

N60087_003877
BRUNSWICK_NAS
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-417104-1, NAS BRUNSWICK ME
08/19/2018
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-41704-1

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
8/19/2018 10:34 AM

David R Alltucker, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4383
david.alltucker@testamericainc.com
08/19/2018

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	28
COAs	62
Organic Sample Data	361
LCMS	361
Method PFC DOD	361
Method PFC DOD QC Summary	362
Method PFC DOD Sample Data	370
Standards Data	432
Method PFC DOD ICAL Data	432
Method PFC DOD CCAL Data	535
Raw QC Data	642

Table of Contents

Method PFC DOD Blank Data	642
Method PFC DOD LCS/LCSD Data	689
Method PFC DOD Run Logs	716
Method PFC DOD Prep Data	720
Shipping and Receiving Documents	723
Client Chain of Custody	724
Sample Receipt Checklist	725

Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Qualifiers

LCMS

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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
320-41704-1

Receipt

The samples were received on 8/2/2018 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2° C.

LCMS

Method(s) EPA 537 (Mod), EPA 537(Mod): 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) EPA 537 (Mod): The concentration of several analytes associated with the following sample exceeded the instrument calibration range: TP-PFC-032-TPI (320-41704-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. This sample has been diluted to bring these analytes within instrument calibration range and both sets of data have been reported.

Method(s) EPA 537 (Mod): Results for sample TP-PFC-032-TPI (320-41704-1) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

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 320-238978.

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: 320-41704-1

Client Sample ID: TP-PFC-032-TPI

Lab Sample ID: 320-41704-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	68	M	1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	200		1.7	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	350	E	1.7	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	62	M	1.7	0.53	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	1300	E M	1.7	0.47	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorononanoic acid (PFNA)	2.4		1.7	0.45	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorodecanoic acid (PFDA)	0.78	J	1.7	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	50		1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	370	E M	1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	7.2		1.7	0.32	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	0.95	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	69	D M	34	10	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	200	D	34	7.4	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	330	D	34	8.1	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	67	D M	34	11	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1800	D M	34	9.3	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	54	D	34	7.9	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	390	D M	34	6.6	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	9.2	J D	34	6.4	ng/L	20		EPA 537 (Mod)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	320	D	69	19	ng/L	20		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-032-MID CARBON

Lab Sample ID: 320-41704-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	110		1.7	0.51	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	280		1.7	0.37	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	230		1.7	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.6		1.7	0.53	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	38	M	1.7	0.47	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	9.3		1.7	0.40	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.7	M	1.7	0.33	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-032-TPE

Lab Sample ID: 320-41704-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	120		1.8	0.52	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	240		1.8	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	130		1.8	0.42	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.2	J	1.8	0.54	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	5.6	M	1.8	0.48	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.3		1.8	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.58	J M	1.8	0.34	ng/L	1		EPA 537 (Mod)	Total/NA

Client Sample ID: TP-PFC-032-TPE-D

Lab Sample ID: 320-41704-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	120		1.8	0.52	ng/L	1		EPA 537 (Mod)	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

TestAmerica Job ID: 320-41704-1

Client Sample ID: TP-PFC-032-TPE-D (Continued)

Lab Sample ID: 320-41704-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	250		1.8	0.38	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	140		1.8	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.4	J	1.8	0.54	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorooctanoic acid (PFOA)	5.8	M	1.8	0.48	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.1		1.8	0.41	ng/L	1		EPA 537 (Mod)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.59	J M	1.8	0.34	ng/L	1		EPA 537 (Mod)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Client Sample ID: TP-PFC-032-TPI

Lab Sample ID: 320-41704-1

Date Collected: 08/01/18 10:05

Matrix: Water

Date Received: 08/02/18 09:45

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	68	M	1.7	0.51	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluoropentanoic acid (PFPeA)	200		1.7	0.37	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorohexanoic acid (PFHxA)	350	E	1.7	0.41	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluoroheptanoic acid (PFHpA)	62	M	1.7	0.53	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorooctanoic acid (PFOA)	1300	E M	1.7	0.47	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorononanoic acid (PFNA)	2.4		1.7	0.45	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorodecanoic acid (PFDA)	0.78	J	1.7	0.41	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	0.62	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.45	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	0.66	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	0.72	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorobutanesulfonic acid (PFBS)	50		1.7	0.40	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorohexanesulfonic acid (PFHxS)	370	E M	1.7	0.33	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluoroheptanesulfonic Acid (PFHpS)	7.2		1.7	0.32	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	0.95	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.48	ng/L		08/09/18 10:23	08/10/18 08:47	1
Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	1.1	ng/L		08/09/18 10:23	08/10/18 08:47	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	102		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C4 PFBA	104		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C5 PFPeA	104		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C2 PFHxA	98		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C4-PFHpA	102		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C4 PFOA	90		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C5 PFNA	99		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C2 PFDA	103		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C2 PFUnA	111		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C2 PFDoA	112		50 - 150				08/09/18 10:23	08/10/18 08:47	1
18O2 PFHxS	93		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C2-PFTeDA	113		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C4 PFOS	98		50 - 150				08/09/18 10:23	08/10/18 08:47	1
13C3-PFBS	102		50 - 150				08/09/18 10:23	08/10/18 08:47	1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	69	D M	34	10	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluoropentanoic acid (PFPeA)	200	D	34	7.4	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorohexanoic acid (PFHxA)	330	D	34	8.1	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluoroheptanoic acid (PFHpA)	67	D M	34	11	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorooctanoic acid (PFOA)	1800	D M	34	9.3	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorononanoic acid (PFNA)	26	U	34	9.0	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorodecanoic acid (PFDA)	17	U	34	8.3	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluoroundecanoic acid (PFUnA)	26	U	34	12	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorododecanoic acid (PFDoA)	26	U	34	9.0	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorotridecanoic Acid (PFTriA)	52	U	69	13	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorotetradecanoic acid (PFTeA)	52	U	69	14	ng/L		08/09/18 10:23	08/10/18 20:12	20

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Client Sample ID: TP-PFC-032-TPI

Lab Sample ID: 320-41704-1

Date Collected: 08/01/18 10:05

Matrix: Water

Date Received: 08/02/18 09:45

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	54	D	34	7.9	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorohexanesulfonic acid (PFHxS)	390	D M	34	6.6	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluoroheptanesulfonic Acid (PFHpS)	9.2	J D	34	6.4	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorooctanesulfonic acid (PFOS)	320	D	69	19	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorodecanesulfonic acid (PFDS)	26	U	34	9.7	ng/L		08/09/18 10:23	08/10/18 20:12	20
Perfluorooctane Sulfonamide (FOSA)	52	U	69	22	ng/L		08/09/18 10:23	08/10/18 20:12	20
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	79		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C4 PFBA	85		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C5 PFPeA	83		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C2 PFHxA	85		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C4-PFHpA	81		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C4 PFOA	87		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C5 PFNA	83		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C2 PFDA	82		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C2 PFUnA	89		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C2 PFDoA	82		50 - 150				08/09/18 10:23	08/10/18 20:12	20
18O2 PFHxS	78		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C2-PFTeDA	85		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C4 PFOS	80		50 - 150				08/09/18 10:23	08/10/18 20:12	20
13C3-PFBS	77		50 - 150				08/09/18 10:23	08/10/18 20:12	20

Client Sample ID: TP-PFC-032-MID CARBON

Lab Sample ID: 320-41704-2

Date Collected: 08/01/18 10:10

Matrix: Water

Date Received: 08/02/18 09:45

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	110		1.7	0.51	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluoropentanoic acid (PFPeA)	280		1.7	0.37	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorohexanoic acid (PFHxA)	230		1.7	0.41	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluoroheptanoic acid (PFHpA)	5.6		1.7	0.53	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorooctanoic acid (PFOA)	38	M	1.7	0.47	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorononanoic acid (PFNA)	1.3	U	1.7	0.45	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorodecanoic acid (PFDA)	0.86	U	1.7	0.41	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	0.62	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	0.45	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	0.66	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	0.72	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorobutanesulfonic acid (PFBS)	9.3		1.7	0.40	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorohexanesulfonic acid (PFHxS)	2.7	M	1.7	0.33	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.86	U	1.7	0.32	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	0.95	ng/L		08/09/18 10:23	08/10/18 08:55	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	0.48	ng/L		08/09/18 10:23	08/10/18 08:55	1

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Client Sample ID: TP-PFC-032-MID CARBON

Lab Sample ID: 320-41704-2

Date Collected: 08/01/18 10:10

Matrix: Water

Date Received: 08/02/18 09:45

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	1.1	ng/L		08/09/18 10:23	08/10/18 08:55	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	84		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C4 PFBA	94		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C5 PFPeA	86		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C2 PFHxA	86		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C4-PFHpA	87		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C4 PFOA	93		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C5 PFNA	83		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C2 PFDA	86		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C2 PFUnA	88		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C2 PFDoA	86		50 - 150				08/09/18 10:23	08/10/18 08:55	1
18O2 PFHxS	83		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C2-PFTeDA	86		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C4 PFOS	85		50 - 150				08/09/18 10:23	08/10/18 08:55	1
13C3-PFBS	84		50 - 150				08/09/18 10:23	08/10/18 08:55	1

Client Sample ID: TP-PFC-032-TPE

Lab Sample ID: 320-41704-3

Date Collected: 08/01/18 10:15

Matrix: Water

Date Received: 08/02/18 09:45

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	120		1.8	0.52	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluoropentanoic acid (PFPeA)	240		1.8	0.38	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorohexanoic acid (PFHxA)	130		1.8	0.42	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluoroheptanoic acid (PFHpA)	1.2	J	1.8	0.54	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorooctanoic acid (PFOA)	5.6	M	1.8	0.48	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorononanoic acid (PFNA)	1.3	U	1.8	0.46	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorodecanoic acid (PFDA)	0.89	U	1.8	0.43	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	0.64	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	0.46	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	0.68	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	0.74	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorobutanesulfonic acid (PFBS)	3.3		1.8	0.41	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorohexanesulfonic acid (PFHxS)	0.58	J M	1.8	0.34	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.89	U	1.8	0.33	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	0.98	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	0.50	ng/L		08/09/18 10:23	08/10/18 09:03	1
Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	1.2	ng/L		08/09/18 10:23	08/10/18 09:03	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	86		50 - 150				08/09/18 10:23	08/10/18 09:03	1
13C4 PFBA	93		50 - 150				08/09/18 10:23	08/10/18 09:03	1
13C5 PFPeA	86		50 - 150				08/09/18 10:23	08/10/18 09:03	1
13C2 PFHxA	86		50 - 150				08/09/18 10:23	08/10/18 09:03	1
13C4-PFHpA	85		50 - 150				08/09/18 10:23	08/10/18 09:03	1
13C4 PFOA	94		50 - 150				08/09/18 10:23	08/10/18 09:03	1

TestAmerica Sacramento

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Client Sample ID: TP-PFC-032-TPE

Lab Sample ID: 320-41704-3

Date Collected: 08/01/18 10:15

Matrix: Water

Date Received: 08/02/18 09:45

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFNA	85		50 - 150	08/09/18 10:23	08/10/18 09:03	1
13C2 PFDA	86		50 - 150	08/09/18 10:23	08/10/18 09:03	1
13C2 PFUnA	94		50 - 150	08/09/18 10:23	08/10/18 09:03	1
13C2 PFDoA	85		50 - 150	08/09/18 10:23	08/10/18 09:03	1
18O2 PFHxS	84		50 - 150	08/09/18 10:23	08/10/18 09:03	1
13C2-PFTeDA	96		50 - 150	08/09/18 10:23	08/10/18 09:03	1
13C4 PFOS	87		50 - 150	08/09/18 10:23	08/10/18 09:03	1
13C3-PFBS	81		50 - 150	08/09/18 10:23	08/10/18 09:03	1

Client Sample ID: TP-PFC-032-TPE-D

Lab Sample ID: 320-41704-4

Date Collected: 08/01/18 00:00

Matrix: Water

Date Received: 08/02/18 09:45

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	120		1.8	0.52	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluoropentanoic acid (PFPeA)	250		1.8	0.38	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorohexanoic acid (PFHxA)	140		1.8	0.41	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluoroheptanoic acid (PFHpA)	1.4	J	1.8	0.54	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorooctanoic acid (PFOA)	5.8	M	1.8	0.48	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorononanoic acid (PFNA)	1.3	U	1.8	0.46	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorodecanoic acid (PFDA)	0.88	U	1.8	0.42	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	0.64	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	0.46	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	0.67	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	0.73	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorobutanesulfonic acid (PFBS)	3.1		1.8	0.41	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorohexanesulfonic acid (PFHxS)	0.59	J M	1.8	0.34	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.88	U	1.8	0.33	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	0.97	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	0.49	ng/L		08/09/18 10:23	08/10/18 09:10	1
Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	1.1	ng/L		08/09/18 10:23	08/10/18 09:10	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	83		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C4 PFBA	90		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C5 PFPeA	81		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C2 PFHxA	81		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C4-PFHpA	82		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C4 PFOA	89		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C5 PFNA	80		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C2 PFDA	84		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C2 PFUnA	85		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C2 PFDoA	88		50 - 150				08/09/18 10:23	08/10/18 09:10	1
18O2 PFHxS	80		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C2-PFTeDA	87		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C4 PFOS	81		50 - 150				08/09/18 10:23	08/10/18 09:10	1
13C3-PFBS	83		50 - 150				08/09/18 10:23	08/10/18 09:10	1

TestAmerica Sacramento

Default Detection Limits

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.0	0.46	ng/L	EPA 537 (Mod)
Perfluorobutanoic acid (PFBA)	2.0	0.59	ng/L	EPA 537 (Mod)
Perfluorodecanesulfonic acid (PFDS)	2.0	0.56	ng/L	EPA 537 (Mod)
Perfluorodecanoic acid (PFDA)	2.0	0.48	ng/L	EPA 537 (Mod)
Perfluorododecanoic acid (PFDoA)	2.0	0.52	ng/L	EPA 537 (Mod)
Perfluoroheptanesulfonic Acid (PFHpS)	2.0	0.37	ng/L	EPA 537 (Mod)
Perfluoroheptanoic acid (PFHpA)	2.0	0.61	ng/L	EPA 537 (Mod)
Perfluorohexanesulfonic acid (PFHxS)	2.0	0.38	ng/L	EPA 537 (Mod)
Perfluorohexanoic acid (PFHxA)	2.0	0.47	ng/L	EPA 537 (Mod)
Perfluorononanoic acid (PFNA)	2.0	0.52	ng/L	EPA 537 (Mod)
Perfluorooctane Sulfonamide (FOSA)	4.0	1.3	ng/L	EPA 537 (Mod)
Perfluorooctanesulfonic acid (PFOS)	4.0	1.1	ng/L	EPA 537 (Mod)
Perfluorooctanoic acid (PFOA)	2.0	0.54	ng/L	EPA 537 (Mod)
Perfluoropentanoic acid (PFPeA)	2.0	0.43	ng/L	EPA 537 (Mod)
Perfluorotetradecanoic acid (PFTeA)	4.0	0.83	ng/L	EPA 537 (Mod)
Perfluorotridecanoic Acid (PFTriA)	4.0	0.76	ng/L	EPA 537 (Mod)
Perfluoroundecanoic acid (PFUnA)	2.0	0.72	ng/L	EPA 537 (Mod)

Isotope Dilution Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFOSA (50-150)	PFBA (50-150)	PFPeA (50-150)	PFHxA (50-150)	PFHpA (50-150)	PFOA (50-150)	PFNA (50-150)	PFDA (50-150)
320-41704-1	TP-PFC-032-TPI	102	104	104	98	102	90	99	103
320-41704-1 - DL	TP-PFC-032-TPI	79	85	83	85	81	87	83	82
320-41704-2	TP-PFC-032-MID CARBON	84	94	86	86	87	93	83	86
320-41704-3	TP-PFC-032-TPE	86	93	86	86	85	94	85	86
320-41704-4	TP-PFC-032-TPE-D	83	90	81	81	82	89	80	84
LCS 320-238978/2-A	Lab Control Sample	81	91	86	83	83	88	83	83
LCSD 320-238978/3-A	Lab Control Sample Dup	81	94	87	86	82	88	83	85
MB 320-238978/1-A	Method Blank	85	94	91	85	88	94	92	89

		Percent Isotope Dilution Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	PFUnA (50-150)	PFDaA (50-150)	PFHxS (50-150)	PFTDA (50-150)	PFOS (50-150)	3C3-PFBs (50-150)
320-41704-1	TP-PFC-032-TPI	111	112	93	113	98	102
320-41704-1 - DL	TP-PFC-032-TPI	89	82	78	85	80	77
320-41704-2	TP-PFC-032-MID CARBON	88	86	83	86	85	84
320-41704-3	TP-PFC-032-TPE	94	85	84	96	87	81
320-41704-4	TP-PFC-032-TPE-D	85	88	80	87	81	83
LCS 320-238978/2-A	Lab Control Sample	90	85	83	87	86	81
LCSD 320-238978/3-A	Lab Control Sample Dup	87	90	83	87	83	86
MB 320-238978/1-A	Method Blank	89	86	85	101	90	84

Surrogate Legend

PFOSA = 13C8 FOSA
PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
PFHpA = 13C4-PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDaA = 13C2 PFDaA
PFHxS = 18O2 PFHxS
PFTDA = 13C2-PFTeDA
PFOS = 13C4 PFOS
13C3-PFBS = 13C3-PFBS

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15

Lab Sample ID: MB 320-238978/1-A

Matrix: Water

Analysis Batch: 239237

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 238978

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.748	J M	2.0	0.59	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.43	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	0.47	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	0.61	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorooctanoic acid (PFOA)	1.5	U	2.0	0.54	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorononanoic acid (PFNA)	1.5	U	2.0	0.52	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.48	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluoroundecanoic acid (PFUnA)	1.5	U M	2.0	0.72	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	0.52	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	0.76	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	0.83	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.46	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.38	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.37	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	1.1	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	0.56	ng/L		08/09/18 10:23	08/10/18 08:23	1
Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	1.3	ng/L		08/09/18 10:23	08/10/18 08:23	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	85		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C4 PFBA	94		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C5 PFPeA	91		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C2 PFHxA	85		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C4-PFHpA	88		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C4 PFOA	94		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C5 PFNA	92		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C2 PFDA	89		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C2 PFUnA	89		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C2 PFDoA	86		50 - 150	08/09/18 10:23	08/10/18 08:23	1
18O2 PFHxS	85		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C2-PFTeDA	101		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C4 PFOS	90		50 - 150	08/09/18 10:23	08/10/18 08:23	1
13C3-PFBS	84		50 - 150	08/09/18 10:23	08/10/18 08:23	1

Lab Sample ID: LCS 320-238978/2-A

Matrix: Water

Analysis Batch: 239237

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 238978

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	40.0	38.9		ng/L		97	83 - 118
Perfluoropentanoic acid (PFPeA)	40.0	38.6		ng/L		97	83 - 108
Perfluorohexanoic acid (PFHxA)	40.0	38.7		ng/L		97	83 - 109
Perfluoroheptanoic acid (PFHpA)	40.0	39.7		ng/L		99	80 - 113
Perfluorooctanoic acid (PFOA)	40.0	39.4		ng/L		98	80 - 107
Perfluorononanoic acid (PFNA)	40.0	40.9		ng/L		102	83 - 113
Perfluorodecanoic acid (PFDA)	40.0	40.4		ng/L		101	85 - 113
Perfluoroundecanoic acid (PFUnA)	40.0	32.3		ng/L		81	76 - 105

TestAmerica Sacramento

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCS 320-238978/2-A

Matrix: Water

Analysis Batch: 239237

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 238978

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	40.0	39.0		ng/L		98	87 - 116
Perfluorotridecanoic Acid (PFTriA)	40.0	39.5		ng/L		99	75 - 129
Perfluorotetradecanoic acid (PFTeA)	40.0	38.9		ng/L		97	82 - 115
Perfluorobutanesulfonic acid (PFBS)	35.4	37.2		ng/L		105	87 - 120
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.7	M	ng/L		92	81 - 106
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.9		ng/L		102	80 - 117
Perfluorooctanesulfonic acid (PFOS)	37.1	36.6		ng/L		99	82 - 112
Perfluorodecanesulfonic acid (PFDS)	38.6	39.1		ng/L		101	81 - 114
Perfluorooctane Sulfonamide (FOSA)	40.0	39.0		ng/L		98	85 - 114

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C8 FOSA	81		50 - 150
13C4 PFBA	91		50 - 150
13C5 PFPeA	86		50 - 150
13C2 PFHxA	83		50 - 150
13C4-PFHpA	83		50 - 150
13C4 PFOA	88		50 - 150
13C5 PFNA	83		50 - 150
13C2 PFDA	83		50 - 150
13C2 PFUnA	90		50 - 150
13C2 PFDoA	85		50 - 150
18O2 PFHxS	83		50 - 150
13C2-PFTeDA	87		50 - 150
13C4 PFOS	86		50 - 150
13C3-PFBS	81		50 - 150

Lab Sample ID: LCSD 320-238978/3-A

Matrix: Water

Analysis Batch: 239237

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 238978

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	38.6		ng/L		96	83 - 118	1	30
Perfluoropentanoic acid (PFPeA)	40.0	38.4		ng/L		96	83 - 108	1	30
Perfluorohexanoic acid (PFHxA)	40.0	38.8		ng/L		97	83 - 109	0	30
Perfluoroheptanoic acid (PFHpA)	40.0	39.3		ng/L		98	80 - 113	1	30
Perfluorooctanoic acid (PFOA)	40.0	39.0		ng/L		97	80 - 107	1	30
Perfluorononanoic acid (PFNA)	40.0	40.5		ng/L		101	83 - 113	1	30
Perfluorodecanoic acid (PFDA)	40.0	39.9		ng/L		100	85 - 113	1	30
Perfluoroundecanoic acid (PFUnA)	40.0	31.3		ng/L		78	76 - 105	3	30
Perfluorododecanoic acid (PFDoA)	40.0	38.0		ng/L		95	87 - 116	3	30

TestAmerica Sacramento

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Method: EPA 537 (Mod) - PFAS for QSM 5.1, Table B-15 (Continued)

Lab Sample ID: LCSD 320-238978/3-A

Matrix: Water

Analysis Batch: 239237

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 238978

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic Acid (PFTriA)	40.0	38.8		ng/L		97	75 - 129	2	30
Perfluorotetradecanoic acid (PFTeA)	40.0	39.5		ng/L		99	82 - 115	1	30
Perfluorobutanesulfonic acid (PFBS)	35.4	34.3		ng/L		97	87 - 120	8	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.8	M	ng/L		93	81 - 106	0	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.0		ng/L		105	80 - 117	3	30
Perfluorooctanesulfonic acid (PFOS)	37.1	38.2		ng/L		103	82 - 112	4	30
Perfluorodecanesulfonic acid (PFDS)	38.6	39.8		ng/L		103	81 - 114	2	30
Perfluorooctane Sulfonamide (FOSA)	40.0	40.2		ng/L		101	85 - 114	3	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C8 FOSA	81		50 - 150
13C4 PFBA	94		50 - 150
13C5 PFPeA	87		50 - 150
13C2 PFHxA	86		50 - 150
13C4-PFHpA	82		50 - 150
13C4 PFOA	88		50 - 150
13C5 PFNA	83		50 - 150
13C2 PFDA	85		50 - 150
13C2 PFUnA	87		50 - 150
13C2 PFDoA	90		50 - 150
18O2 PFHxS	83		50 - 150
13C2-PFTeDA	87		50 - 150
13C4 PFOS	83		50 - 150
13C3-PFBS	86		50 - 150

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

LCMS

Prep Batch: 238978

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41704-1	TP-PFC-032-TPI	Total/NA	Water	3535	
320-41704-1 - DL	TP-PFC-032-TPI	Total/NA	Water	3535	
320-41704-2	TP-PFC-032-MID CARBON	Total/NA	Water	3535	
320-41704-3	TP-PFC-032-TPE	Total/NA	Water	3535	
320-41704-4	TP-PFC-032-TPE-D	Total/NA	Water	3535	
MB 320-238978/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-238978/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-238978/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 239237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41704-1	TP-PFC-032-TPI	Total/NA	Water	EPA 537 (Mod)	238978
320-41704-2	TP-PFC-032-MID CARBON	Total/NA	Water	EPA 537 (Mod)	238978
320-41704-3	TP-PFC-032-TPE	Total/NA	Water	EPA 537 (Mod)	238978
320-41704-4	TP-PFC-032-TPE-D	Total/NA	Water	EPA 537 (Mod)	238978
MB 320-238978/1-A	Method Blank	Total/NA	Water	EPA 537 (Mod)	238978
LCS 320-238978/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (Mod)	238978
LCSD 320-238978/3-A	Lab Control Sample Dup	Total/NA	Water	EPA 537 (Mod)	238978

Analysis Batch: 239343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-41704-1 - DL	TP-PFC-032-TPI	Total/NA	Water	EPA 537 (Mod)	238978

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Client Sample ID: TP-PFC-032-TPI

Date Collected: 08/01/18 10:05

Date Received: 08/02/18 09:45

Lab Sample ID: 320-41704-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			238978	08/09/18 10:23	KMK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239237	08/10/18 08:47	ABH	TAL SAC
Total/NA	Prep	3535	DL		238978	08/09/18 10:23	KMK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)	DL	20	239343	08/10/18 20:12	S1M	TAL SAC

Client Sample ID: TP-PFC-032-MID CARBON

Date Collected: 08/01/18 10:10

Date Received: 08/02/18 09:45

Lab Sample ID: 320-41704-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			238978	08/09/18 10:23	KMK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239237	08/10/18 08:55	ABH	TAL SAC

Client Sample ID: TP-PFC-032-TPE

Date Collected: 08/01/18 10:15

Date Received: 08/02/18 09:45

Lab Sample ID: 320-41704-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			238978	08/09/18 10:23	KMK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239237	08/10/18 09:03	ABH	TAL SAC

Client Sample ID: TP-PFC-032-TPE-D

Date Collected: 08/01/18 00:00

Date Received: 08/02/18 09:45

Lab Sample ID: 320-41704-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			238978	08/09/18 10:23	KMK	TAL SAC
Total/NA	Analysis	EPA 537 (Mod)		1	239237	08/10/18 09:10	ABH	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.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Laboratory: TestAmerica Sacramento

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-29-19

Method Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Method	Method Description	Protocol	Laboratory
EPA 537 (Mod)	PFAS for QSM 5.1, Table B-15	DOD 5.1	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

DOD 5.1 = Department of Defense Quality Systems Manual V5.1

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

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

TestAmerica Job ID: 320-41704-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41704-1	TP-PFC-032-TPI	Water	08/01/18 10:05	08/02/18 09:45
320-41704-2	TP-PFC-032-MID CARBON	Water	08/01/18 10:10	08/02/18 09:45
320-41704-3	TP-PFC-032-TPE	Water	08/01/18 10:15	08/02/18 09:45
320-41704-4	TP-PFC-032-TPE-D	Water	08/01/18 00:00	08/02/18 09:45

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 238193Lab Sample ID: IC 320-238193/3 Client Sample ID: _____Date Analyzed: 08/06/18 11:17 Lab File ID: 2018.08.06LLICAL_003.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.39	Incomplete Integration	westendor fc	08/06/18 15:52

Lab Sample ID: ICB 320-238193/9 Client Sample ID: _____Date Analyzed: 08/06/18 12:04 Lab File ID: 2018.08.06LLICAL_009.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.40	Baseline	mongkols	08/07/18 14:31

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 239237Lab Sample ID: CCB 320-239237/1 Client Sample ID: _____Date Analyzed: 08/10/18 08:00 Lab File ID: 2018.08.10LLA_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)		Invalid Compound ID	roycea	08/10/18 12:40

Lab Sample ID: CCVL 320-239237/2 Client Sample ID: _____Date Analyzed: 08/10/18 08:08 Lab File ID: 2018.08.10LLA_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.66	Baseline	hannigana	08/10/18 13:52
Perfluorooctanoic acid (PFOA)	2.61	Baseline	hannigana	08/10/18 13:53

Lab Sample ID: CCV 320-239237/3 CCVIS Client Sample ID: _____Date Analyzed: 08/10/18 08:15 Lab File ID: 2018.08.10LLA_006.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.51	Isomers	hannigana	08/10/18 13:54

Lab Sample ID: MB 320-238978/1-A Client Sample ID: _____Date Analyzed: 08/10/18 08:23 Lab File ID: 2018.08.10LLA_007.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.40	Baseline	hannigana	08/10/18 13:56
Perfluoroundecanoic acid (PFUnA)	3.67	Wrong peak	hannigana	08/10/18 13:57

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 239237Lab Sample ID: LCS 320-238978/2-A Client Sample ID: _____Date Analyzed: 08/10/18 08:31 Lab File ID: 2018.08.10LLA_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.28	Isomers	hannigana	08/10/18 13:58

Lab Sample ID: LCSD 320-238978/3-A Client Sample ID: _____Date Analyzed: 08/10/18 08:39 Lab File ID: 2018.08.10LLA_009.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.29	Isomers	hannigana	08/10/18 13:59

Lab Sample ID: 320-41704-1 Client Sample ID: TP-PFC-032-TPIDate Analyzed: 08/10/18 08:47 Lab File ID: 2018.08.10LLA_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.41	Baseline	hannigana	08/10/18 14:00
Perfluoroheptanoic acid (PFHpA)	2.27	Split Peak	hannigana	08/10/18 14:00
Perfluorohexanesulfonic acid (PFHxS)	2.29	Isomers	hannigana	08/10/18 14:01
Perfluorooctanoic acid (PFOA)	2.63	Isomers	hannigana	08/10/18 14:01

Lab Sample ID: 320-41704-2 Client Sample ID: TP-PFC-032-MID CARBONDate Analyzed: 08/10/18 08:55 Lab File ID: 2018.08.10LLA_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.28	Isomers	hannigana	08/10/18 14:03
Perfluorooctanoic acid (PFOA)	2.62	Isomers	hannigana	08/13/18 08:26

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 239237Lab Sample ID: 320-41704-3 Client Sample ID: TP-PFC-032-TPEDate Analyzed: 08/10/18 09:03 Lab File ID: 2018.08.10LLA_012.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.28	Isomers	hannigana	08/10/18 14:04
Perfluorooctanoic acid (PFOA)	2.54	Isomers	hannigana	08/10/18 14:14

Lab Sample ID: 320-41704-4 Client Sample ID: TP-PFC-032-TPE-DDate Analyzed: 08/10/18 09:10 Lab File ID: 2018.08.10LLA_013.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.29	Isomers	hannigana	08/10/18 14:05
Perfluorooctanoic acid (PFOA)	2.54	Isomers	hannigana	08/10/18 14:05

Lab Sample ID: CCV 320-239237/14 Client Sample ID: _____Date Analyzed: 08/10/18 09:42 Lab File ID: 2018.08.10LLA_017.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.51	Isomers	hannigana	08/10/18 14:10

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 239308Lab Sample ID: CCB 320-239308/1 Client Sample ID: _____Date Analyzed: 08/10/18 16:33 Lab File ID: 2018.08.10LLAAAX_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)		Invalid Compound ID	roycea	08/12/18 12:18

Lab Sample ID: CCVL 320-239308/2 Client Sample ID: _____Date Analyzed: 08/10/18 16:41 Lab File ID: 2018.08.10LLAAAX_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.41	Baseline	mongkols	08/13/18 08:39
Perfluoroheptanoic acid (PFHpA)	2.27	Baseline	mongkols	08/13/18 08:39
Perfluorohexanesulfonic acid (PFHxS)	2.28	Isomers	mongkols	08/13/18 08:38
Perfluorooctanesulfonic acid (PFOS)	2.99	Baseline	mongkols	08/13/18 08:39

Lab Sample ID: CCV 320-239308/3 CCVIS Client Sample ID: _____Date Analyzed: 08/10/18 16:48 Lab File ID: 2018.08.10LLAAAX_045.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.41	Baseline	mongkols	08/13/18 08:41

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 239343Lab Sample ID: CCV 320-239343/1 Client Sample ID: _____Date Analyzed: 08/10/18 20:04 Lab File ID: 2018.08.10LLAAAX_079.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.51	Isomers	mongkols	08/16/18 12:54

Lab Sample ID: 320-41704-1 DL Client Sample ID: TP-PFC-032-TPI DLDate Analyzed: 08/10/18 20:12 Lab File ID: 2018.08.10LLAAAX_080.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.41	Baseline	mongkols	08/16/18 12:54
Perfluoroheptanoic acid (PFHpA)	2.27	Baseline	mongkols	08/16/18 12:54
Perfluorohexanesulfonic acid (PFHxS)	2.28	Isomers	mongkols	08/16/18 12:54
Perfluorooctanoic acid (PFOA)	2.62	Isomers	mongkols	08/16/18 12:55

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00092	01/30/19	07/30/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA 00009	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FTS 00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA 00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM3HFPO-DA 00004	200 uL	13C3 HFPO-DA	0.05 ug/mL
					LCM4PFHPA 00015	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA 00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA 00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA 00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS 00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDaA 00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00016	200 uL	1802 PFHxS	0.0473 ug/mL
					LCMPFNA 00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA 00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS 00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa 00018	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA 00009	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NETFOSAA 00009	11/08/22		WELLINGTON, Lot d5NETFOSAA1117		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
.LCM2-6:FTS 00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS 00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA 00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA 00015	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM3HFPO-DA 00004	05/18/21	WELLINGTON, Lot M3HFPODA0518			(Purchased Reagent)		13C3 HFPO-DA	50 ug/mL
.LCM4PFHPA 00015	05/03/22	Wellington Laboratories, Lot M4PFHpa0517			(Purchased Reagent)		13C4-PFHpa	50 ug/mL
.LCM5PFPEA 00016	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA 00020	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA 00016	02/16/23	Wellington Laboratories, Lot MPFBA0218			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS 00009	02/15/23	Wellington Laboratories, Lot M3PFBS0218			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA 00021	02/16/23	Wellington Laboratories, Lot MPFDA0218			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDaA 00016	02/16/23	Wellington Laboratories, Lot MPFDaA0218			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA 00023	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS 00016	03/22/23	Wellington Laboratories, Lot MPFHxS0318			(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
.LCMPFNA 00016	12/14/22	Wellington Laboratories, Lot MPFNA1217			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA 00020	05/04/23	Wellington Laboratories, Lot MPFOA0418			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS 00028	06/15/23	Wellington Laboratories, Lot MPFOS0618			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUDa 00018	05/11/23	Wellington Laboratories, Lot MPFUDa0518			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFIC-IS_00073	12/25/18	07/26/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA 00008	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFIC_LL0_00008	01/25/19	07/25/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ICALSU_00001	10 mL	13C2-PFOA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFIC_LL0_00008	01/25/19	07/25/18	MeOH/H2O, Lot Baker 141039	200 mL	LCMPFC_ICALSU_00001	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
							18O2 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
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NetFOSAA_00009	200 uL	d5-NetFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHFA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA1117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NetFOSAA_00009	11/08/22	WELLINGTON, Lot d5NetFOSAA1117			(Purchased Reagent)		d5-NetFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23	WELLINGTON, Lot M262FTS0218			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23	WELLINGTON, Lot M282FTS0118			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM2PFTeDA 00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHpA 00015	05/03/22		Wellington Laboratories, Lot M4PFHpA0517		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPeA 00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00018	05/11/23		Wellington Laboratories, Lot MPFUdA0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC_LL1_00007	01/16/19	07/25/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ICALSU_00001	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-PFOA	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
					LCPFCSP_00163	0.25 mL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.02335 ng/mL
							1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.0237 ng/mL
							1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.02395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							Perfluorobutanoic acid (PFBA)	0.025 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.025 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025025 ng/mL
							Perfluorononanesulfonic acid (PFOS)	0.024 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.025 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.025 ng/mL
							Perfluoropentanesulfonic acid (PFTeA)	0.02345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.025 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.025 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.025 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NetFOSAA_00009	200 uL	d5-NetFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00018	200 uL	13C2 PFUnA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd3-NMeFOSAA 00009	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA 00009	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS 00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS 00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA 00017	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA 00012	10/26/22		Wellington Laboratories, Lot M2PFOA1017		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA 00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00015	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA 00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 FFOA	50 ug/mL
..LCMPFOS 00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00018	05/11/23		Wellington Laboratories, Lot MPFUDa0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA 00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA 00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA 00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS 00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid (PFPeS)	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCBr-NEtFOSAA_00001	01/17/23		WELLINGTON, Lot brNEtFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCBr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00010	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOS-br_00007	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOSA_00013	09/01/22		Wellington Laboratories, Lot FOSA0817I		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFPeA_00010	06/14/22		Wellington Laboratories, Lot PFPeA0617		(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeS_00003	01/11/22		Wellington Laboratories, Lot LPFPeS0117		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
					(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL2_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	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-PFOA	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
							18O2 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_00163	0.5 mL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.0467 ng/mL
							1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.0474 ng/mL
							1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.0479 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutanoic acid (PFBA)	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.05 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05005 ng/mL
							Perfluorononanesulfonic acid (PFOS)	0.048 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.05 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluoropentanesulfonic acid (PFPeA)	0.0469 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.05 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.05 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00009	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00009	11/08/22		WELLINGTON, Lot d5NETFOSAA1117		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22		Wellington Laboratories, Lot M2PFOA1017		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22		Wellington Laboratories, Lot M4PFHpA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFBA 00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00018	05/11/23		Wellington Laboratories, Lot MPFUDa0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCBr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCBr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA 00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA 00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA 00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFNS 00003	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOA 00011	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS 00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFUDa_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCBr-NETFOSAA_00001	01/17/23	WELLINGTON, Lot brNETFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCBr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LFPFeS0117			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluoropentanesulfonic acid (PFPeS)	46.9 ug/mL
..LCPFTTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTTrDA0517			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFUDa_00008	10/18/21	Wellington Laboratories, Lot PFUDa1016			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTTriA)	50 ug/mL
LCPFC_LL3_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	10 mL	Perfluoroundecanoic acid (PFUnA)	50 ug/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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2-PFOA	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
							18O2 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_00163	2.5 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.2335 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.237 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (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
							Perfluorohexanoic acid (PFHxA)	0.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25025 ng/mL
							Perfluorononanesulfonic acid (PFOS)	0.24 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.25 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.25 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanesulfonic acid	0.2345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.25 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.25 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.25 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22		Wellington Laboratories, Lot M2PFOA1017		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22		Wellington Laboratories, Lot M4PFHPa0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00018	05/11/23		Wellington Laboratories, Lot MPFUDa0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFuDA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCbr-NEtFOSAA_00001	01/17/23		WELLINGTON, Lot brNetFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCBr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA 00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA 00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA 00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS 00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA 00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeS 00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTTrDA0517			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL4_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NMeFOSAA	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-PFOA	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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_00163	10 mL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.934 ng/mL
							1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.948 ng/mL
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.958 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							Perfluorobutanoic acid (PFBA)	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							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
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1.001 ng/mL
							Perfluoronananesulfonic acid	0.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluoropentanesulfonic acid	0.938 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00009	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00009	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22		Wellington Laboratories, Lot M2PFOA1017		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00018	05/11/23		Wellington Laboratories, Lot MPFUDa0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPPCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFBs_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCBr-NEtFOSAA_00001	01/17/23		WELLINGTON, Lot brNEtFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCBr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBs_00009	09/21/22		Wellington Laboratories, Lot LFPBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00010	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LFPDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTTriA)	50 ug/mL
..LCPFUDa_00008	10/18/21	Wellington Laboratories, Lot PFUDa1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL5_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ICALSU_00001	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-PFOA	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
							18O2 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_00163	25 mL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	2.335 ng/mL
					1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)		2.37 ng/mL	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	2.395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.38 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5025 ng/mL
							Perfluorononanesulfonic acid	2.4 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL
							Perfluoropentanesulfonic acid	2.345 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00009	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFDA 00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00016	200 uL	1802 PFHxS	0.0473 ug/mL
					LCMPFNA 00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA 00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS 00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa 00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA 00009	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA 00009	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS 00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS 00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA 00017	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA 00012	10/26/22		Wellington Laboratories, Lot M2PFOA1017		(Purchased Reagent)		13C2 PFOA	50 ug/mL
..LCM2PFTeDA 00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00015	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA 00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00018	05/11/23		Wellington Laboratories, Lot MPFUDa0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	0.01916 ug/mL
					LCBr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCBr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA 00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA 00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFNS_00003	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.0192 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.02002 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.01856 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCBr-NETFOSAA_00001	01/17/23		WELLINGTON, Lot brNETFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCBr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LFPBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00010	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LFPDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPPHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
							Perfluorononanesulfonic acid	48 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTTriA)	50 ug/mL
..LCPFUDa_00008	10/18/21	Wellington Laboratories, Lot PFUDa1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL6_00007	01/16/19	07/25/18	MeOH/H2O, Lot 090285	30 mL	LCMPFC_ICALSU_00001	1.5 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-PFOA	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
							18O2 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_00163	7.5 mL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	4.67 ng/mL
							1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	4.74 ng/mL
							1H,1H,2H,2H-perfluorodecanesul fonic acid (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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5.005 ng/mL
							Perfluorononanesulfonic acid (PFOS)	4.8 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluoropentanesulfonic acid (PFPeA)	4.69 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00009	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22	WELLINGTON, Lot d3NMeFOSAA117			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd5-NEtFOSAA 00009	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS 00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS 00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA 00017	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA 00012	10/26/22		Wellington Laboratories, Lot M2PFOA1017		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA 00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00015	05/03/22		Wellington Laboratories, Lot M4PFHPA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA 00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00018	05/11/23		Wellington Laboratories, Lot MPFUdA0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpa_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpsA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid (PFPeS)	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22		WELLINGTON, Lot 62FTS0417		(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21		WELLINGTON, Lot 82FTS1216		(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCBr-NEtFOSAA_00001	01/17/23		WELLINGTON, Lot brNEtFOSAA0118		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCBr-NMeFOSAA_00001	01/17/23		WELLINGTON, Lot brNMeFOSAA0118		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22		Wellington Laboratories, Lot PFBA0517		(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22		Wellington Laboratories, Lot LPFBS0917		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22		Wellington Laboratories, Lot PFDA0517		(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00010	05/29/22		Wellington Laboratories, Lot PFDoA0517		(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22		Wellington Laboratories, Lot LPFDS1117		(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22		Wellington Laboratories, Lot PFHpA0917		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22		Wellington Laboratories, Lot LPFHpS0817		(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22		Wellington Laboratories, Lot PFHxA0917		(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22		Wellington Laboratories, Lot brPFHxSK0117		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22		Wellington Laboratories, Lot PFNA0717		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22		Wellington Laboratories, Lot LPFNS0917		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22		Wellington Laboratories, Lot PFOA0917		(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOS-br_00007	01/12/22		Wellington Laboratories, Lot brPFOSK0117		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOSA_00013	09/01/22		Wellington Laboratories, Lot FOSA0817I		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFPeA_00010	06/14/22		Wellington Laboratories, Lot PFPeA0617		(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeS_00003	01/11/22		Wellington Laboratories, Lot LPFPeS0117		(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
					(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL7_00006	01/16/19	07/25/18	MeOH/H2O, Lot 090285	30 mL	LCMPFC_ICALSU_00001	1.5 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NMeFOSAA	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-PFOA	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
							18O2 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_00163	15 mL	1H,1H,2H,2H-perfluorohexanesul fonic acid (4:2)	9.34 ng/mL
							1H,1H,2H,2H-perfluorooctanesul fonic acid (6:2)	9.48 ng/mL
							1H,1H,2H,2H-perfluorodecanesul fonic acid (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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10.01 ng/mL
							Perfluorononanesulfonic acid (PFOS)	9.6 ng/mL
							Perfluorooctanesulfonic acid (FOSA)	9.28 ng/mL
							Perfluorooctane Sulfonamide (PFPeA)	10 ng/mL
							Perfluoropentanoic acid (PFPeA)	10 ng/mL
							Perfluoropentanesulfonic acid (PFTeA)	9.38 ng/mL
							Perfluorotetradecanoic acid (PFTriA)	10 ng/mL
							Perfluorotridecanoic Acid (PFUnA)	10 ng/mL
							Perfluoroundecanoic acid (PFUnA)	10 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NETFOSAA_00009	200 uL	d5-NETFOSAA	0.05 ug/mL
					LCM2-6:FTS_00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFOA_00012	200 uL	13C2-PFOA	0.05 ug/mL
					LCM2PFTeDA_00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00015	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA_00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUDa_00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00009	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NETFOSAA_00009	11/08/22		WELLINGTON, Lot d5NETFOSAA1117		(Purchased Reagent)		d5-NETFOSAA	50 ug/mL
..LCM2-6:FTS_00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00017	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFOA_00012	10/26/22		Wellington Laboratories, Lot M2PFOA1017		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCM2PFTeDA_00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00015	05/03/22		Wellington Laboratories, Lot M4PFHpA0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFBA 00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00018	05/11/23		Wellington Laboratories, Lot MPFUDa0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LCBr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCBr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA 00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA 00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA 00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFNS 00003	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFOA 00011	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS 00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFUdA_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
..LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
..LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
..LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
..LCBr-NETFOSAA_00001	01/17/23	WELLINGTON, Lot brNETFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCBr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00009	09/21/22	Wellington Laboratories, Lot LFPBS0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LFPDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LFPHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFNS_00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.05 ug/mL
..LCPFOA_00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
..LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeS_00003	01/11/22	Wellington Laboratories, Lot LFPPeS0117			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
..LCPFTTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTTrDA0517			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFCIC_FULL_00013	01/25/19	07/31/18	MeOH/H2O, Lot 09285	100 mL	LCMPFC_ICALSU_00001	5 mL	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
..LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCM2PFOA_00012	200 uL	13C2-PFOA	2.5 ng/mL
..LCM2PFOA_00012	10/26/22	Wellington Laboratories, Lot M2PFOA1017			(Purchased Reagent)		13C2-PFOA	0.05 ug/mL
LCPFCIC_FULL_00013	01/25/19	07/31/18	MeOH/H2O, Lot 09285	100 mL	LCMPFC_ICALSU_00001	5 mL	d3-NMeFOSAA	50 ug/mL
							d5-NETFOSAA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
							18O2 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
					LCPFAC-24PAR_00002	125 uL	Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
							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 (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ICALSU_00001	01/25/19	07/25/18	Methanol, Lot Fisher 168632	200 mL	LCd3-NMeFOSAA_00009	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NetFOSAA_00009	200 uL	d5-NetFOSAA	0.05 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM2-6:FTS 00009	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS 00011	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA 00017	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA 00015	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA 00015	200 uL	13C4-PFHpa	0.05 ug/mL
					LCM5PFPEA 00016	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA 00020	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA 00016	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS 00009	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA 00021	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA 00016	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA 00023	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS 00016	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA 00016	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA 00020	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS 00028	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA 00018	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA 00009	11/08/22		WELLINGTON, Lot d3NMeFOSAA1117		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA 00009	11/08/22		WELLINGTON, Lot d5NEtFOSAA1117		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS 00009	02/16/23		WELLINGTON, Lot M262FTS0218		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS 00011	01/24/23		WELLINGTON, Lot M282FTS0118		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA 00017	07/13/22		Wellington Laboratories, Lot M2PFHxDA0717		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00015	11/30/22		Wellington Laboratories, Lot M2PFTeDA1117		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00015	05/03/22		Wellington Laboratories, Lot M4PFHpa0517		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA 00016	07/20/22		Wellington Laboratories, Lot M5PFPeA0717		(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA 00020	10/11/22		Wellington Laboratories, Lot M8FOSA1017I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00016	02/16/23		Wellington Laboratories, Lot MPFBA0218		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS 00009	02/15/23		Wellington Laboratories, Lot M3PFBS0218		(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA 00021	02/16/23		Wellington Laboratories, Lot MPFDA0218		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00016	02/16/23		Wellington Laboratories, Lot MPFDoA0218		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00023	10/27/22		Wellington Laboratories, Lot MPFHxA1017		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00016	03/22/23		Wellington Laboratories, Lot MPFHxS0318		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00016	12/14/22		Wellington Laboratories, Lot MPFNA1217		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00020	05/04/23		Wellington Laboratories, Lot MPFOA0418		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00028	06/15/23		Wellington Laboratories, Lot MPFOS0618		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00018	05/11/23		Wellington Laboratories, Lot MPFUdA0518		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFAC-24PAR_00002	04/18/23		Wellington Laboratories, Lot PFAC24PAR0418		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	1.93 ug/mL
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid (PFDoA)	2 ug/mL
							Perfluoroheptanesulfonic Acid (PFHps)	1.9 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	1.824 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.851 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid (PFPeA)	2 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
LCPFCS_00163	01/16/19	07/20/18	Methanol, Lot 180632	250 mL	LC10:2FTS_00001	100 uL	1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2)	0.01928 ug/mL
					LC11CIPF3OUdS_00002	100 uL	11-Chloroeicosafuoro-3-oxaundecane-1-sulfonate	0.01884 ug/mL
					LC4:2FTS_00005	100 uL	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	0.01868 ug/mL
					LC6:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.01896 ug/mL
					LC8:2FTS_00007	100 uL	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	0.01916 ug/mL
					LC9CI-PF3ONS_00002	100 uL	9-Chlorohexadecafluoro-3-oxanane-1-sulfonate	0.01864 ug/mL
					LCbr-NEtFOSAA_00001	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCbr-NMeFOSAA_00001	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCDONA_00002	100 uL	ADONA	0.02 ug/mL
					LCHFPO-DA_00002	100 uL	Perfluoro(2-propoxypropanoic) acid	0.02 ug/mL
					LCN-EtFOSA-M_00011	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.02 ug/mL
					LCN-MeFOSA-M_00010	100 uL	MeFOSA	0.02 ug/mL
					LCPFBA_00008	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00009	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00008	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00010	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDoS_00004	100 uL	Perfluorododecanesulfonic acid (PFDoS)	0.01936 ug/mL
					LCPFDS_00008	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpA_00011	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00010	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00010	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00006	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00010	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
							Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFNS_00003	100 uL	Perfluorononanesulfonic acid	0.0192 ug/mL
					LCPFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	0.02002 ug/mL
					LCPFODA_00010	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00007	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00013	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00010	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFPeS_00003	100 uL	Perfluoropentanesulfonic acid	0.01876 ug/mL
					LCPFTeDA_00009	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00009	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL
					LCPFUDa_00008	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.LC10:2FTS_00001	11/18/19	WELLINGTON, Lot 102FTS1116			(Purchased Reagent)		1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2)	48.2 ug/mL
.LC11CIPF3OUdS_00002	09/30/21	Wellington Labs, Lot 11CIPF3OUdS0916			(Purchased Reagent)		11-Chloroeicosafuoro-3-oxaundecane-1-sulfonate	47.1 ug/mL
.LC4:2FTS_00005	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)	46.7 ug/mL
.LC6:2FTS_00007	04/20/22	WELLINGTON, Lot 62FTS0417			(Purchased Reagent)		1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	47.4 ug/mL
.LC8:2FTS_00007	12/12/21	WELLINGTON, Lot 82FTS1216			(Purchased Reagent)		1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	47.9 ug/mL
.LC9CI-PF3ONS_00002	09/30/21	Wellington Labs, Lot 9CIPF3ONS0916			(Purchased Reagent)		9-Chlorohexadecafluoro-3-oxonane-1-sulfonate	46.6 ug/mL
.LCbr-NEtFOSAA_00001	01/17/23	WELLINGTON, Lot brNEtFOSAA0118			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCbr-NMeFOSAA_00001	01/17/23	WELLINGTON, Lot brNMeFOSAA0118			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCDONA_00002	03/26/23	WELLINGTON, Lot NADONA0318			(Purchased Reagent)		ADONA	50 ug/mL
.LCHFPO-DA_00002	03/26/21	WELLINGTON, Lot HFPODA0318			(Purchased Reagent)		Perfluoro(2-propoxypropanoic) acid	50 ug/mL
.LCN-EtFOSA-M_00011	05/31/23	WELLINGTON, Lot NEtFOSA0518M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
.LCN-MeFOSA-M_00010	05/31/23	WELLINGTON, Lot NMeFOSA0518M			(Purchased Reagent)		MeFOSA	50 ug/mL
.LCPFBA_00008	05/29/22	Wellington Laboratories, Lot PFBA0517			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-41704-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFBs_00009	09/21/22	Wellington Laboratories, Lot LPFBS0917			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA 00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00010	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDoS_00004	09/30/21	Wellington Laboratories, Lot LPFDoS0916			(Purchased Reagent)		Perfluorododecanesulfonic acid (PFDoS)	48.4 ug/mL
.LCPFDS_00008	11/08/22	Wellington Laboratories, Lot LPFDS1117			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00011	09/27/22	Wellington Laboratories, Lot PFHpA0917			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
.LCPFHxA 00010	09/27/22	Wellington Laboratories, Lot PFHxA0917			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA 00010	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00006	01/04/22	Wellington Laboratories, Lot brPFHxSK0117			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00010	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
							Perfluorooctanoic acid (PFOA)	0.05 ug/mL
.LCPFNS 00003	09/27/22	Wellington Laboratories, Lot LPFNS0917			(Purchased Reagent)		Perfluorononanesulfonic acid	48 ug/mL
.LCPFOA 00011	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA 00010	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00007	01/12/22	Wellington Laboratories, Lot brPFOSK0117			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00013	09/01/22	Wellington Laboratories, Lot FOSA0817I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00010	06/14/22	Wellington Laboratories, Lot PFPeA0617			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFPeS 00003	01/11/22	Wellington Laboratories, Lot LPFPeS0117			(Purchased Reagent)		Perfluoropentanesulfonic acid	46.9 ug/mL
.LCPFTeDA_00009	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00009	05/02/22	Wellington Laboratories, Lot PFTrDA0517			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
.LCPFUdA_00008	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC10:2FTS_00001

