COD
	LVL 6	LVL 7													
13C8 FOSA	1.0308		1.0156	1.0178	0.9955	Ave		1.0067				2.5	50	. 0	
M2-8:2FTS	0.1862 0.1771		0.1811	0.1727	0.1782	Ave		0.1795				2.3	50	. 0	
13C2 PFDA	0.6444		0.6279	0.6313	0.6343	Ave		0.6306				1.2	50	. 0	
d3-NMeFOSAA	0.3174		0.3169	0.3149	0.3063	Ave		0.3147				1.3	50	. 0	
d5-NEtFOSAA	0.3461		0.3232	0.3158	0.3054	Ave		0.3182				4.9	50	. 0	
13C2 PFUnA	0.4983		0.4836	0.4728	0.4716	Ave		0.4783				3.1	50	. 0	
13C2 PFDoA	0.5470		0.5263	0.4927	0.5060	Ave		0.5192				4.0	50	. 0	
13C2-PFTeDA	0.7322 0.6661	0.7412	0.6868	0.6615	0.6446	Ave		0.6785				6.7	50	. 0	
13C2-PFHxDA	1.2777			1.2154	1.1984	Ave		1.2091				5.6	50	. 0	

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-204375/2	2018.01.17CURVELLA 002.d
Level 2	IC 320-204375/3	2018.01.17CURVELLA 003.d
Level 3	IC 320-204375/4	2018.01.17CURVELLA 004.d
Level 4	IC 320-204375/5	2018.01.17CURVELLA 005.d
Level 5	IC 320-204375/6	2018.01.17CURVELLA 006.d
Level 6	IC 320-204375/7	2018.01.17CURVELLA 007.d
Level 7	IC 320-204375/8	2018.01.17CURVELLA 008.d

ANALYTE	IS CURV			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF TYP	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)	Avel	71970 13027499	134919 24898296	645094	2581287	6694565	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)	Avel	D 56184 9469006	102787 17890417	488305	1934955	4900043	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)	Avel	D 67976 12635108	122306 22970596	656362	2532634	6433939	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS	Avel	13839 2364722	22803 4712009	116305	459884	1228862	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)	Avel	55664 9016831	92376 16747455	466560	1861593	4586272	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanoic acid (PFHpA)	Avel	50371 9111535	99406 16533181	517603	1803022	4706368	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)	Avel	0 68319 9935695	117059 18787887	523793	1981094	5134885	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2FTS	Avel	14322 2504300	23999 4633505	119814	488565	1258940	0.0237 4.74	0.0474	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)	Avel	0 61549 8993265	105297 17167030	484462	1890626	4896648	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)	Avel	0 44381 8721809	84987 15956747	431169	1717801	4563453	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)	Avel	37531 7021740	69666 12938458	352431	1428679	3585870	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)	Avel	39589 6686934	70183 12870491	344328	1355316	3505745	0.0232 4.64	0.0464	0.232	0.928	2.32
Perfluorooctane Sulfonamide (FOSA)	Avel	0 49852 8973330	93805 16389523	464966	1866404	4822749	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
8:2FTS	Avel	9860 1941077	20684 3762460	99090	377296	981168	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)	AveI	31882 5653894	55975 10721843	292799	1122840	2809263	0.0250	0.0500	0.250	1.00	2.50

FORM VI LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

ANALYTE	IS	CURVE			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	18275 3100803	31785 6179313	150110	630879	1546077	0.0250 5.00	0.0500	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	22837 4067427	39594 8022809	216397	857674	2182261	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	30104 4341065	47415 8080078	227630	855685	2244135	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16362 2837873	30312 5261873	142743	554613	1447969	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	25166 4798721	54026 9080911	256381	975905	2517800	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	36726 5174158	57967 9922216	263708	1119808	2742788	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	9714 1437735	16612 2672440	75670	295170	754490	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	+++++ 10121041	164489 17956480	561148	2195395	5582637	++++ 5.00	0.0500	0.250	1.00	2.50
Perfluoro-n-octadecanoic acid (PFODA)		AveID	63769 11861271	119958 20806019	579412	2429777	6281608	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	7581930 6889924	7186789 6689622	6999196	7075449	7104763	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	4448756 4122126	4347864 3854737	4140508	4261723	4159040	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	92724 83073	85395 81139	85313	85658	90418	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4761111 4349882	4611605 4166297	4611448	4467394	4634604	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4672251 4126515	4481837 3856924	4249130	4367056	4357423	2.50 2.50	2.50 2.50	2.50	2.50	2.50
1802 PFHxS	13PF OA	Ave	5502563 4694368	5188305 4592963	5102469	5091273	4900649	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	786962 704248	783363 688126	769728	786039	768843	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	4596206 4052198	4324416 3781095	4253926	4182465	4316678	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3430582 3110246	3278250 2906103	3268191	3235344	3190243	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3728829 3273972	3562167 3133770	3494654	3397294	3329183	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PF OA	Ave	5121669 4414446	4978224 4220474	4753896	4845519	4670673	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	886480 757639	827776 762870	811941	787775	800715	2.40	2.40	2.40	2.40	2.40