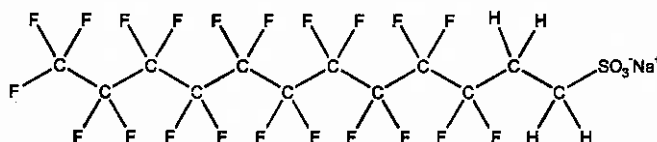


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 10:2FTS **LOT NUMBER:** 102FTS1116
COMPOUND: Sodium 1H,1H,2H,2H-perfluorododecane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{12}H_4F_{21}SO_3Na$ **MOLECULAR WEIGHT:** 650.18
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
48.2 ± 2.4 µg/ml (10:2FTS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/18/2016
EXPIRY DATE: (mm/dd/yyyy) 11/18/2019
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.G. Chittim Date: 12/07/2016
(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

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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

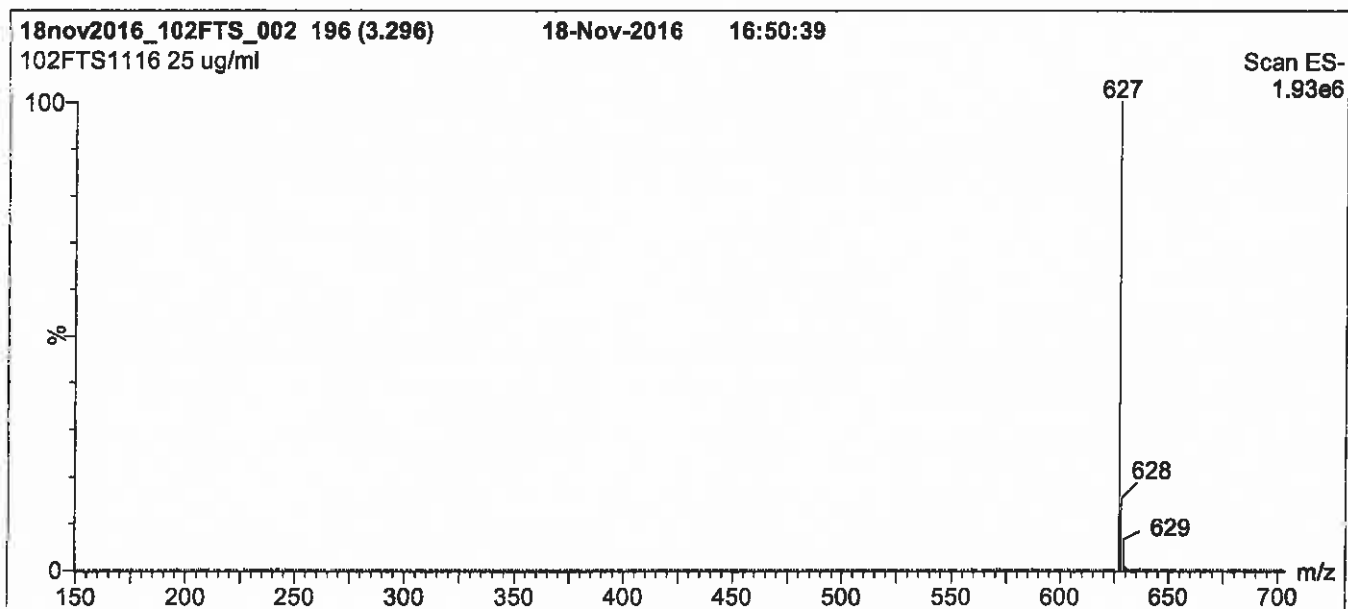
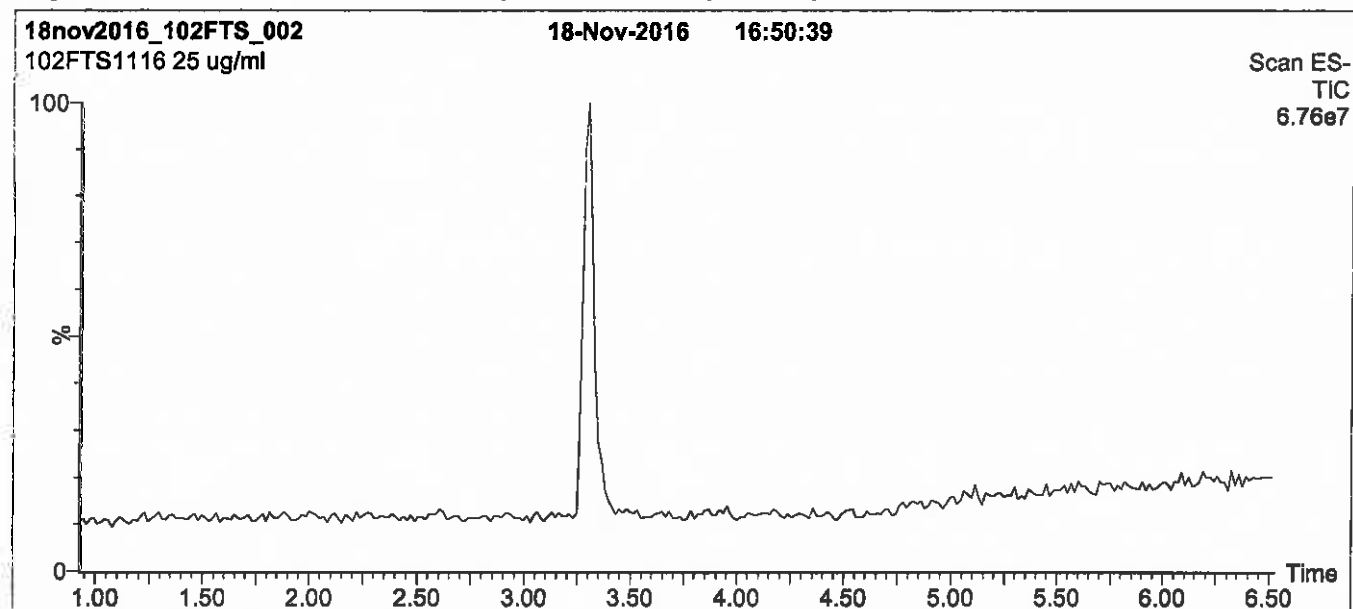
QUALITY MANAGEMENT:

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: 10:2FTS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 95% organic over 6 min and hold for 2.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

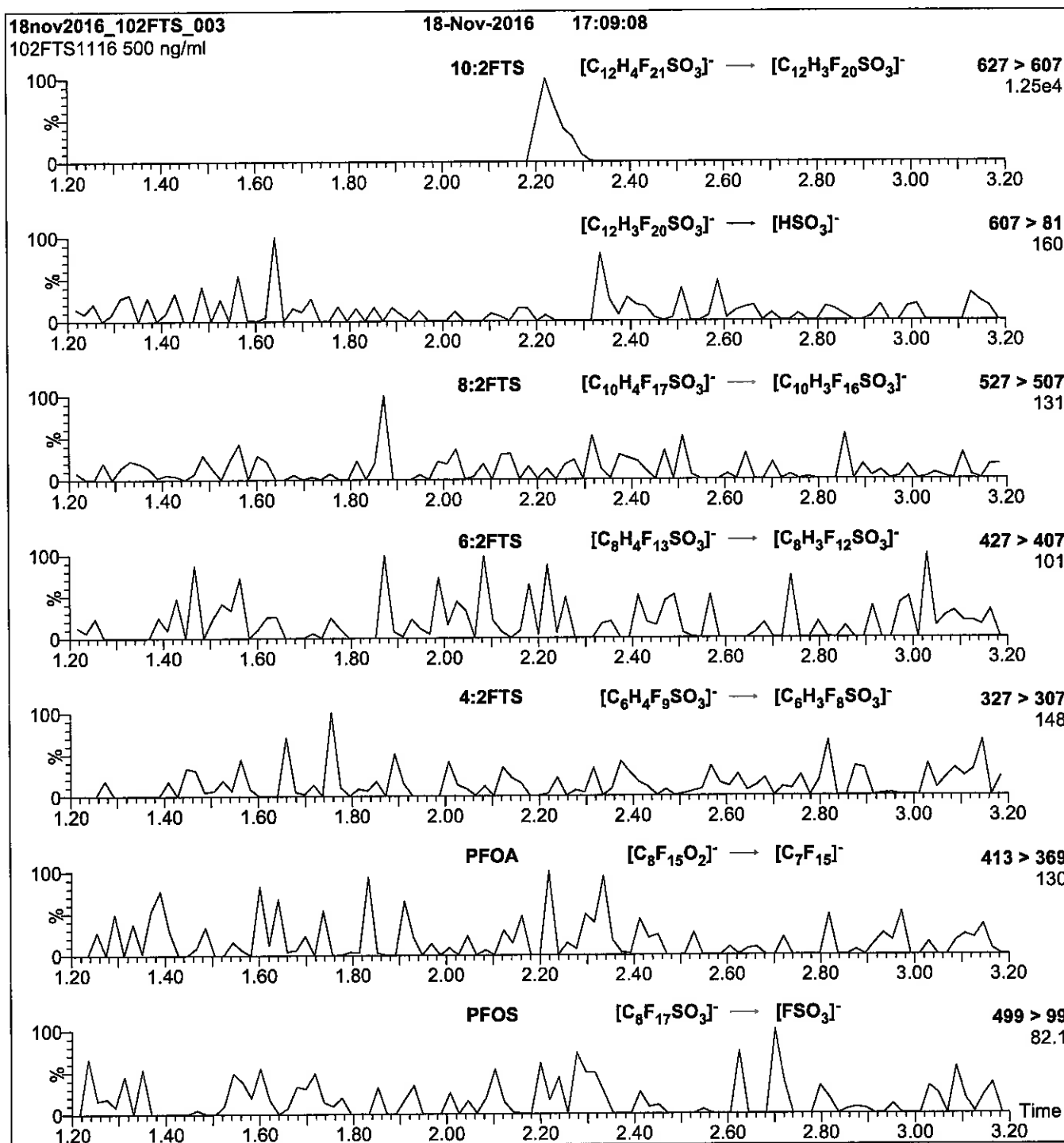
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: 10:2FTS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml 10:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 25

Reagent

LC11CIPF3OUds_00002



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

11CI-PF3OUdS

LOT NUMBER:

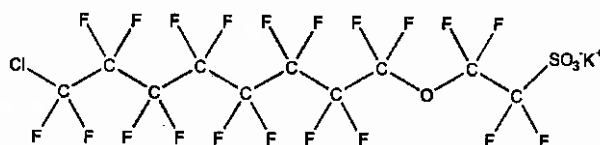
11CIPF3OUdS0916

COMPOUND:

Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate

STRUCTURE:**CAS #:**

83329-89-9

**MOLECULAR FORMULA:** $C_{10}F_{20}ClSO_4K$ **MOLECULAR WEIGHT:**

670.69

CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/ml}$ (K Salt)**SOLVENT(S):**

Methanol

 $47.1 \pm 2.4 \mu\text{g/ml}$ (11CI-PF3OUdS anion)**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.
- This compound is a minor component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/19/2016

(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

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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

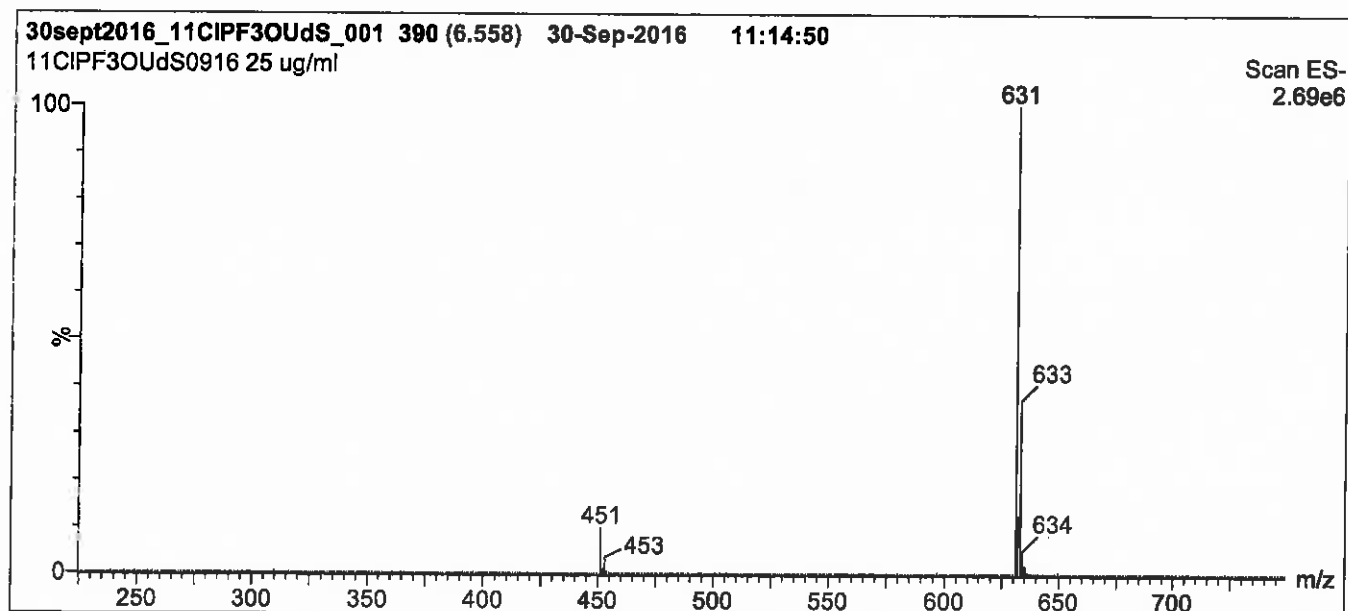
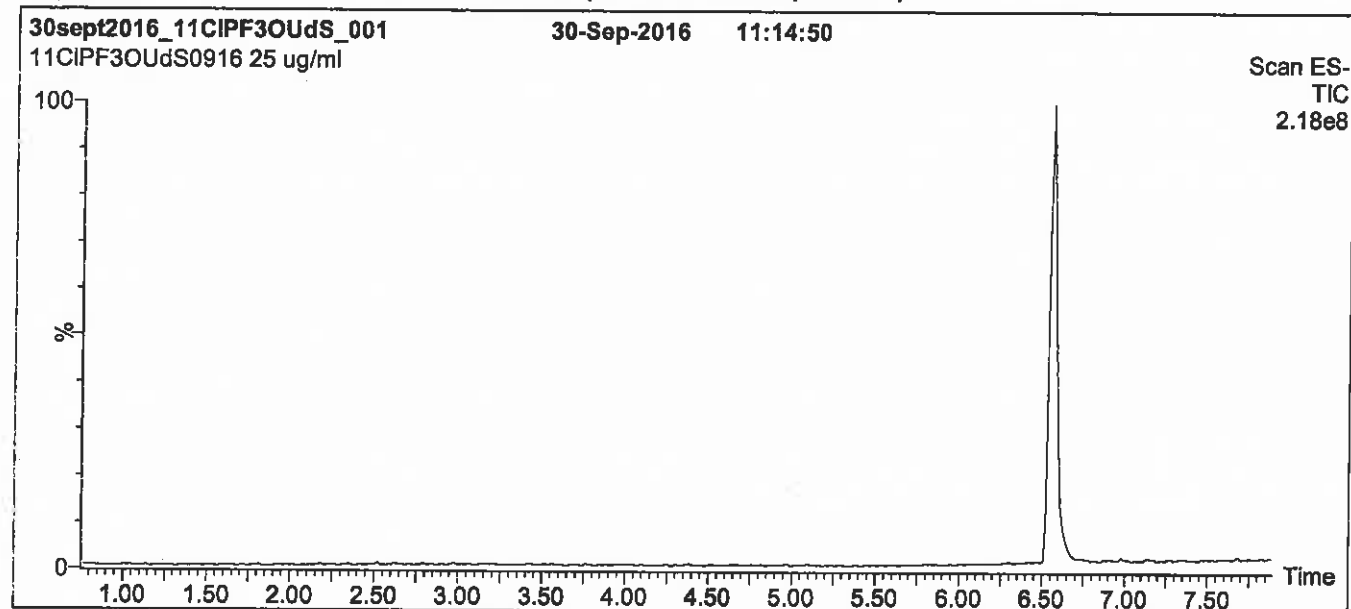
QUALITY MANAGEMENT:

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: 11CI-PF3OUdS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

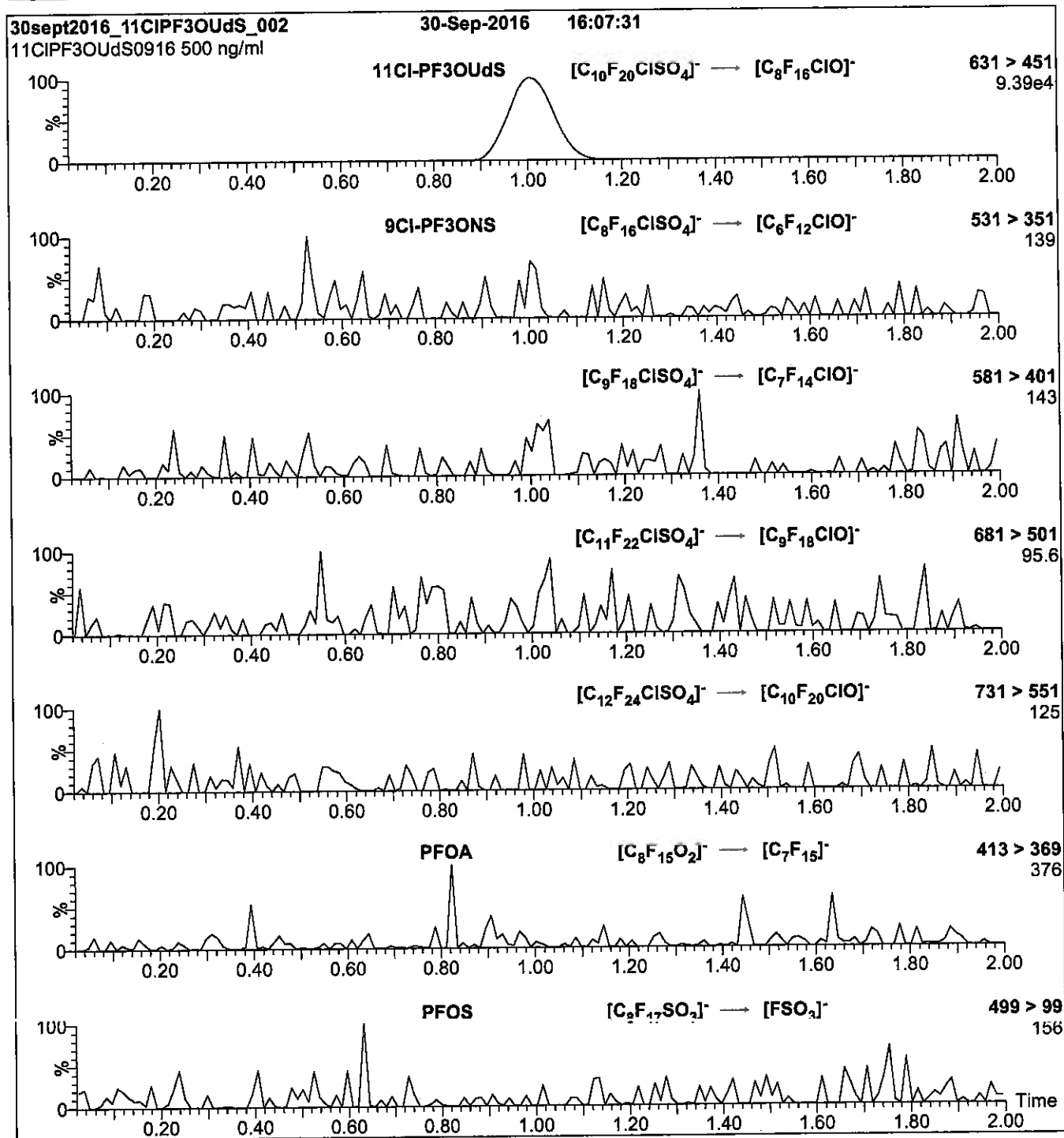
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 45.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: 11CI-PF3OUdS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml 11CI-PF3OUdS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 20

Reagent

LC4 : 2FTS_00005

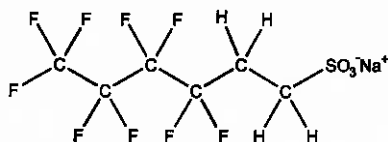


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS1216
COMPOUND: Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_6H_4F_9SO_3Na$ **MOLECULAR WEIGHT:** 350.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 46.7 ± 2.3 µg/ml (4:2FTS anion)
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.G. Chittim

Date: 12/21/2016
(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

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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

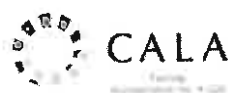
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

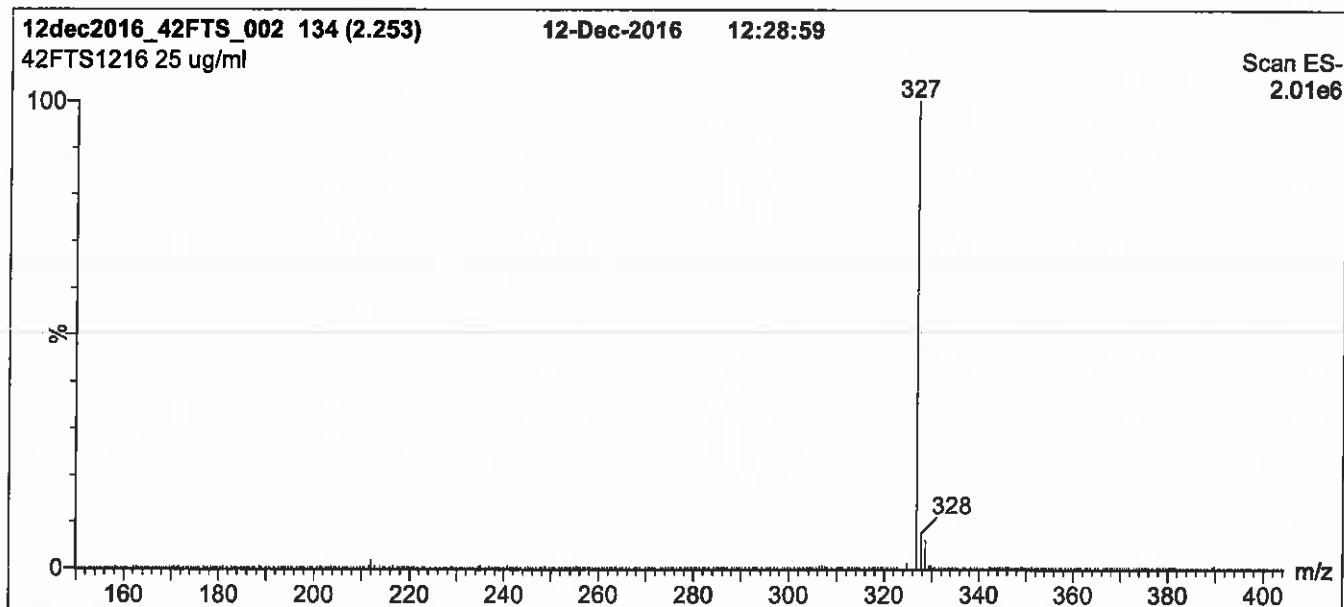
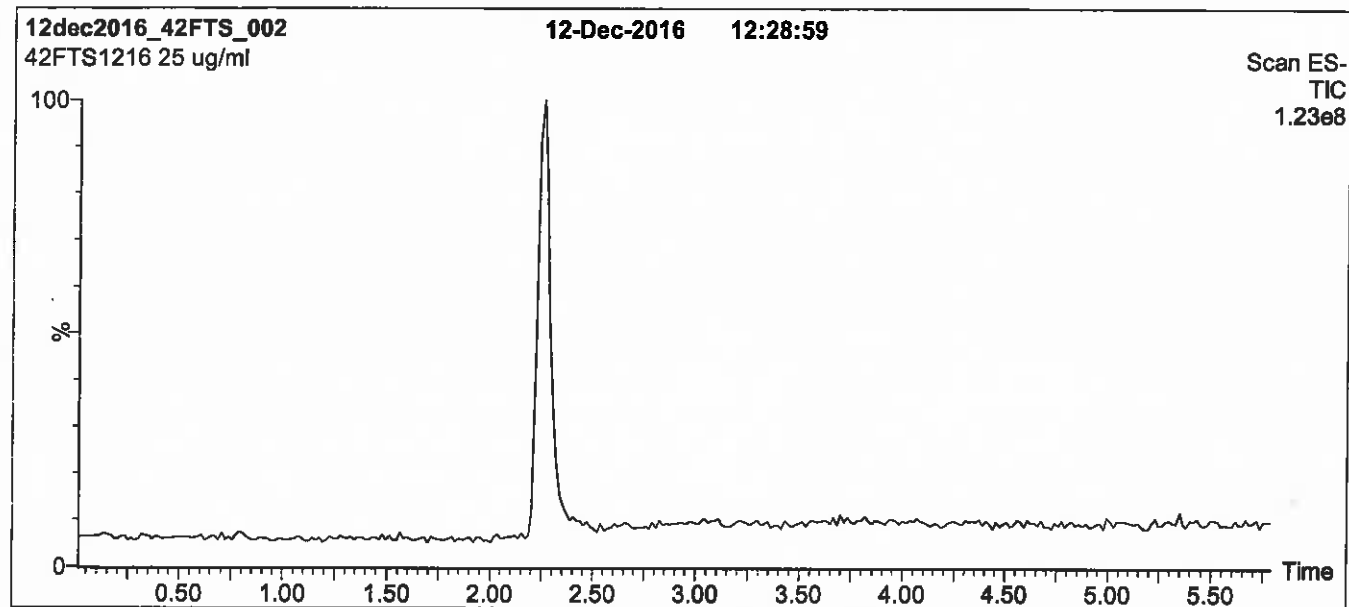
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

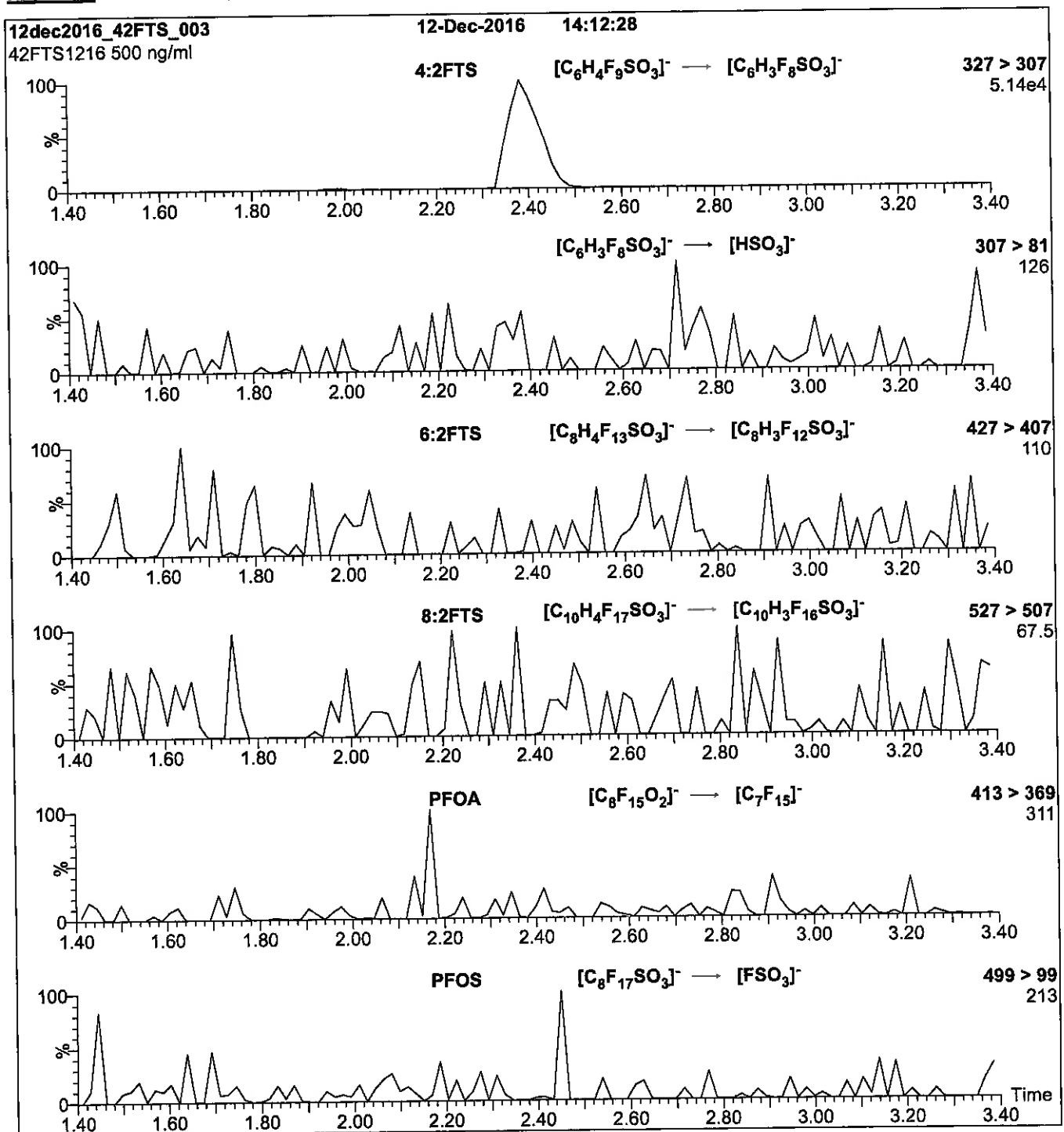
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 25.00

Cone Gas Flow (l/hr) = 100

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml 4:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LC6:2FTS_00007

r: 9/20/17 SW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

6:2FTS

LOT NUMBER:

62FTS0417

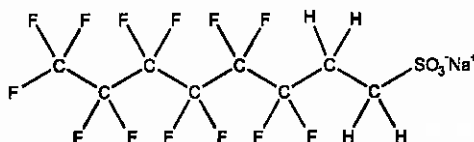
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

$C_8H_4F_{13}SO_3Na$

MOLECULAR WEIGHT:

450.15

CONCENTRATION:

$50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt)

SOLVENT(S):

Methanol

$47.4 \pm 2.4 \mu\text{g/ml}$ (6:2FTS anion)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

04/20/2017

EXPIRY DATE: (mm/dd/yyyy)

04/20/2022

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 04/24/2017

(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

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

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

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:

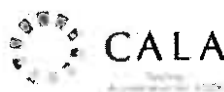
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

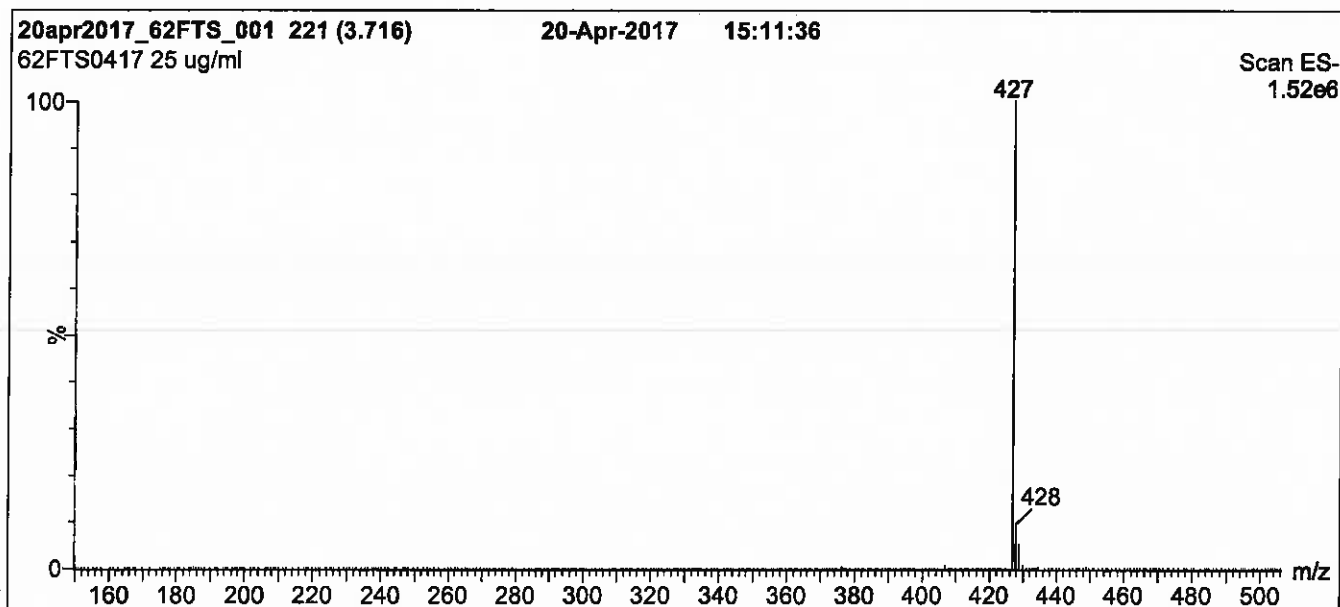
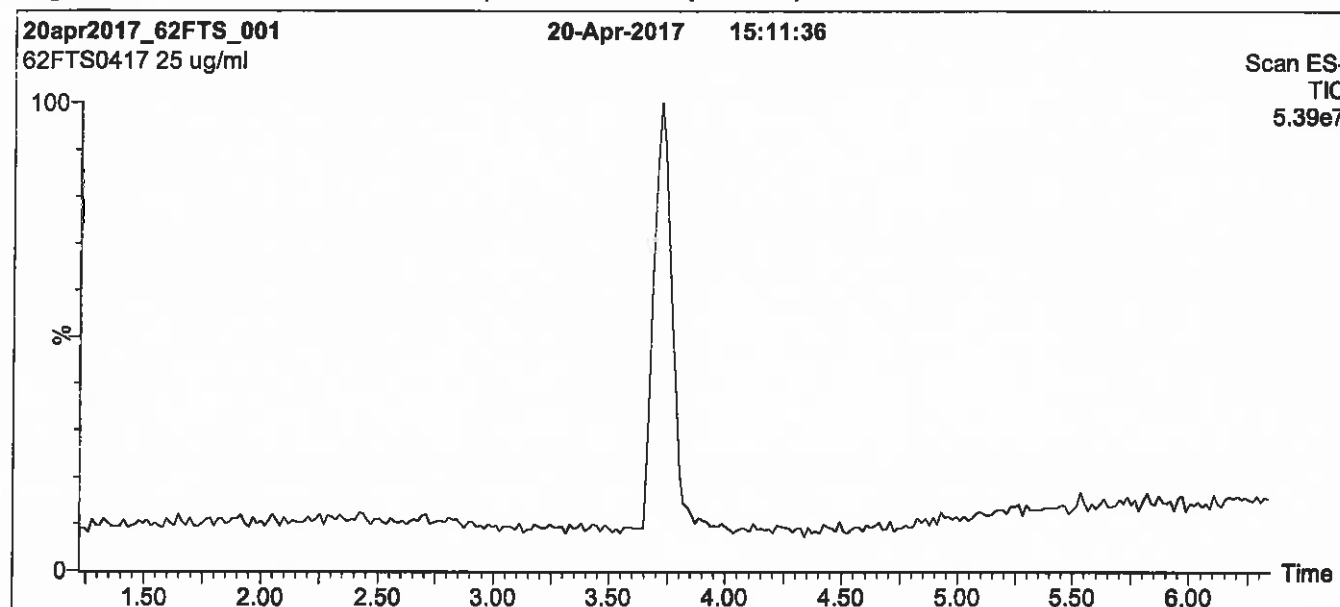
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

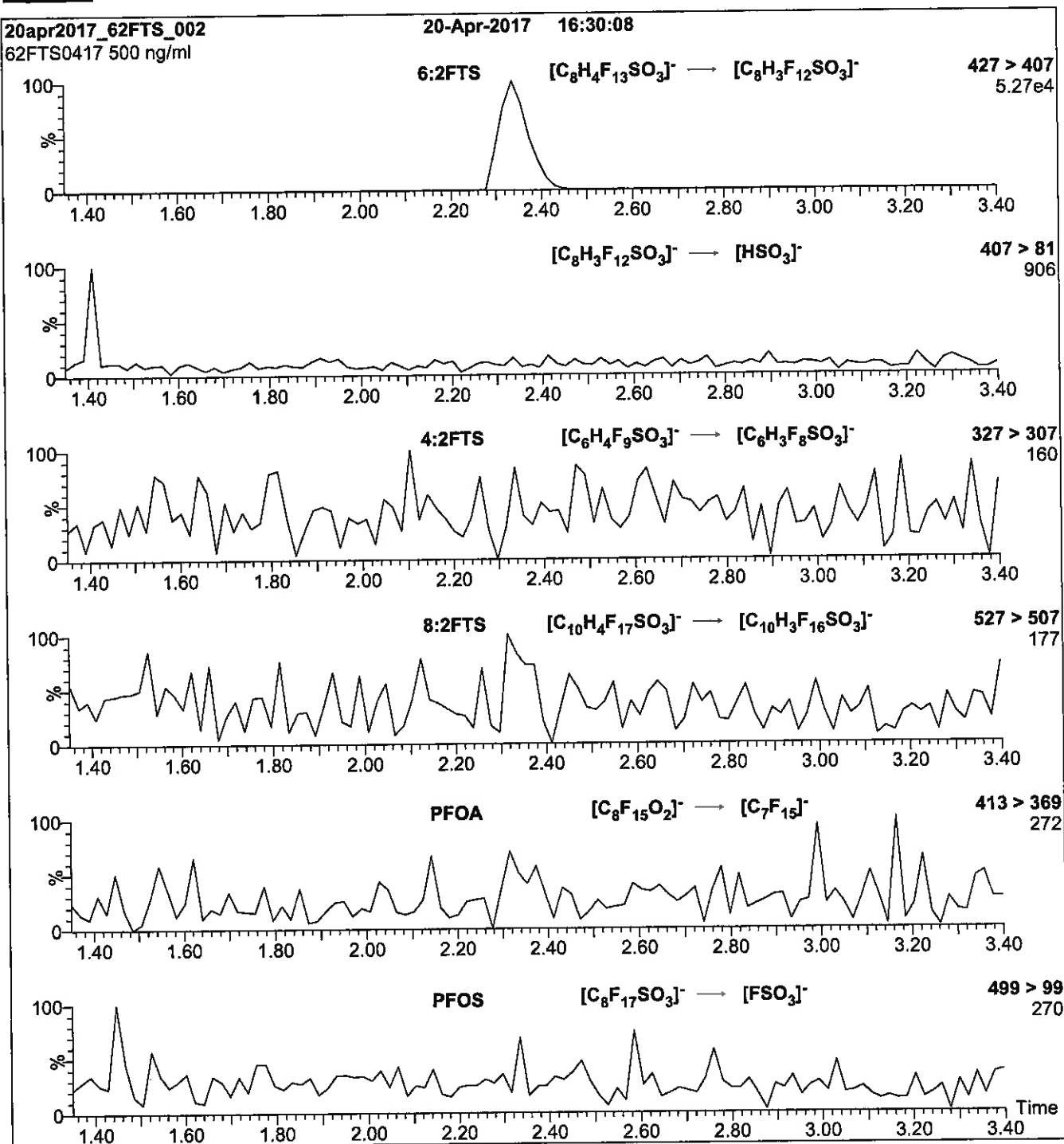
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml 6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 25

Reagent

LC8 : 2FTS_00007



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

8:2FTS

LOT NUMBER:

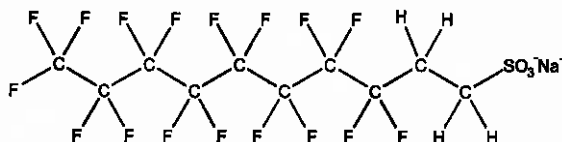
82FTS1216

COMPOUND:

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

STRUCTURE:**CAS #:**

Not available

**MOLECULAR FORMULA:** $C_{10}H_4F_{17}SO_3Na$ **MOLECULAR WEIGHT:**

550.16

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)

SOLVENT(S):

Methanol

47.9 ± 2.4 µg/ml (8:2FTS anion)

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.G. Chittim

Date: 12/21/2016

(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

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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

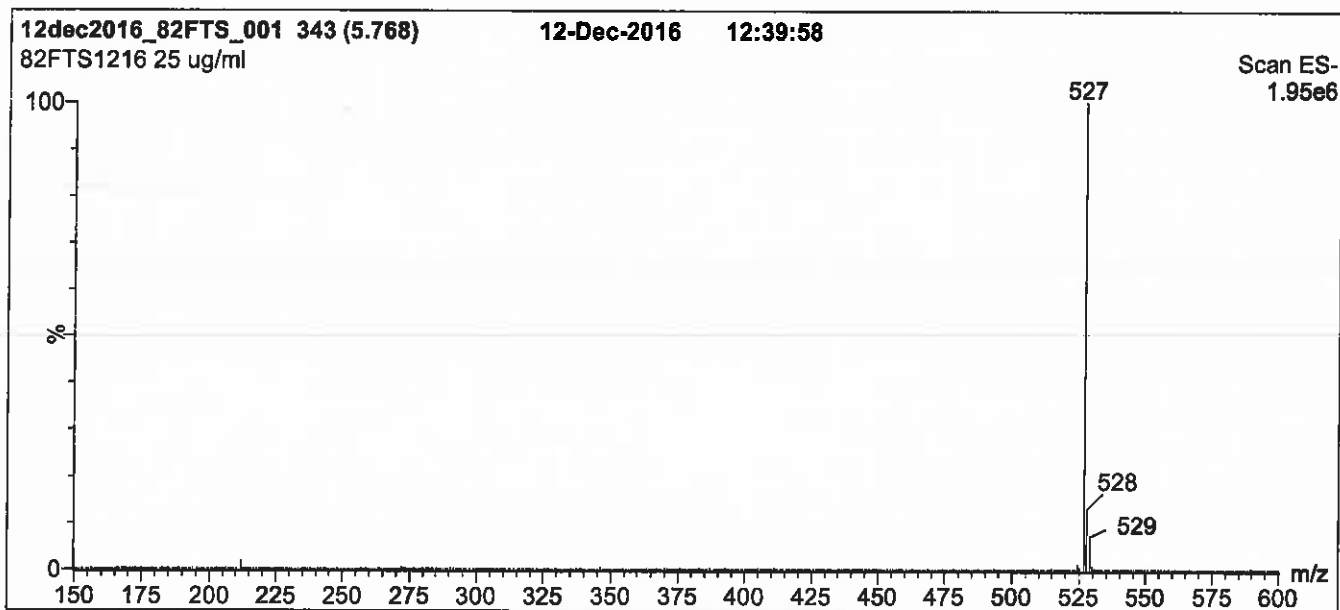
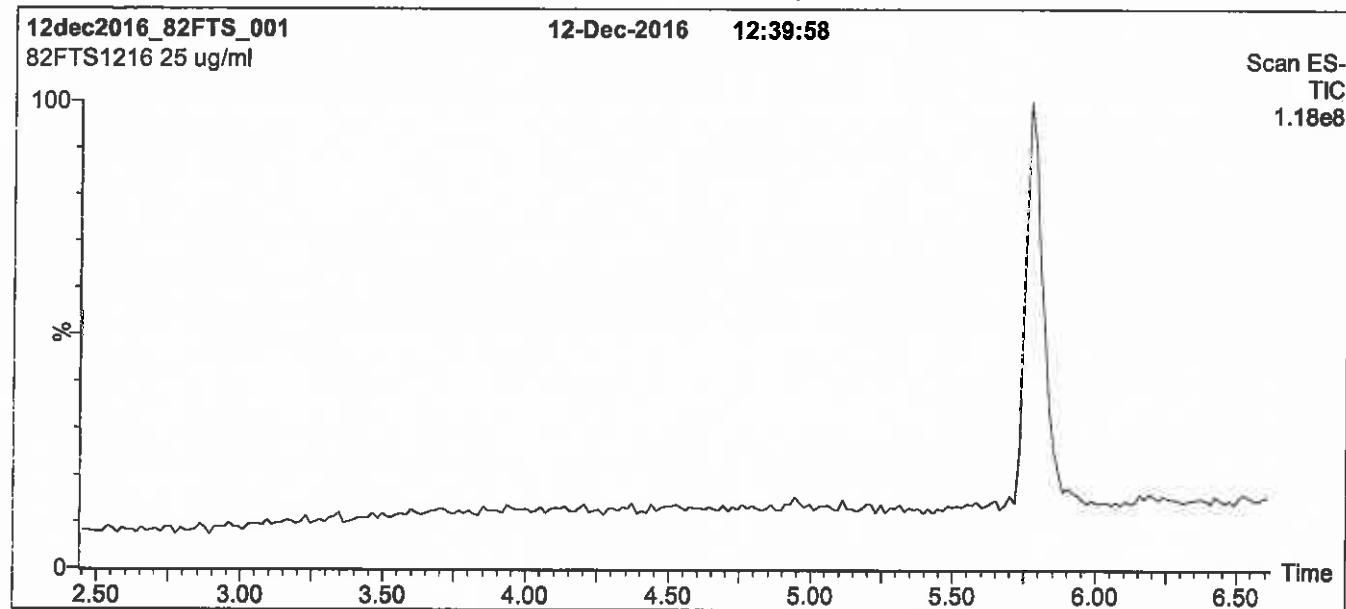
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

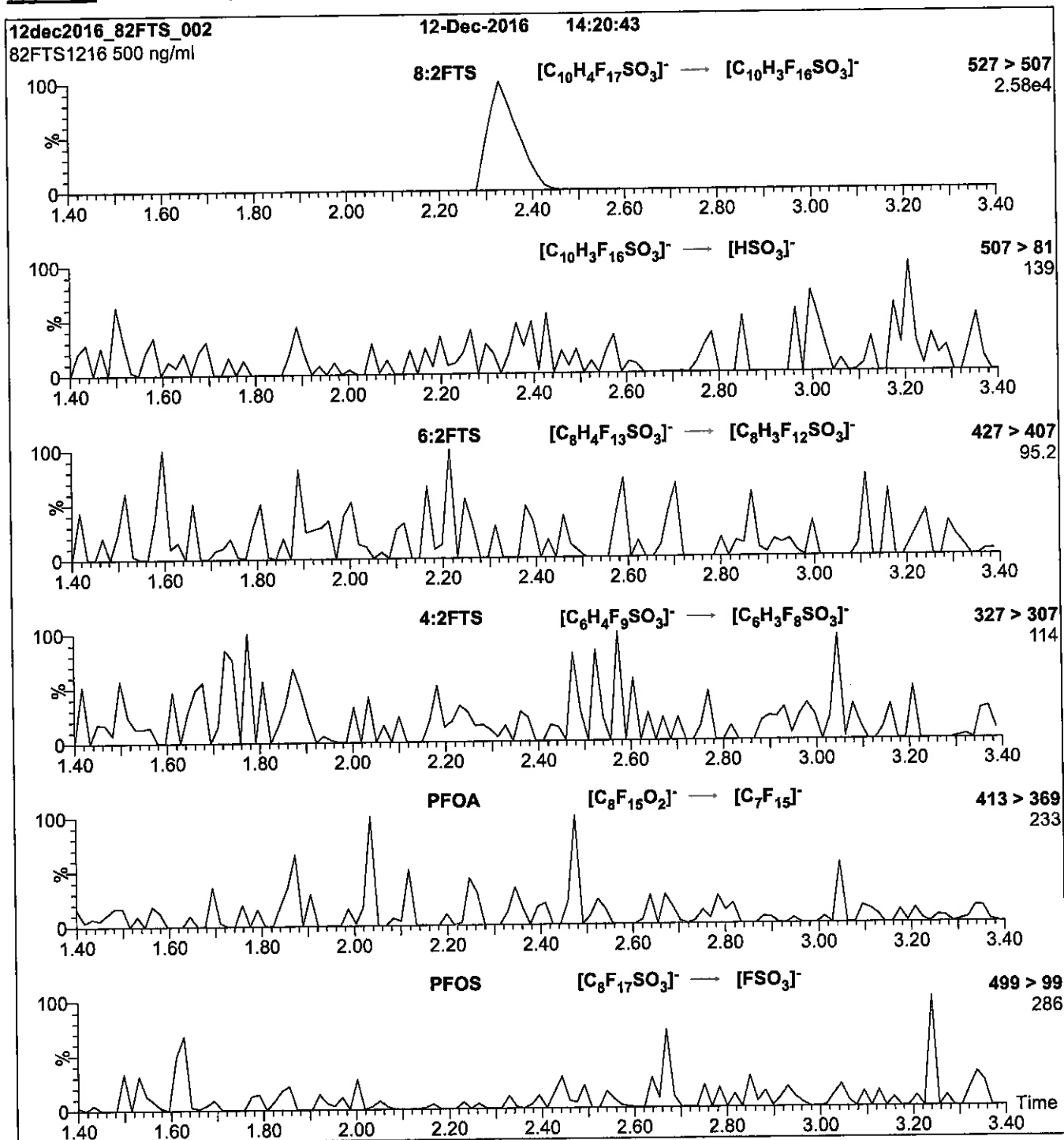
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml 8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 30

Reagent

LC9CI-PF3ONS_00002

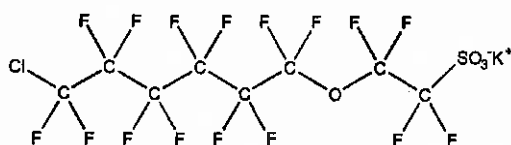


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 9CI-PF3ONS **LOT NUMBER:** 9CIPF3ONS0916
COMPOUND: Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate

STRUCTURE: **CAS #:** 73606-19-6



MOLECULAR FORMULA: $C_9F_{16}ClSO_4K$ **MOLECULAR WEIGHT:** 570.67
CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/ml}$ (K Salt) **SOLVENT(S):** Methanol
 $46.6 \pm 2.3 \mu\text{g/ml}$ (9CI-PF3ONS anion)
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.
- This compound is the major component of the commercial formulation known as F-53B.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/19/2016
(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

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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

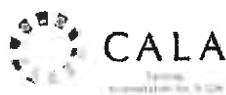
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

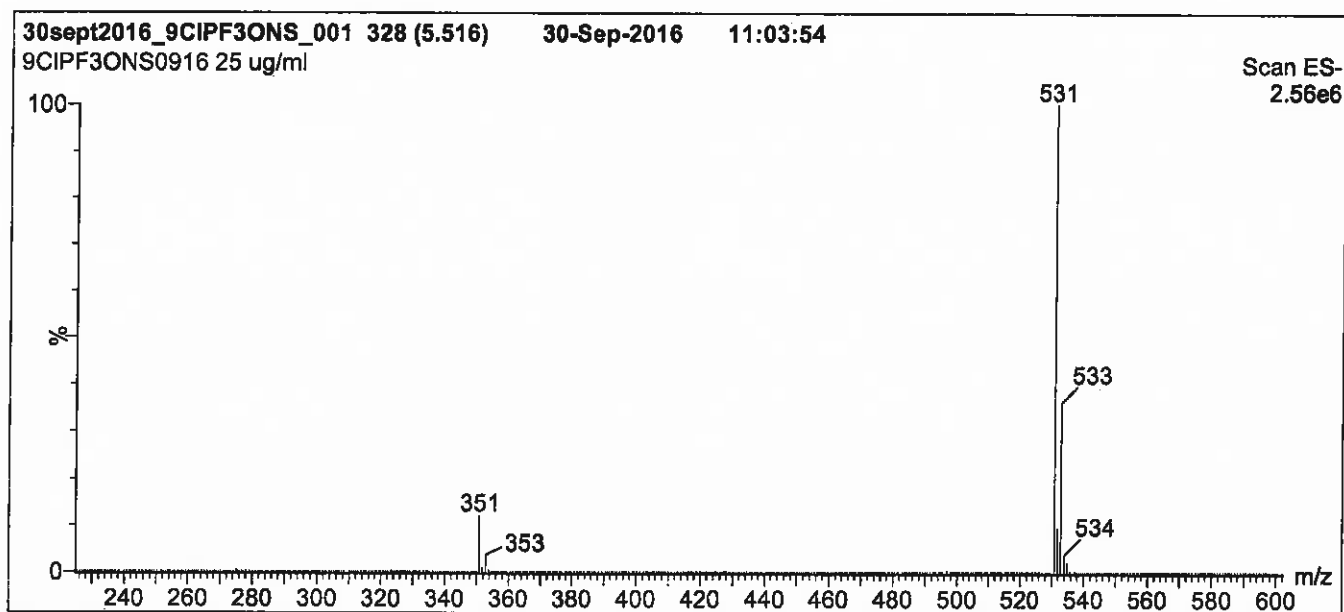
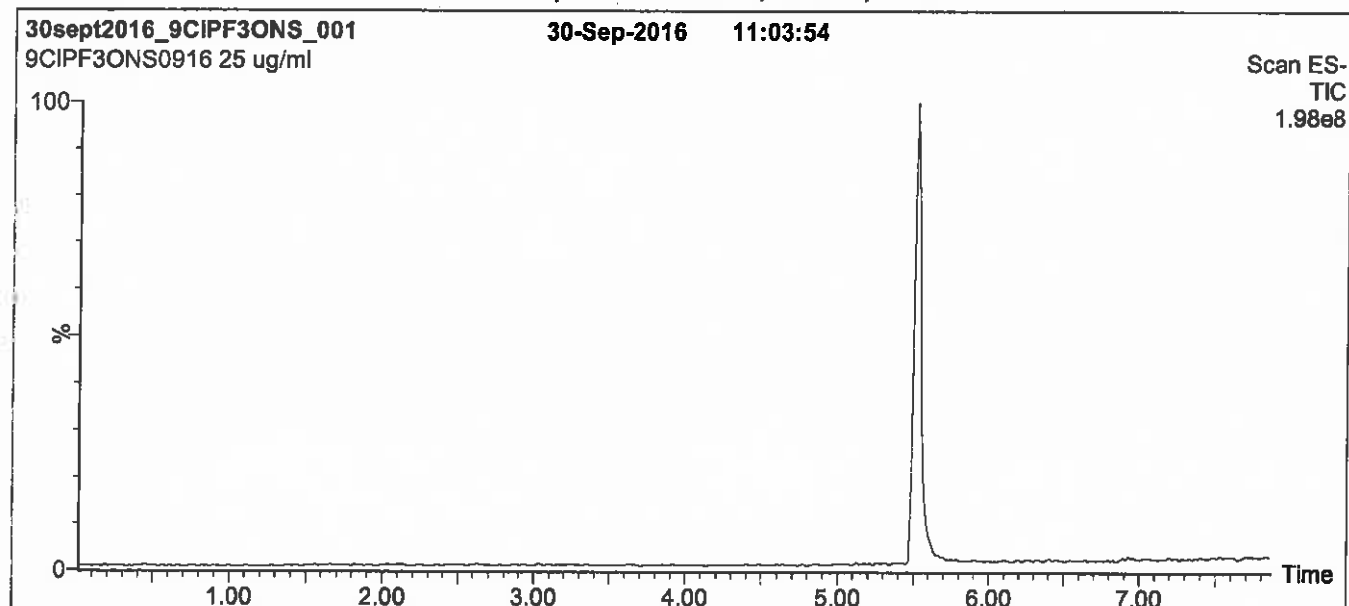
QUALITY MANAGEMENT:

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: 9CI-PF3ONS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈,
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

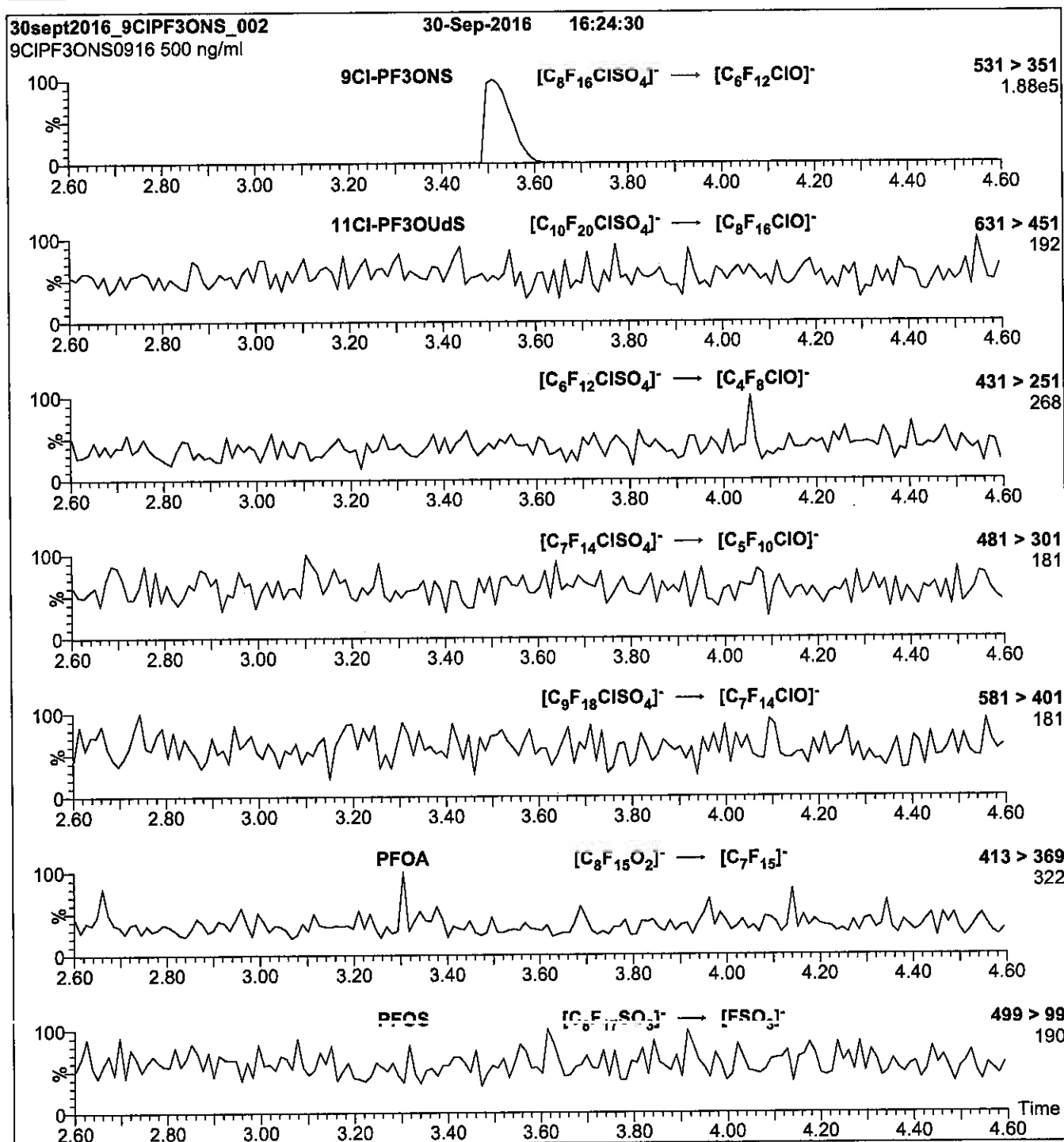
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: 9CI-PF3ONS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml 9CI-PF3ONS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 25

Reagent

LCbr-NEtFOSAA_00001



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-NEtFOSAA

N-Ethylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

<u>PRODUCT CODE:</u>	br-NEtFOSAA
<u>LOT NUMBER:</u>	brNEtFOSAA0118
<u>CONCENTRATION:</u>	50.0 ± 2.5 µg/ml
<u>SOLVENT(S):</u>	Methanol/Water (<1%)
<u>DATE PREPARED:</u> (mm/dd/yyyy)	01/10/2018
<u>LAST TESTED:</u> (mm/dd/yyyy)	01/17/2018
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	01/17/2023
<u>RECOMMENDED STORAGE:</u>	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-ethylperfluorooctanesulfonamidoacetic acid (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 (SIR)
 Figure 3: 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 acetic acid moiety to its respective methyl ester.

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

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 compounds it contains.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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. This 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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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 17034 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

Table A: br-NEtFOSAA; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

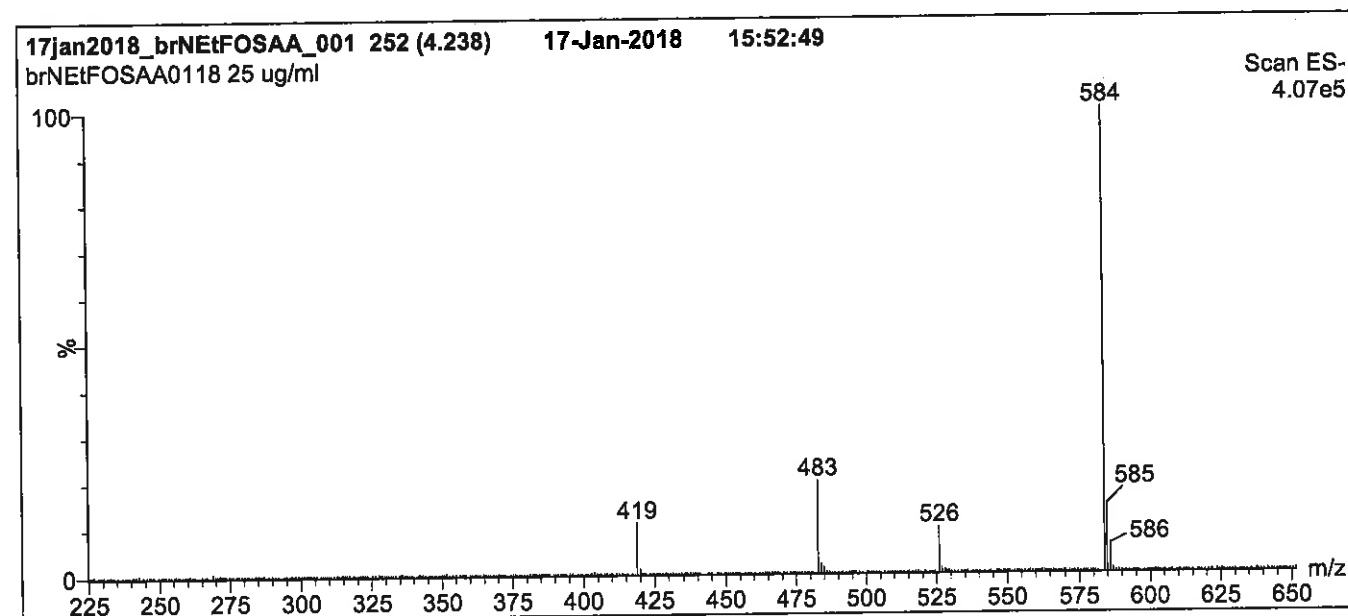
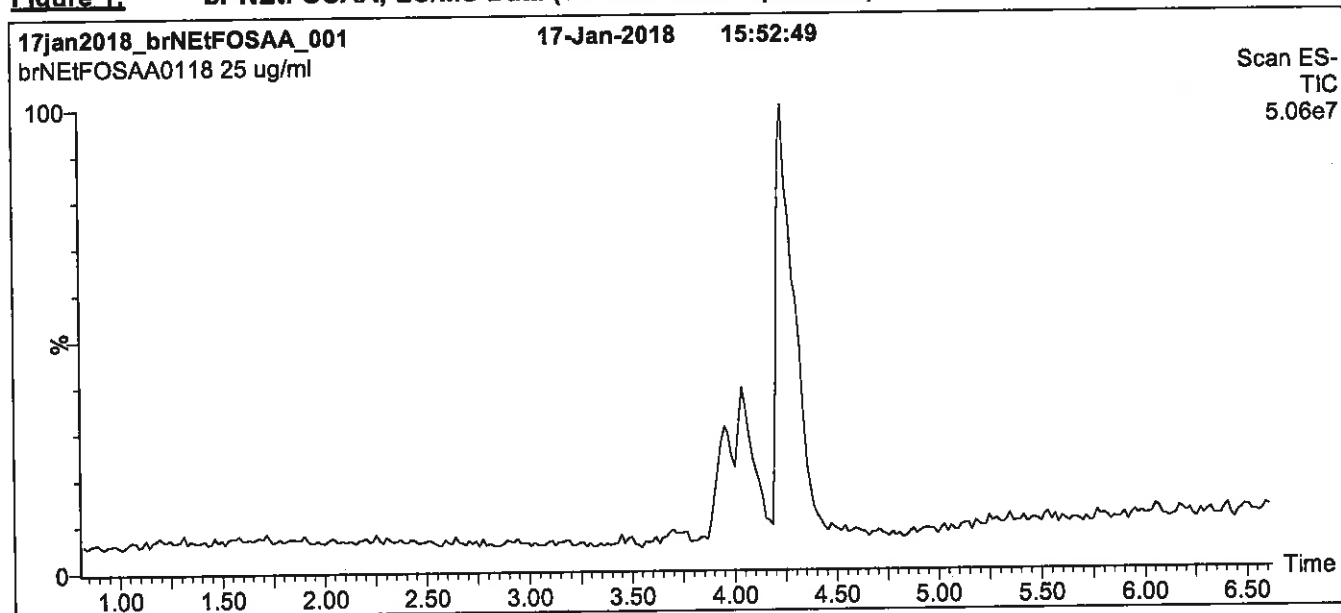
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_7\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \text{C}_2\text{H}_5$	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_3\text{CF}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	2.3
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_2\text{CF}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	2.2
4	N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid	$\text{CF}_3\text{CF}_2\text{CF}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	5.4
5	N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid	$\text{CF}_3\text{CF}(\text{CF}_2)_5\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	10.4
6	N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$\text{CF}_3\text{C}(\text{CF}_3)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	0.3
7	N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid	$\text{CF}_3\text{CF}(\text{CF}_3)\text{CF}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	0.3
8	N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid	$\text{CF}_3\text{CF}(\text{CF}_3)\text{CF}_2\text{CF}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$ $\quad \quad \quad \text{CF}_3 \quad \quad \quad \text{C}_2\text{H}_5$	0.3
9	Other Unidentified Isomers		1.3

* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: 
B.G. Chittim, General Manager

Date: 03/22/2018
(mm/dd/yyyy)

Figure 1: br-NEtFOSAA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1.

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

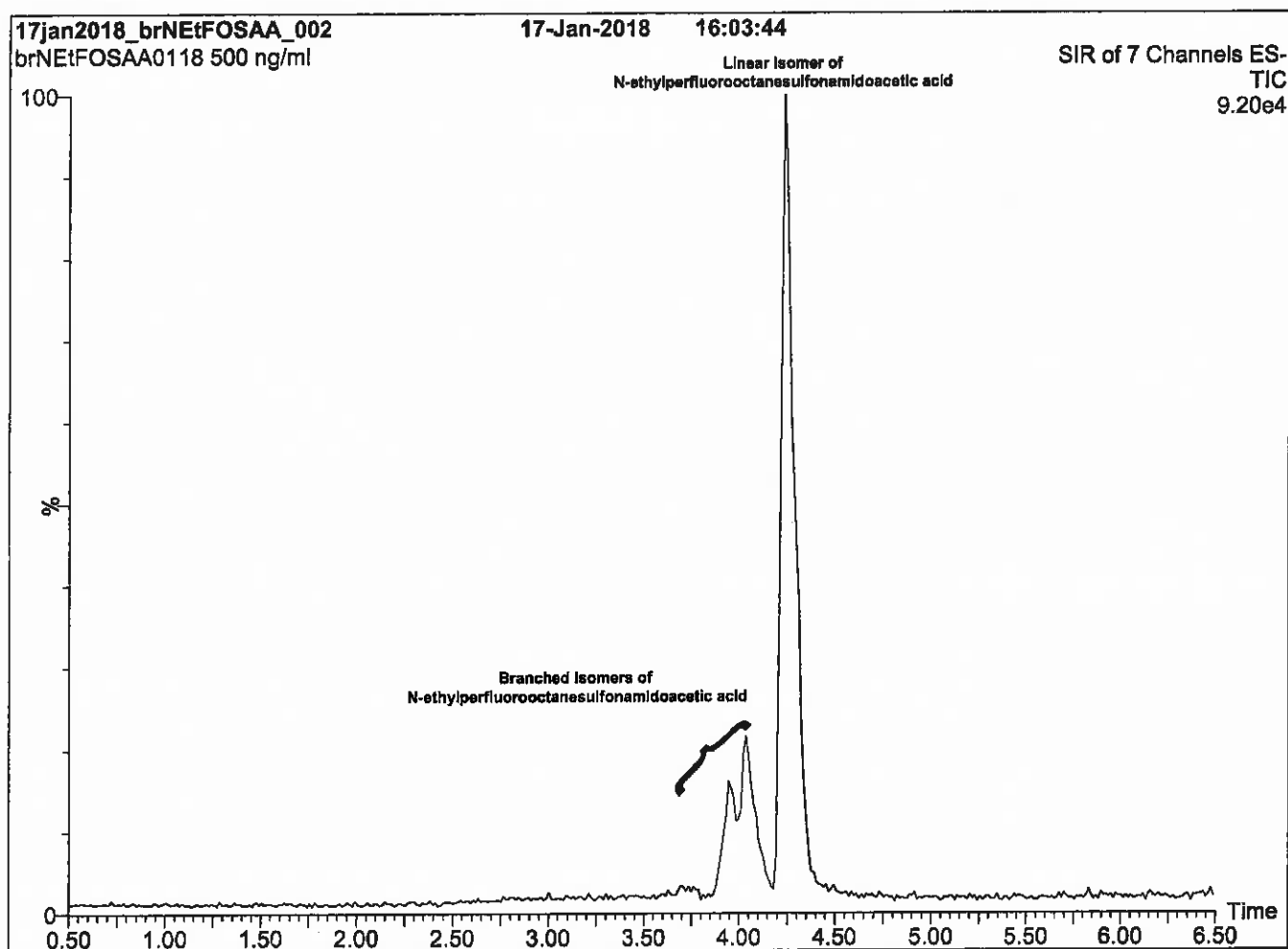
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: br-NEtFOSAA; 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

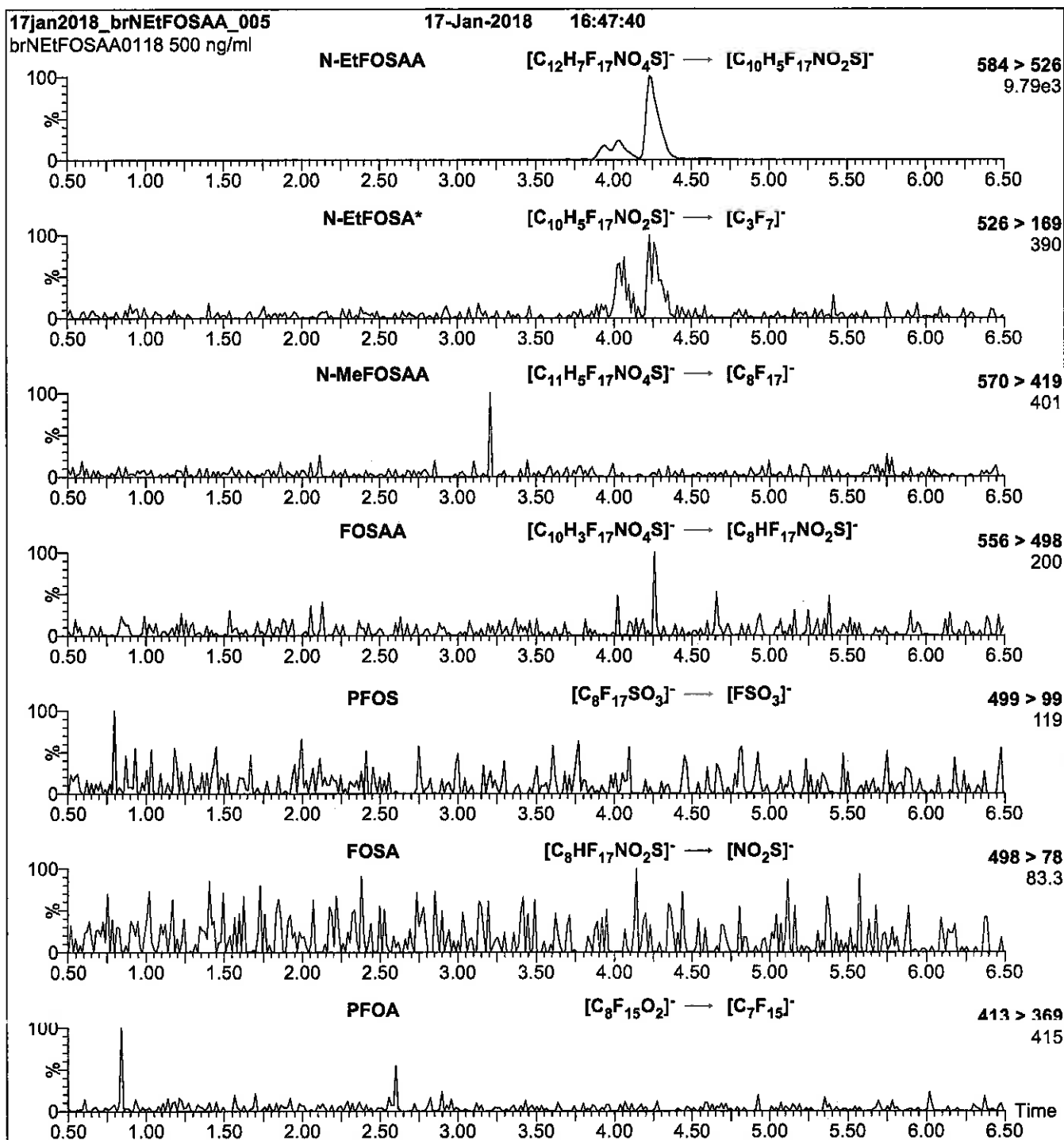
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 3: br-NEtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



*Note: N-EtFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3

Collision Energy (eV) = 11-40 (variable)

Reagent

LCbr-NMeFOSAA_00001



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-NMeFOSAA

N-Methylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NMeFOSAA
LOT NUMBER:	brNMeFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-methylperfluorooctanesulfonamidoacetic acid (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 (SIR)
 Figure 3: 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 acetic acid moiety to its respective methyl ester.

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

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 compounds it contains.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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. This 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

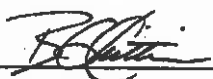


For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: br-NMeFOSAA; Isomeric Components and Percent Composition (by ¹⁹F-NMR)*

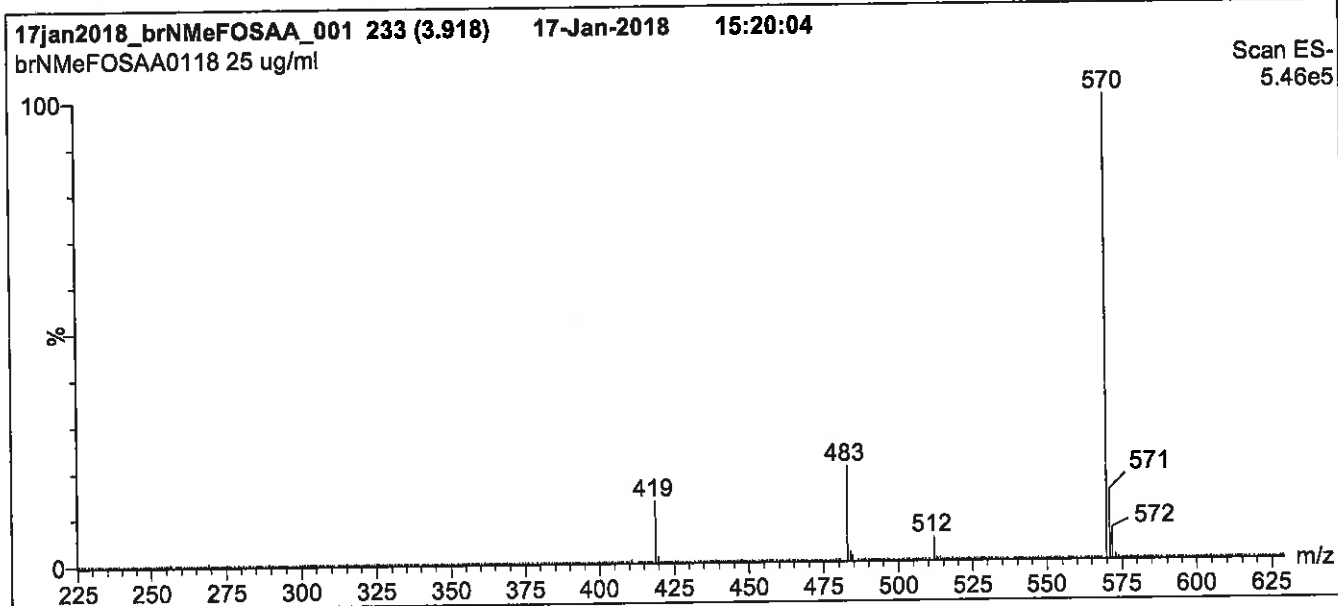
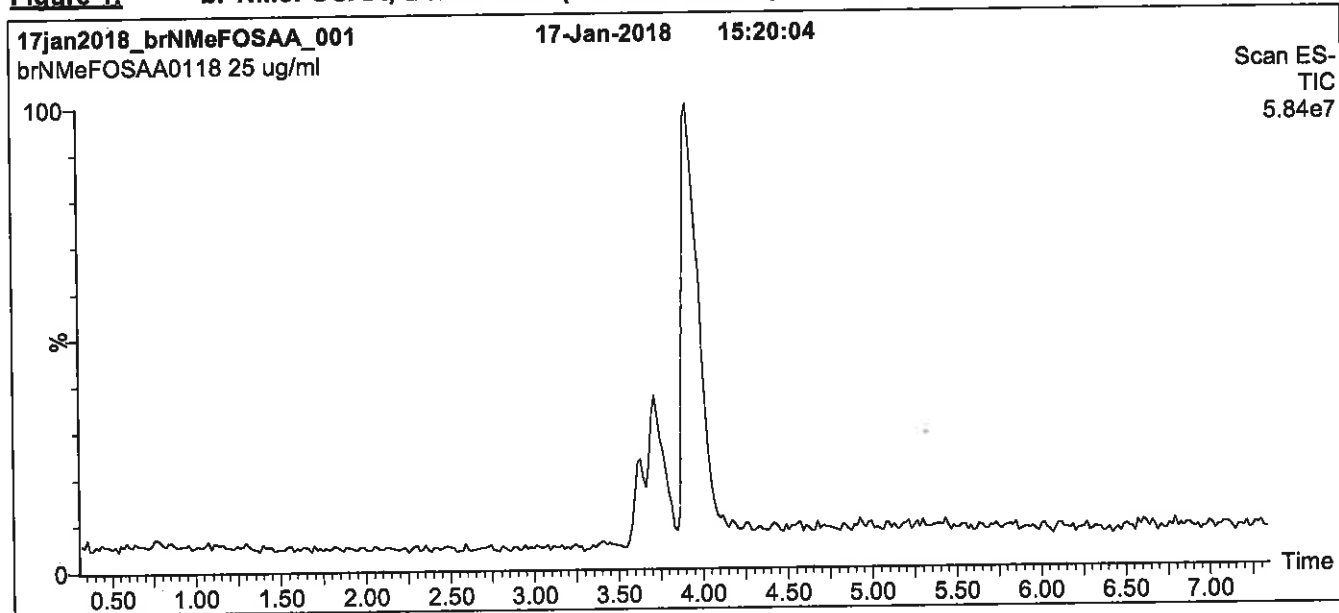
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_7\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_3\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	$\text{CF}_3(\text{CF}_2)_2\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	2.0
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	$\text{CF}_3\text{CF}_2\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	6.0
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	$\text{CF}_3\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_5\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	14.0
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$\text{CF}_3\underset{\text{CF}_3}{\text{C}}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$	0.2
7	Other Unidentified isomers		1.1

* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

Certified By: 
B.G. Chittim, General Manager

Date: 03/22/2018
(mm/dd/yyyy)

Figure 1: br-NMeFOSAA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

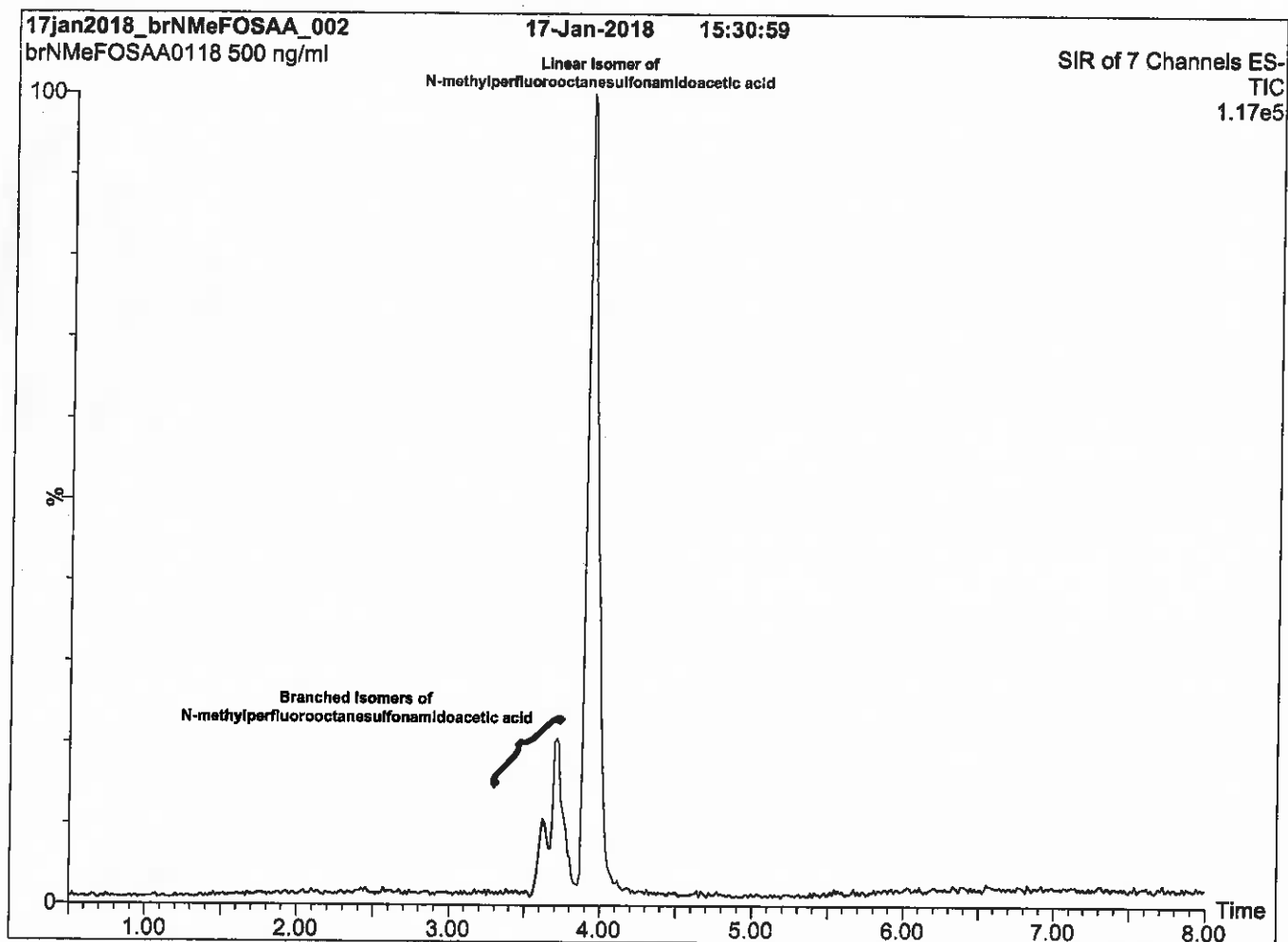
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: br-NMeFOSAA; 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

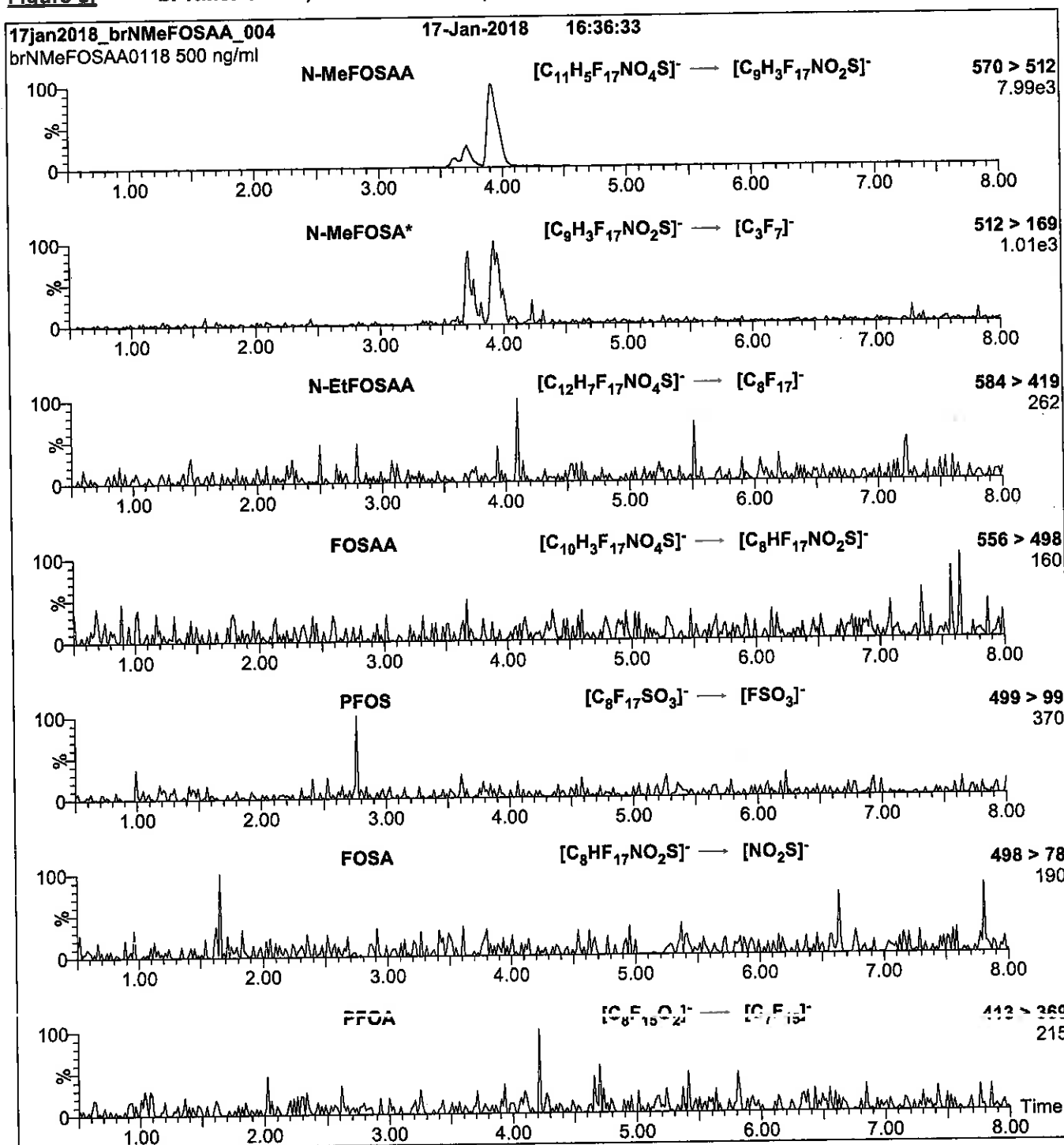
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 3: br-NMeFOSAA; LC/MS/MS Data (Selected MRM Transitions)



*Note: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3

Collision Energy (eV) = 11-40 (variable)

Reagent

LCd3-NMeFOSAA_00009



1287340

ID: LCd3-NMeFOSAA_00009

Exp: 11/08/22 Prod: CBW Opr: 06/26/18

d3-N-MeFOSAA

R: 6/26/18 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d3-N-MeFOSAA

LOT NUMBER:

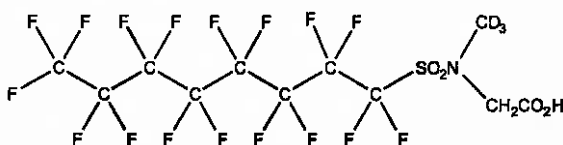
d3NMeFOSAA1117

COMPOUND:

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

STRUCTURE:**CAS #:**

Not available

**MOLECULAR FORMULA:** $C_{11}D_3H_3F_{17}NO_4S$ **CONCENTRATION:** $50 \pm 2.5 \mu\text{g/ml}$ **MOLECULAR WEIGHT:**

574.23

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY: $\geq 98\% \text{ } ^2\text{H}_3$ **LAST TESTED:** (mm/dd/yyyy)

11/08/2017

EXPIRY DATE: (mm/dd/yyyy)

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 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: 11/16/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

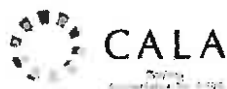
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

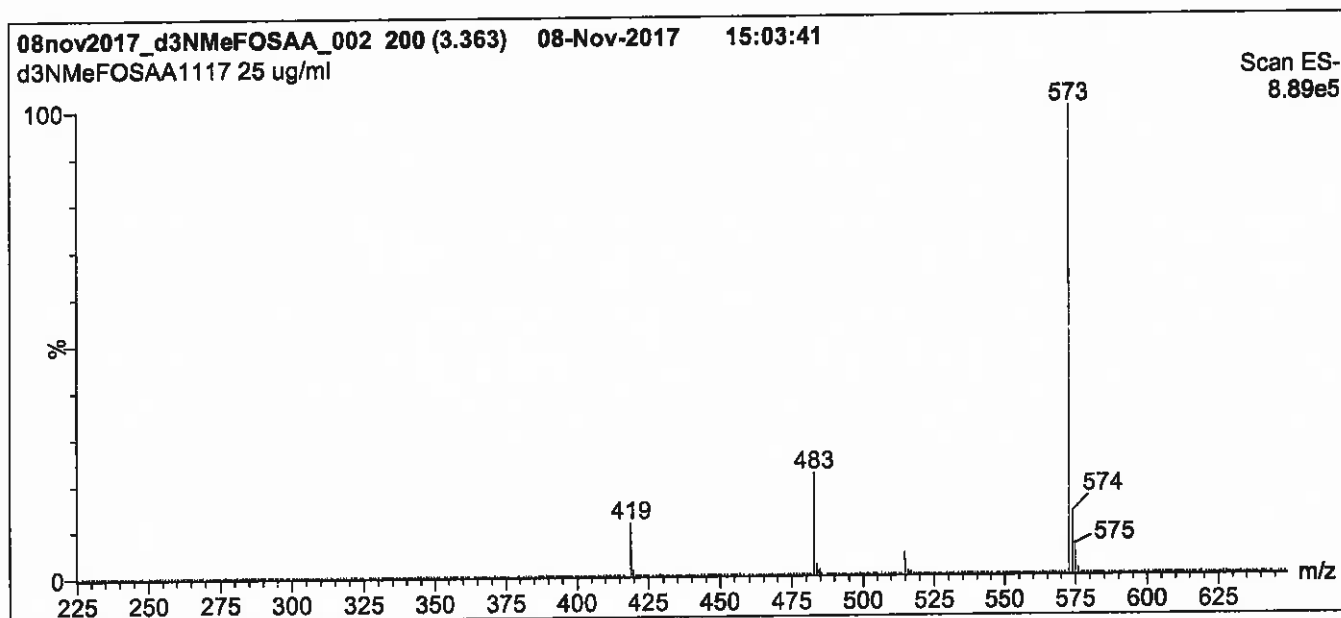
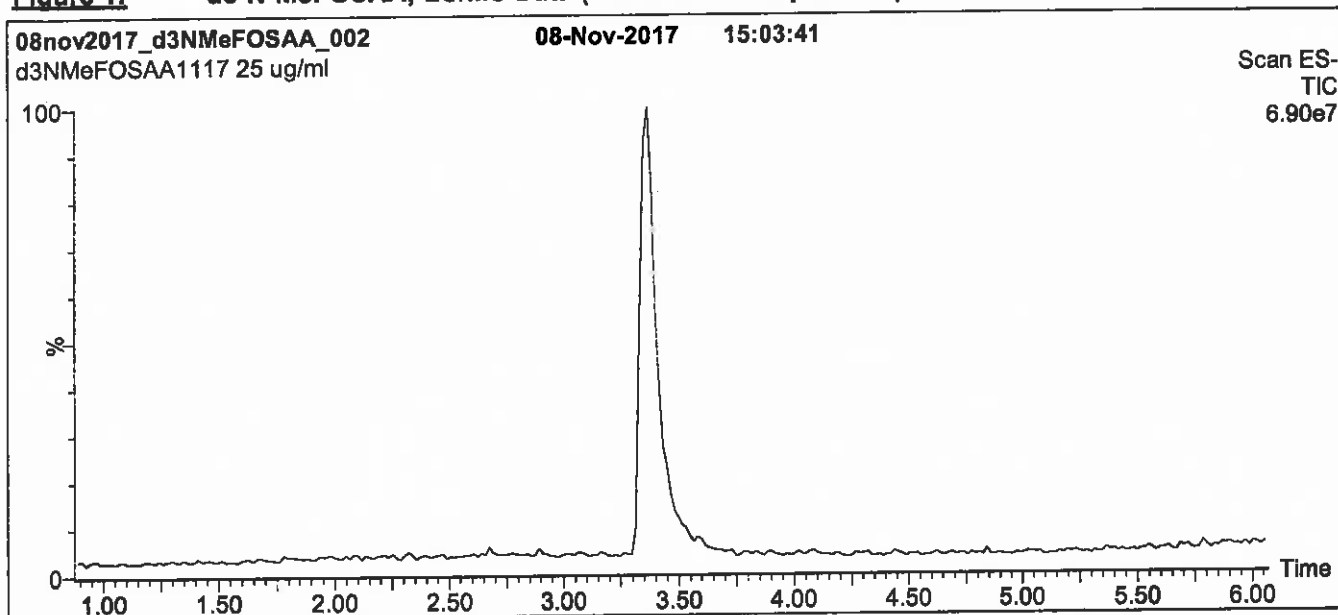
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

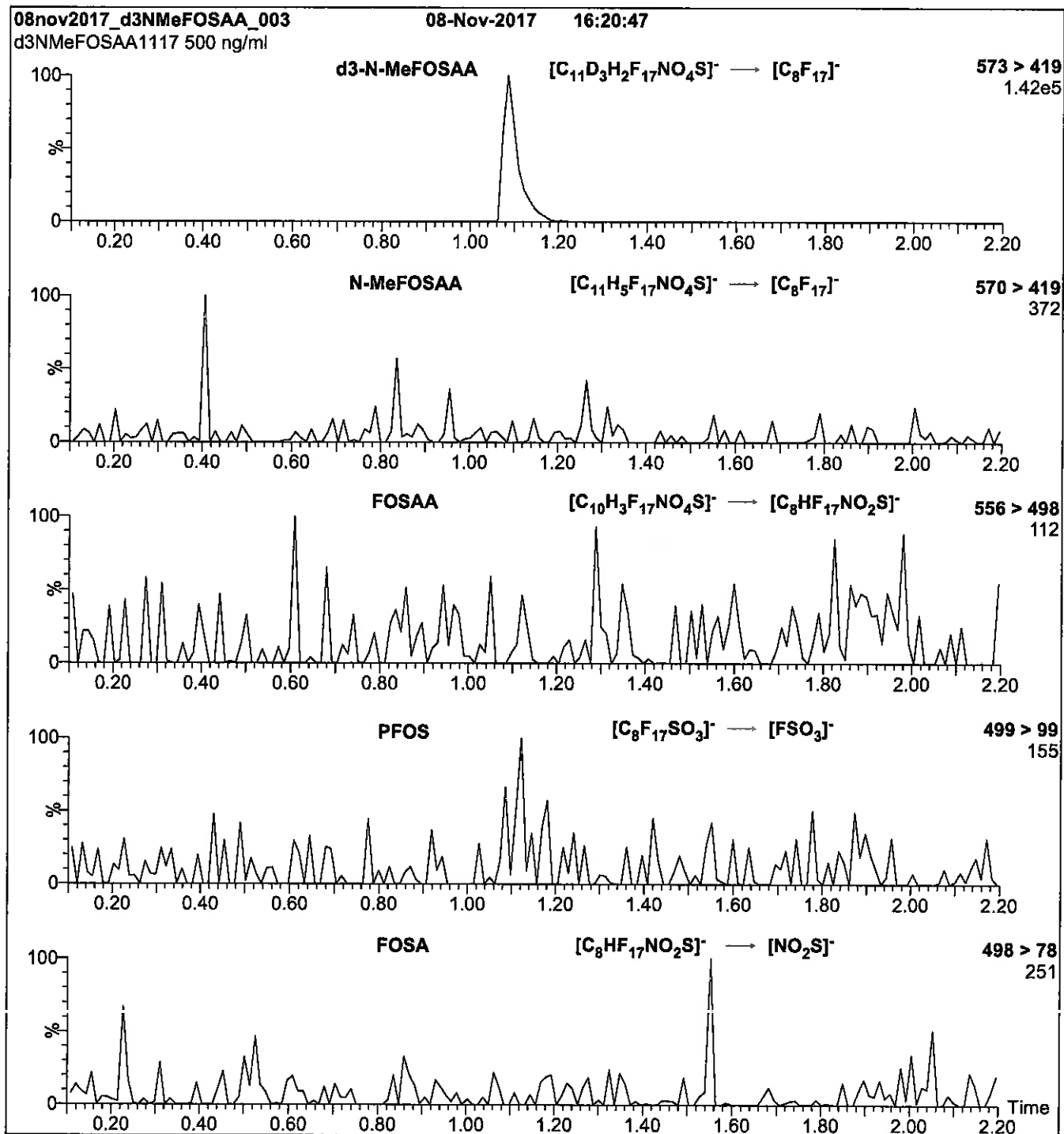
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml d3-N-MeFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 20