FORM VI

LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8 N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

ANALYTE	IS	CURVE			RESPONSE				CONCEN	NTRATION (N	NG/ML)	
	REF	TYPE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
13C2 PFDA	13PF	Ave	3201735	3024128	2939305	3005224	2975947	2.50	2.50	2.50	2.50	2.50
	OA		2810507	2706406				2.50	2.50			
d3-NMeFOSAA	13PF	Ave	1577189	1505517	1483575	1499251	1437020	2.50	2.50	2.50	2.50	2.50
	OA		1419745	1384778				2.50	2.50			
d5-NEtFOSAA	13PF	Ave	1719534	1560100	1512999	1503508	1432688	2.50	2.50	2.50	2.50	2.50
	OA		1408625	1301953				2.50	2.50			
13C2 PFUnA	13PF	Ave	2475898	2331330	2263551	2250985	2212774	2.50	2.50	2.50	2.50	2.50
	OA		2170924	1975688				2.50	2.50			
13C2 PFDoA	13PF	Ave	2717793	2591482	2463501	2345552	2374065	2.50	2.50	2.50	2.50	2.50
	OA		2348326	2179814				2.50	2.50			
13C2-PFTeDA	13PF	Ave	3638245	3565275	3214801	3148987	3024149	2.50	2.50	2.50	2.50	2.50
	OA		2973878	2702115				2.50	2.50			
13C2-PFHxDA	13PF	Ave	6348846	6235993	5624728	5786263	5622608	2.50	2.50	2.50	2.50	2.50
	OA		5288590	4770244				2.50	2.50			

Curve Type Legend:

Ave = Average ISTD

AveID = Average isotope dilution

L2ID = Linear 1/conc^2 IsoDil

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: ICV 320-204375/10 Calibration Date: 01/17/2018 15:22

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.17CURVELLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9126		2.44	2.50	-2.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.142		2.42	2.50	-3.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	77.17		2.21	2.21	-0.0	25.0
4:2 FTS	AveID	13.89	13.58		2.28	2.34	-2.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9860		2.38	2.50	-4.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.048		2.38	2.50	-4.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.050		2.15	2.28	-5.7	25.0
6:2FTS	AveID	1.655	1.696		2.43	2.38	2.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.068		2.28	2.50	-8.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.417		2.48	2.38	4.6	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	0.9807		2.38	2.50	-5.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.080		2.23	2.31	-3.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9902		2.52	2.50	0.8	25.0
8:2FTS	AveID	1.217	1.281		2.53	2.40	5.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9547		2.46	2.50	-1.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.060		2.45	2.50	-1.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6815		2.51	2.41	4.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9448		2.29	2.50	-8.5	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9541		2.45	2.50	-2.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.024		2.50	2.50	-0.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.075		2.31	2.50	-7.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2434		2.49	2.50	-0.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8997		2.35	2.50	-5.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.176		2.79	2.50	11.6	25.0
13C4 PFBA	Ave	1.512	1.595		2.64	2.50	5.4	50.0
13C5 PFPeA	Ave	0.8956	0.9288		2.59	2.50	3.7	50.0
13C3-PFBS	Ave	0.0198	0.0205		2.40	2.33	3.3	50.0
13C2 PFHxA	Ave	0.9649	1.003		2.60	2.50	3.9	50.0
13C4-PFHpA	Ave	0.9187	0.9576		2.61	2.50	4.2	50.0
1802 PFHxS	Ave	1.131	1.197		2.50	2.37	5.8	50.0
M2-6:2FTS	Ave	0.1699	0.1786		2.50	2.38	5.1	50.0

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>ICV 320-204375/10</u> Calibration Date: <u>01/17/2018 15:22</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.17CURVELLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9552		2.65	2.50	6.1	50.0
13C4 PFOS	Ave	0.7158	0.7476		2.50	2.39	4.4	50.0
13C5 PFNA	Ave	0.7300	0.7759		2.66	2.50	6.3	50.0
13C8 FOSA	Ave	1.007	1.031		2.56	2.50	2.4	50.0
M2-8:2FTS	Ave	0.1795	0.1774		2.37	2.40	-1.2	50.0
13C2 PFDA	Ave	0.6306	0.6405		2.54	2.50	1.6	50.0
d3-NMeFOSAA	Ave	0.3147	0.3234		2.57	2.50	2.8	50.0
13C2 PFUnA	Ave	0.4783	0.5040		2.63	2.50	5.4	50.0
d5-NEtFOSAA	Ave	0.3182	0.3385		2.66	2.50	6.4	50.0
13C2 PFDoA	Ave	0.5192	0.5336		2.57	2.50	2.8	50.0
13C2-PFTeDA	Ave	0.6785	0.6646		2.45	2.50	-2.0	50.0
13C2-PFHxDA	Ave	1.209	1.217		2.52	2.50	0.7	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: <u>320-35042-1</u>
SDG No.:	
Instrument ID: A8_N	Start Date: 01/18/2018 10:35
Analysis Batch Number: 204504	End Date: 01/18/2018 15:01

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
CCVL 320-204504/1		01/18/2018 10:35	1	2018.01.18LLC_0 04.d	GeminiC18 3x100 3(mm)
CCV 320-204504/2		01/18/2018 10:43	1		GeminiC18 3x100 3(mm)
ZZZZZ		01/18/2018 10:50	1		GeminiC18 3x100 3(mm)
CCV 320-204504/14		01/18/2018 12:17	1		GeminiC18 3x100 3(mm)
CCV 320-204504/25		01/18/2018 13:43	1		GeminiC18 3x100 3(mm)
CCV 320-204504/35		01/18/2018 15:01	1		GeminiC18 3x100 3(mm)

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCVL 320-204504/1 Calibration Date: 01/18/2018 10:35

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: <u>GeminiC18 3x100</u> ID: <u>3.00(mm)</u> Calib End Date: <u>01/17/2018 15:06</u>

Lab File ID: 2018.01.18LLC_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.8680		0.0465	0.0500	-7.1	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.222		0.0519	0.0500	3.7	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	74.95		0.0429	0.0442	-2.9	50.0
4:2 FTS	AveID	13.89	11.20		0.377	0.467	-19.4	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9268		0.0447	0.0500	-10.6	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.051		0.0478	0.0500	-4.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.174		0.0480	0.0455	5.5	50.0
6:2FTS	AveID	1.655	2.071		0.593	0.474	25.1	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.097		0.0468	0.0500	-6.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.210		0.0425	0.0476	-10.7	50.0
Perfluorononanoic acid (PFNA)	AveID	1.032	0.9026		0.0437	0.0500	-12.6	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.101		0.0456	0.0464	-1.7	50.0
8:2FTS	AveID	1.217	1.092		0.430	0.479	-10.3	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9336		0.0475	0.0500	-5.0	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9508		0.0490	0.0500	-2.0	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	0.999		0.462	0.500	-7.6	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6052		0.0445	0.0482	-7.6	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.8778		0.451	0.500	-9.9	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	1.065		0.0516	0.0500	3.2	50.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.080		0.0527	0.0500	5.4	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.176		0.0506	0.0500	1.3	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2516		0.0516	0.0500	3.1	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.286		0.0485	0.0500	-2.9	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.060		0.0503	0.0500	0.6	50.0
13C4 PFBA	Ave	1.512	1.533		2.53	2.50	1.4	50.0
13C5 PFPeA	Ave	0.8956	0.9106		2.54	2.50	1.7	50.0
13C3-PFBS	Ave	0.0198	0.0203		2.38	2.33	2.5	50.0
13C2 PFHxA	Ave	0.9649	0.9886		2.56	2.50	2.5	50.0
13C4-PFHpA	Ave	0.9187	0.9411		2.56	2.50	2.4	50.0
1802 PFHxS	Ave	1.131	1.139		2.38	2.37	0.7	50.0
M2-6:2FTS	Ave	0.1699	0.1579		2.21	2.38	-7.0	50.0