Reagent

LCd5-NEtFOSAA_00009



1287349

ID: LCd5-NEtFOSAA_00009

Exp: 11/08/22 Prod: CBW Opn: 05/26/18

d5-N-EtFOSAA

R: 6/26/18 CW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d5-N-EtFOSAA

LOT NUMBER:

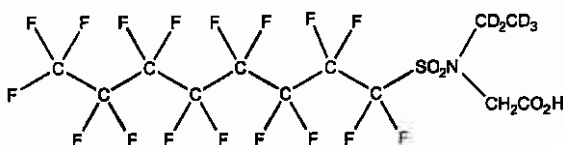
d5NEtFOSAA1117

COMPOUND:

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

STRUCTURE:**CAS #:**

Not available

**MOLECULAR FORMULA:** $C_{12}D_5H_3F_{17}NO_4S$ **CONCENTRATION:** $50 \pm 2.5 \mu\text{g/ml}$ **MOLECULAR WEIGHT:**

590.26

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY: $\geq 98\% \text{ } ^2\text{H}_5$ **LAST TESTED:** (mm/dd/yyyy)

11/08/2017

EXPIRY DATE: (mm/dd/yyyy)

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 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:

11/16/2017
(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

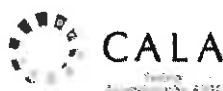
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

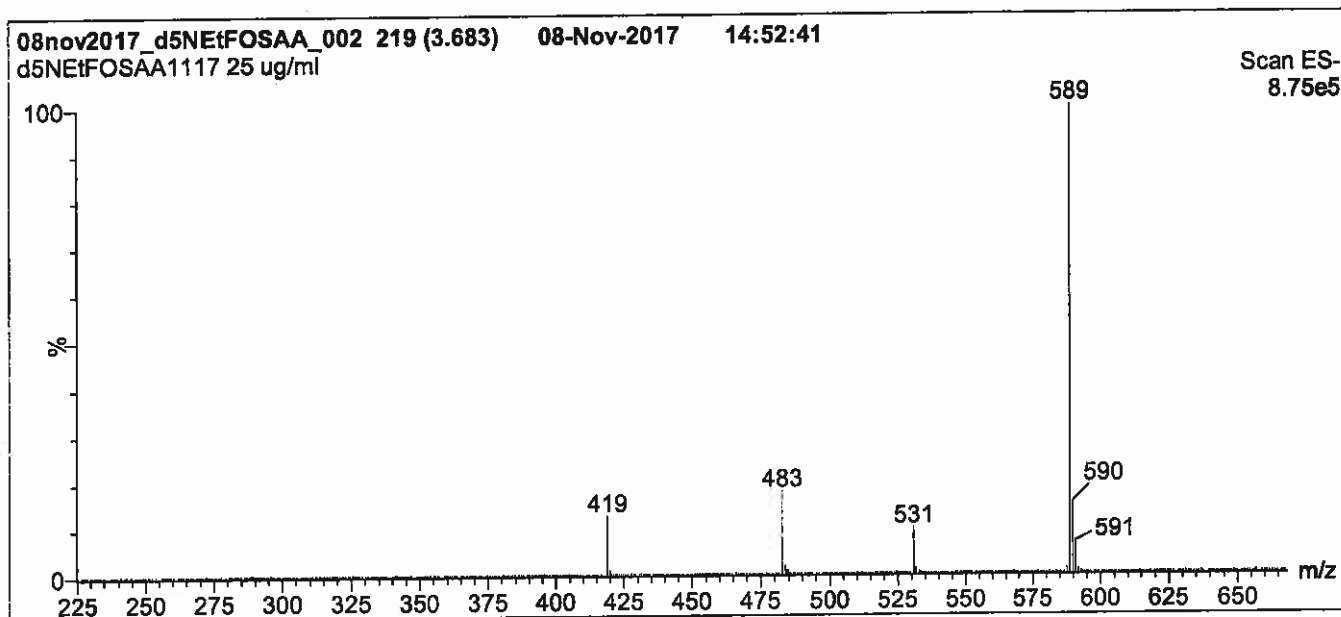
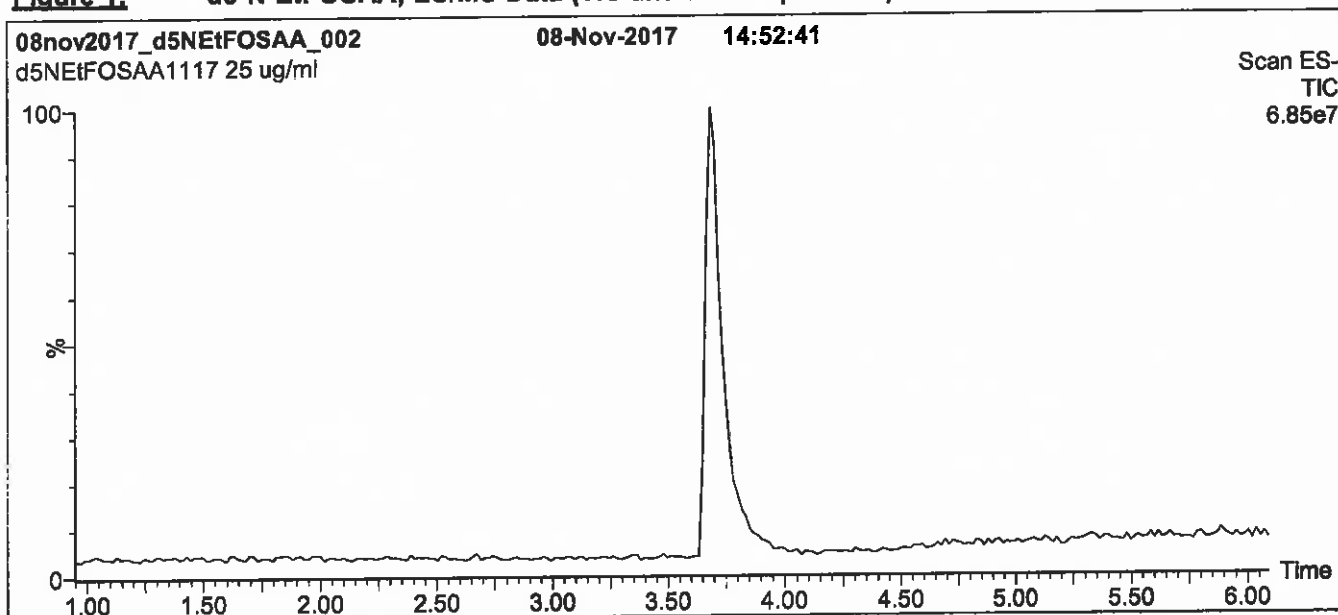
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

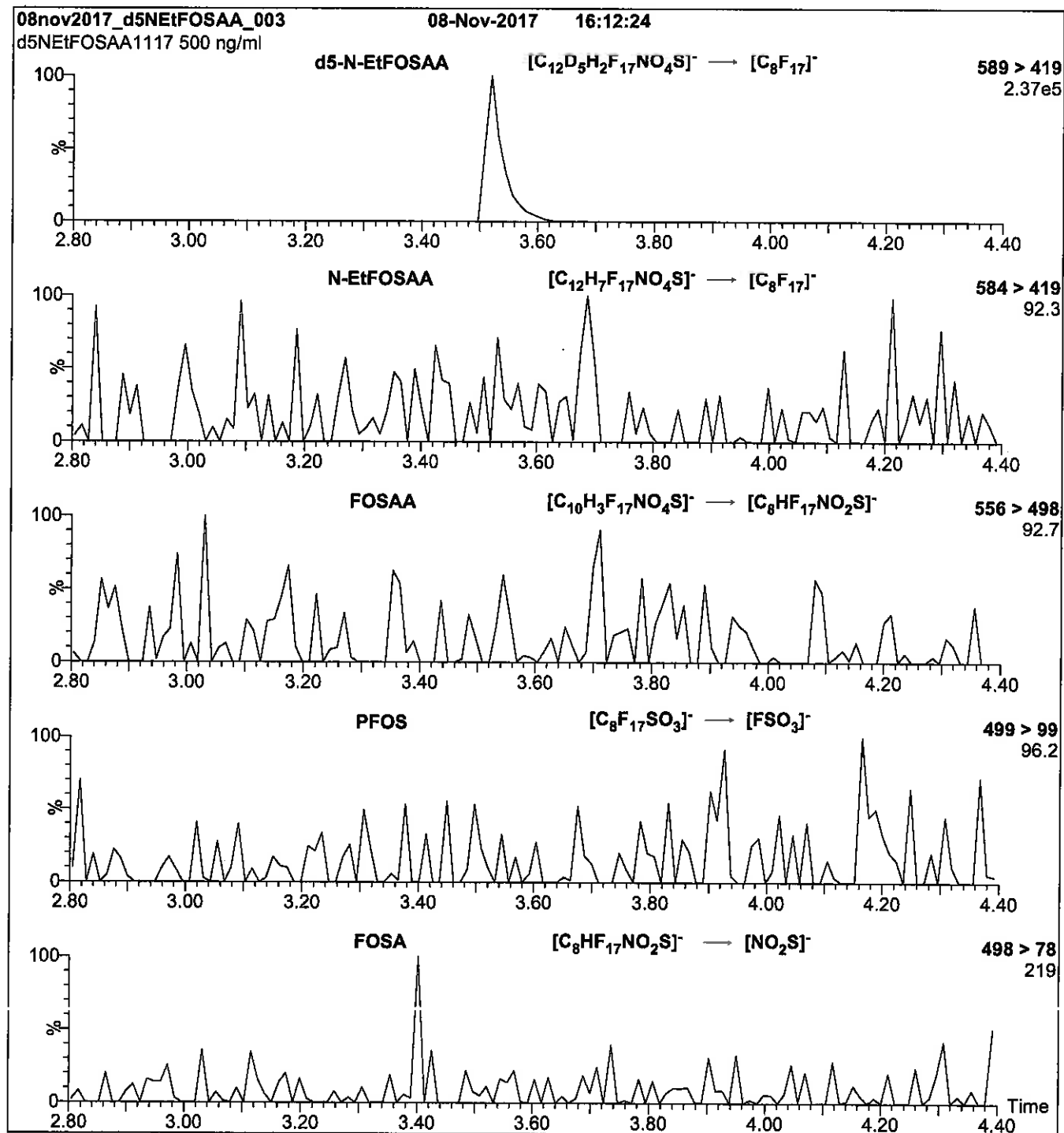
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 20

Reagent

LCDONA_00002



WELLINGTON LABORATORIES

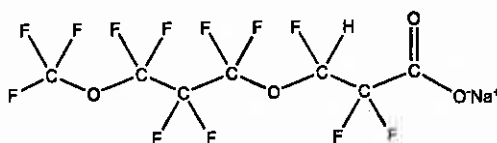
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

NaDONA

LOT NUMBER: NaDONA0318**COMPOUND:**

Sodium dodecafluoro-3H-4,8-dioxanonanoate

STRUCTURE:**CAS #:**958445-44-8
(ammonium salt)**MOLECULAR FORMULA:** $C_{12}H_2F_{12}O_4Na$ **MOLECULAR WEIGHT:**

400.05

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ (Na Salt)**SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

03/26/2018

EXPIRY DATE: (mm/dd/yyyy)

03/26/2023

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.
- Product is commercially known as ADONA.
- 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: 03/27/2018
(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

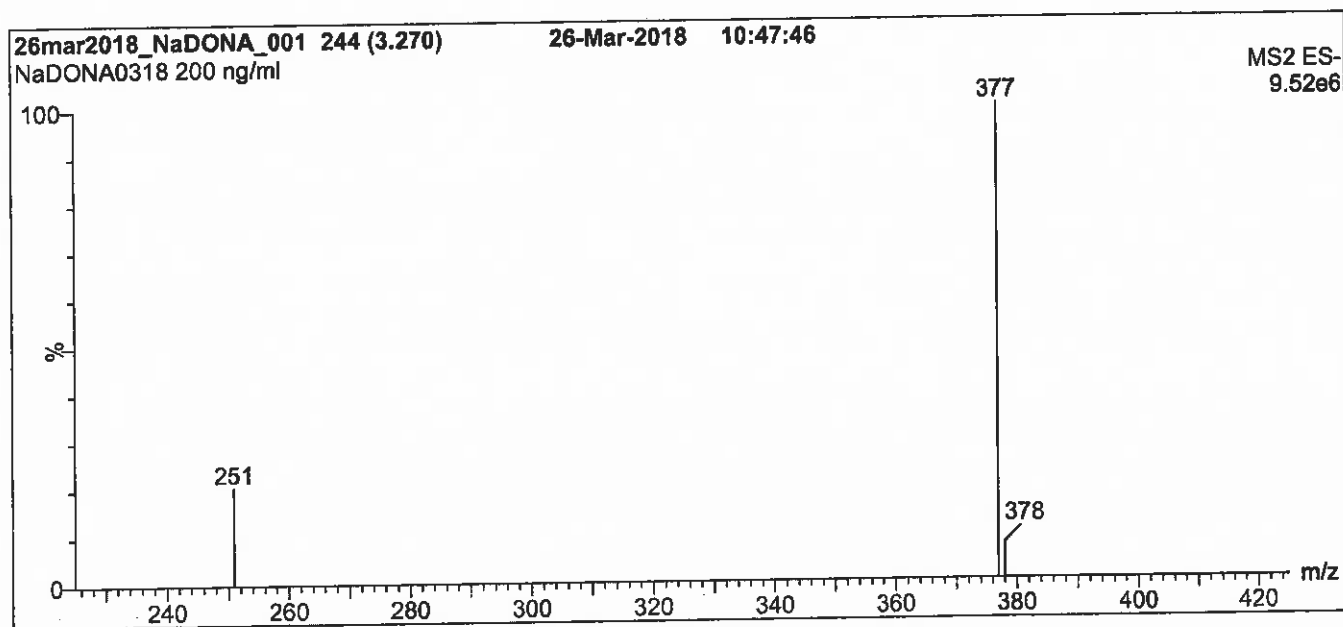
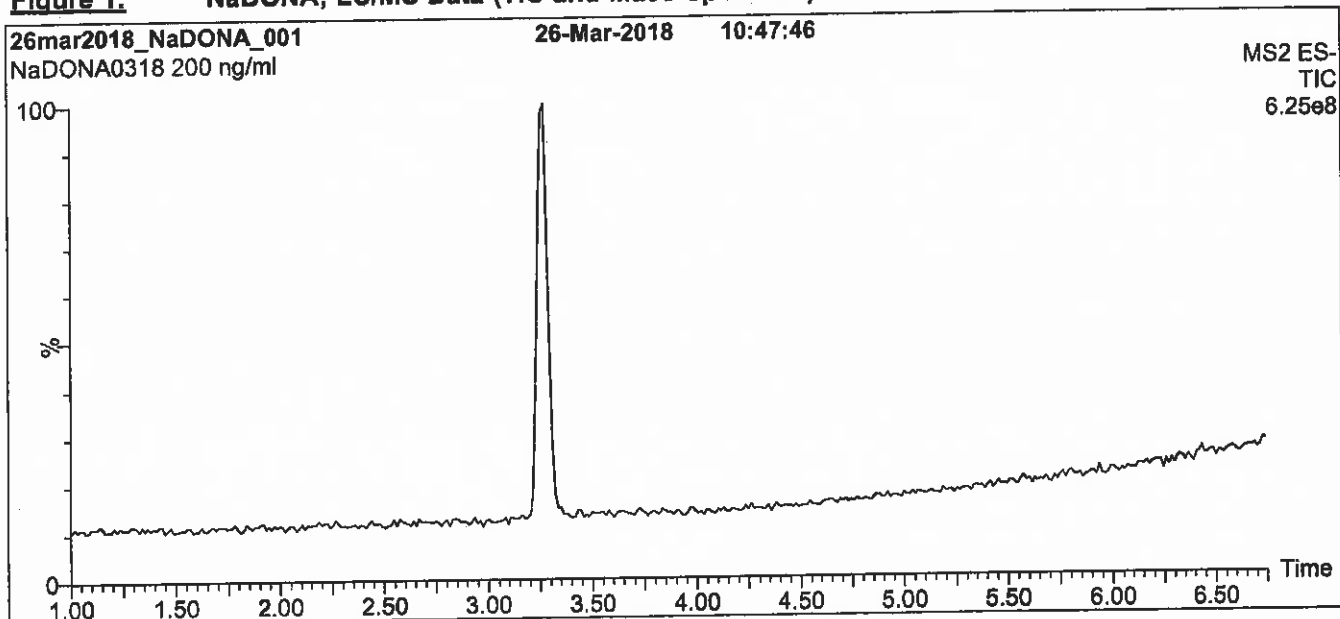
QUALITY MANAGEMENT:

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 17034 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: NaDONA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 80% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

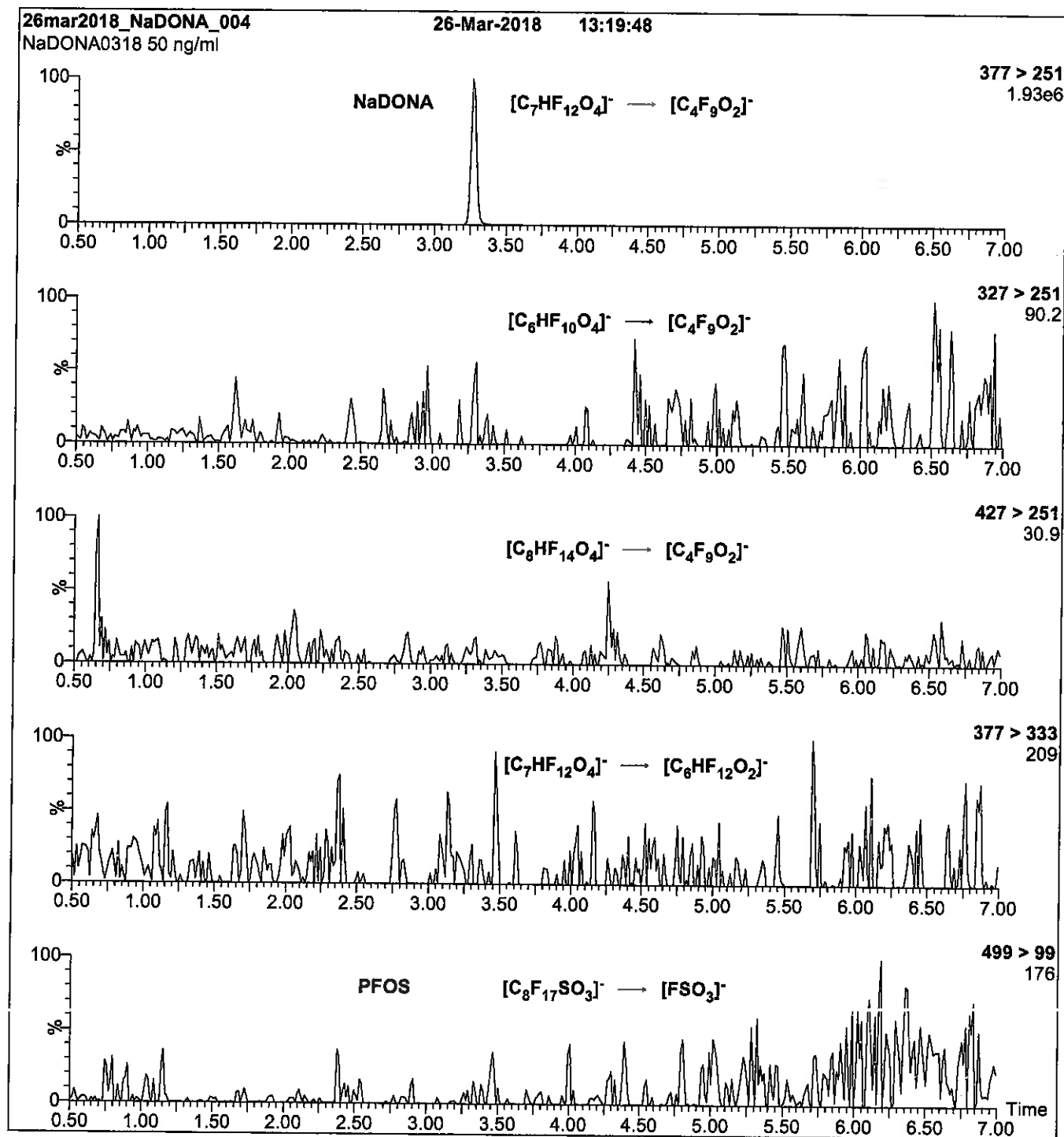
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.70
Cone Voltage (V) = 20.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (NaDONA)

Mobile phase: Same as Figure 1

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.65e-3

Collision Energy (eV) = 10

Reagent

LCHFPO-DA_00002

17/4/18/18 Seal



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

HFPO-DA

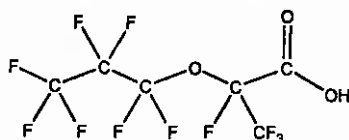
LOT NUMBER: HFPODA0318

COMPOUND:

2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid

STRUCTURE:

CAS #: 13252-13-6



MOLECULAR FORMULA:

C₈H₅F₁₁O₃

MOLECULAR WEIGHT: 330.05

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

03/26/2018

EXPIRY DATE: (mm/dd/yyyy)

03/26/2021

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.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 03/28/2018
(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

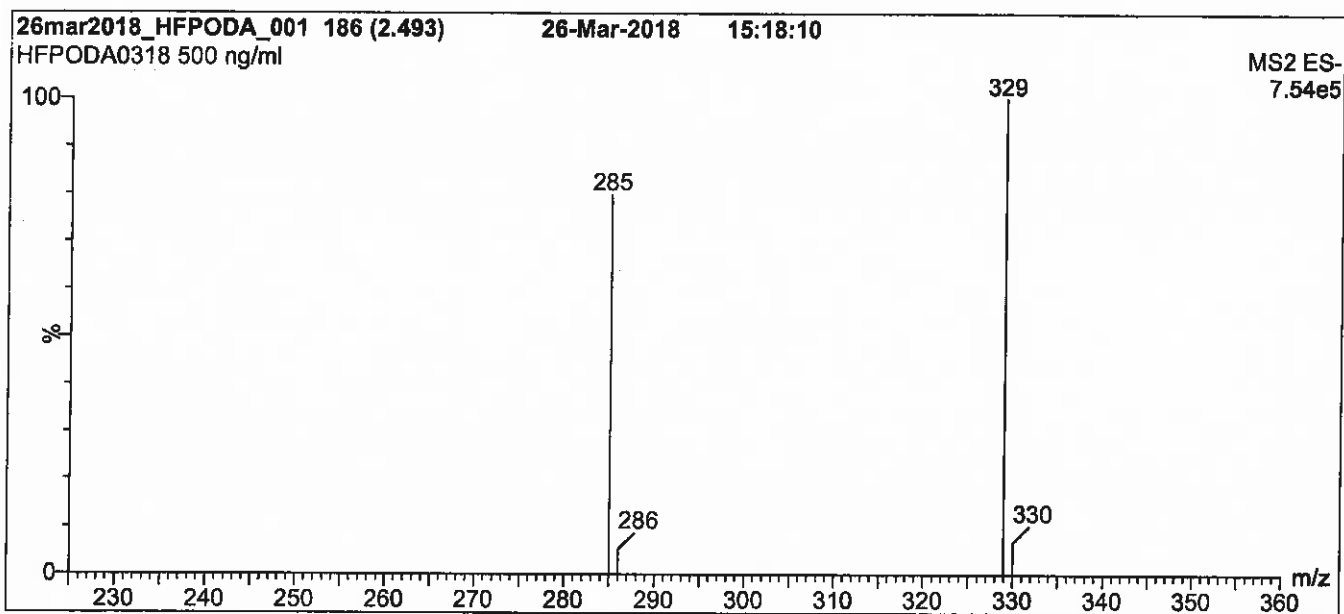
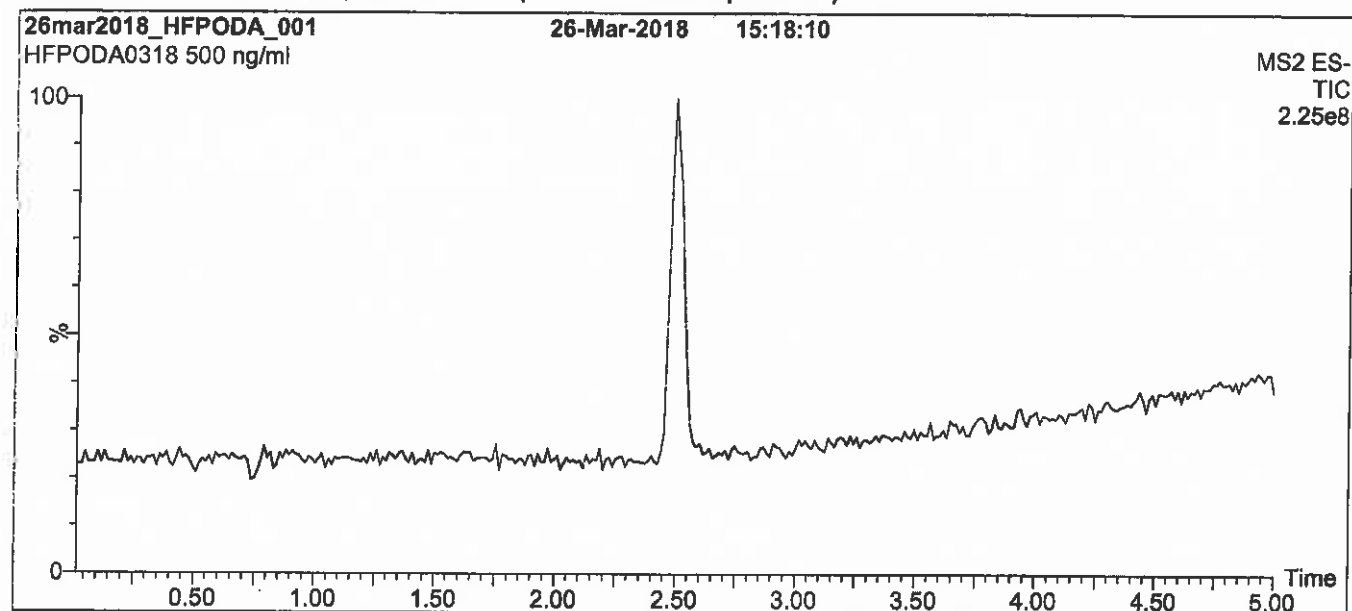
QUALITY MANAGEMENT:

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 17034 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: HFPO-DA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 80% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

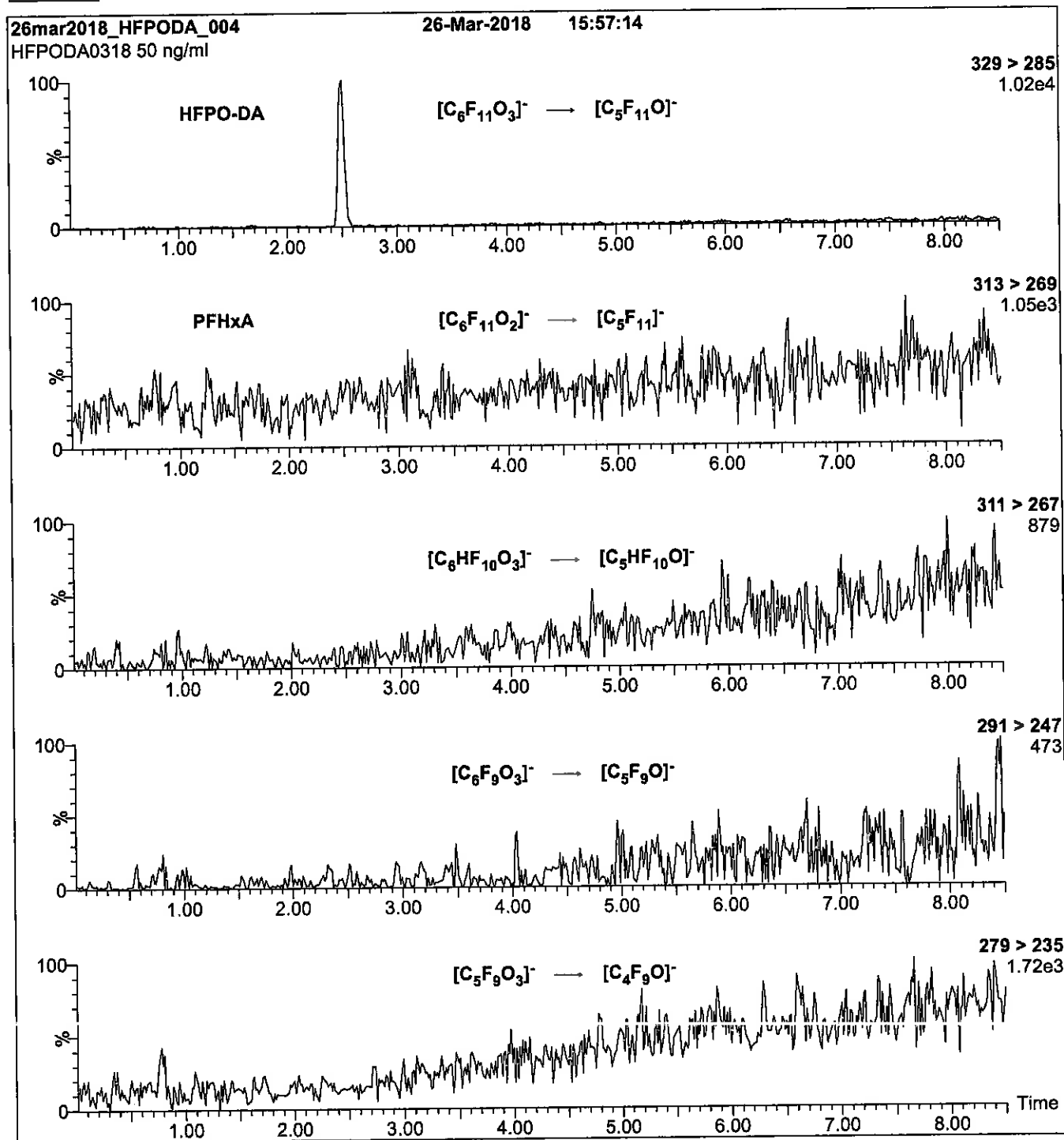
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.10
Cone Voltage (V) = 7.50
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (l/hr) = 750

Figure 2: HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: On-column (HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.69e-3

Collision Energy (eV) = 6

Reagent

LCM2-6:FTS_00009



1287352
ID: LCM2-6:FTS_00009
Exp:02/16/23 Ppdt:CBW Opn:05/26/18
M2-6:2FTS

2:6/26/18 *lsc*



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-6:2FTS

LOT NUMBER:

M262FTS0218

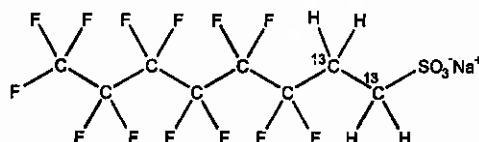
COMPOUND:

Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]octane sulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₆H₄F₁₃SO₃Na

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)
47.5 ± 2.4 µg/ml (M2-6:2FTS anion)

MOLECULAR WEIGHT:

452.13

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C
(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy)

02/16/2018

EXPIRY DATE: (mm/dd/yyyy)

02/16/2023

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:

B.G. Chittim, General Manager

Date: 03/07/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

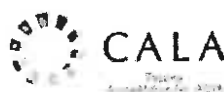
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

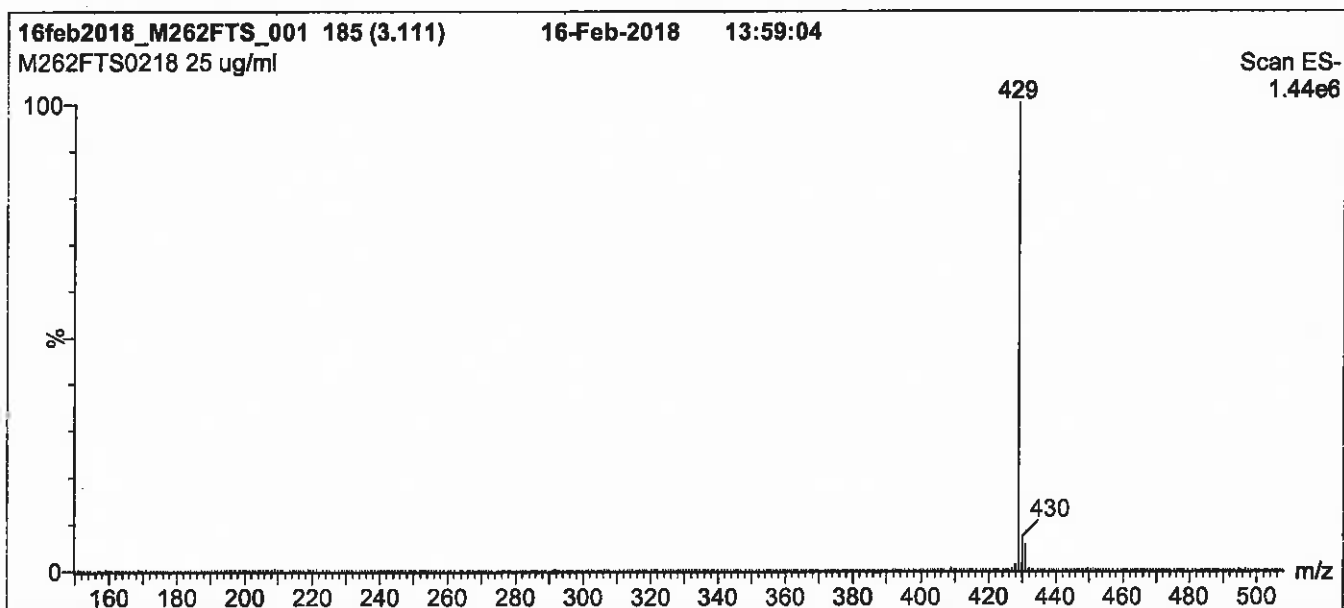
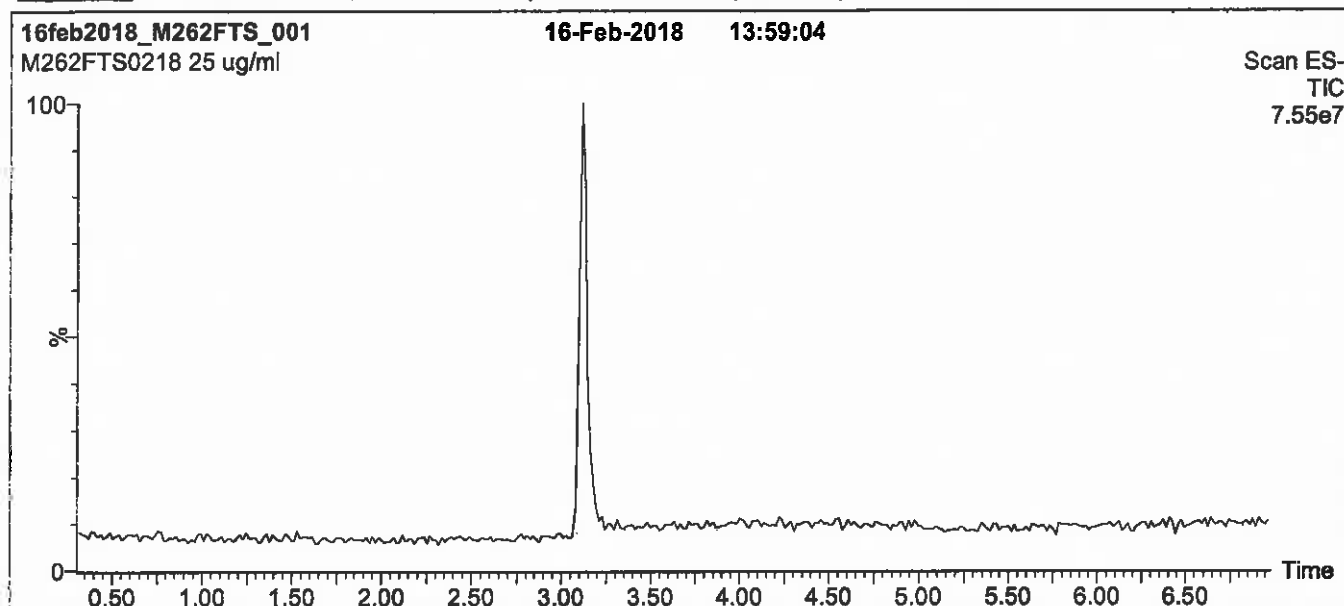
QUALITY MANAGEMENT:

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 17034 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: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

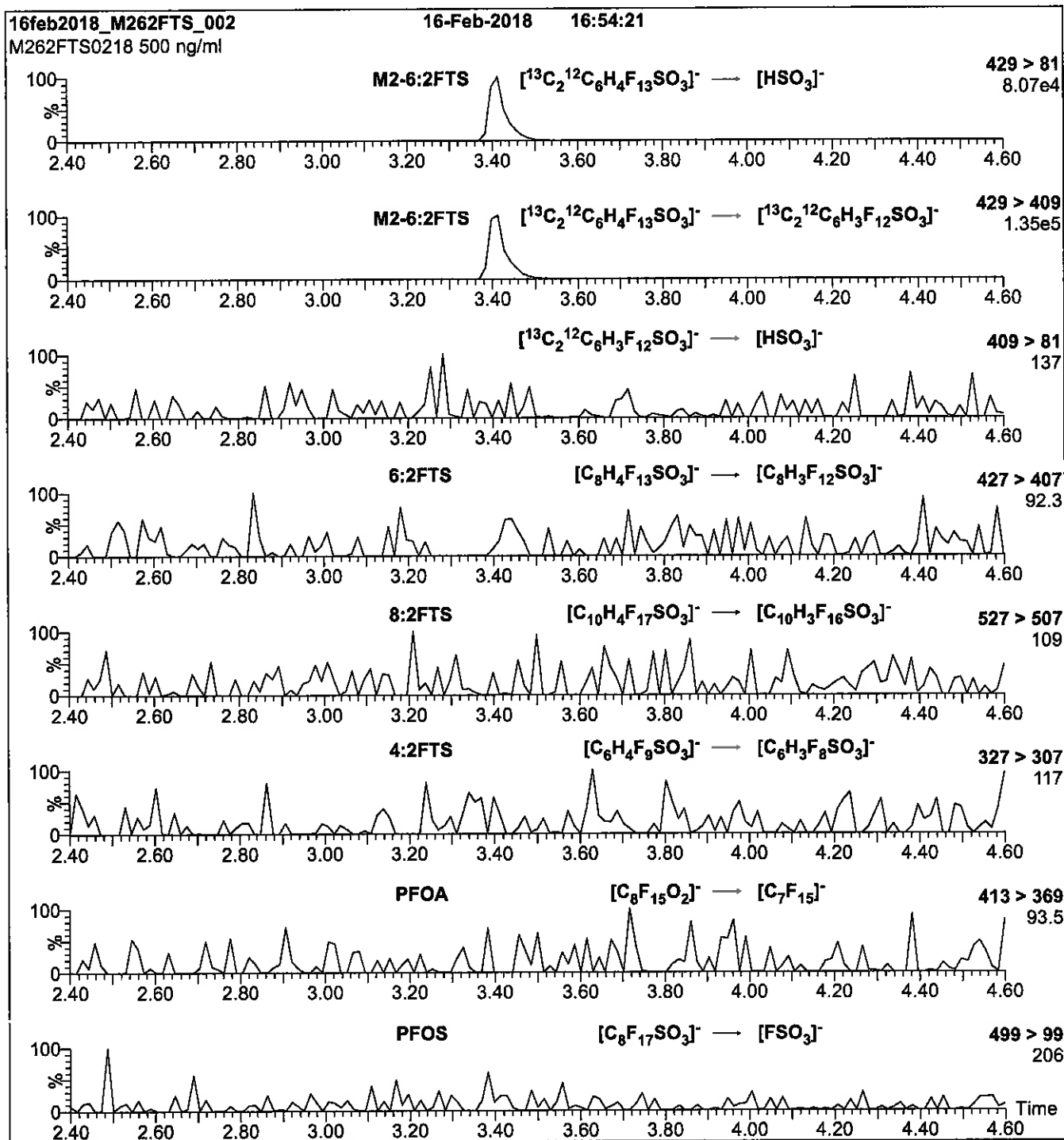
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2-6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00011



1287355

ID: LCM2-8:2FTS_03011

Exp: 01/24/23 Prod: CBW Opm: 05/26/18

M2-8:2FTS

R: 6/26/18 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

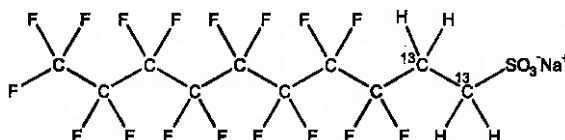
M2-8:2FTS

LOT NUMBER:

M282FTS0118

COMPOUND:Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₈H₄F₁₇SO₃Na**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)

MOLECULAR WEIGHT:

552.15

SOLVENT(S):

Methanol

47.9 ± 2.4 µg/ml (M2-8:2FTS anion)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C**LAST TESTED:** (mm/dd/yyyy)

01/24/2018

(1,2-¹³C₂)**EXPIRY DATE:** (mm/dd/yyyy)

01/24/2023

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:

B.G. Chittim, General Manager

Date:

01/26/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

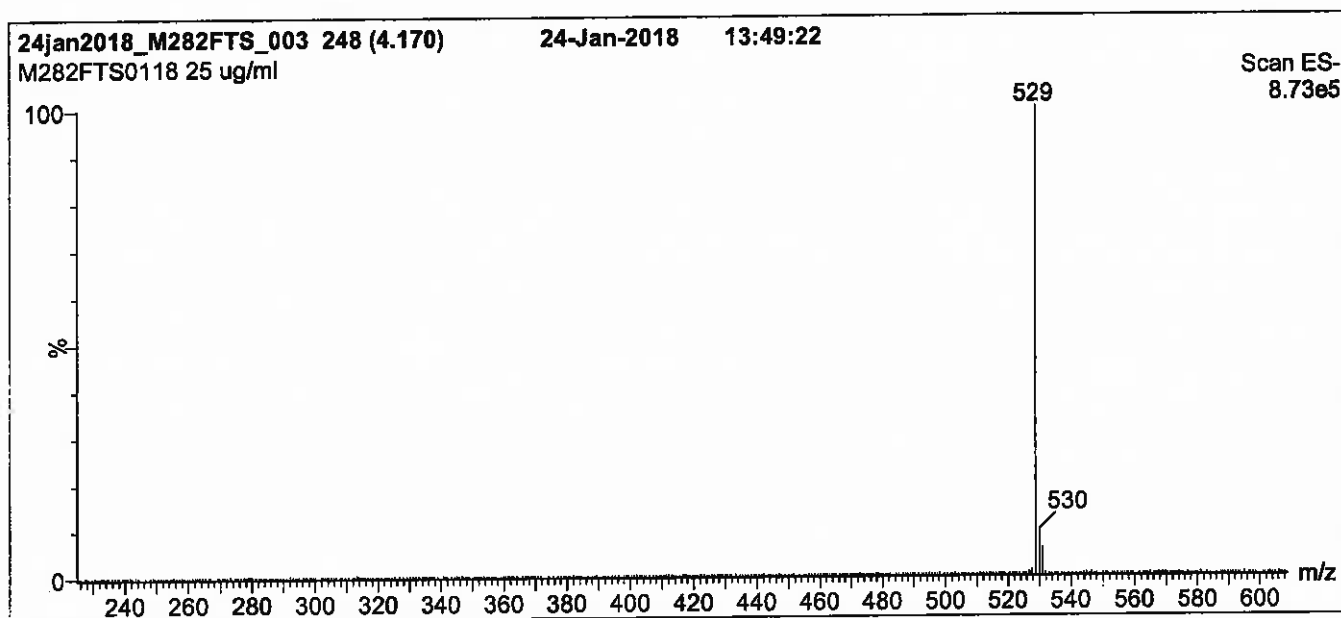
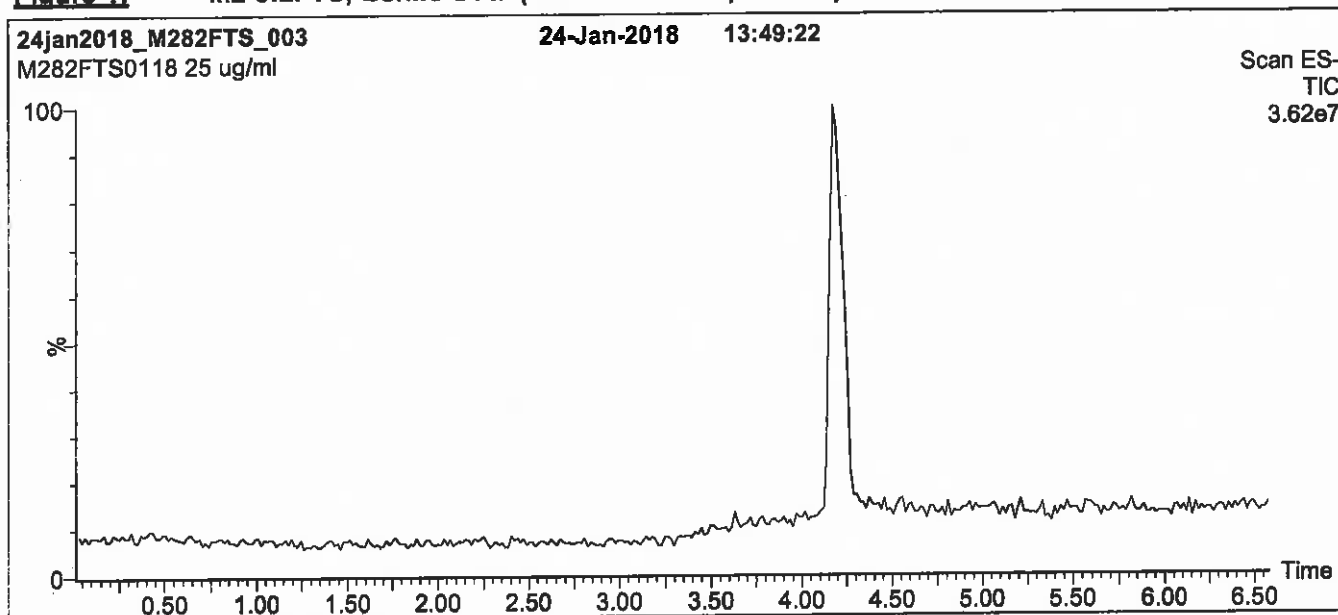
QUALITY MANAGEMENT:

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 17034 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: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

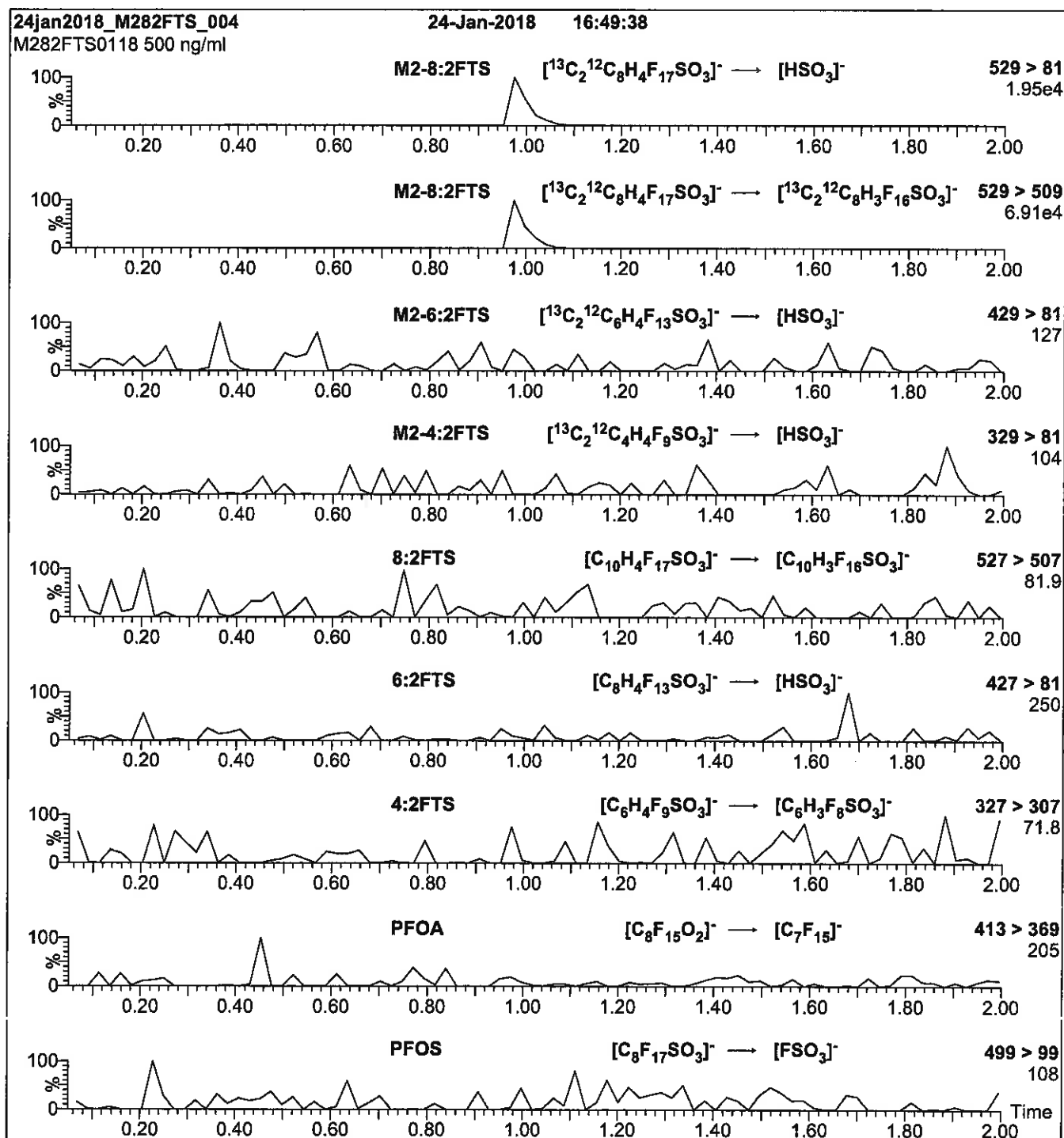
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2-8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 25