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCVL 320-204504/1</u> Calibration Date: <u>01/18/2018</u> 10:35

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLC_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	용D	MAX %D
13C4 PFOA	Ave	0.9004	0.9370		2.60	2.50	4.1	50.0
13C4 PFOS	Ave	0.7158	0.7233		2.42	2.39	1.1	50.0
13C5 PFNA	Ave	0.7300	0.7351		2.52	2.50	0.7	50.0
M2-8:2FTS	Ave	0.1795	0.1584		2.11	2.40	-11.8	50.0
13C2 PFDA	Ave	0.6306	0.6236		2.47	2.50	-1.1	50.0
13C8 FOSA	Ave	1.007	1.020		2.53	2.50	1.4	50.0
d3-NMeFOSAA	Ave	0.3147	0.2736		2.17	2.50	-13.0	50.0
d5-NEtFOSAA	Ave	0.3182	0.3117		2.45	2.50	-2.1	50.0
13C2 PFUnA	Ave	0.4783	0.5095		2.66	2.50	6.5	50.0
13C2 PFDoA	Ave	0.5192	0.4589		2.21	2.50	-11.6	50.0
13C2-PFTeDA	Ave	0.6785	0.5997		2.21	2.50	-11.6	50.0
13C2-PFHxDA	Ave	1.209	1.028		2.13	2.50	-15.0	50.0

LCMS ANALYSIS RUN LOG

Lab Name: Te	stAmerica Sacramento	Job No.: 320-35042-1
SDG No.:		
Instrument I	D: <u>A8_</u> N	Start Date: 01/18/2018 17:29
Analysis Bat	ch Number: 204556	End Date: 01/18/2018 18:40

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
CCV 320-204556/1		01/18/2018 17:29	1	2018.01.18LLA_0 01.d	GeminiC18 3x100 3(mm)
MB 320-204105/1-A		01/18/2018 17:37	1	2018.01.18LLA_0 02.d	GeminiC18 3x100 3(mm)
LCS 320-204105/2-A		01/18/2018 17:45	1	2018.01.18LLA_0 03.d	GeminiC18 3x100 3(mm)
LCSD 320-204105/3-A		01/18/2018 17:53	1	2018.01.18LLA_0 04.d	GeminiC18 3x100 3(mm)
320-35042-1		01/18/2018 18:01	1	2018.01.18LLA_0 05.d	GeminiC18 3x100 3(mm)
320-35042-2		01/18/2018 18:08	1	2018.01.18LLA_0 06.d	GeminiC18 3x100 3(mm)
320-35042-3		01/18/2018 18:16	1	2018.01.18LLA_0 07.d	GeminiC18 3x100 3(mm)
320-35042-4		01/18/2018 18:24	1	2018.01.18LLA_0 08.d	GeminiC18 3x100 3(mm)
CCV 320-204556/10		01/18/2018 18:40	1	2018.01.18LLD_0 01.d	GeminiC18 3x100 3(mm)

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCV 320-204556/1</u> Calibration Date: <u>01/18/2018 17:29</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9343	0.9484		2.54	2.50	1.5	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.174		2.49	2.50	-0.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	79.55		2.28	2.21	3.0	25.0
4:2 FTS	AveID	13.89	14.13		2.37	2.34	1.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	1.012		2.44	2.50	-2.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.077		2.45	2.50	-2.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.061		2.17	2.28	-4.7	25.0
6:2FTS	AveID	1.655	1.894		2.71	2.37	14.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.128		2.41	2.50	-3.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.385		2.43	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.067		2.59	2.50	3.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.085		2.25	2.32	-3.1	25.0
8:2FTS	AveID	1.217	1.220		2.40	2.40	0.3	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.032		2.63	2.50	5.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	1.040		2.68	2.50	7.2	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.072		2.48	2.50	-0.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.7010		2.58	2.41	7.0	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9922		2.55	2.50	1.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9827		2.38	2.50	-4.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.068		2.61	2.50	4.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.061		2.28	2.50	-8.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2430		2.49	2.50	-0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.997		2.61	2.50	4.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.138		2.70	2.50	8.0	25.0
13C4 PFBA	Ave	1.512	1.473		2.43	2.50	-2.6	50.0
13C5 PFPeA	Ave	0.8956	0.8673		2.42	2.50	-3.2	50.0
13C3-PFBS	Ave	0.0198	0.0190		2.23	2.33	-4.1	50.0
13C2 PFHxA	Ave	0.9649	0.9571		2.48	2.50	-0.8	50.0
13C4-PFHpA	Ave	0.9187	0.8903		2.42	2.50	-3.1	50.0
1802 PFHxS	Ave	1.131	1.094		2.29	2.37	-3.2	50.0
M2-6:2FTS	Ave	0.1699	0.1631		2.28	2.38	-4.0	50.0

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCV 320-204556/1</u> Calibration Date: <u>01/18/2018 17:29</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8903		2.47	2.50	-1.1	50.0
13C4 PFOS	Ave	0.7158	0.7093		2.37	2.39	-0.9	50.0
13C5 PFNA	Ave	0.7300	0.7224		2.47	2.50	-1.0	50.0
13C8 FOSA	Ave	1.007	0.9258		2.30	2.50	-8.0	50.0
M2-8:2FTS	Ave	0.1795	0.1776		2.37	2.40	-1.1	50.0
13C2 PFDA	Ave	0.6306	0.5911		2.34	2.50	-6.3	50.0
d3-NMeFOSAA	Ave	0.3147	0.3029		2.41	2.50	-3.7	50.0
d5-NEtFOSAA	Ave	0.3182	0.3070		2.41	2.50	-3.5	50.0
13C2 PFUnA	Ave	0.4783	0.4751		2.48	2.50	-0.7	50.0
13C2 PFDoA	Ave	0.5192	0.4848		2.33	2.50	-6.6	50.0
13C2-PFTeDA	Ave	0.6785	0.6259		2.31	2.50	-7.8	50.0
13C2-PFHxDA	Ave	1.209	0.9925		2.05	2.50	-17.9	50.0

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/10 Calibration Date: 01/18/2018 18:40

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLD_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9122		0.976	1.00	-2.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.107		0.939	1.00	-6.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	77.33		0.885	0.884	0.1	25.0
4:2 FTS	AveID	13.89	14.34		0.964	0.934	3.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9735		0.939	1.00	-6.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.054		0.959	1.00	-4.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.015		0.830	0.910	-8.8	25.0
6:2FTS	AveID	1.655	1.968		1.13	0.948	18.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.102		0.940	1.00	-6.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.373		0.965	0.952	1.4	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.073		1.04	1.00	3.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.102		0.914	0.928	-1.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9705		0.988	1.00	-1.2	25.0
8:2FTS	AveID	1.217	1.307		1.03	0.958	7.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.8965		0.924	1.00	-7.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.081		1.00	1.00	0.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6568		0.967	0.964	0.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9267		0.898	1.00	-10.2	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9608		0.987	1.00	-1.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.004		0.980	1.00	-2.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.057		0.910	1.00	-9.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2430		0.996	1.00	-0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9423		0.975	1.00	-2.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.105		1.05	1.00	4.9	25.0
13C4 PFBA	Ave	1.512	1.509		2.49	2.50	-0.2	50.0
13C5 PFPeA	Ave	0.8956	0.9029		2.52	2.50	0.8	50.0
13C3-PFBS	Ave	0.0198	0.0194		2.28	2.33	-2.0	50.0
13C2 PFHxA	Ave	0.9649	0.9473		2.45	2.50	-1.8	50.0
13C4-PFHpA	Ave	0.9187	0.8834		2.40	2.50	-3.8	50.0
1802 PFHxS	Ave	1.131	1.156		2.42	2.37	2.2	50.0
M2-6:2FTS	Ave	0.1699	0.1826		2.55	2.38	7.5	50.0

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/10 Calibration Date: 01/18/2018 18:40