Reagent

LCM2PFHxDA_00017



1287278
ID: LCM2PFHxDA_00017
Exp 07/13/22 Prod: CBW Opn 06/26/16
13C2-PFHxDA at 50ug/ml

R: 6/26/18 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA0717

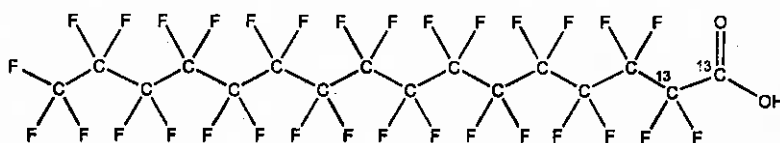
COMPOUND:

Perfluoro-n-[1,2-¹³C₂]hexadecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₄HF₃₁O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

816.11

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 07/14/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

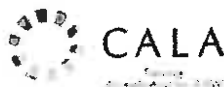
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

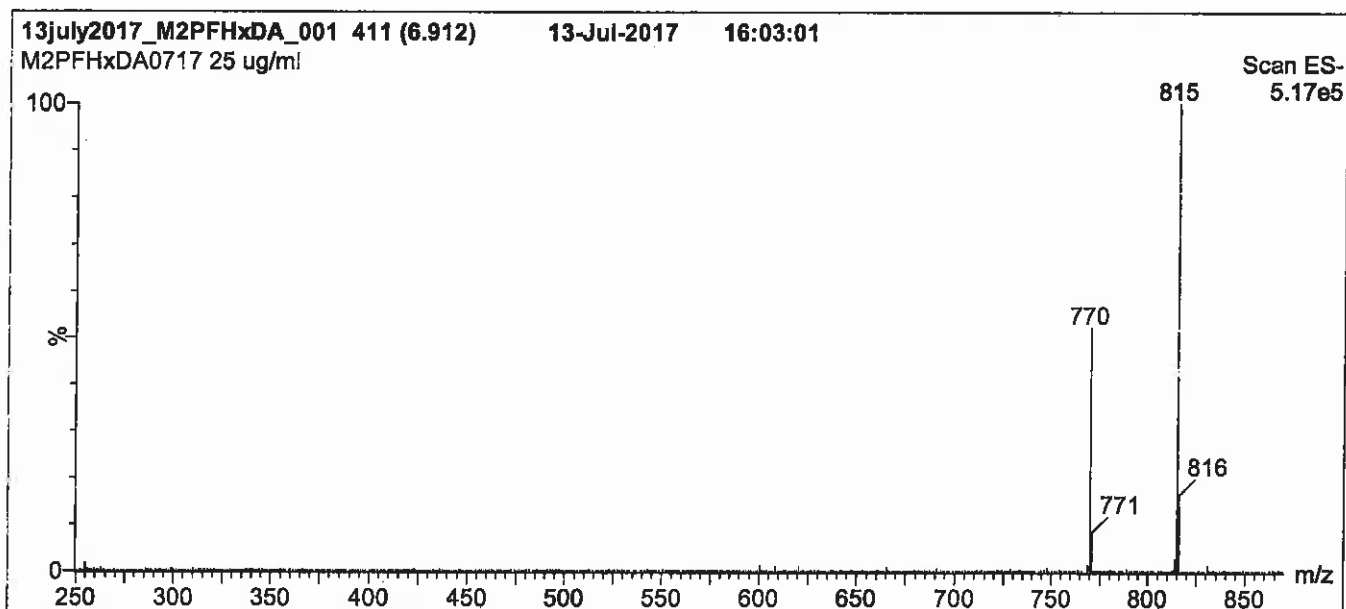
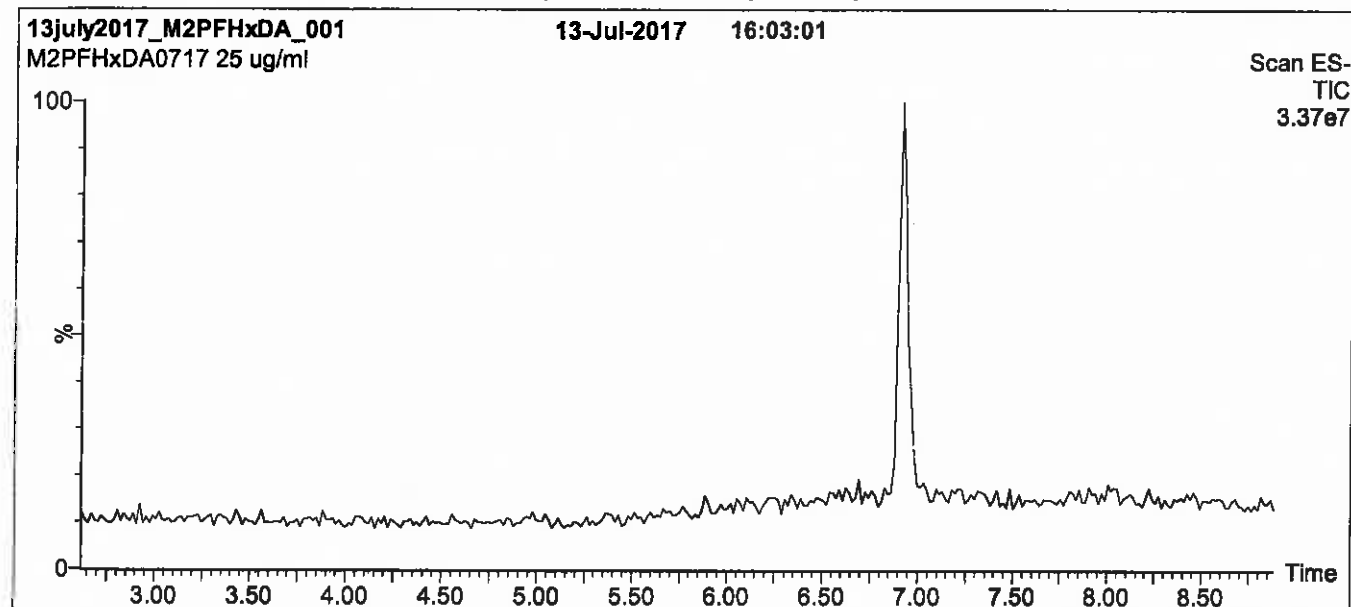
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

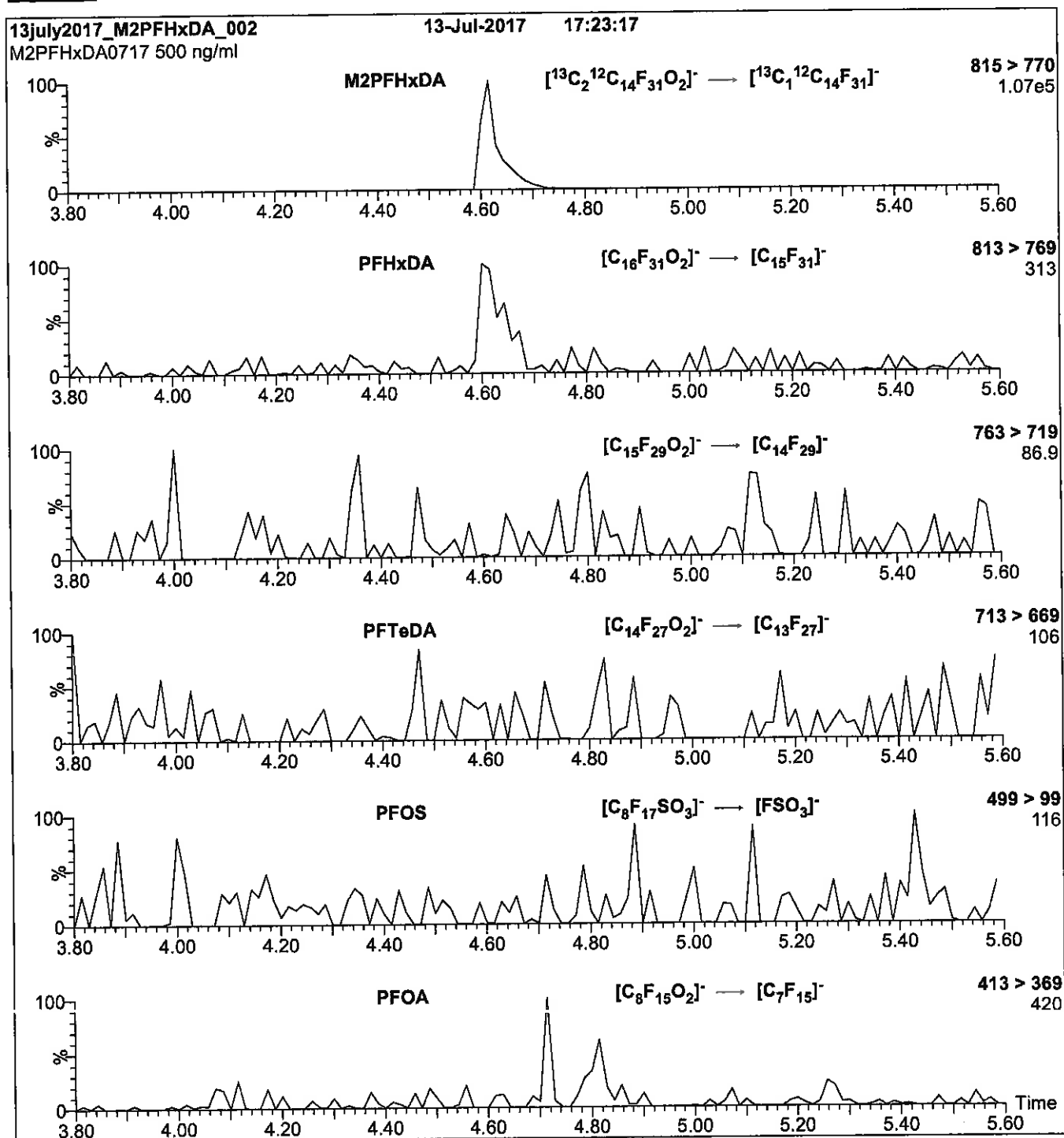
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM2PFOA_00008



WELLINGTON LABORATORIES

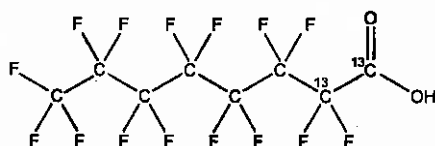
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]octanoic acid

LOT NUMBER: M2PFOA0216

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 416.05
SOLVENT(S): 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/yyyy)

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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

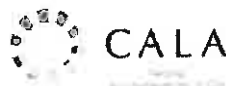
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

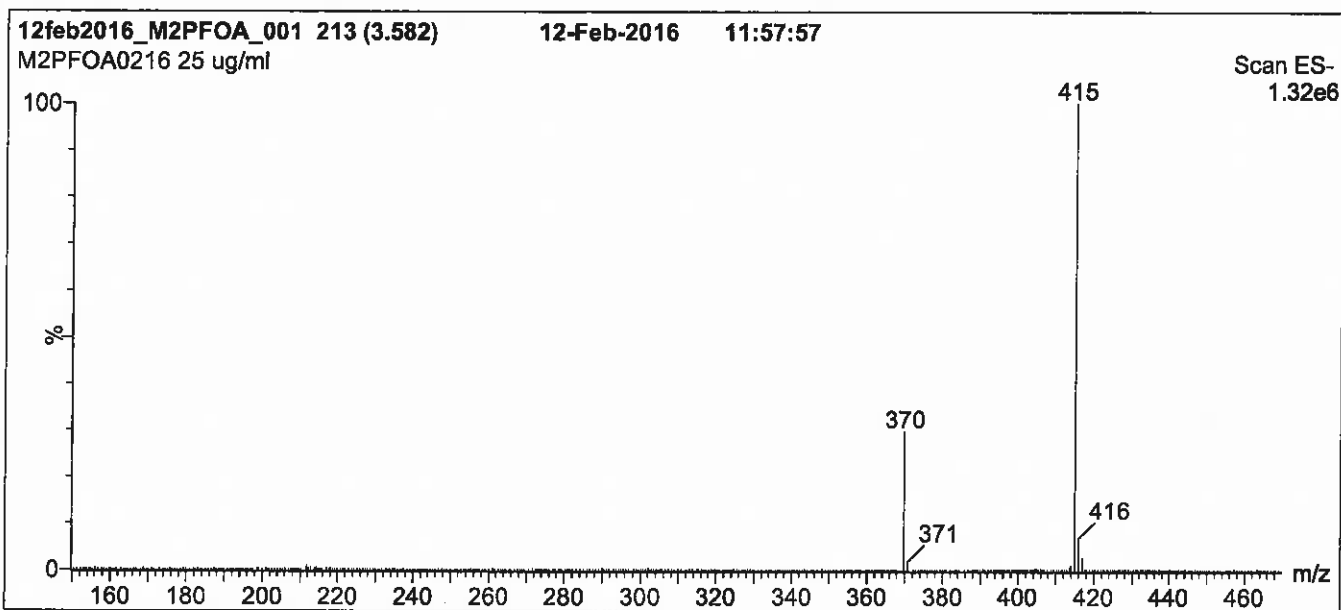
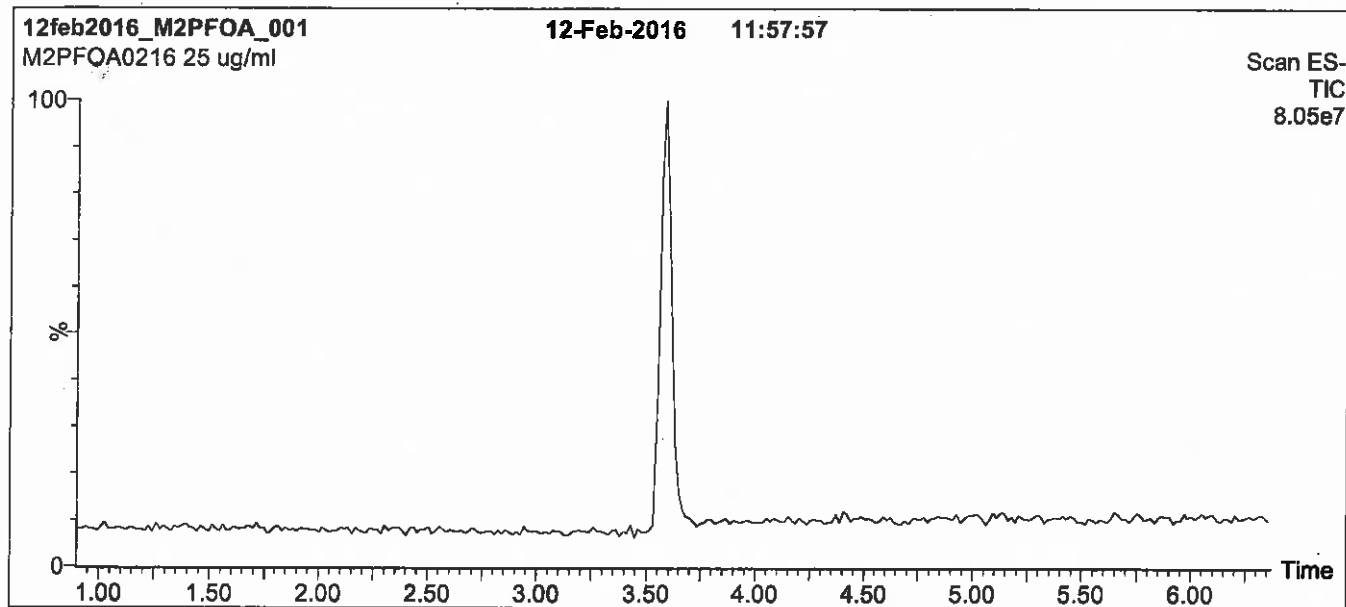
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

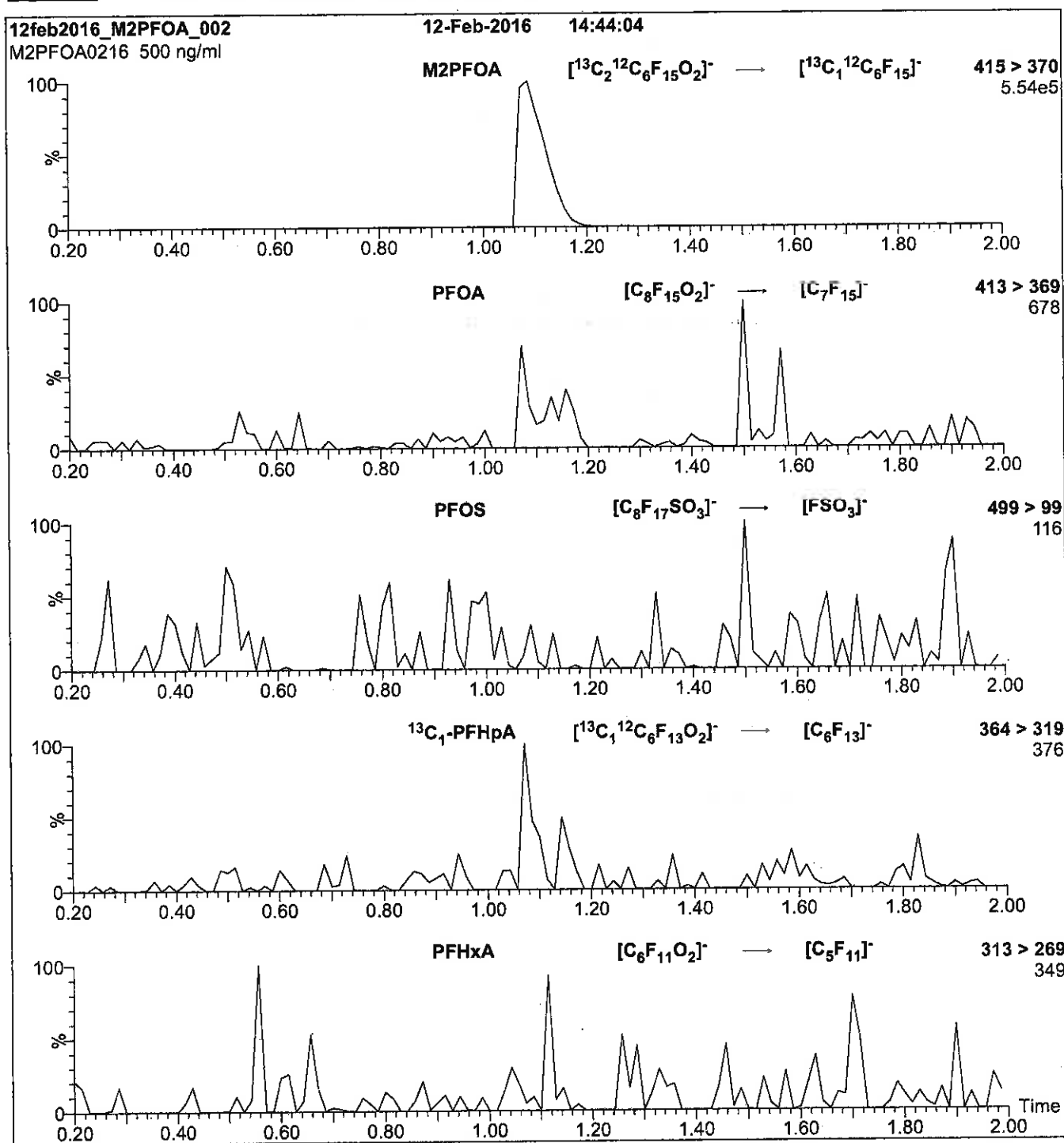
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

Reagent

LCM2PFOA_00012

P: 6/26/18 *can*



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFOA

COMPOUND:

Perfluoro-n-[1,2-¹³C₂]octanoic acid

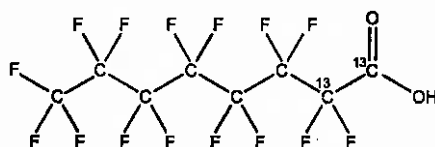
LOT NUMBER:

M2PFOA1017

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₆HF₁₆O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

416.05

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

10/26/2017

EXPIRY DATE: (mm/dd/yyyy)

10/26/2022

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: 10/30/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

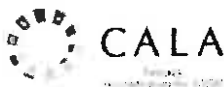
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

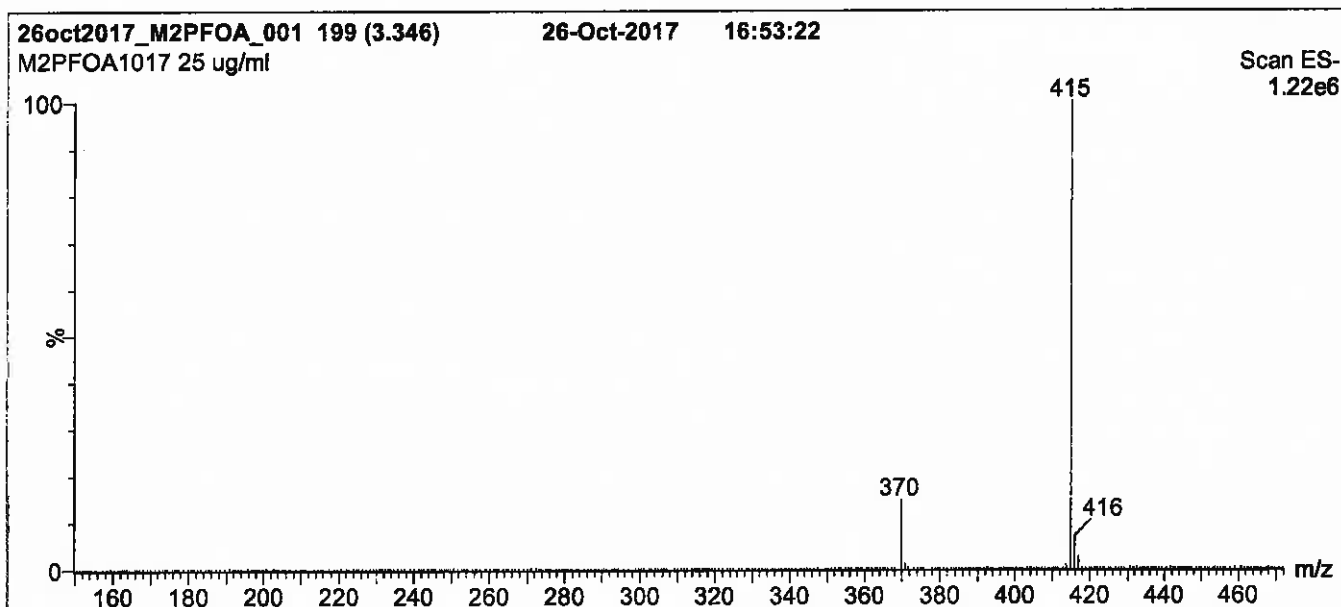
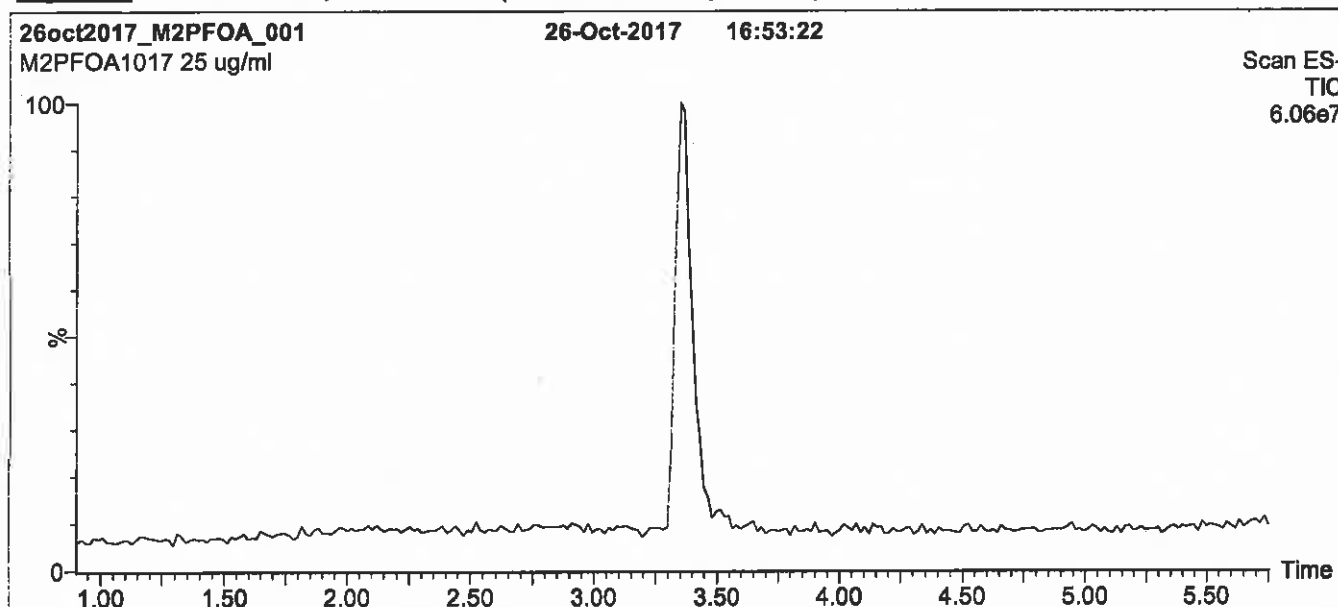
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

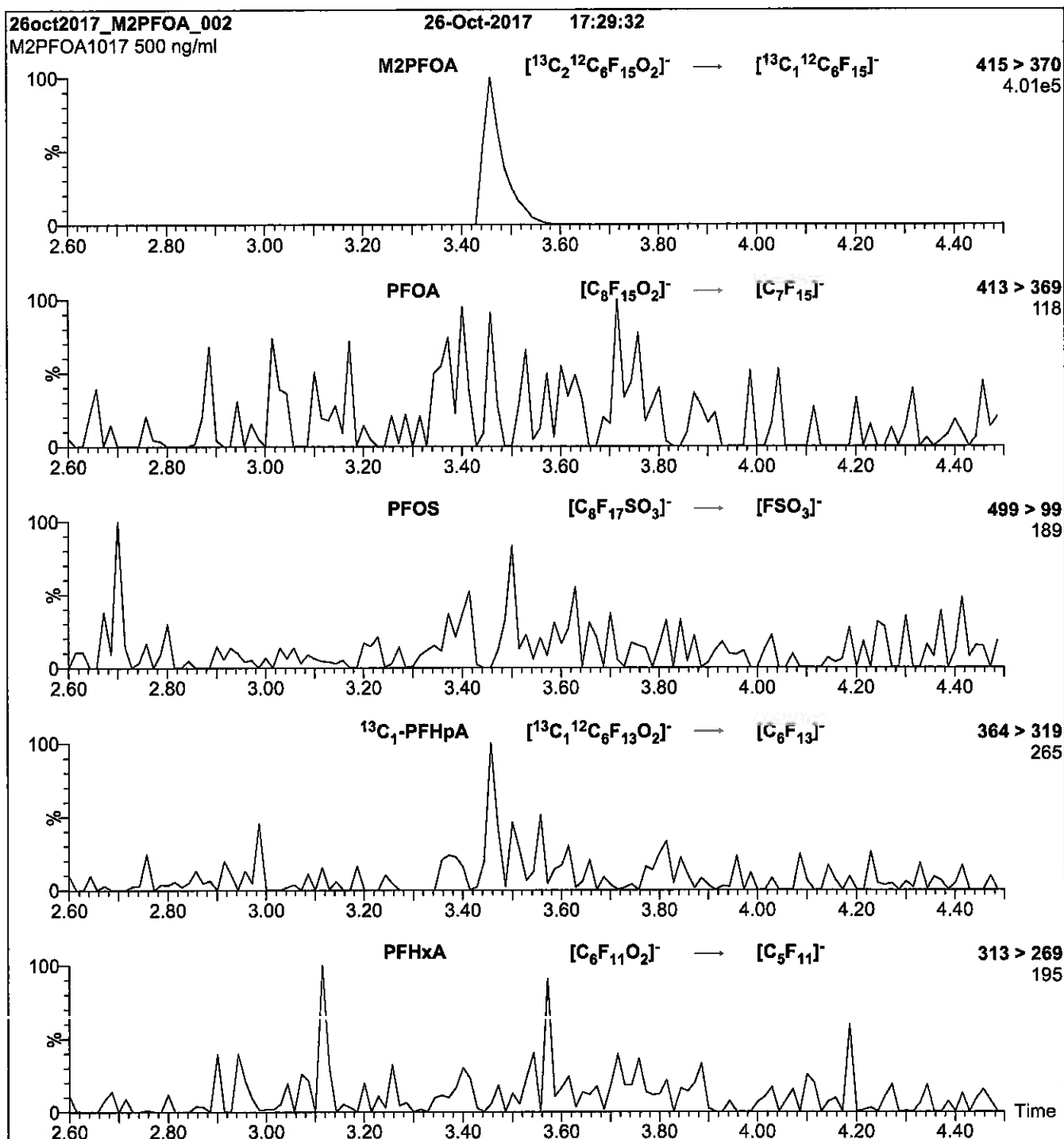
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 10

Reagent

LCM2PFTeDA_00015



R: 6/26/18 CBW

1287281

ID: LCM2PFTeDA_03015

Exp: 11/30/22 Prod: CBW Opn: 06/26/18

13C2-PFTeDA at 50ug/mL

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

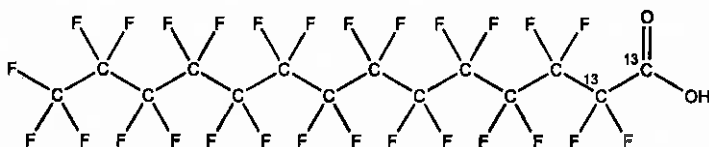
M2PFTeDA

LOT NUMBER:

M2PFTeDA1117

COMPOUND:Perfluoro-n-[1,2-¹³C₂]tetradecanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₁₂HF₂₇O₂**CONCENTRATION:**

50 ± 2.5 µg/mL

MOLECULAR WEIGHT:

716.10

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C(1,2-¹³C₂)**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

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

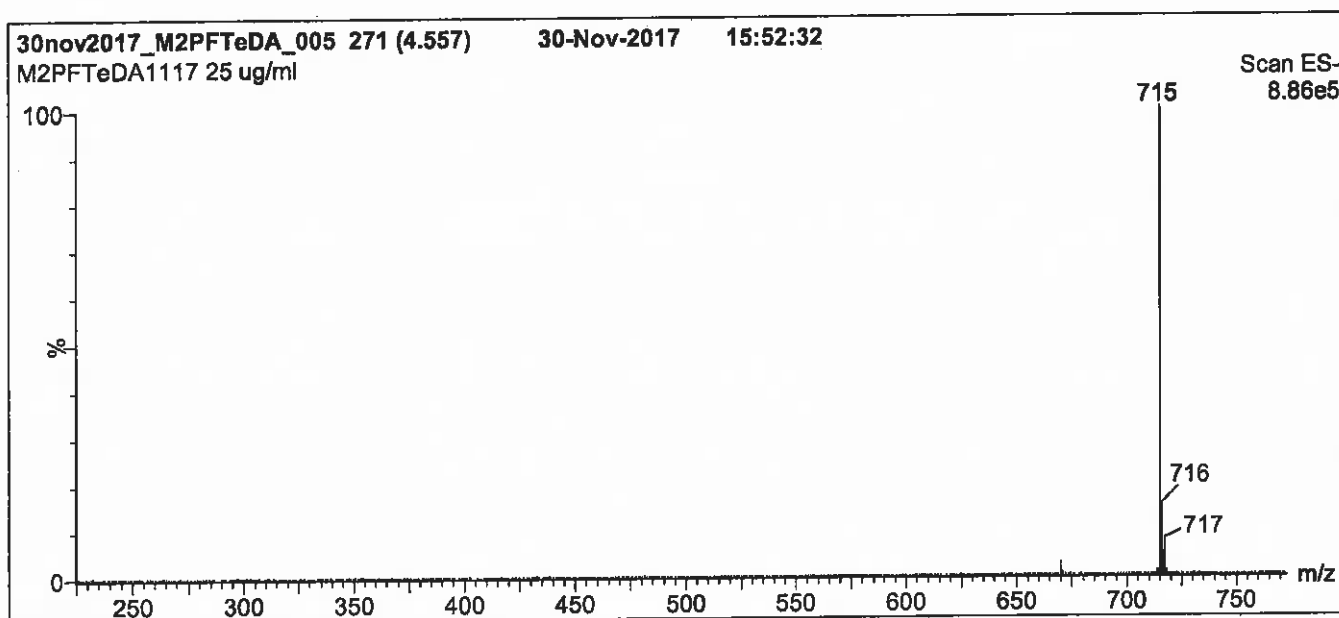
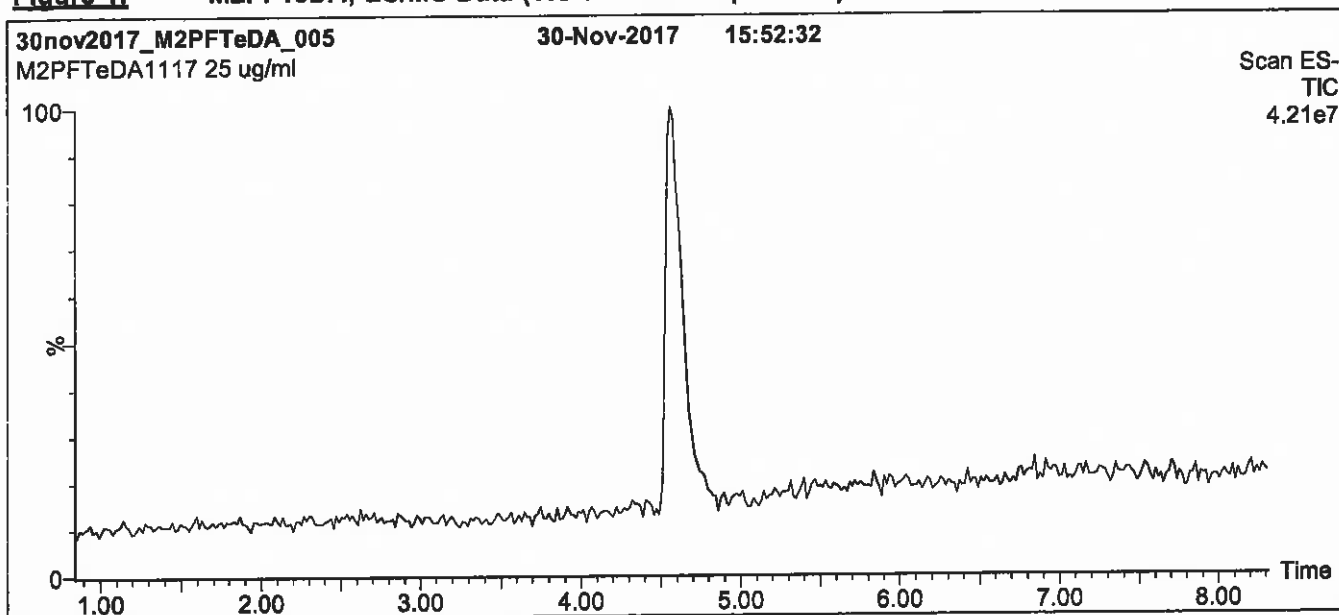
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

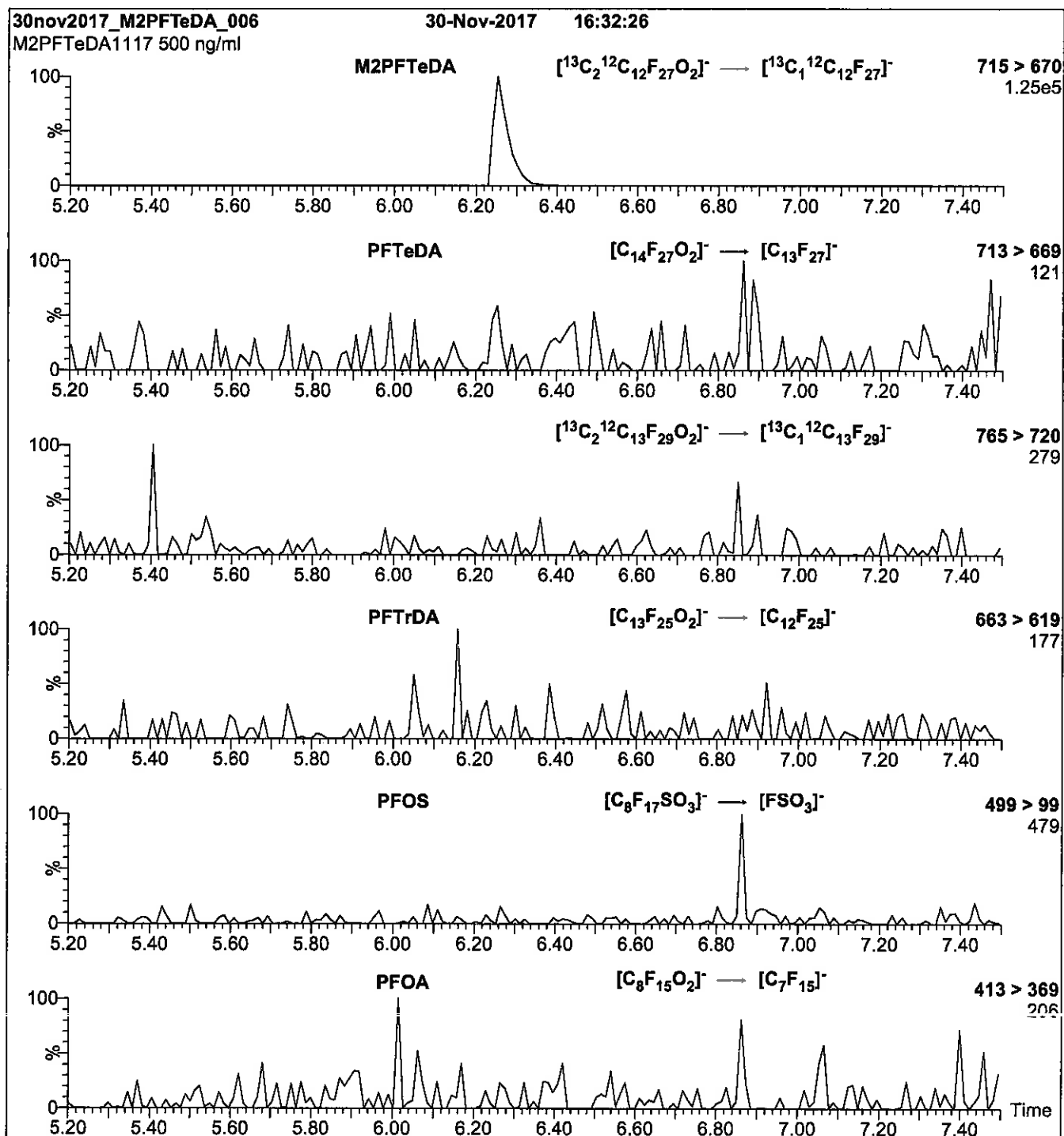
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM3HFPO-DA_00004

R: 6/26/18 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M3HFPO-DA

LOT NUMBER:

M3HFPODA0518

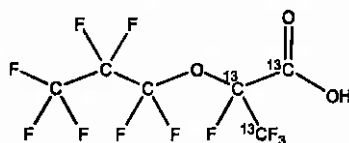
COMPOUND:

2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-¹³C₃-propanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₃¹²C₃HF₁₁O₃

CONCENTRATION:

50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/18/2018

EXPIRY DATE: (mm/dd/yyyy)

05/18/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

MOLECULAR WEIGHT:

333.03

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

≥99% ¹³C
(¹³C₃)

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 ~ 1.5% of two constitutional isomers.
- Product is commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 05/25/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

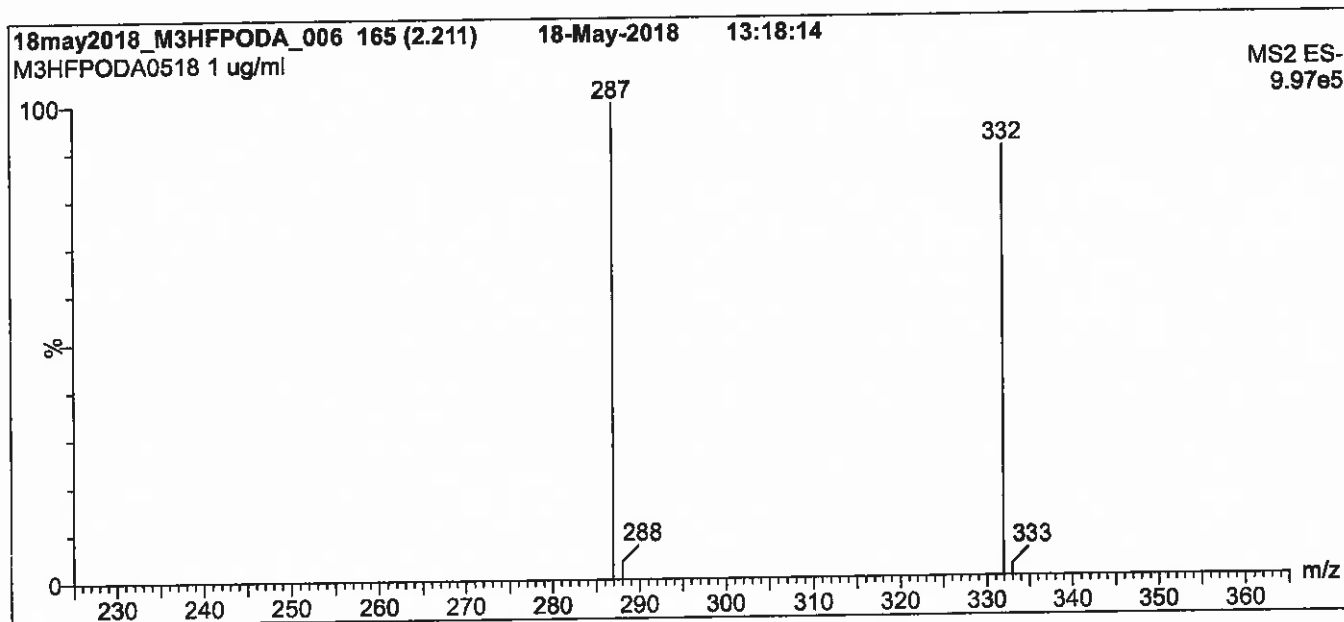
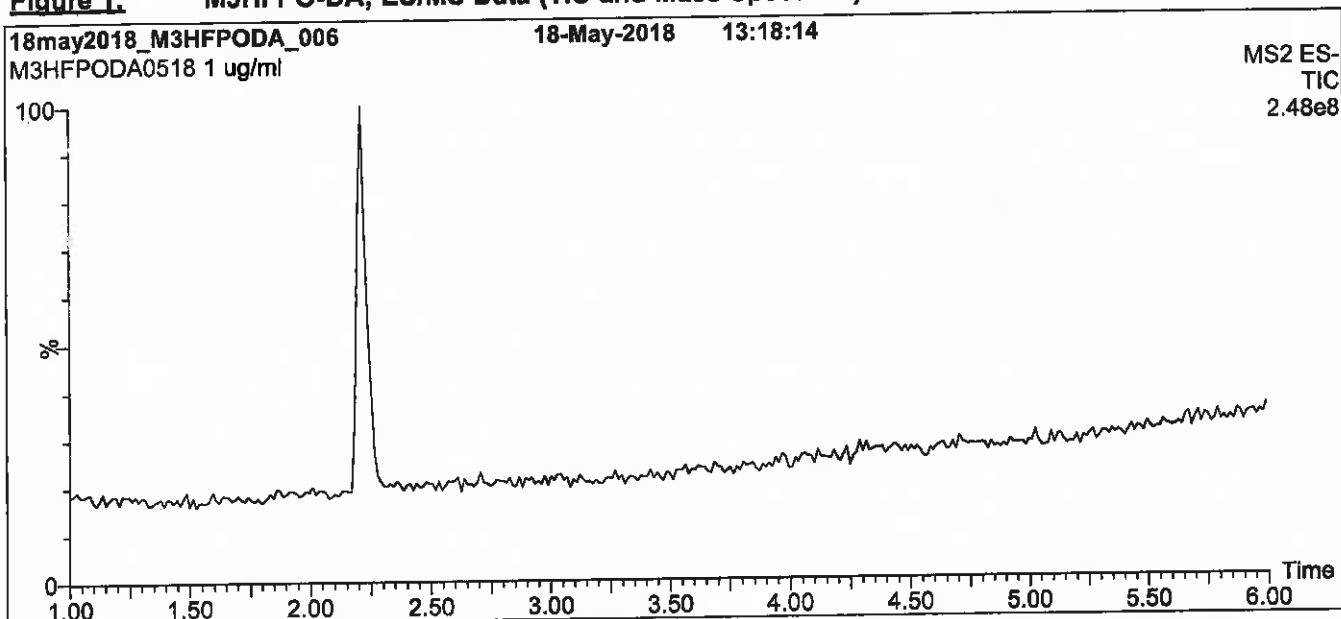
QUALITY MANAGEMENT:

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 17034 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: M3HFPO-DA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

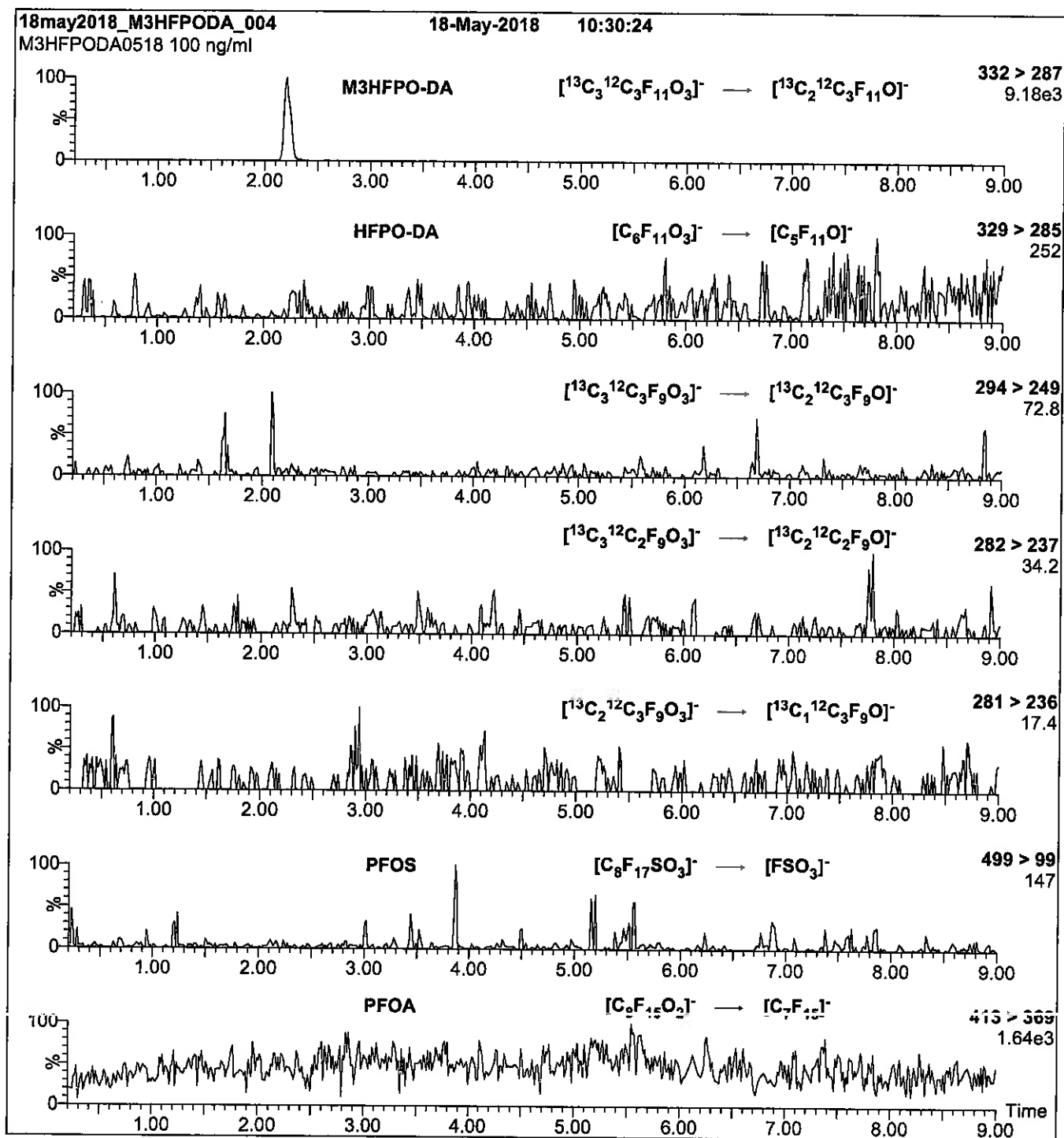
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.10
Cone Voltage (V) = 7.50
Desolvation Temperature (°C) = 350
Desolvation Gas Flow (l/hr) = 750

Figure 2: M3HFPO-DA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: On-column (M3HFPO-DA)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.50e-3

Collision Energy (eV) = 6

Reagent

LCM4PFHPA_00015



1287287
ID: LCM4PFHPA_00015
Exp: 05/03/22 Prod: CBW Opn: 05/26/18
13C4-Perfluoroheptanoic a

R 6/26/18 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M4PFHPA

LOT NUMBER:

M4PFHPA0517

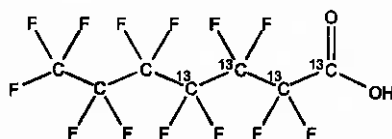
COMPOUND:

Perfluoro-n-[1,2,3,4-¹³C₄]heptanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₄¹²C₃HF₁₃O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

368.03

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

05/03/2017

EXPIRY DATE: (mm/dd/yyyy)

05/03/2022

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

(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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 05/11/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

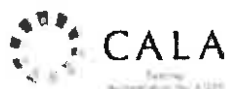
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

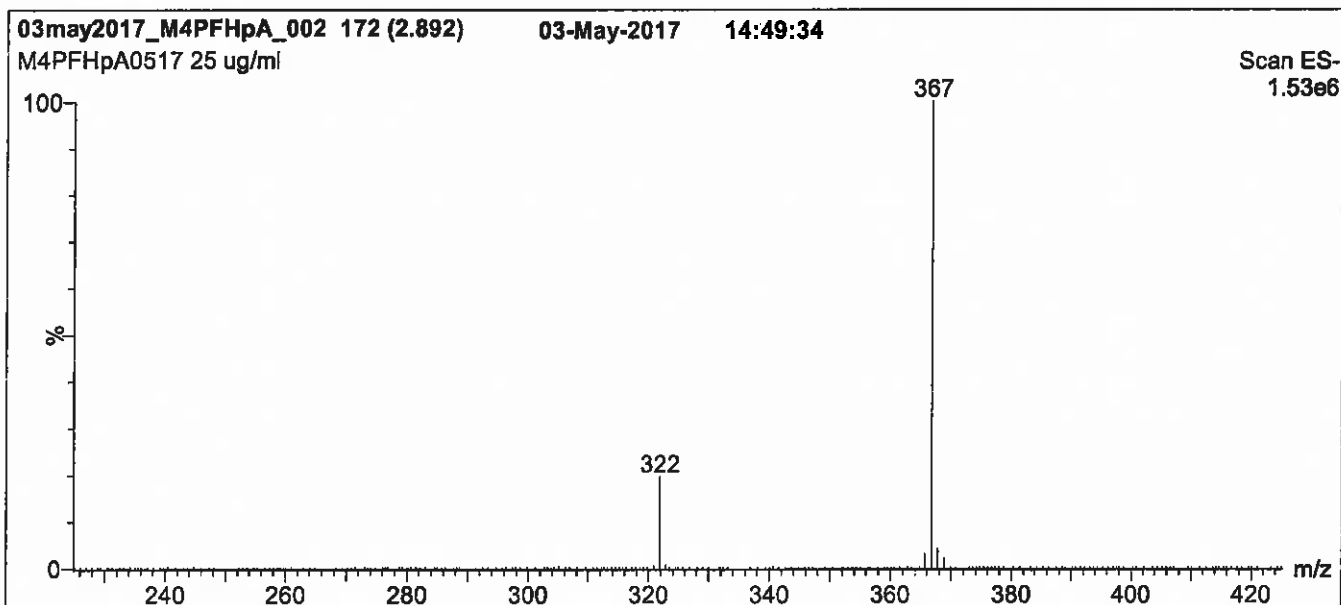
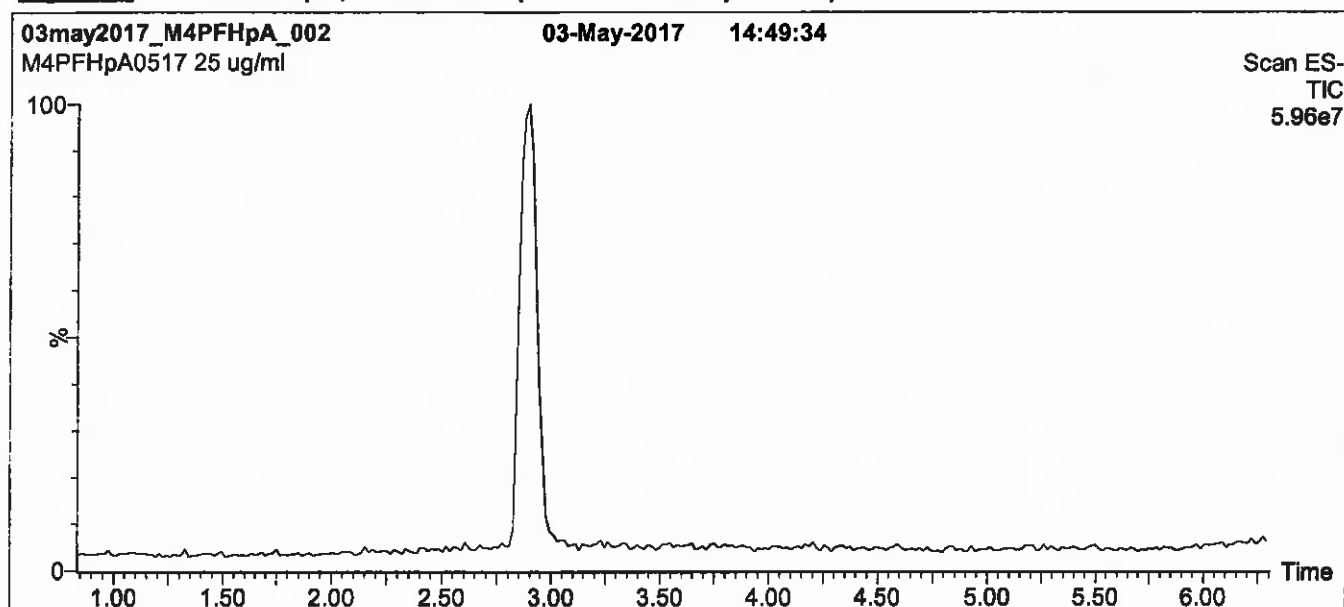
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

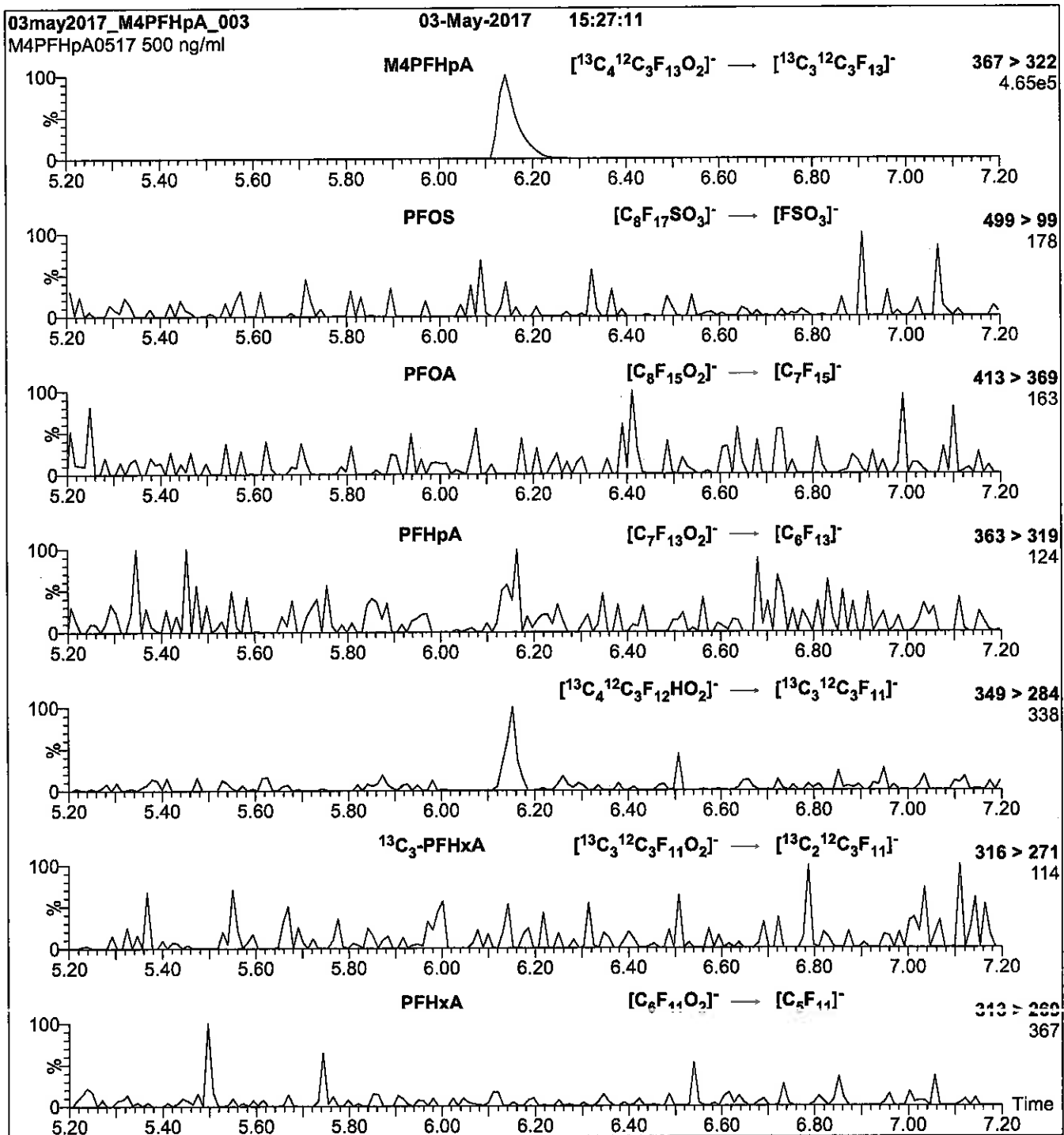
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 9

Reagent

LCM5PFPEA_00016



1287290
ID: LCM5PFPEA_00016
Exp: 07/20/22 Prpd: CBW Opm: 06/26/18
13C5-Perfluoropentanoic a

R-6/26/18 CBW



WELLINGTON LABORATORIES

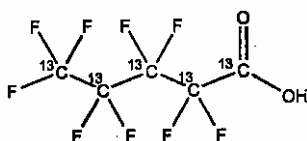
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[¹³C]₅pentanoic acid

LOT NUMBER: M5PFPeA0717

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₅HF₈O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 269.01
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

ISOTOPIC PURITY: ≥99% ¹³C
(¹³C₅)

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
(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

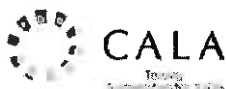
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

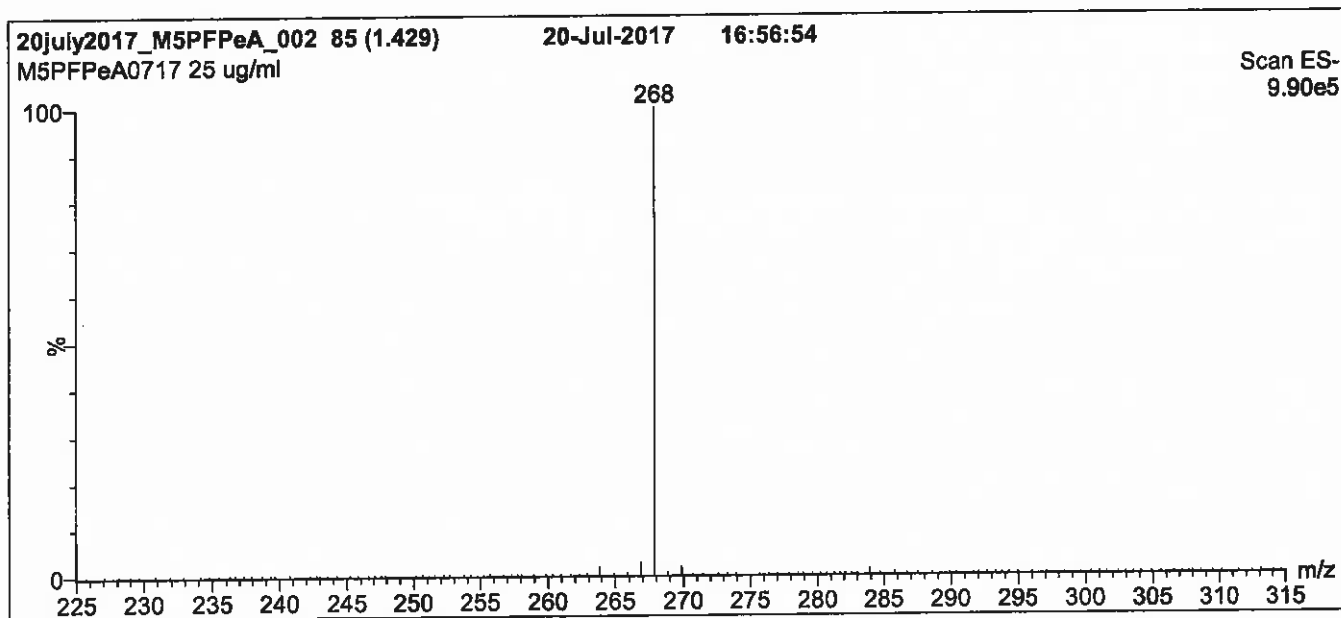
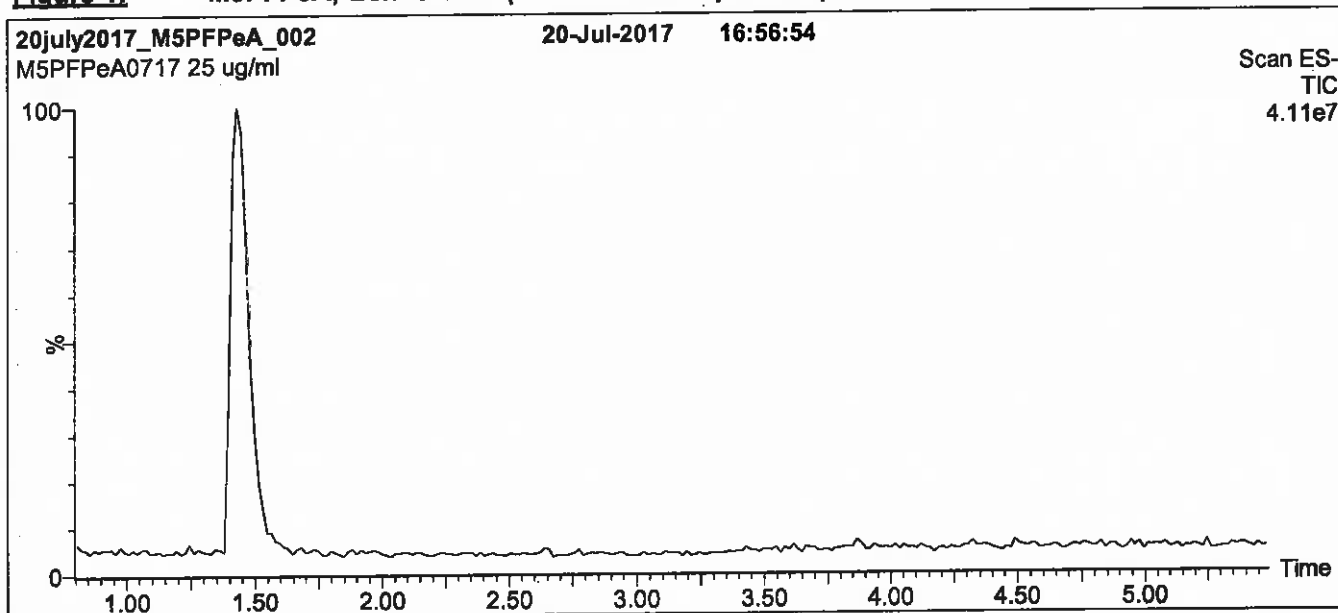
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

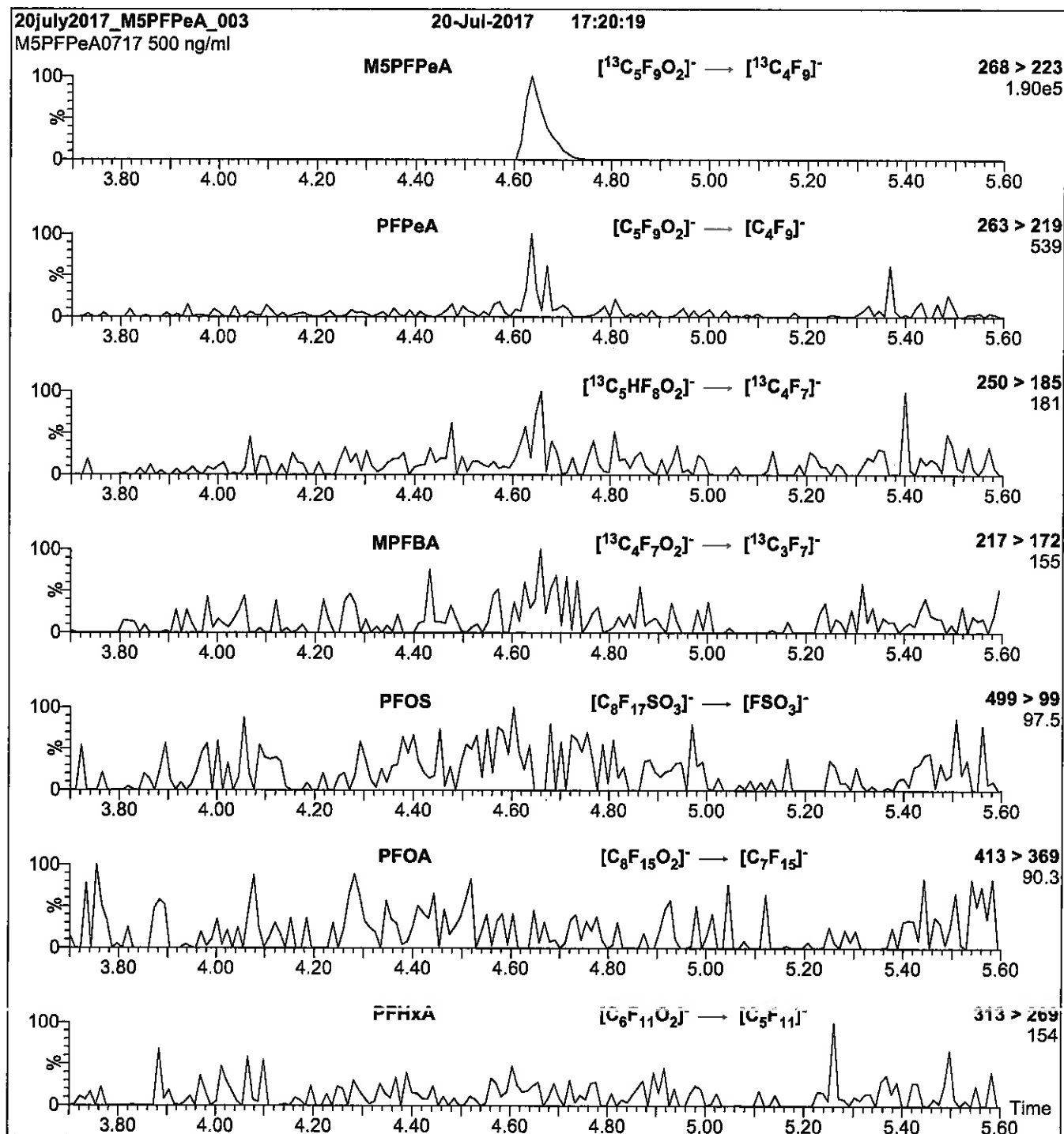
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.54\text{e-}3$
Collision Energy (eV) = 9

Reagent

LCM8FOSA_00020

R=6/26/18 CBW



WELLINGTON LABORATORIES

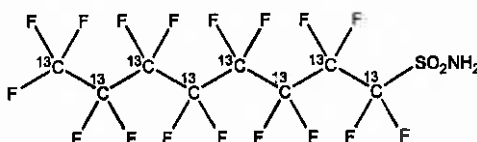
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[¹³C₈]octanesulfonamide

LOT NUMBER: M8FOSA1017I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₈H₂F₁₇NO₂S
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: 507.09
SOLVENT(S): Isopropanol
ISOTOPIC PURITY: ≥99% ¹³C
(¹³C₈)

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-[¹³C₈]octanesulfonamide and ~ 0.01% of perfluoro-1-[¹³C₇]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim, General Manager

Date: 10/20/2017
(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

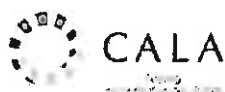
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

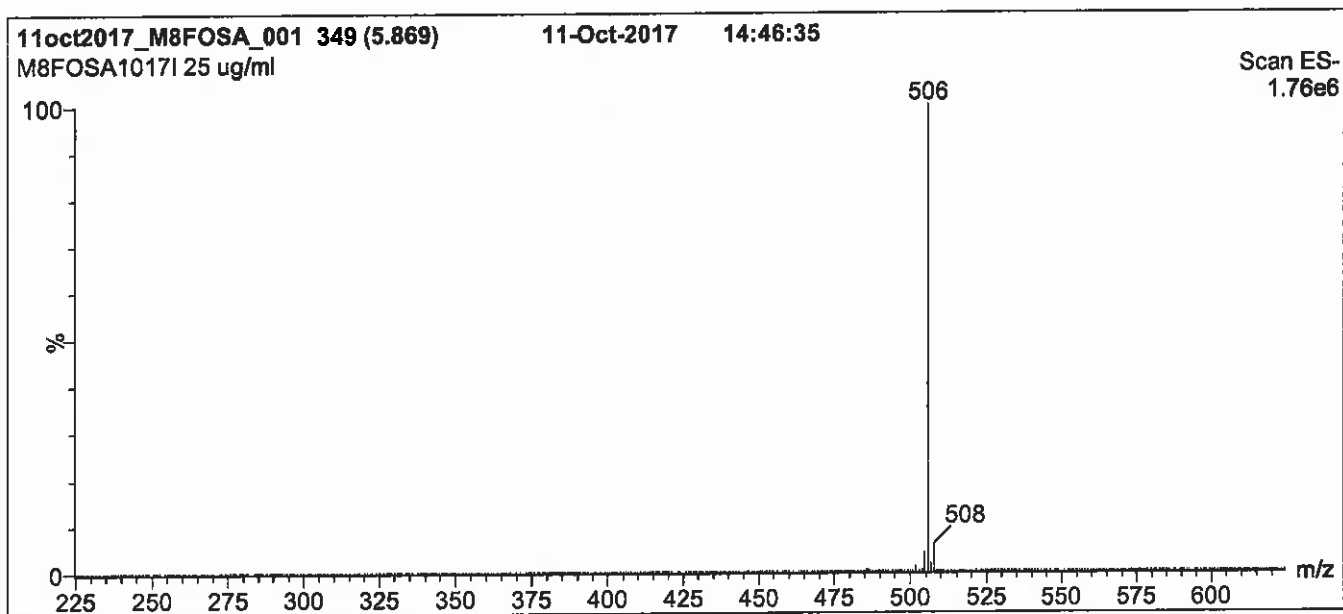
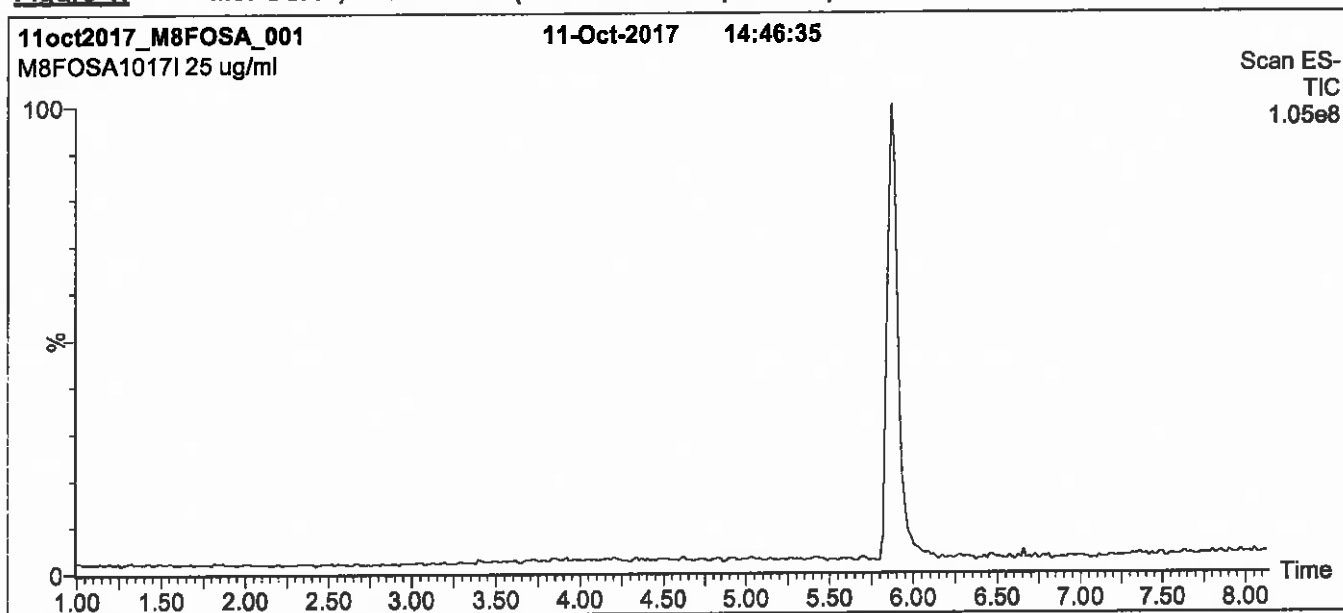
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

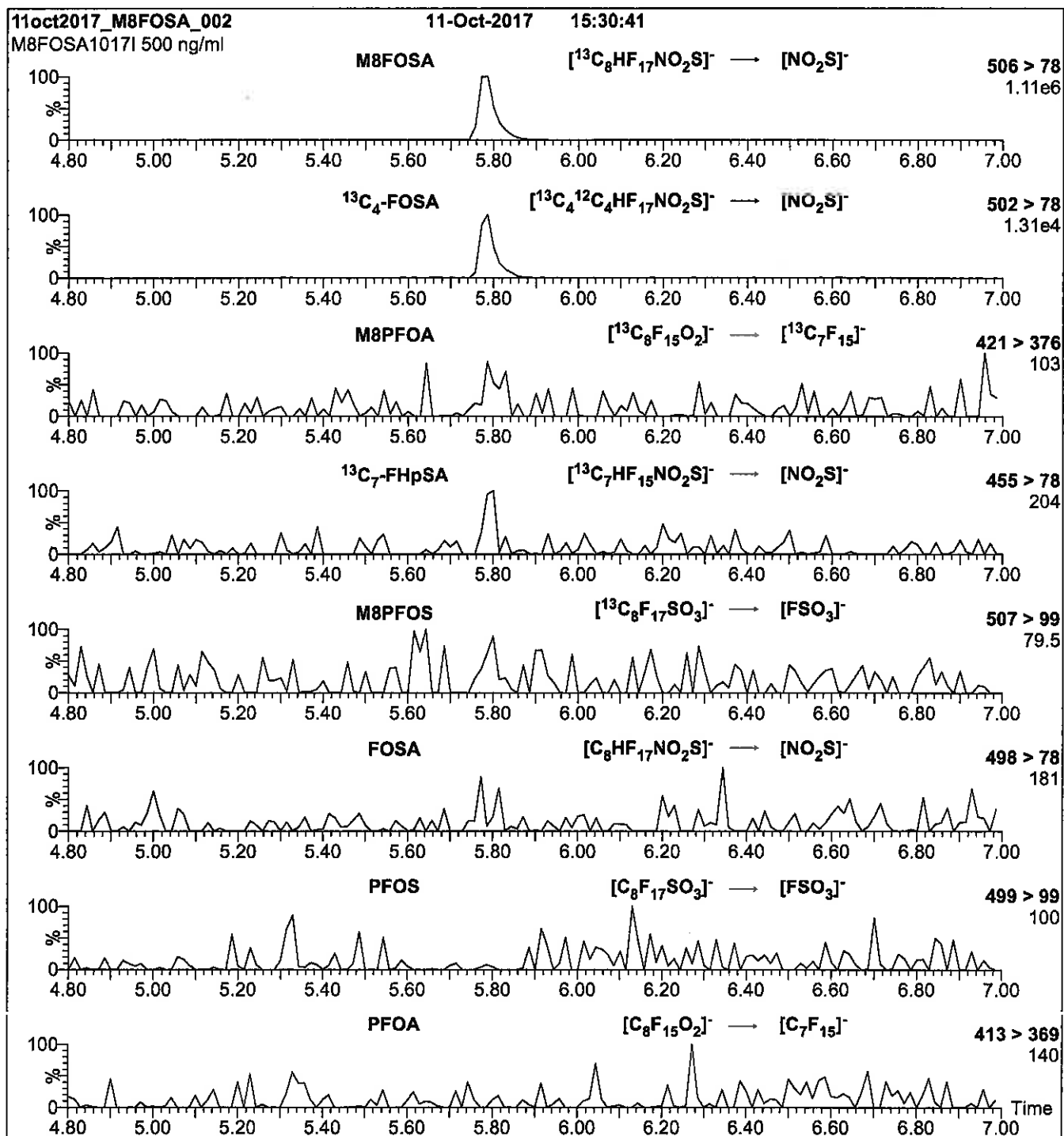
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00016

R= 8/26/18 can



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFBA

COMPOUND:

Perfluoro-n-[1,2,3,4-¹³C₄]butanoic acid

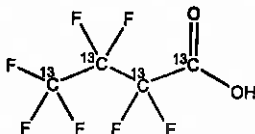
LOT NUMBER:

MPFBA0218

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₄HF₇O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

218.01

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

02/16/2018

(1,2,3,4-¹³C₄)

EXPIRY DATE: (mm/dd/yyyy)

02/16/2023

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: 02/22/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

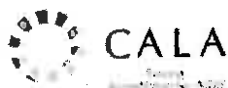
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

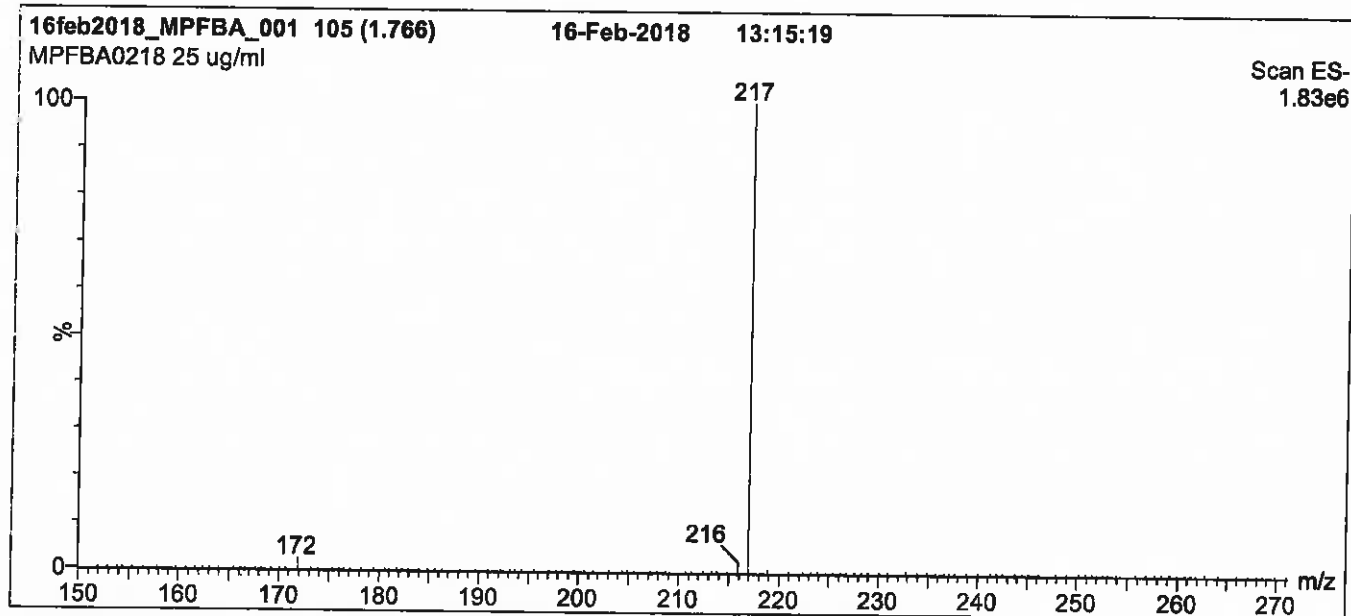
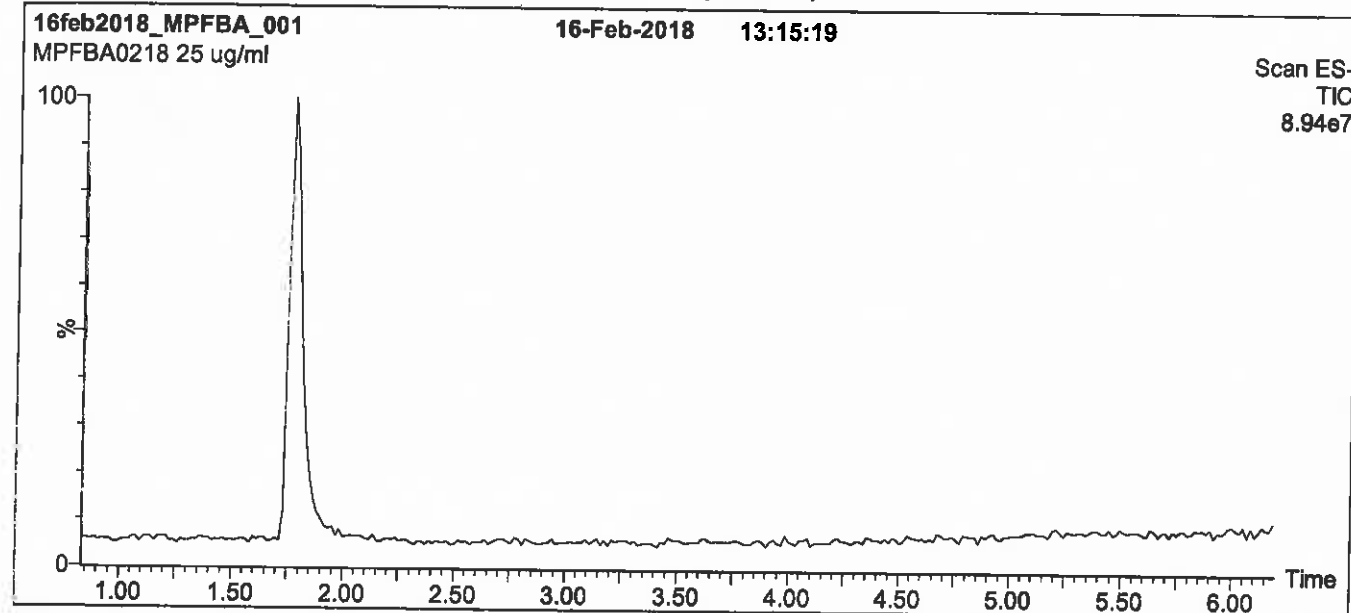
QUALITY MANAGEMENT:

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 17034 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: MPFBA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

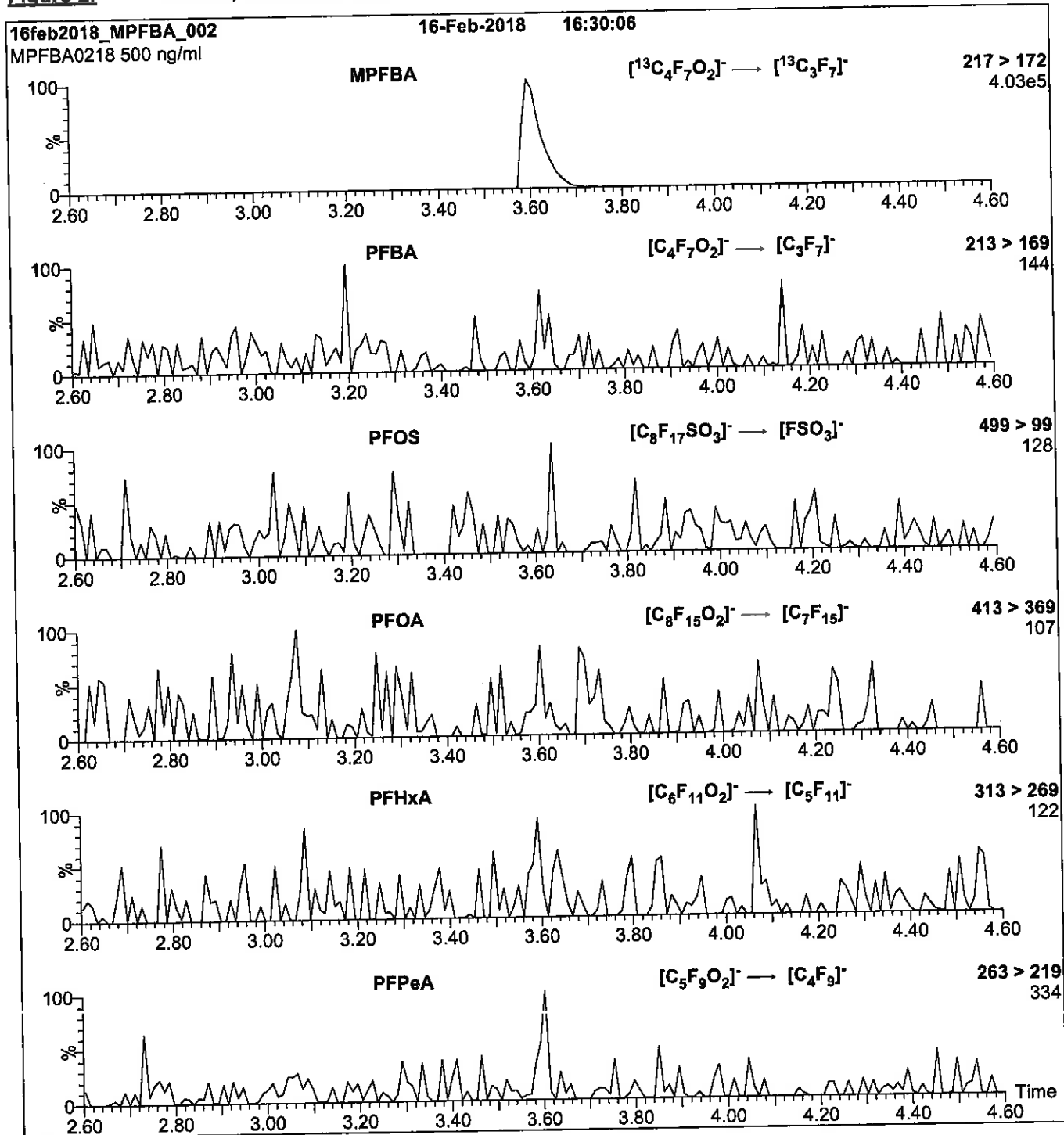
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.31\text{e-}3$
Collision Energy (eV) = 10

Reagent

LCMPFBS_00009

R-6/26/18 CW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

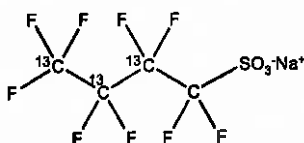
PRODUCT CODE:
COMPOUND:

M3PFBS
Sodium perfluoro-1-[2,3,4-¹³C₃]butanesulfonate

LOT NUMBER: M3PFBS0218

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:
CONCENTRATION:

¹³C₃¹²CF₉SO₃Na
50.0 ± 2.5 µg/ml (Na salt)
46.5 ± 2.3 µg/ml (M3PFBS anion)

MOLECULAR WEIGHT: 325.06
SOLVENT(S): Methanol

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

>98%
02/15/2018
02/15/2023

ISOTOPIC PURITY: ≥99% ¹³C
(2,3,4-¹³C₃)

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:

B.G. Chittim, General Manager

Date: 02/16/2018
(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

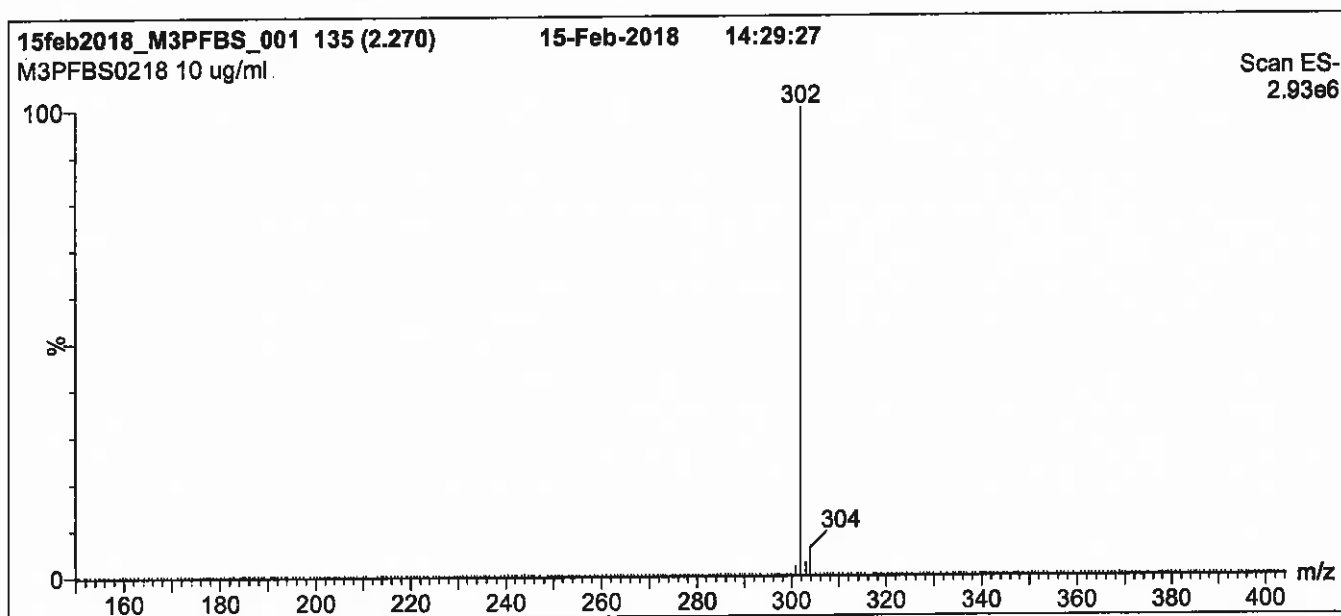
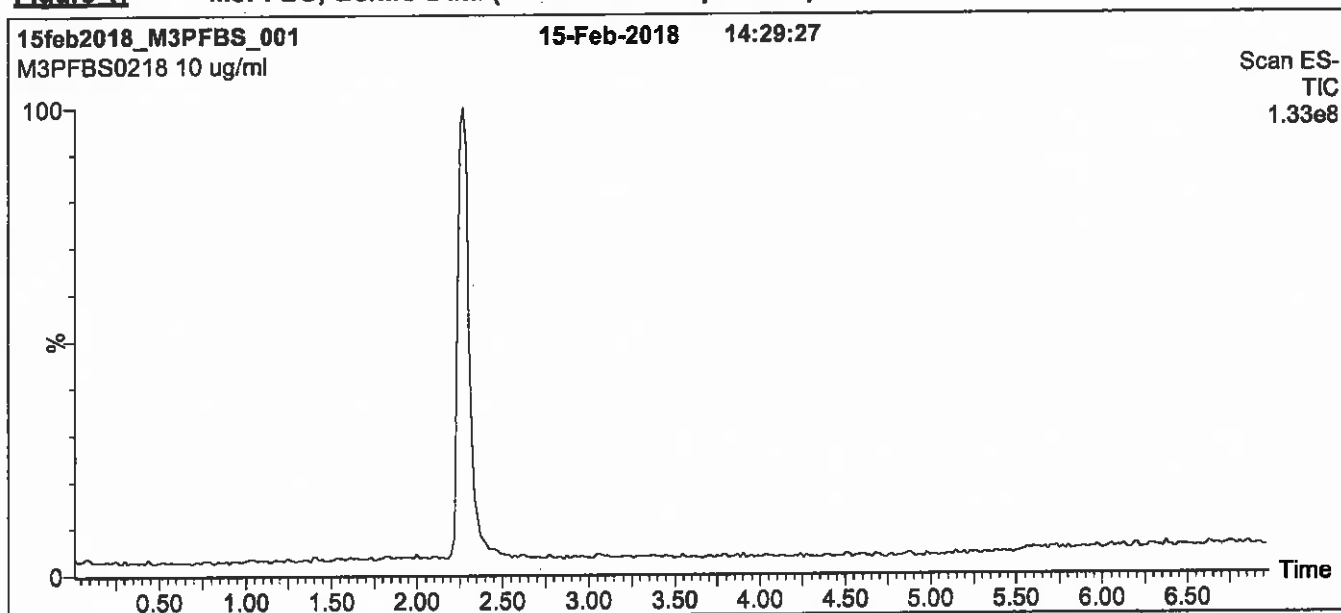
QUALITY MANAGEMENT:

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 17034 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: M3PFBS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

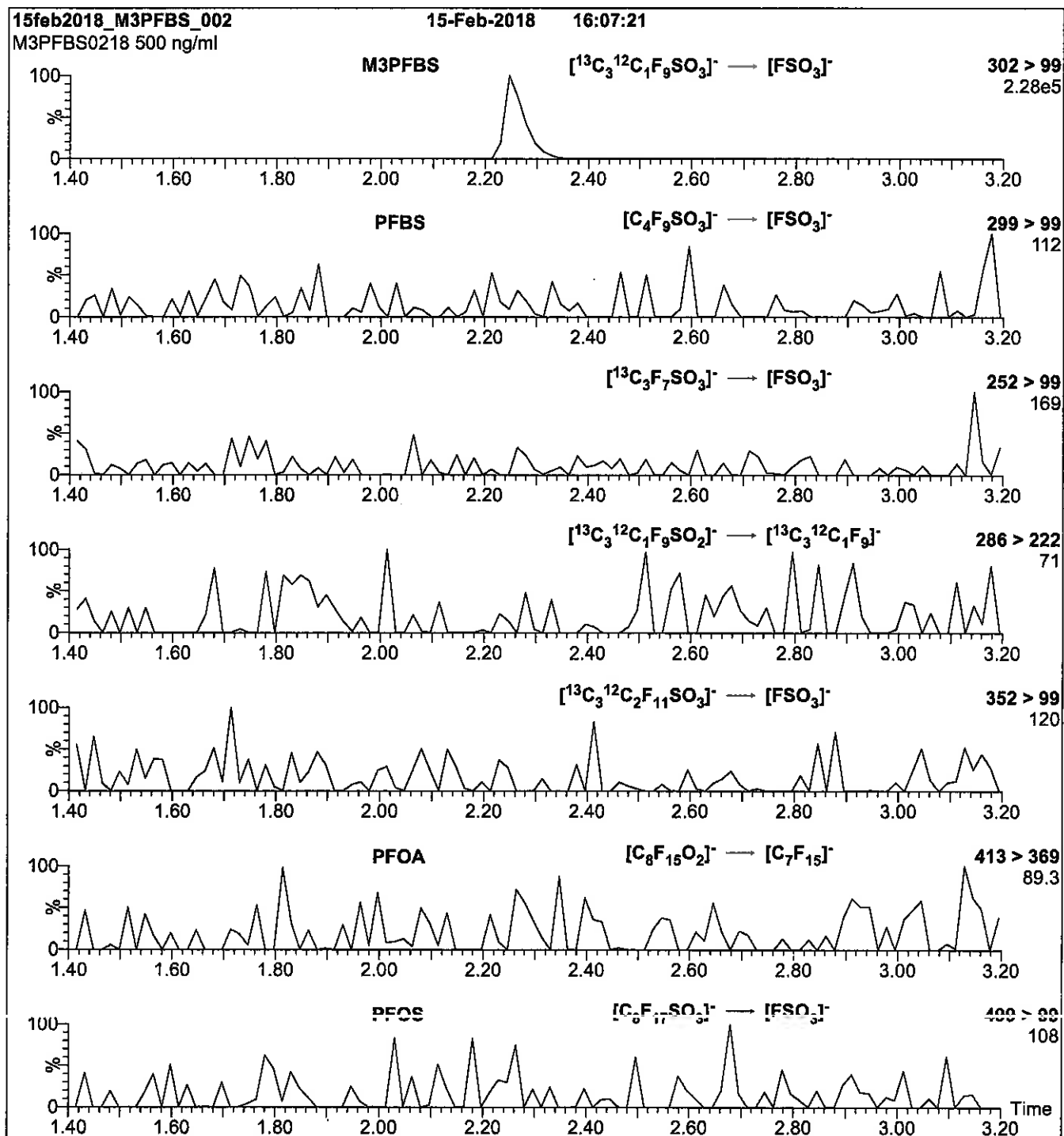
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M3PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 25

Reagent

LCMPFDA_00021



1287334

ID: LCMFDA_00021

Exp: 02/16/23 Prod: CBW Opn: 06/26/18

13C2-Perfluorodecanoic acid

R-6/26/18 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

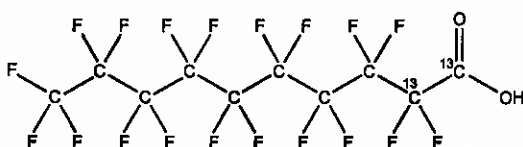
MPFDA

LOT NUMBER:

MPFDA0218

COMPOUND:Perfluoro-n-[1,2-¹³C₂]decanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₈HF₁₉O₂**CONCENTRATION:**

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

516.07

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C**LAST TESTED:** (mm/dd/yyyy)

02/16/2018

EXPIRY DATE: (mm/dd/yyyy)

02/16/2023

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 ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**Certified By:**

B.G. Chittim, General Manager
Date: 03/07/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

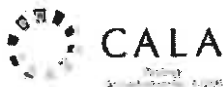
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