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLD_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8813		2.45	2.50	-2.1	50.0
13C4 PFOS	Ave	0.7158	0.7113		2.38	2.39	-0.6	50.0
13C5 PFNA	Ave	0.7300	0.7119		2.44	2.50	-2.5	50.0
13C8 FOSA	Ave	1.007	0.9891		2.46	2.50	-1.8	50.0
M2-8:2FTS	Ave	0.1795	0.1814		2.42	2.40	1.0	50.0
13C2 PFDA	Ave	0.6306	0.6663		2.64	2.50	5.7	50.0
d3-NMeFOSAA	Ave	0.3147	0.3181		2.53	2.50	1.1	50.0
d5-NEtFOSAA	Ave	0.3182	0.3252		2.55	2.50	2.2	50.0
13C2 PFUnA	Ave	0.4783	0.4955		2.59	2.50	3.6	50.0
13C2 PFDoA	Ave	0.5192	0.5079		2.45	2.50	-2.2	50.0
13C2-PFTeDA	Ave	0.6785	0.6420		2.37	2.50	-5.4	50.0
13C2-PFHxDA	Ave	1.209	1.076		2.22	2.50	-11.0	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento	Job No.: <u>320-35042-1</u>
SDG No.:	
Instrument ID: A8_N	Start Date: 01/19/2018 16:50
Analysis Batch Number: 204757	End Date: 01/19/2018 17:13

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
CCV 320-204757/1		01/19/2018 16:50	1	2018.01.19LLC_0 09.d	GeminiC18 3x100 3(mm)
320-35042-1 DL		01/19/2018 16:58	10	2018.01.19LLC_0 10.d	GeminiC18 3x100 3(mm)
ZZZZZ		01/19/2018 17:06	1		GeminiC18 3x100 3(mm)
CCV 320-204757/4		01/19/2018 17:13	1	2018.01.19LLC_0 12.d	GeminiC18 3x100 3(mm)

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCV 320-204757/1</u> Calibration Date: <u>01/19/2018 16:50</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX 응D
	TIEL				AMOUNT	AMOUNI		-0 D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9541		2.55	2.50	2.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.165		2.47	2.50	-1.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	83.66		2.39	2.21	8.4	25.0
4:2 FTS	AveID	13.89	17.30		2.91	2.34	24.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	1.026		2.47	2.50	-1.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.095		2.49	2.50	-0.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.086		2.22	2.28	-2.5	25.0
6:2FTS	AveID	1.655	1.803		2.58	2.37	9.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.164		2.48	2.50	-0.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.386		2.43	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.093		2.65	2.50	5.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.105		2.29	2.32	-1.3	25.0
8:2FTS	AveID	1.217	1.142		2.25	2.40	-6.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.033		2.63	2.50	5.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	1.027		2.65	2.50	5.8	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.078		2.49	2.50	-0.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6815		2.51	2.41	4.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9513		2.44	2.50	-2.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	1.072		2.60	2.50	3.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.090		2.66	2.50	6.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.145		2.46	2.50	-1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2381		2.44	2.50	-2.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9352		2.45	2.50	-2.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.093		2.59	2.50	3.7	25.0
13C4 PFBA	Ave	1.512	1.482		2.45	2.50	-2.0	50.0
13C5 PFPeA	Ave	0.8956	0.8970		2.50	2.50	0.2	50.0
13C3-PFBS	Ave	0.0198	0.0189		2.21	2.33	-4.9	50.0
13C2 PFHxA	Ave	0.9649	0.9676		2.51	2.50	0.3	50.0
13C4-PFHpA	Ave	0.9187	0.9002		2.45	2.50	-2.0	50.0
1802 PFHxS	Ave	1.131	1.101		2.30	2.37	-2.7	50.0
M2-6:2FTS	Ave	0.1699	0.1972		2.76	2.38	16.1	50.0

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/1 Calibration Date: 01/19/2018 16:50

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8985		2.49	2.50	-0.2	50.0
13C4 PFOS	Ave	0.7158	0.7403		2.47	2.39	3.4	50.0
13C5 PFNA	Ave	0.7300	0.7346		2.52	2.50	0.6	50.0
13C8 FOSA	Ave	1.007	0.999		2.48	2.50	-0.8	50.0
M2-8:2FTS	Ave	0.1795	0.2287		3.05	2.40	27.4	50.0
13C2 PFDA	Ave	0.6306	0.6203		2.46	2.50	-1.6	50.0
d3-NMeFOSAA	Ave	0.3147	0.3523		2.80	2.50	12.0	50.0
d5-NEtFOSAA	Ave	0.3182	0.3602		2.83	2.50	13.2	50.0
13C2 PFUnA	Ave	0.4783	0.4916		2.57	2.50	2.8	50.0
13C2 PFDoA	Ave	0.5192	0.4895		2.36	2.50	-5.7	50.0
13C2-PFTeDA	Ave	0.6785	0.6797		2.50	2.50	0.2	50.0
13C2-PFHxDA	Ave	1.209	1.092		2.26	2.50	-9.7	50.0

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/4 Calibration Date: 01/19/2018 17:13

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.9343	0.9181		0.983	1.00	-1.7	25.0
(PFBA) Perfluoropentanoic acid	AveID	1.178	1.096		0.930	1.00	-7.0	25.0
(PFPeA) Perfluorobutanesulfonic acid	AveID	77.21	79.38		0.909	0.884	2.8	25.0
(PFBS) 4:2 FTS	AveID	13.89	15.58		1.05	0.934	12.1	25.0
Perfluorohexanoic acid	AveID	1.036	0.9706		0.936	1.00	-6.4	25.0
(PFHxA) Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.086		0.988	1.00	-1.2	25.0
Perfluorohexanesulfonic acid	AveID	1.113	1.095		0.895	0.910	-1.6	25.0
(PFHxS) 6:2FTS	AveID	1.655	1.739		0.996	0.948	5.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.098		0.937	1.00	-6.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.400		0.984	0.952	3.4	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.030		0.998	1.00	-0.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.091		0.904	0.928	-2.6	25.0
8:2FTS	AveID	1.217	1.100		0.866	0.958	-9.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.011		1.03	1.00	3.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9368		0.965	1.00	-3.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	0.9785		0.906	1.00	-9.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6870		1.01	0.964	4.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9616		0.932	1.00	-6.8	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9028		0.927	1.00	-7.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.029		1.00	1.00	0.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.095		0.943	1.00	-5.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2410		0.988	1.00	-1.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9328		0.965	1.00	-3.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.026		0.974	1.00	-2.6	25.0
13C4 PFBA	Ave	1.512	1.464		2.42	2.50	-3.2	50.0
13C5 PFPeA	Ave	0.8956	0.8847		2.47	2.50	-1.2	50.0
13C3-PFBS	Ave	0.0198	0.0193		2.26	2.33	-2.7	50.0
13C2 PFHxA	Ave	0.9649	0.9644		2.50	2.50	-0.0	50.0
13C4-PFHpA	Ave	0.9187	0.9102		2.48	2.50	-0.9	50.0
1802 PFHxS	Ave	1.131	1.098		2.30	2.37	-2.9	50.0
M2-6:2FTS	Ave	0.1699	0.2028		2.83	2.38	19.4	50.0

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: <u>CCV 320-204757/4</u> Calibration Date: <u>01/19/2018 17:13</u>

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3×100 ID: 3.00 (mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9031		2.51	2.50	0.3	50.0
13C4 PFOS	Ave	0.7158	0.7027		2.35	2.39	-1.8	50.0
13C5 PFNA	Ave	0.7300	0.7264		2.49	2.50	-0.5	50.0
13C8 FOSA	Ave	1.007	0.9702		2.41	2.50	-3.6	50.0
M2-8:2FTS	Ave	0.1795	0.2206		2.94	2.40	22.8	50.0
13C2 PFDA	Ave	0.6306	0.6162		2.44	2.50	-2.3	50.0
d3-NMeFOSAA	Ave	0.3147	0.3480		2.76	2.50	10.6	50.0
d5-NEtFOSAA	Ave	0.3182	0.3620		2.84	2.50	13.8	50.0
13C2 PFUnA	Ave	0.4783	0.5040		2.63	2.50	5.4	50.0
13C2 PFDoA	Ave	0.5192	0.4992		2.40	2.50	-3.9	50.0
13C2-PFTeDA	Ave	0.6785	0.6407		2.36	2.50	-5.6	50.0
13C2-PFHxDA	Ave	1.209	1.092		2.26	2.50	-9.7	50.0

DODCMD_ID INSTALLATION_ID SDG	SITE_NAME NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC BRUNSWICK_NAS 320-35042-1	SITE 00011 SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-025-MID-CARBON	Ground water	Normal (Regular)	11-Jan-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC BRUNSWICK_NAS 320-35042-1	SITE 00011 SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-025-TPE-D	Ground water	Field duplicate	11-Jan-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC BRUNSWICK_NAS 320-35042-1	SITE 00011 SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-025-TPE	Ground water	Normal (Regular)	11-Jan-18	537	Perfluoroalkyl Compounds
MID ATLANTIC BRUNSWICK NAS 320-35042-1	SITE 00011 SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-025-TPI	Ground water	Normal (Regular)	11-Jan-18	537	Perfluoroalkyl Compounds