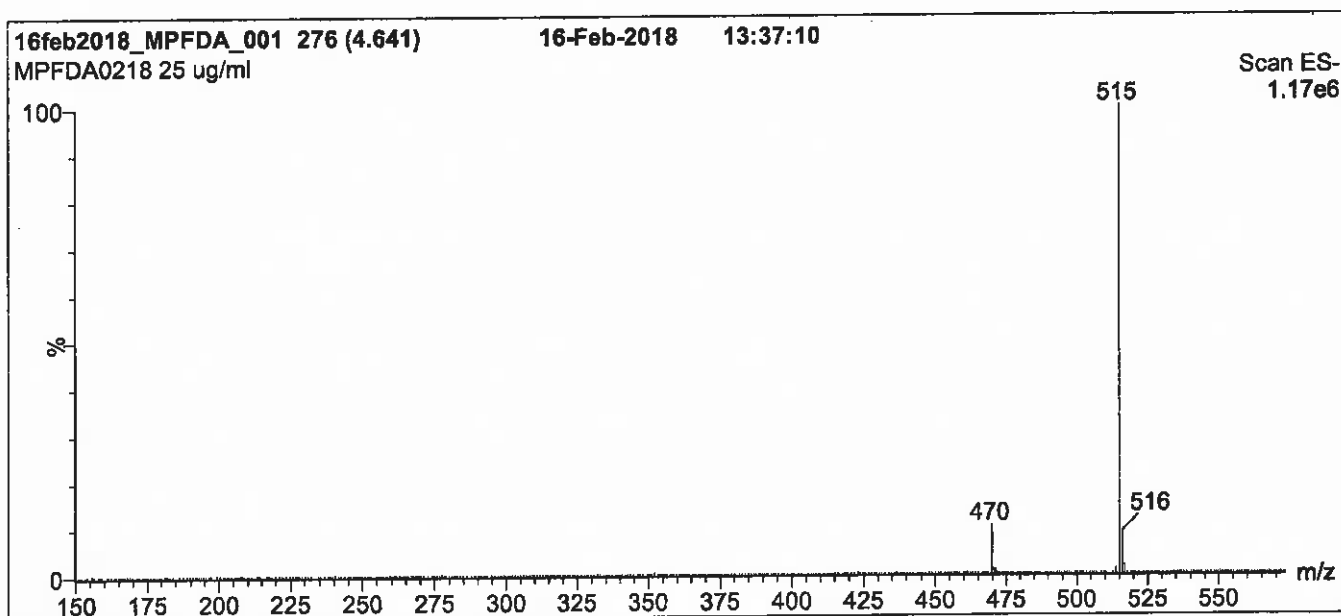
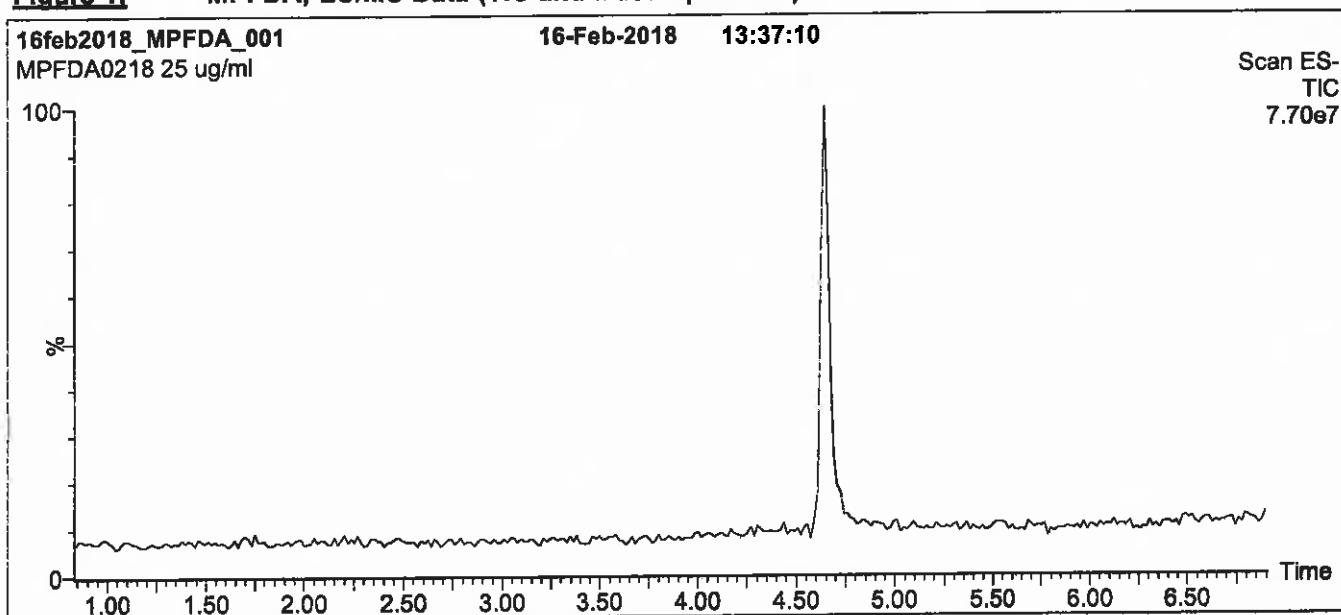
QUALITY MANAGEMENT:

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 17034 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: MPFDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

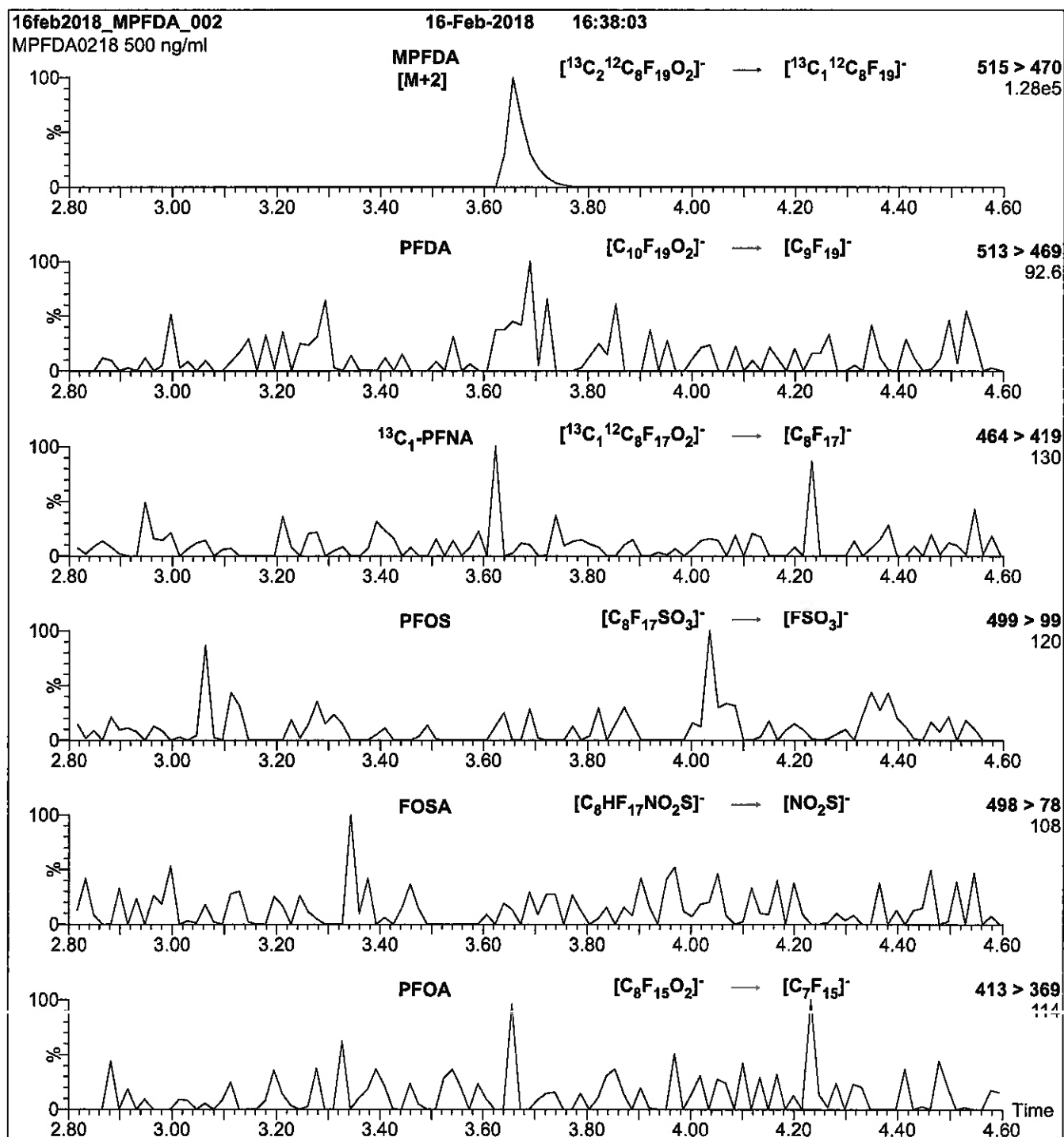
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCMPFD_oA_00016



1287284

ID: LCMFDoA_00016

Exp: 02/16/23 Prip: CBW Opn: 06/26/18

13C2-Perfluorododecanoic

6/26/18 CBW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

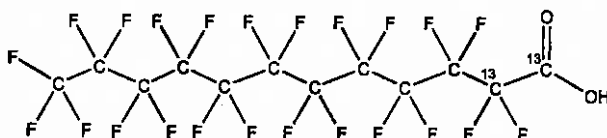
MPFDoA

LOT NUMBER:

MPFDoA0218

COMPOUND:Perfluoro-n-[1,2-¹³C₂]dodecanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:** $^{13}\text{C}_2\text{ }^{12}\text{C}_{10}\text{HF}_{23}\text{O}_2$ **MOLECULAR WEIGHT:**

616.08

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY: $\geq 99\% \text{ } ^{13}\text{C}$ **LAST TESTED:** (mm/dd/yyyy)

02/16/2018

(1,2-¹³C₂)**EXPIRY DATE:** (mm/dd/yyyy)

02/16/2023

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: 02/23/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

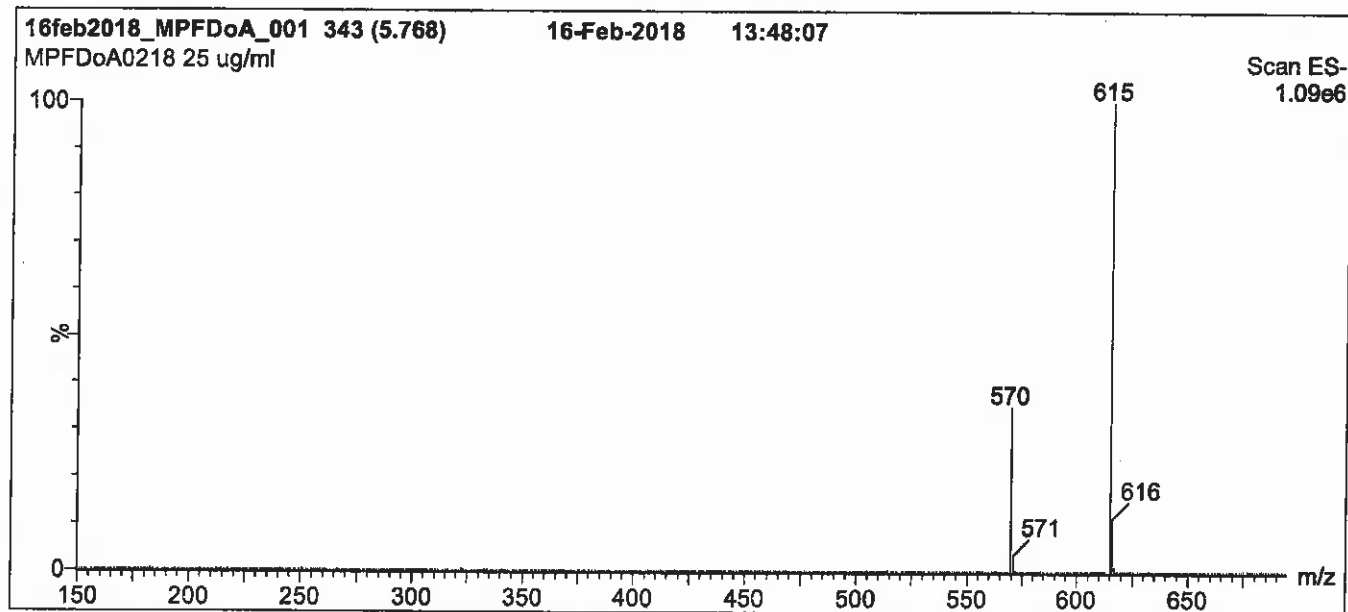
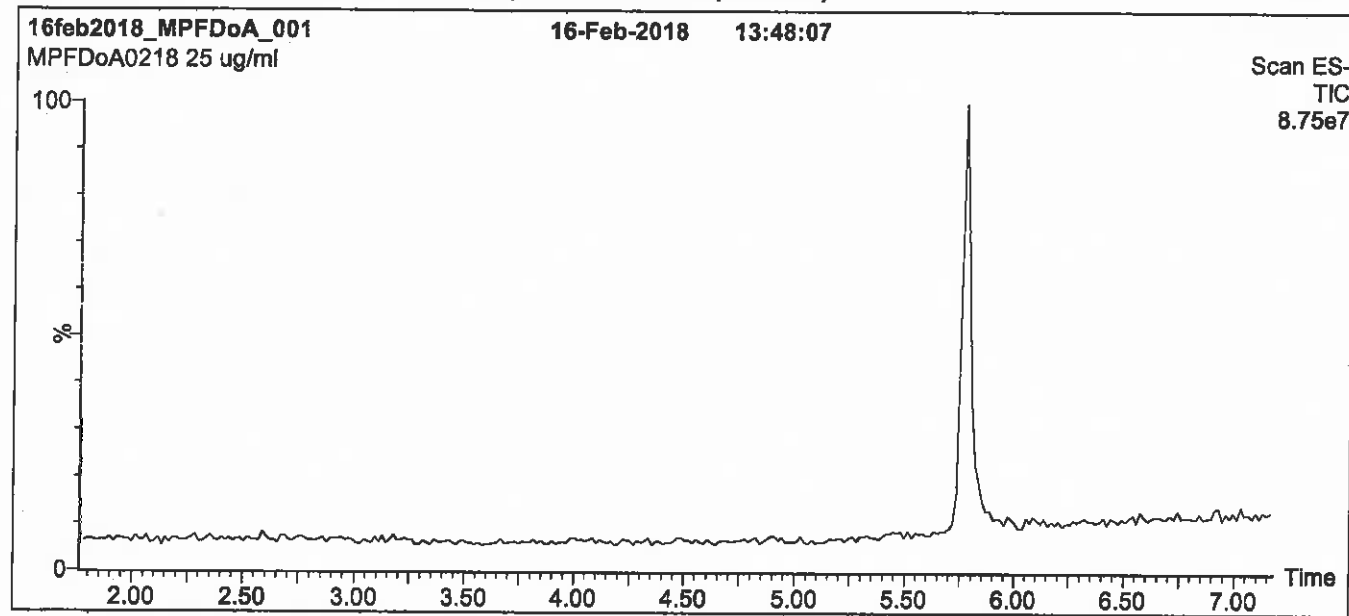
QUALITY MANAGEMENT:

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 17034 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)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O

(both with 10 mM NH₄OAc buffer)

Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

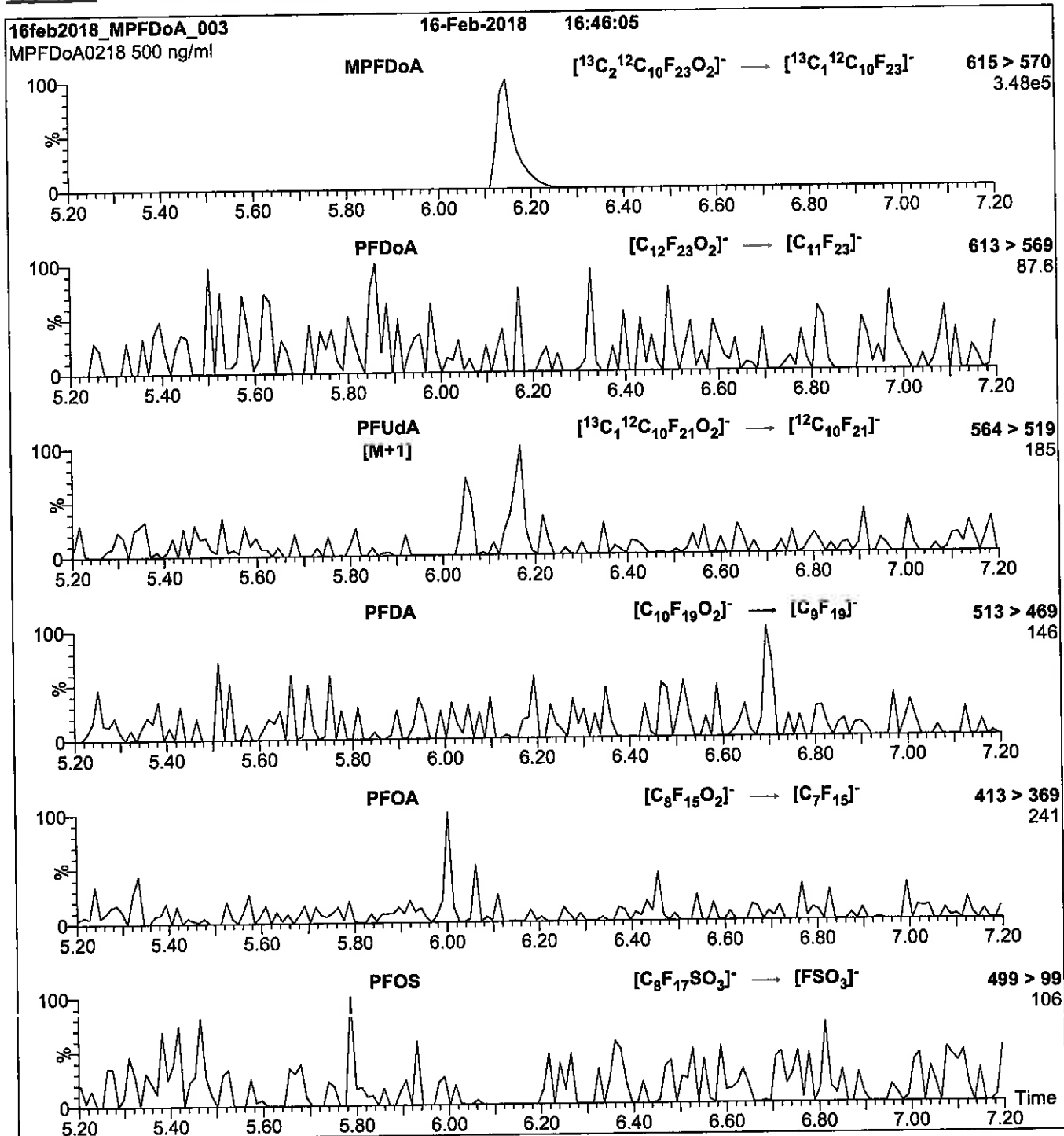
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 20.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.31\text{e-}3$
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00023

R: 6/26/18 CBW



WELLINGTON LABORATORIES

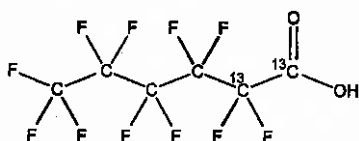
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexanoic acid

LOT NUMBER: MPFHxA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₄HF₁₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 316.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

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/yyyy)

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

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

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.

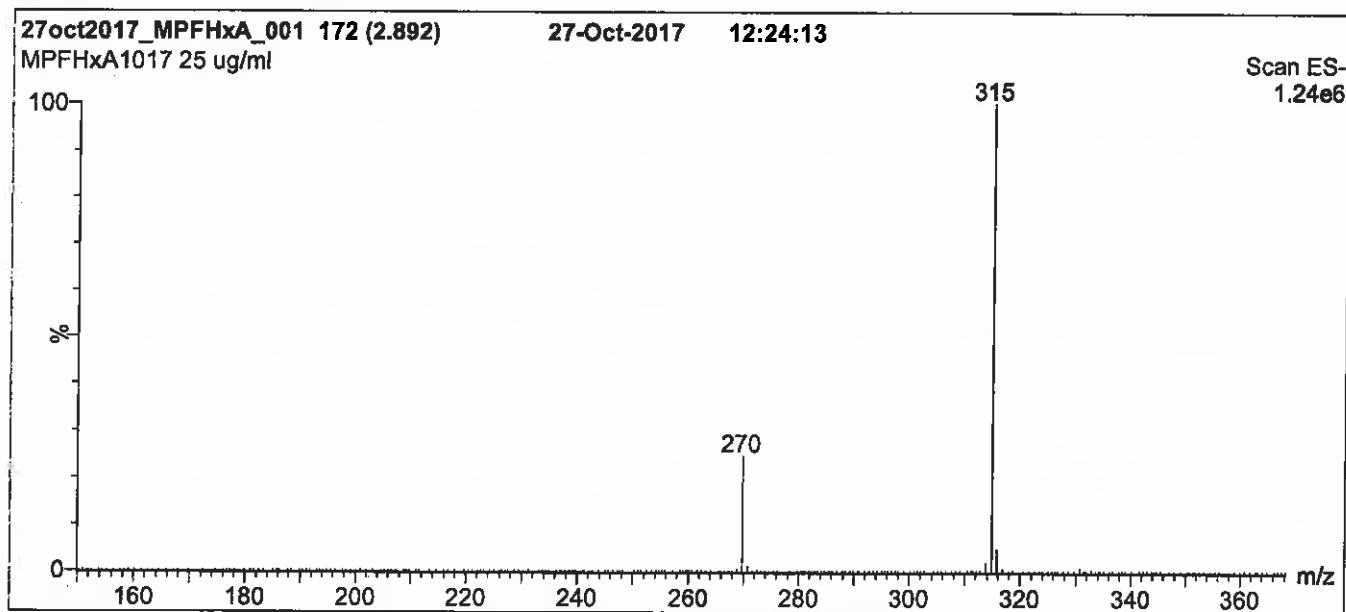
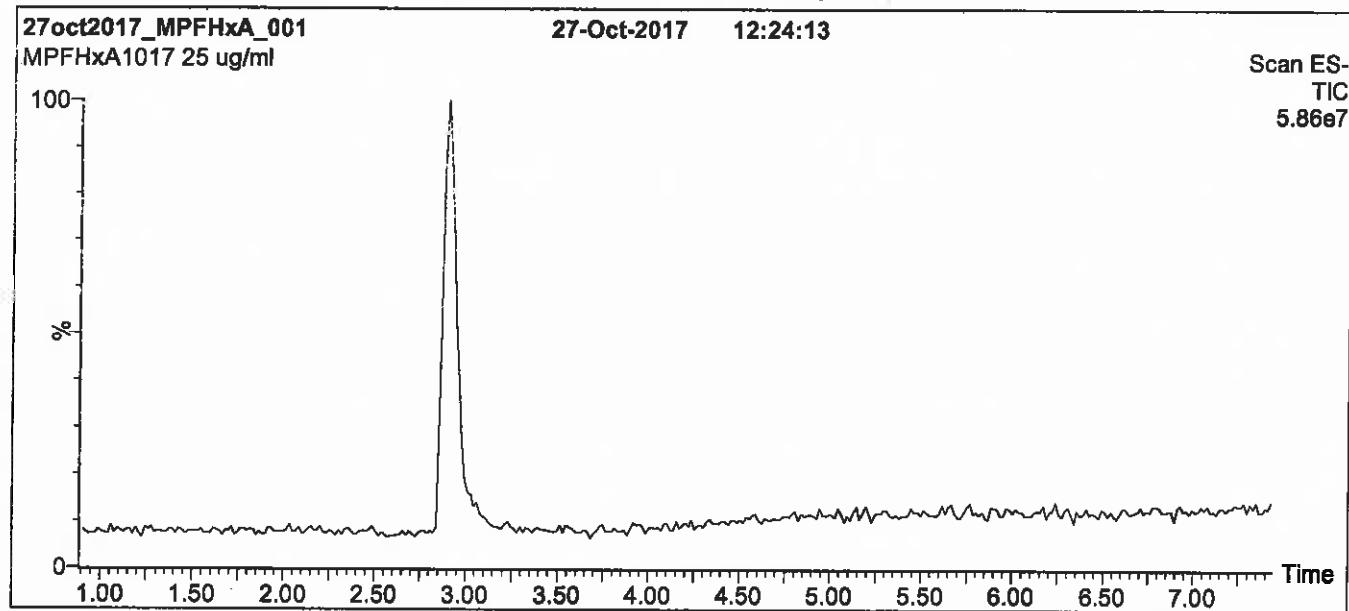
QUALITY MANAGEMENT:

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)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

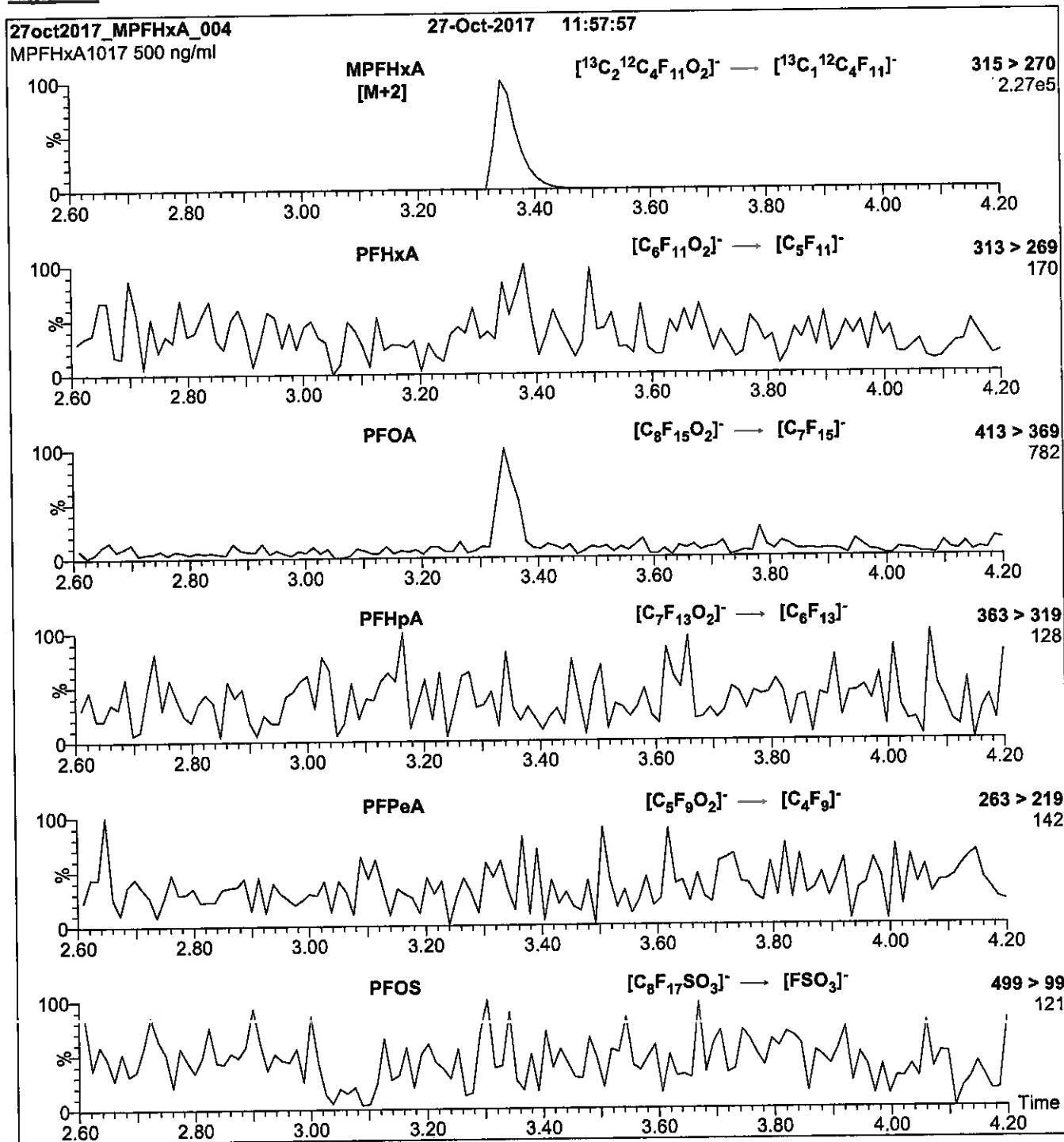
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxS_00016



1287304

ID: LCMPFHxS_00016

Exp: 03/22/23 Ppd: CBW Ogn: 06/26/18
18O2-Perfluorohexanesulfo

K: 6/26/18 CBW

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:**

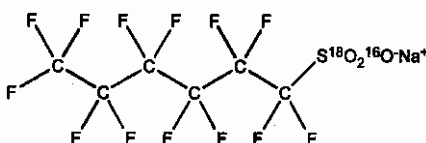
MPFHxS

LOT NUMBER:

MPFHxS0318

COMPOUND:Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate**STRUCTURE:****CAS #:**

1585941-14-5

**MOLECULAR FORMULA:**C₆F₁₃S¹⁸O₂¹⁶ONa**MOLECULAR WEIGHT:**

426.10

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)

SOLVENT(S):

Methanol

47.3 ± 2.4 µg/ml (MPFHxS anion)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:>94% (¹⁸O₂)**LAST TESTED:** (mm/dd/yyyy)

03/22/2018

EXPIRY DATE: (mm/dd/yyyy)

03/22/2023

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.
- The response factor for MPFHxS (C₆F₁₃S¹⁸O₂¹⁶O⁻) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃⁻) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[¹⁸O₂]sulfonate (¹⁸O₂-PFOS) and ~ 0.3% of sodium perfluoro-1-heptane[¹⁸O₂]sulfonate (¹⁸O₂-PFHpS).
- 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, General Manager

Date: 06/07/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

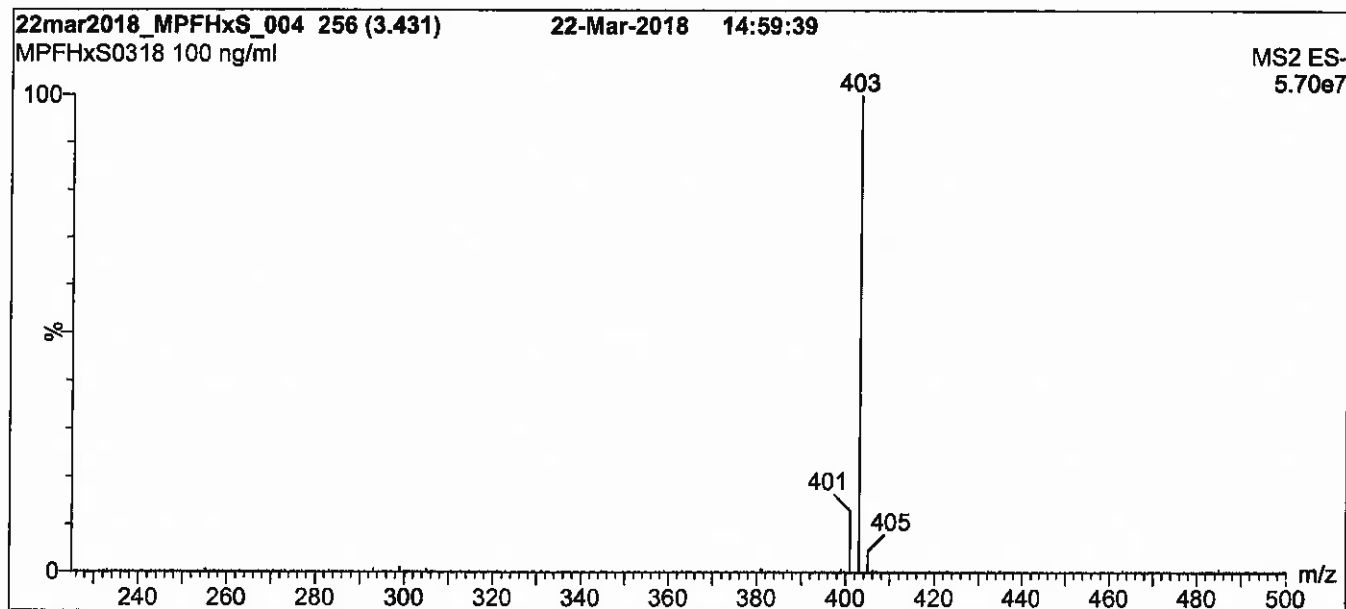
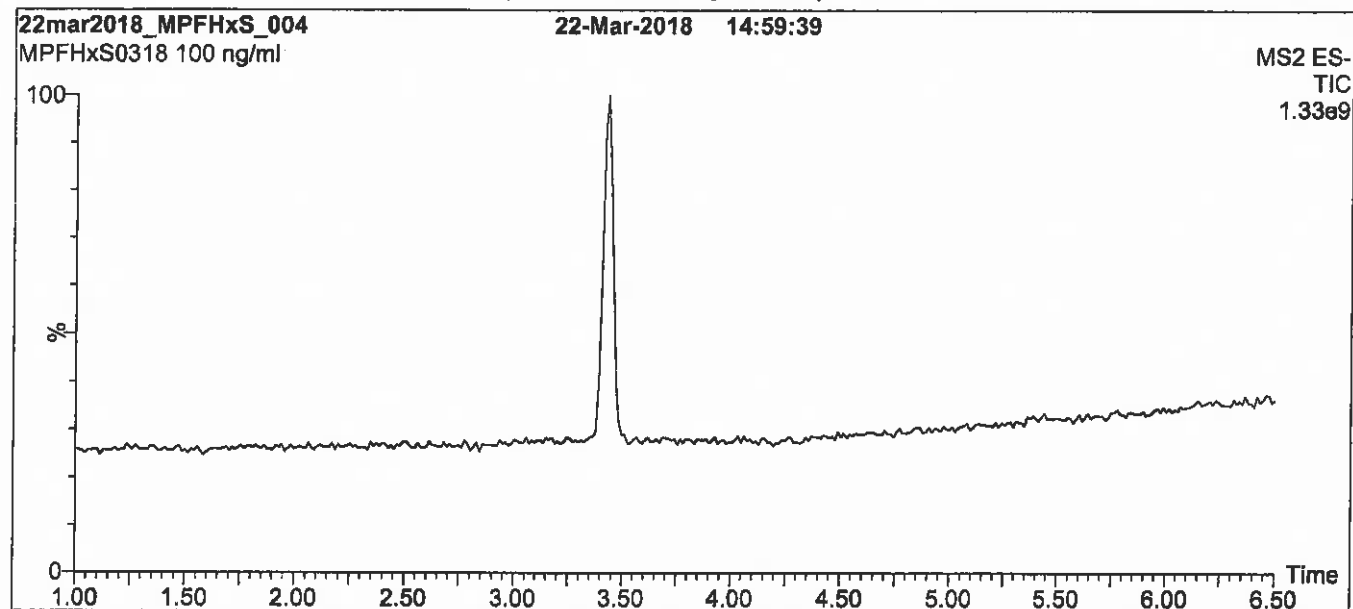
QUALITY MANAGEMENT:

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 17034 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)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

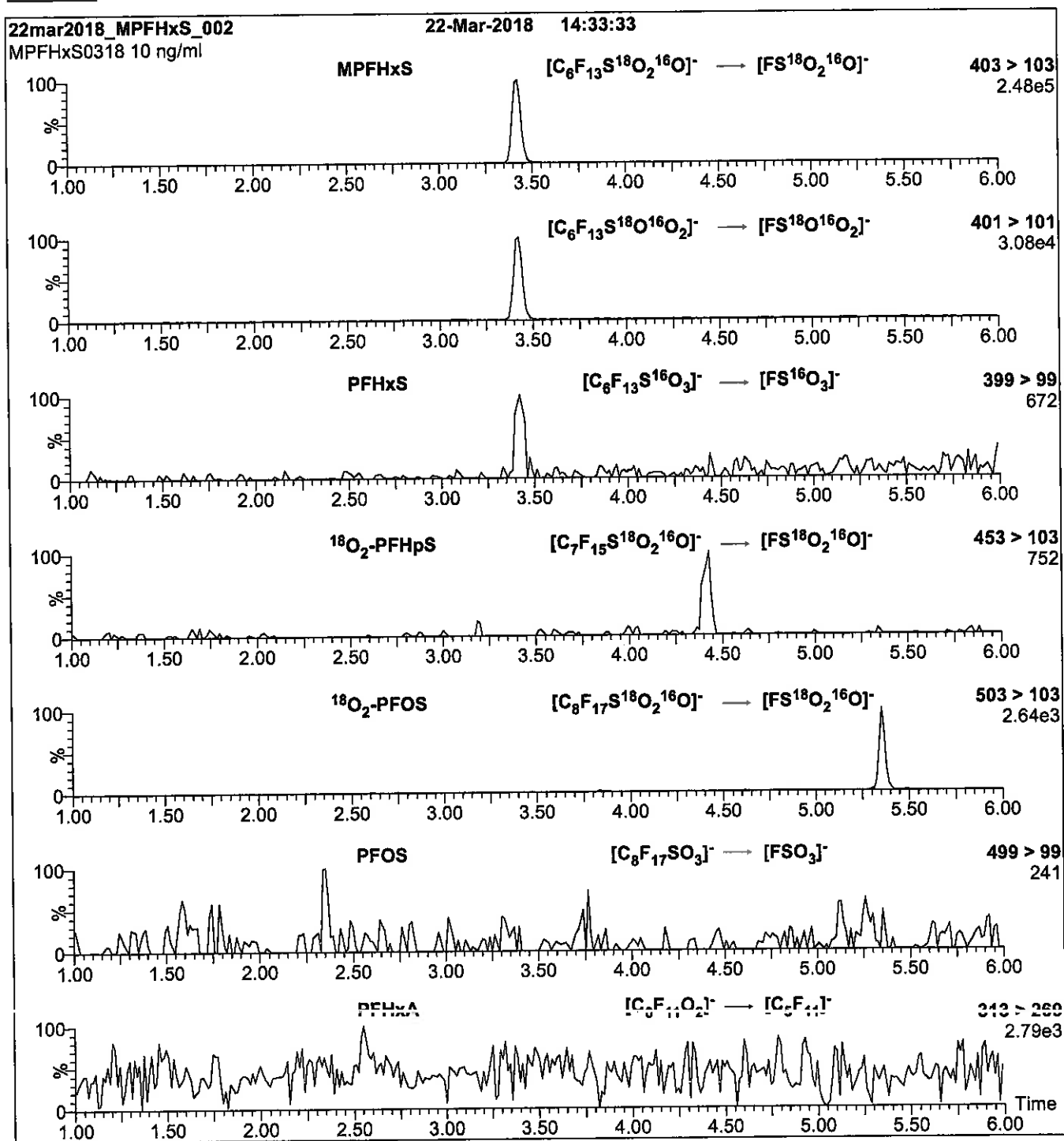
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (MPFHxS)
Mobile phase: Same as Figure 1
Flow: 300 μ /min

MS Parameters

Collision Gas (mbar) = 3.64e-3
Collision Energy (eV) = 32

Reagent

LCMPFNA_00016

R: 6/26/18 CBW



WELLINGTON LABORATORIES

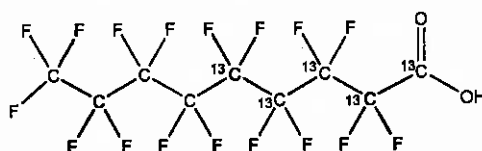
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-¹³C₅]nonanoic acid

LOT NUMBER: MPFNA1217

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₅¹²C₄HF₁₇O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 469.04
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99% ¹³C
(1,2,3,4,5-¹³C₅)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/14/2017
EXPIRY DATE: (mm/dd/yyyy) 12/14/2022
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: 12/19/2017
(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

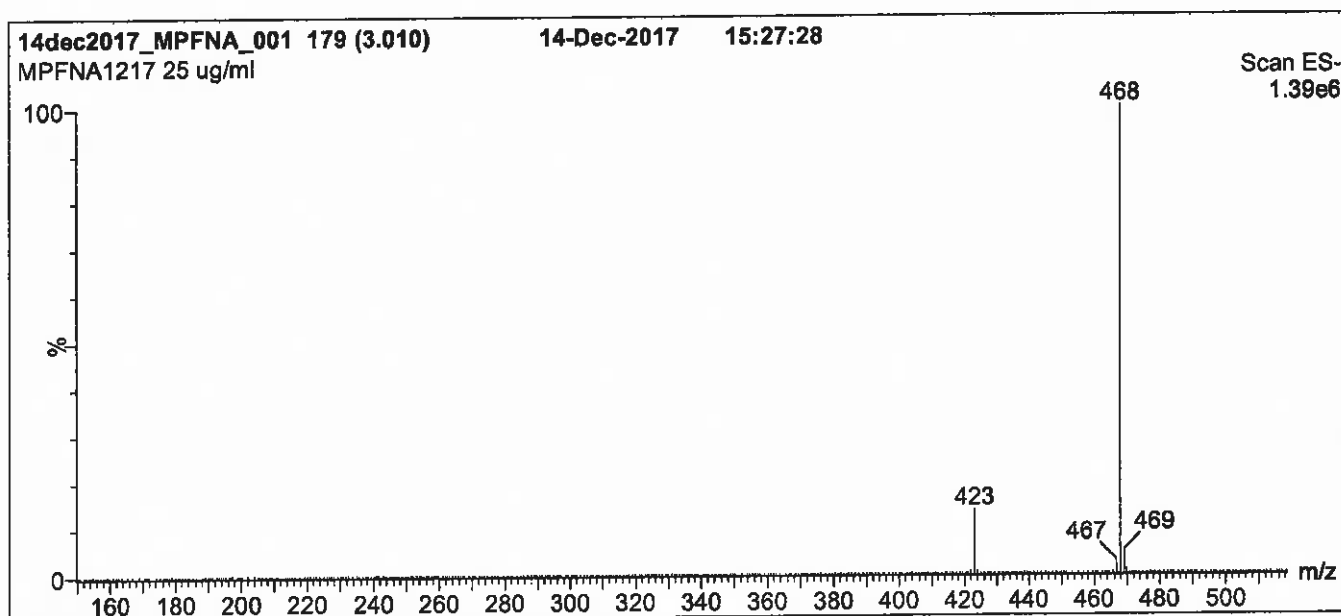
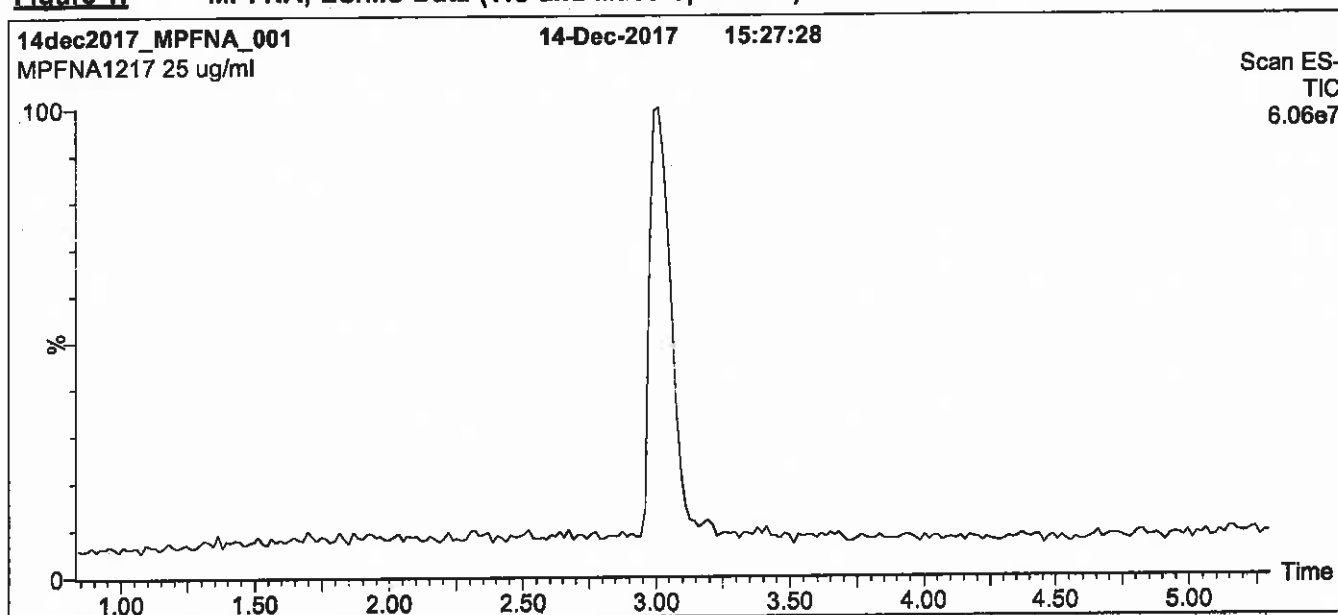
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

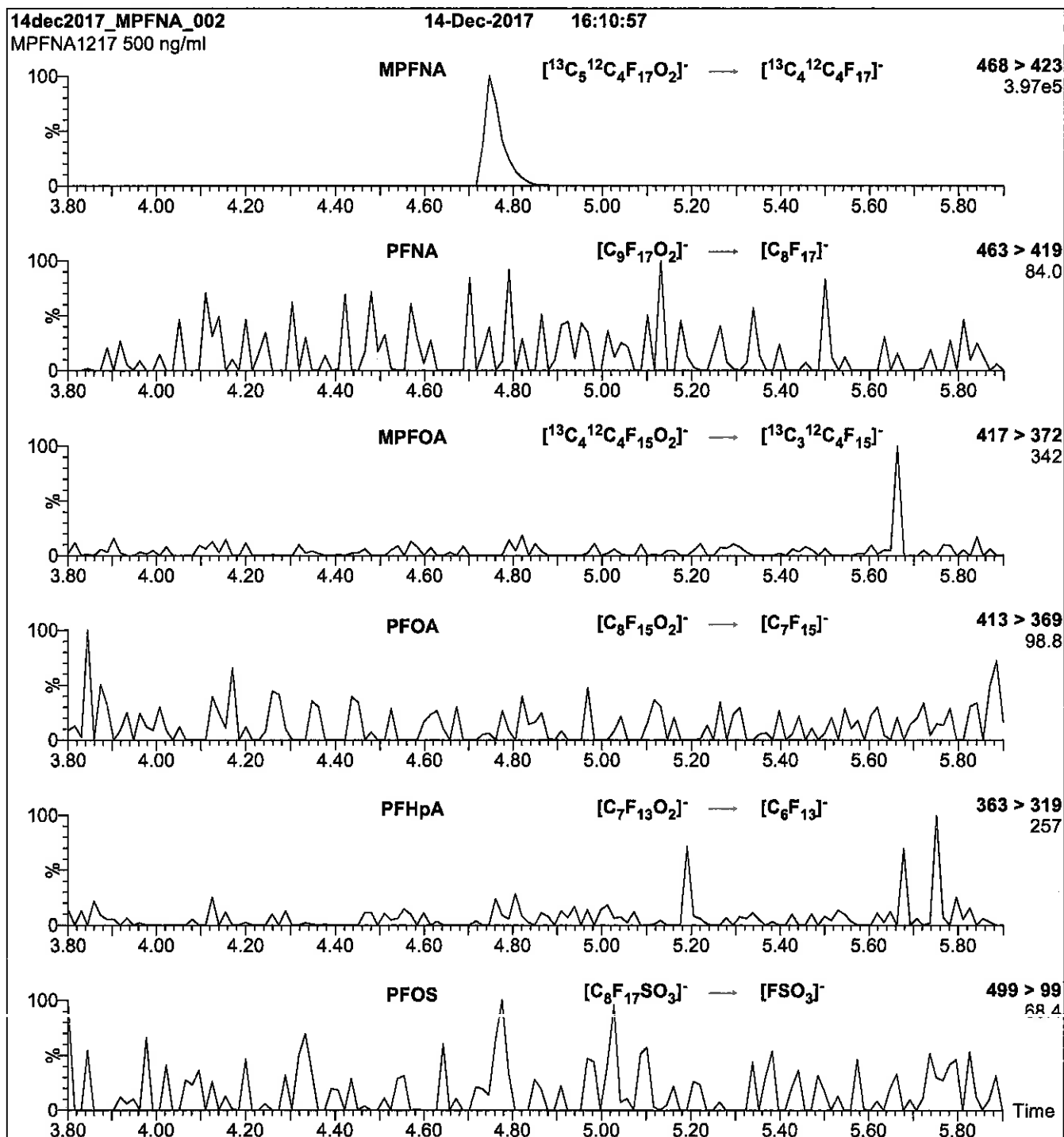
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00020



1287275

ID: LCMFOA_00020

Exp:05/04/23 Prod:CBW Opr:06/26/18

13C4-Perfluorooctanoic ac

R: CBW 6/26/18



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

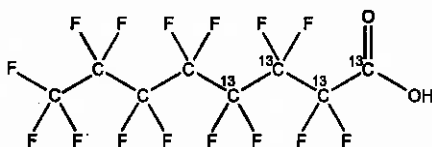
MPFOA

LOT NUMBER:

MPFOA0418

COMPOUND:Perfluoro-n-[1,2,3,4-¹³C₄]octanoic acid**STRUCTURE:****CAS #:**

960315-48-4

**MOLECULAR FORMULA:**¹³C₄¹²C₄HF₁₅O₂**CONCENTRATION:**

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

418.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C**LAST TESTED:** (mm/dd/yyyy)

05/04/2018

EXPIRY DATE: (mm/dd/yyyy)

05/04/2023

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

(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

Date: 06/13/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

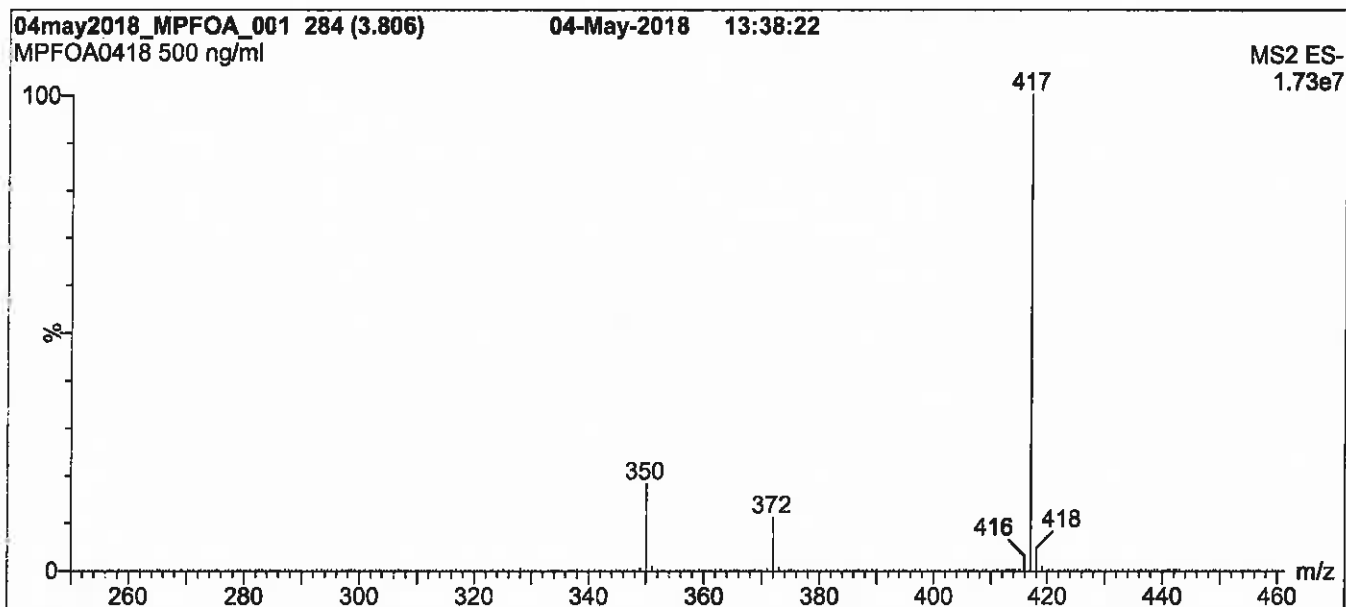
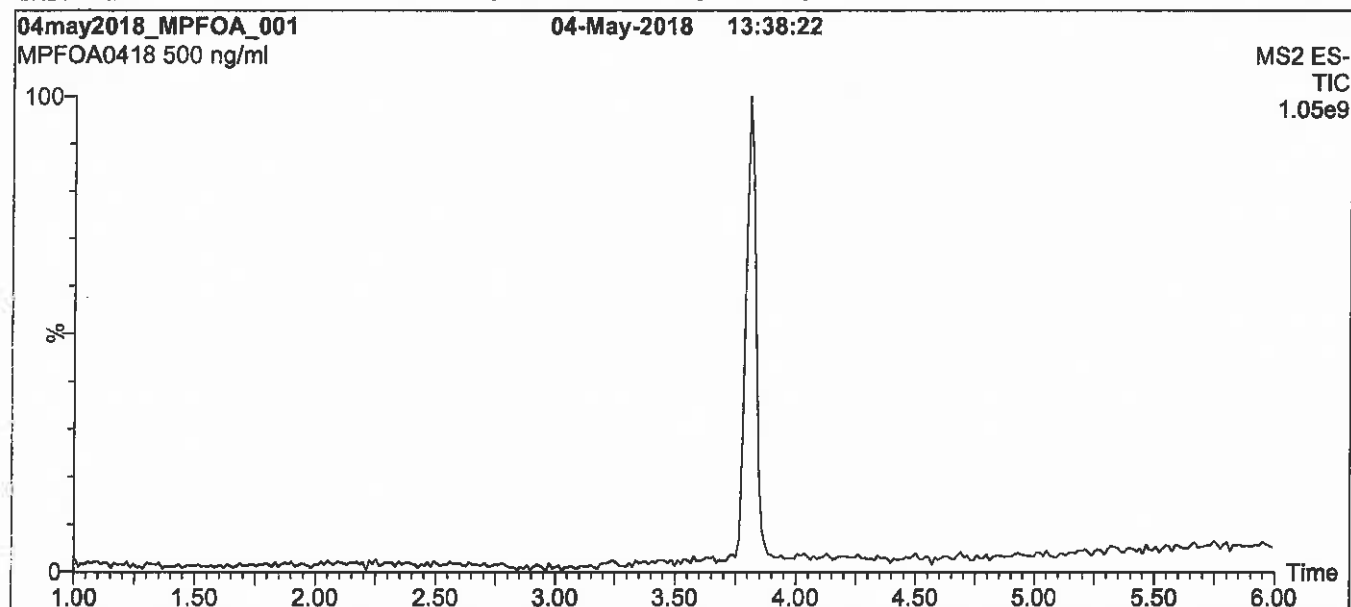
QUALITY MANAGEMENT:

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 17034 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)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min
before returning to initial conditions in 0.75 min.
Time: 12 min

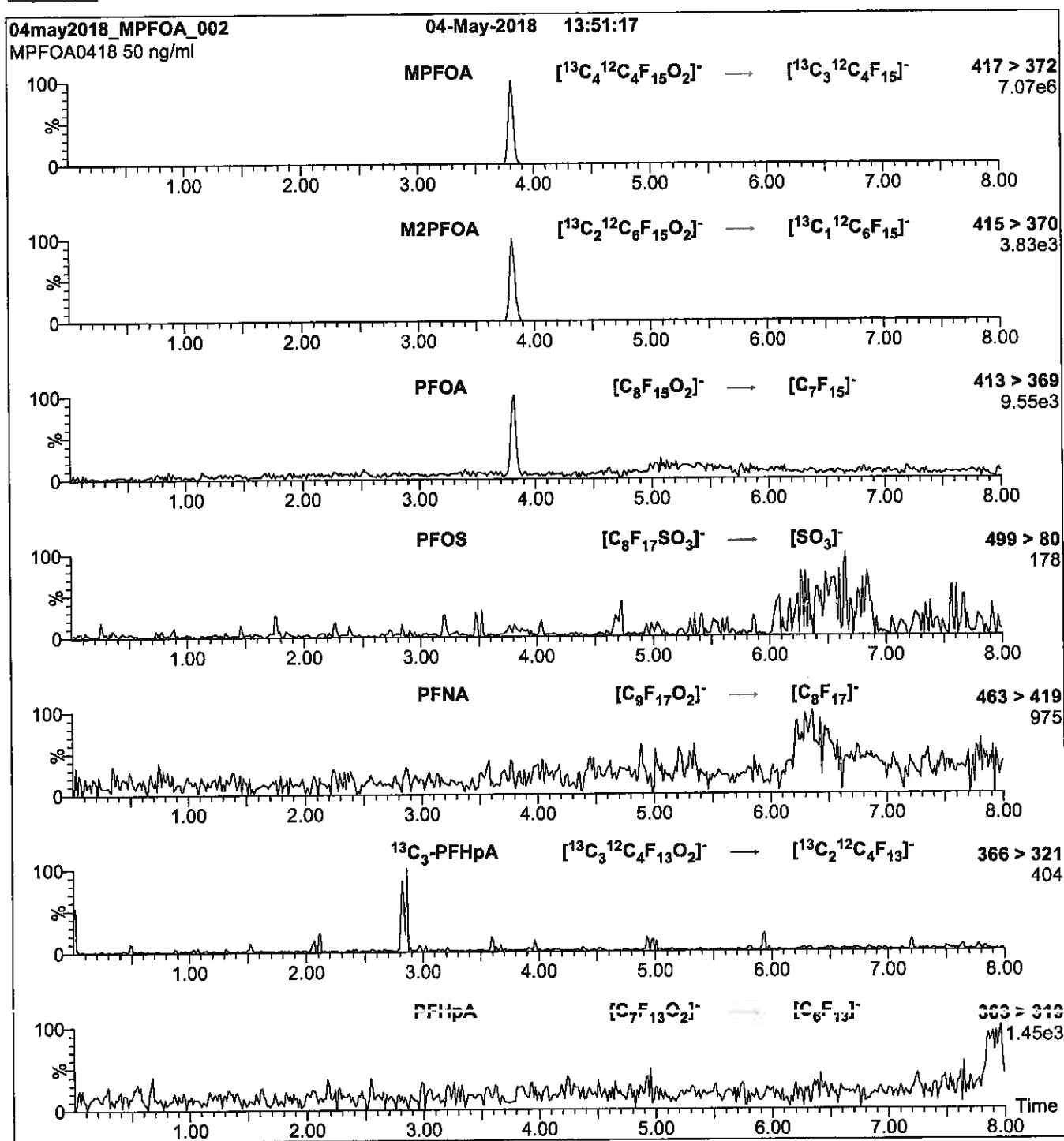
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (MPFOA)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.45e-3

Collision Energy (eV) = 8

Reagent

LCMPFOS_00028



1287343

ID: LCMFOS_00028

Exp:06/15/23 Prep:CBW Opn:06/26/18

13C4-Perfluorooctanesulfo

R=6/26/18 *an*

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

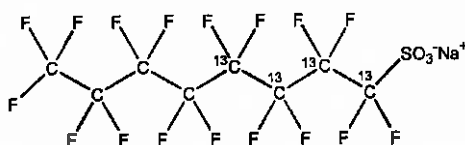
MPFOS

LOT NUMBER:

MPFOS0618

COMPOUND:Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₄¹²C₄F₁₇SO₃Na**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)

47.8 ± 2.4 µg/ml (MPFOS anion)

MOLECULAR WEIGHT:

526.08

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C**LAST TESTED:** (mm/dd/yyyy)

06/15/2018

EXPIRY DATE: (mm/dd/yyyy)

06/15/2023

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

(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 ~ 0.2% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 06/18/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

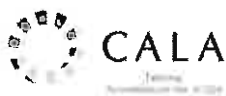
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

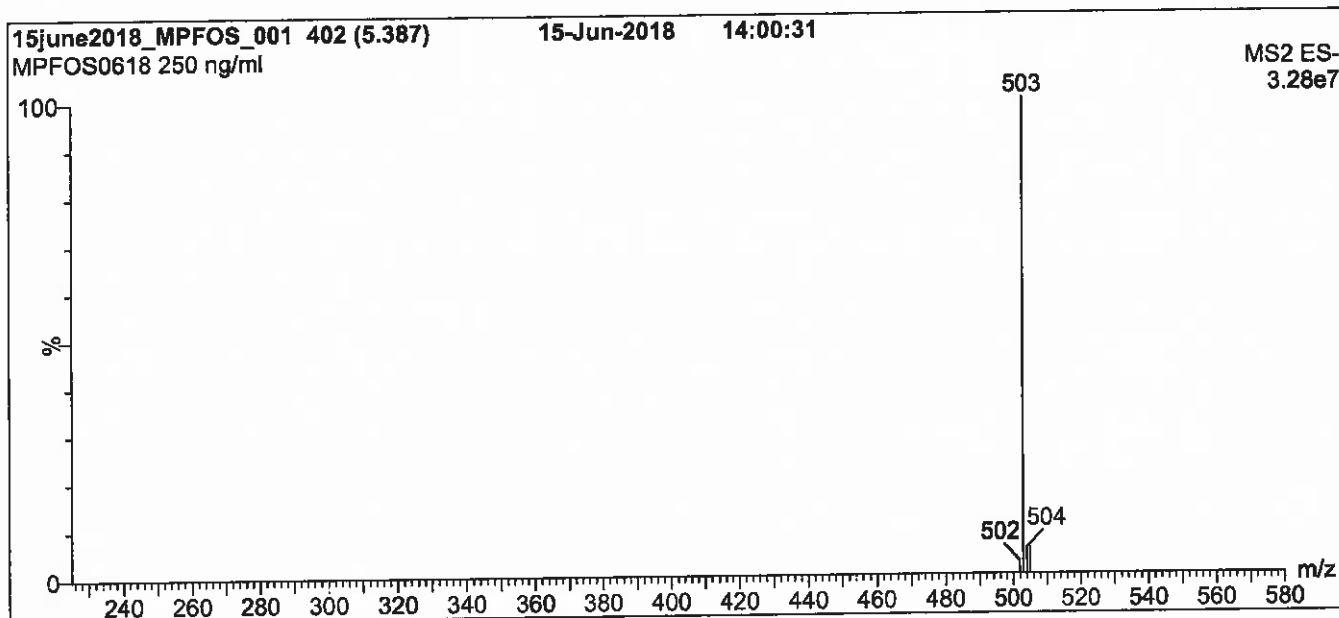
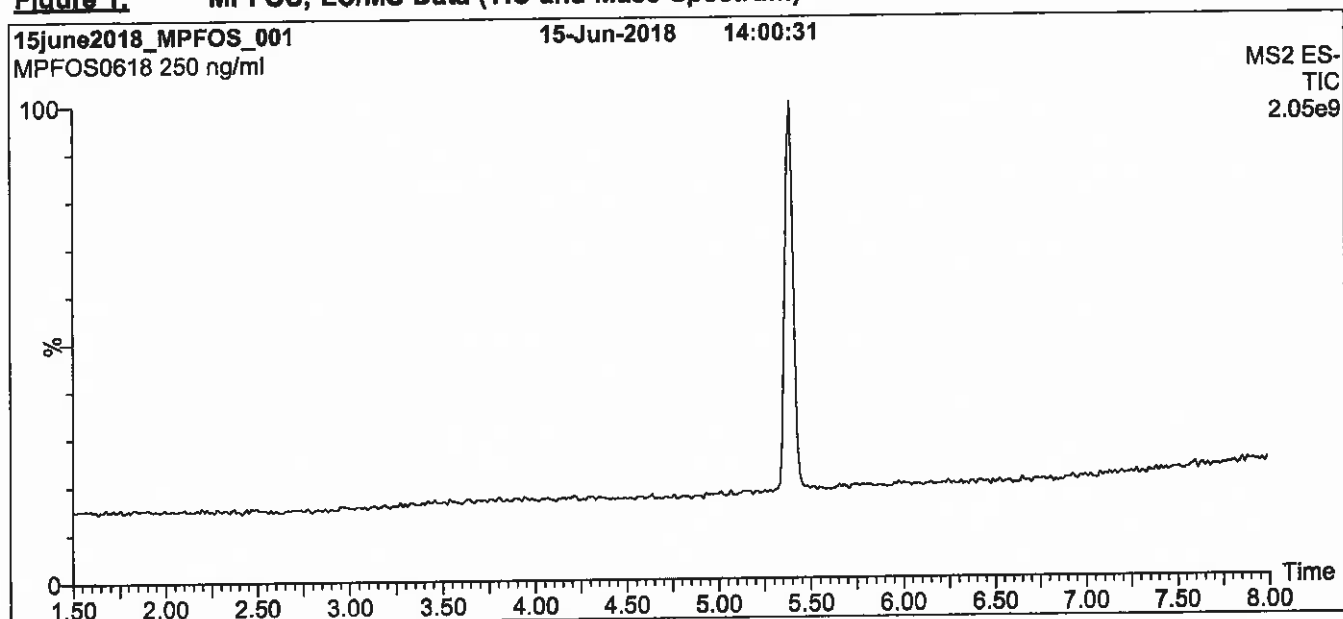
QUALITY MANAGEMENT:

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 17034 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: MPFOS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

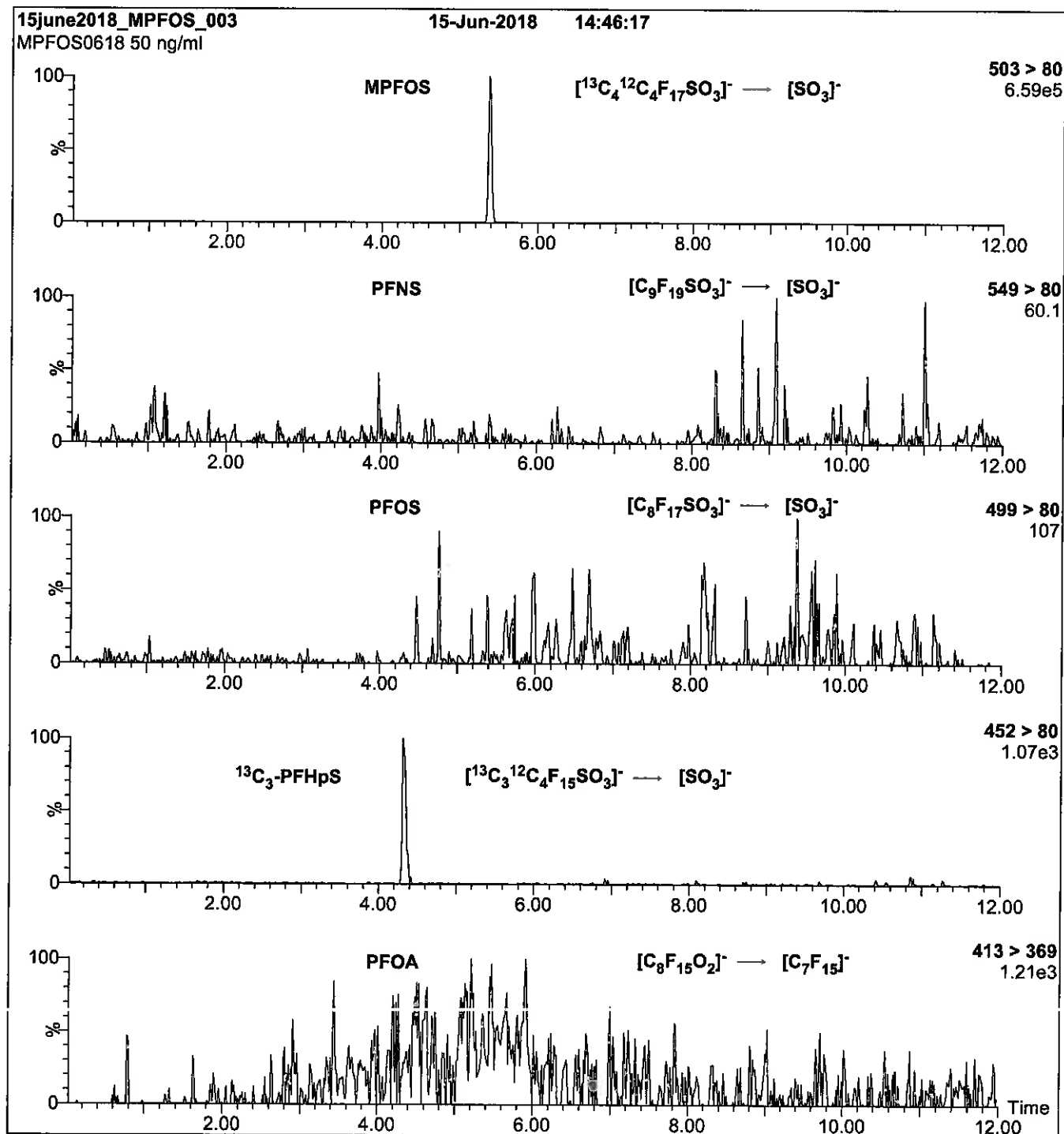
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (MPFOS)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.41e-3

Collision Energy (eV) = 42

Reagent

LCMPFUdA_00018



1287321

ID: LCMPFUdA_00018

Exp:05/11/23 Ppdt:CBW Opn:06/26/18

13C2-Perfluoroundecanoic

R-6126/18 *OK*

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

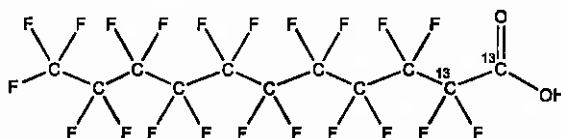
MPFUdA

LOT NUMBER:

MPFUdA0518

COMPOUND:Perfluoro-n-[1,2-¹³C₂]undecanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₉HF₂₁O₂**CONCENTRATION:**

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

566.08

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C(1,2-¹³C₂)**LAST TESTED:** (mm/dd/yyyy)

05/11/2018

EXPIRY DATE: (mm/dd/yyyy)

05/11/2023

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 1-¹³C₁-PFUdA (~1%; see Figure 2), 2-¹³C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

 B.G. Chittim, General Manager

Date: 05/25/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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.

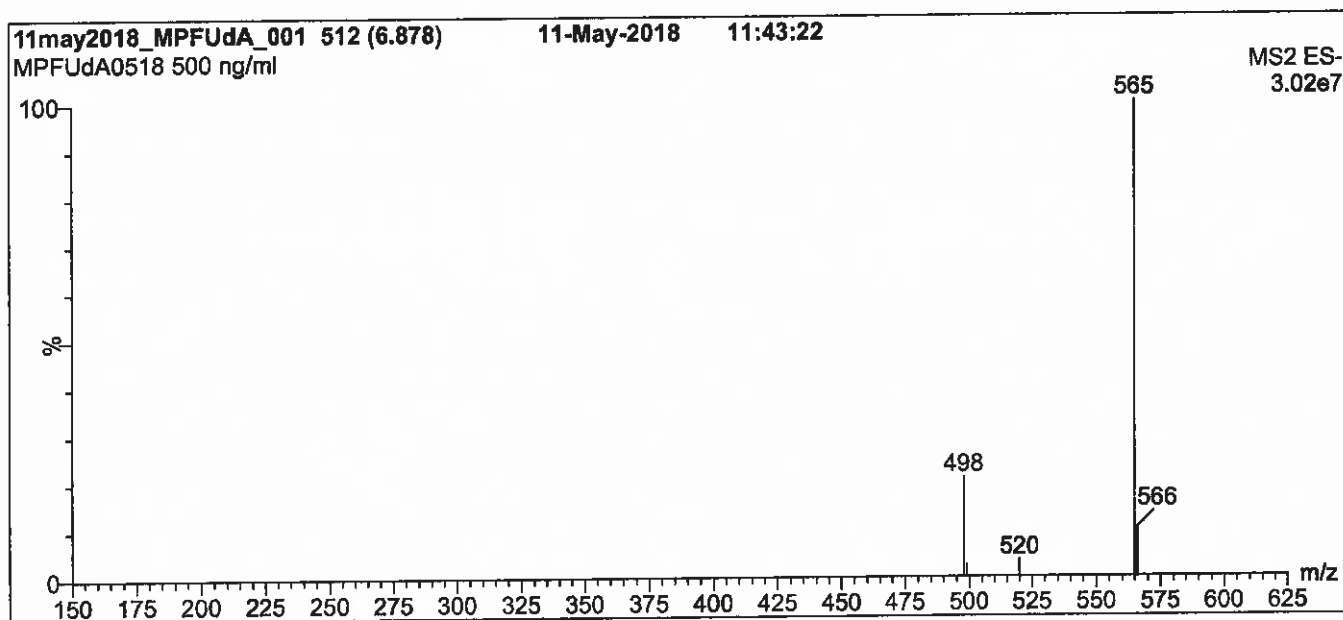
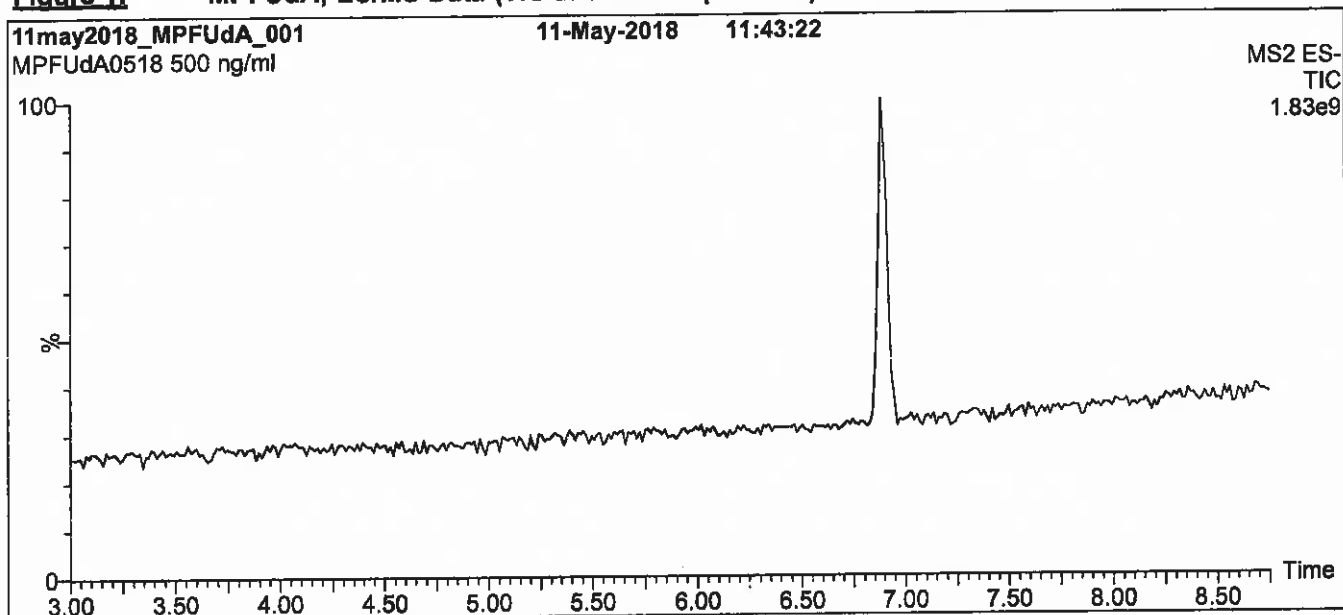
QUALITY MANAGEMENT:

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 17034 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)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 80% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

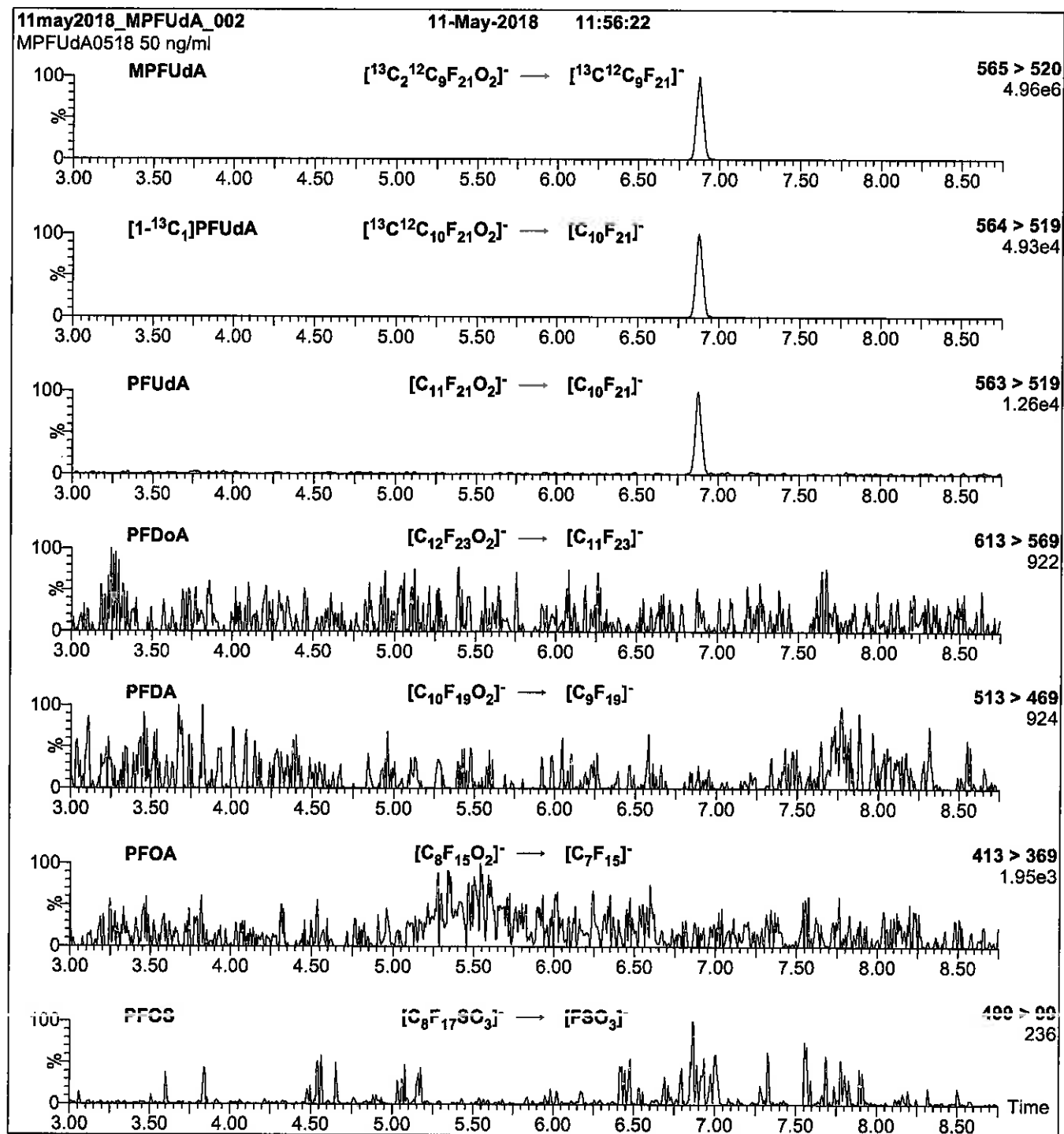
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (MPFUDa)

Mobile phase: Same as Figure 1

Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = 3.51e-3

Collision Energy (eV) = 12

Reagent

LCN-EtFOSA-M_00011

E: 7/19/18 *can*

1307258

ID: LCN-EtFOSA-M_00011

Exp: 05/31/23 Prod: CSW Opn: 07/19/18

N-EtFOSA-M



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSA-M

LOT NUMBER:

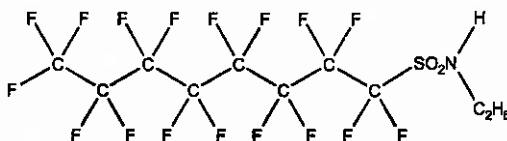
NEtFOSA0518M

COMPOUND:

N-ethylperfluoro-1-octanesulfonamide

STRUCTURE:**CAS #:**

4151-50-2

**MOLECULAR FORMULA:** $C_{10}H_{17}F_{17}NO_2S$ **MOLECULAR WEIGHT:**

527.20

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/31/2018

EXPIRY DATE: (mm/dd/yyyy)

05/31/2023

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 ~ 0.5% branched isomers of N-ethylperfluorooctanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date:

06/12/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

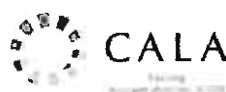
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

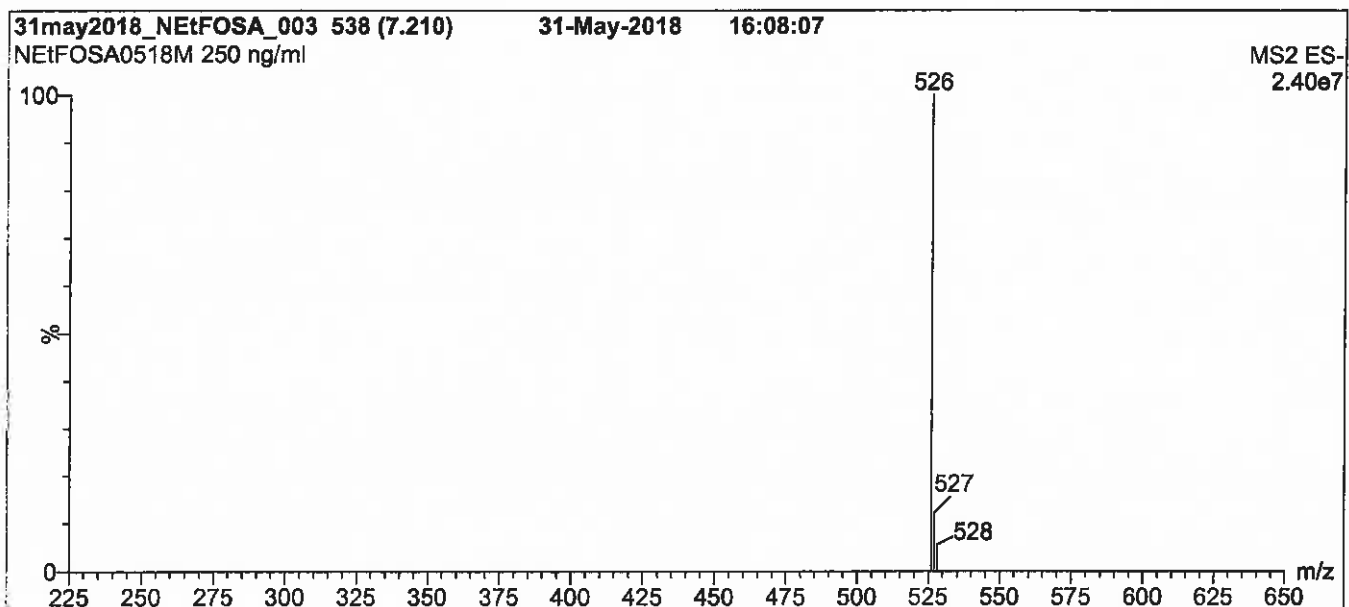
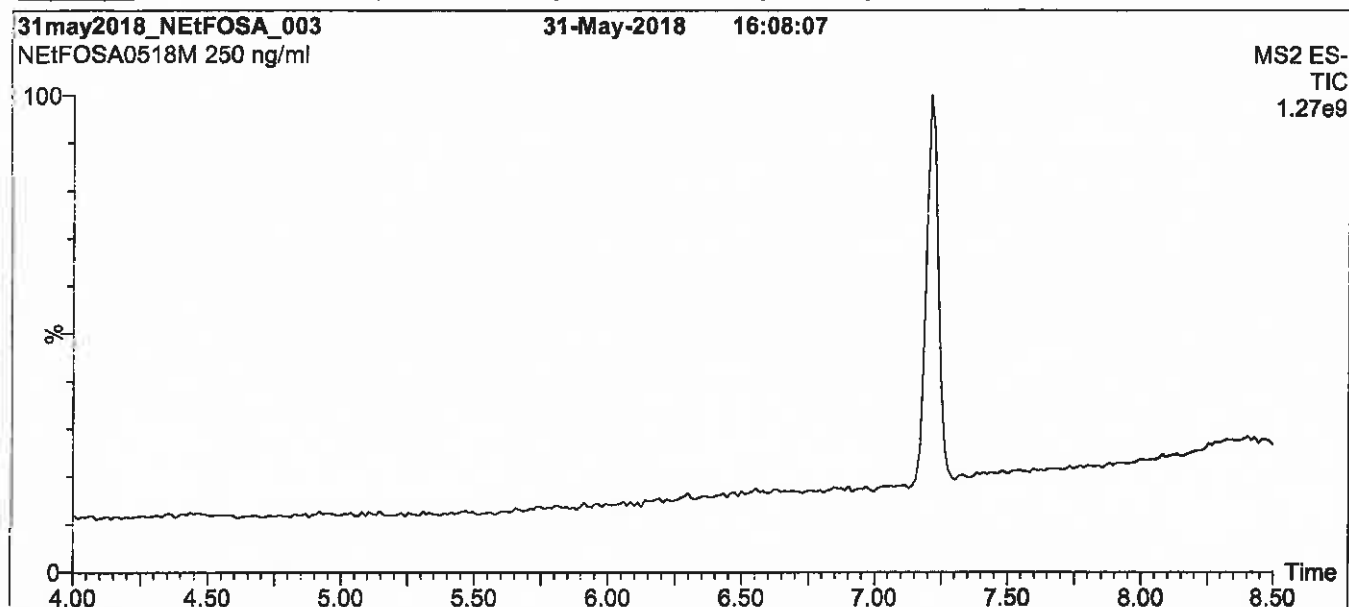
QUALITY MANAGEMENT:

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 17034 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: N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH C₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 85% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

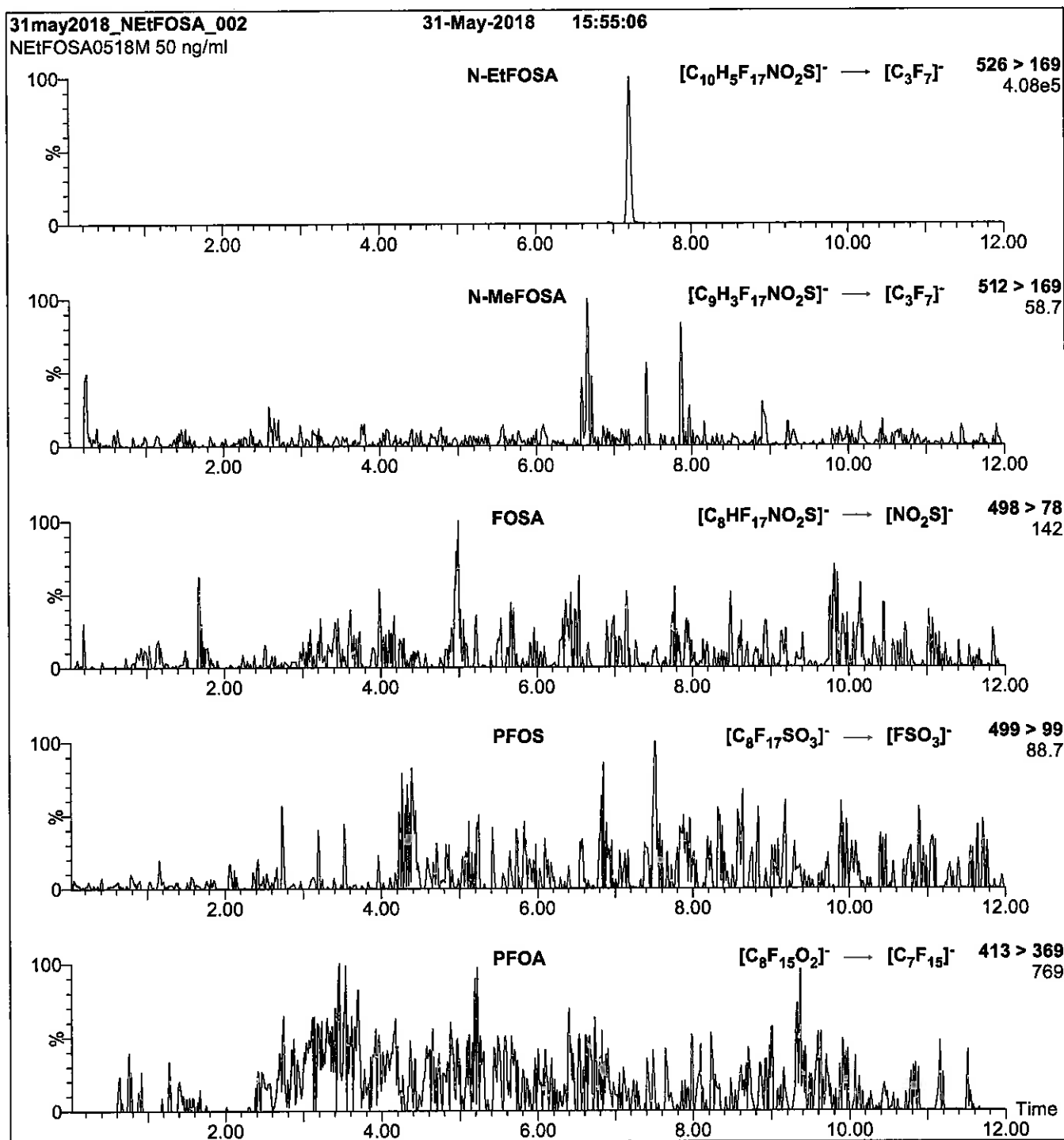
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (N-EtFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.37e-3

Collision Energy (eV) = 24

Reagent

LCN-MeFOSA-M_00010

R: 7/19/18 *aw*

1307243

ID: LCN-MeFOSA-M_00010

Exp: 05/31/23 Pp'd: CGW Opn: 07/19/18

N-MeFOSA-M



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSA-M

LOT NUMBER:

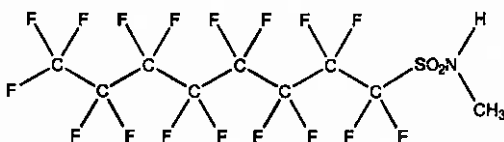
NMeFOSA0518M

COMPOUND:

N-methylperfluoro-1-octanesulfonamide

STRUCTURE:**CAS #:**

31506-32-8

**MOLECULAR FORMULA:** $C_8H_4F_{17}NO_2S$ **MOLECULAR WEIGHT:**

513.17

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/31/2018

EXPIRY DATE: (mm/dd/yyyy)

05/31/2023

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:

B.G. Chittim, General Manager

Date: 06/07/2018

(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

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.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

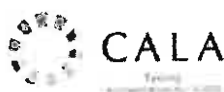
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

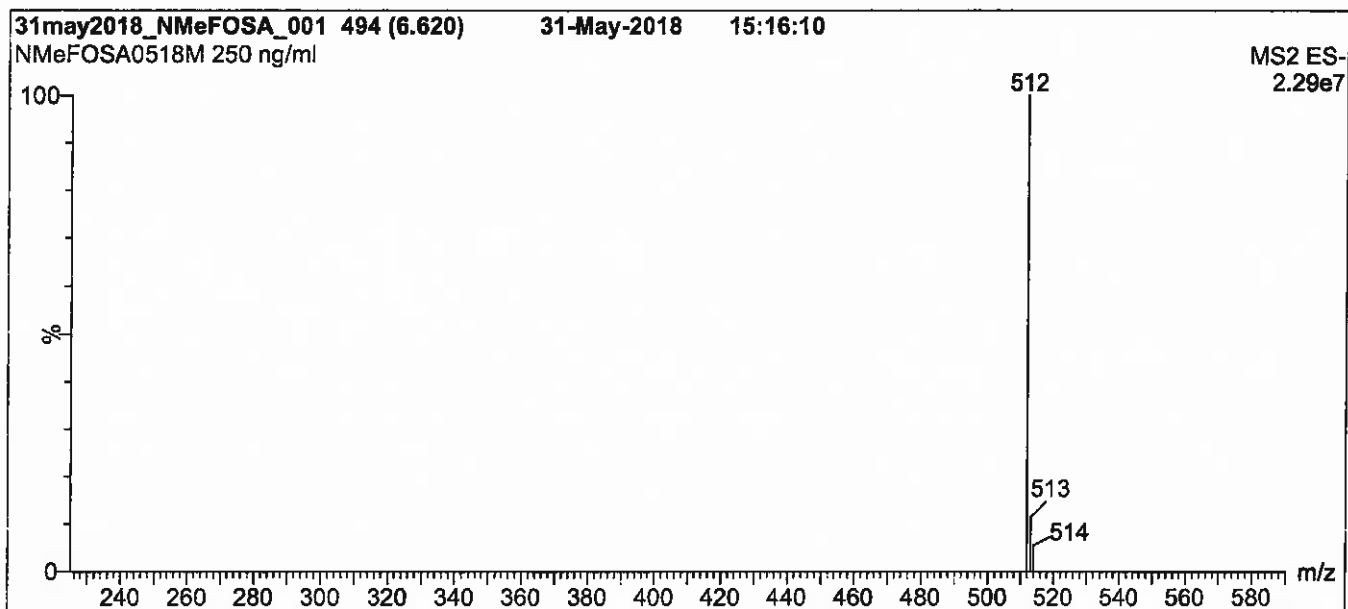
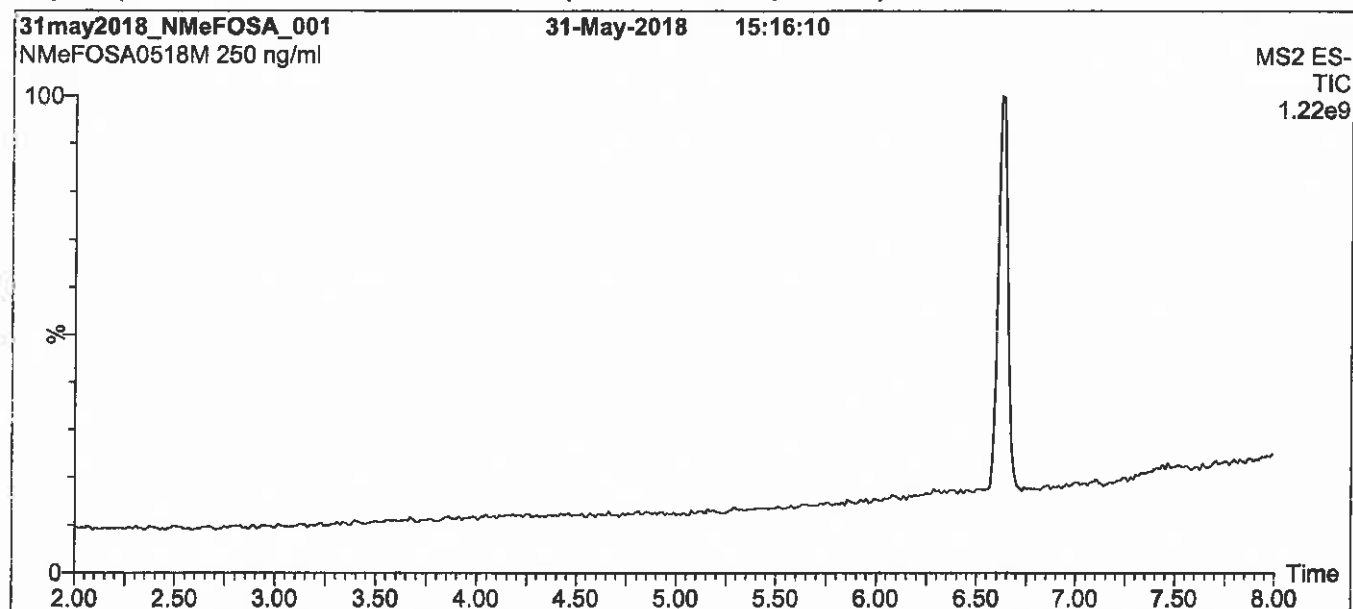
QUALITY MANAGEMENT:

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 17034 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: N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH C₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 85% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

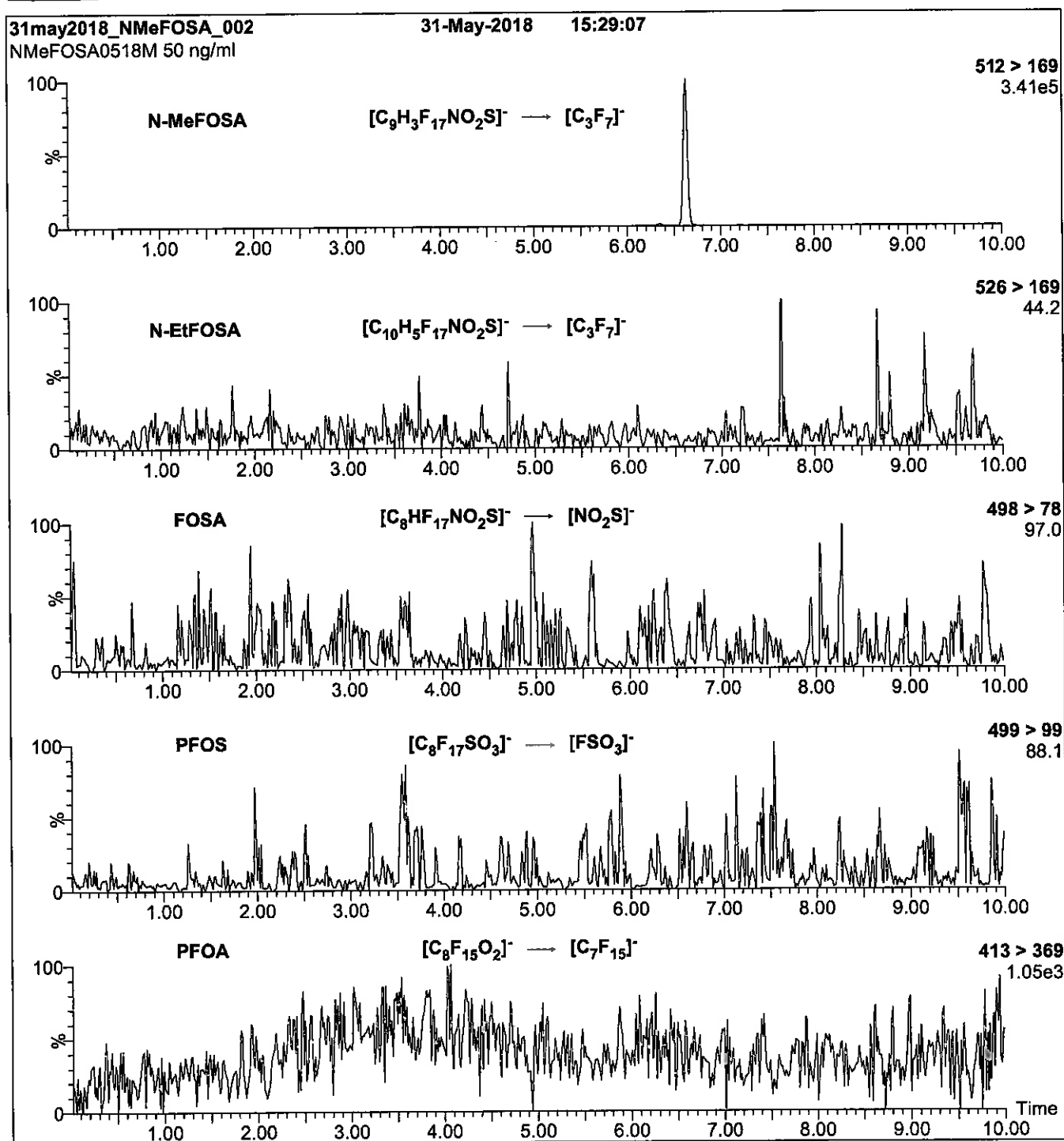
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: On-column (N-MeFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.37e-3

Collision Energy (eV) = 24

Reagent

LCPFAC-24PAR_00002



1310191

ID: LCPFAC-24PAR_00002

Exp: 04/18/23 Prid: TTP Opn: 07/24/18
PFAC/PFAS MixRec: 7/24/18 TP
Opn: 7/24/18 TP
Exp: 4/18/23**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PFAC-24PAR****Native Per- and Poly-fluoroalkyl Substance**
Precision and Recovery Standard Solution

PRODUCT CODE: PFAC-24PAR
LOT NUMBER: PFAC24PAR0418
SOLVENT(S): Methanol / Isopropanol (4%) / Water (<1%)
DATE PREPARED: (mm/dd/yyyy) 04/09/2018
LAST TESTED: (mm/dd/yyyy) 04/18/2018
EXPIRY DATE: (mm/dd/yyyy) 04/18/2023
RECOMMENDED STORAGE: Refrigerate ampoule

DESCRIPTION:

PFAC-24PAR is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C₄-C₁₄), seven native perfluoroalkylsulfonates (C₄, C₅, C₇, C₉, and C₁₀ linear; C₈ and C₉ linear and branched), three native telomer sulfonates (4:2, 6:2, and 8:2), two native perfluorooctanesulfonamidoacetic 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

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 compounds it contains.

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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. This 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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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 calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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 17034 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

Table A: PFAC-24PAR; Components and Concentrations
(ng/ml, $\pm$ 5% in Methanol / Isopropanol (4%) / Water (<1%))

Compound	Abbreviation	Concentration *** (ng/ml)		Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000		A
Perfluoro-n-pentanoic acid	PFPeA	2000		B
Perfluoro-n-hexanoic acid	PFHxA	2000		E
Perfluoro-n-heptanoic acid	PFHpA	2000		G
Perfluoro-n-octanoic acid	PFOA	2000		K
Perfluoro-n-nonanoic acid	PFNA	2000		M
Perfluoro-n-decanoic acid	PFDA	2000		Q
Perfluoro-n-undecanoic acid	PFUdA	2000		V
Perfluoro-n-dodecanoic acid	PFDoA	2000		X
Perfluoro-n-tridecanoic acid	PFTrDA	2000		Y
Perfluoro-n-tetradecanoic acid	PFTeDA	2000		Z
Perfluoro-1-octanesulfonamide	FOSA	2000		T
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 In Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2000	1880	F
Potassium perfluorohexanesulfonate*	PFHxSK: linear isomer	1620	1480	I
	PFHxSK: Σ branched isomers	378	344	H
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2000	1900	L
Potassium perfluorooctanesulfonate**	PFOSK: linear isomer	1580	1460	O
	PFOSK: Σ branched isomers	422	391	N
Sodium perfluoro-1-nonanesulfonate	L-PFNS	2000	1920	R
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.
 *** Concentrations have been rounded to three significant figures.

Table B: PFHxSK; Isomeric Components and Percent Composition (by ^{19}F -NMR)*

Isomer	Name	Structure	Percent Composition by ^{19}F -NMR	
1	Potassium perfluoro-1-hexanesulfonate	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	81.1	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{SO}_3^-\text{K}^+$	2.9	18.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{SO}_3^-\text{K}^+$	1.4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	5.0	
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	8.9	
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\text{CF}_3\text{C}(\text{CF}_3)_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	0.2	
7	Other Unidentified Isomers		0.5	

* Percent of total perfluorohexanesulfonate isomers only.
 ** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Table C: 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 CF ₂ CF ₂ CF ₂ CF ₂ 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 CF(SO ₃ ⁻)K ⁺ CF ₃	1.2	21.1
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(CF ₃)SO ₃ ⁻ K ⁺ CF ₃	0.6	
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺ CF ₃	1.9	
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	2.2	
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	4.5	
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(CF ₃)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 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 CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.4	
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF(CF ₃)CF ₂ CF(CF ₃)CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.07	

* Percent of total perfluorooctanesulfonate isomers only.
 ** Systematic Name: Potassium perfluorooctane-2-sulfonate.

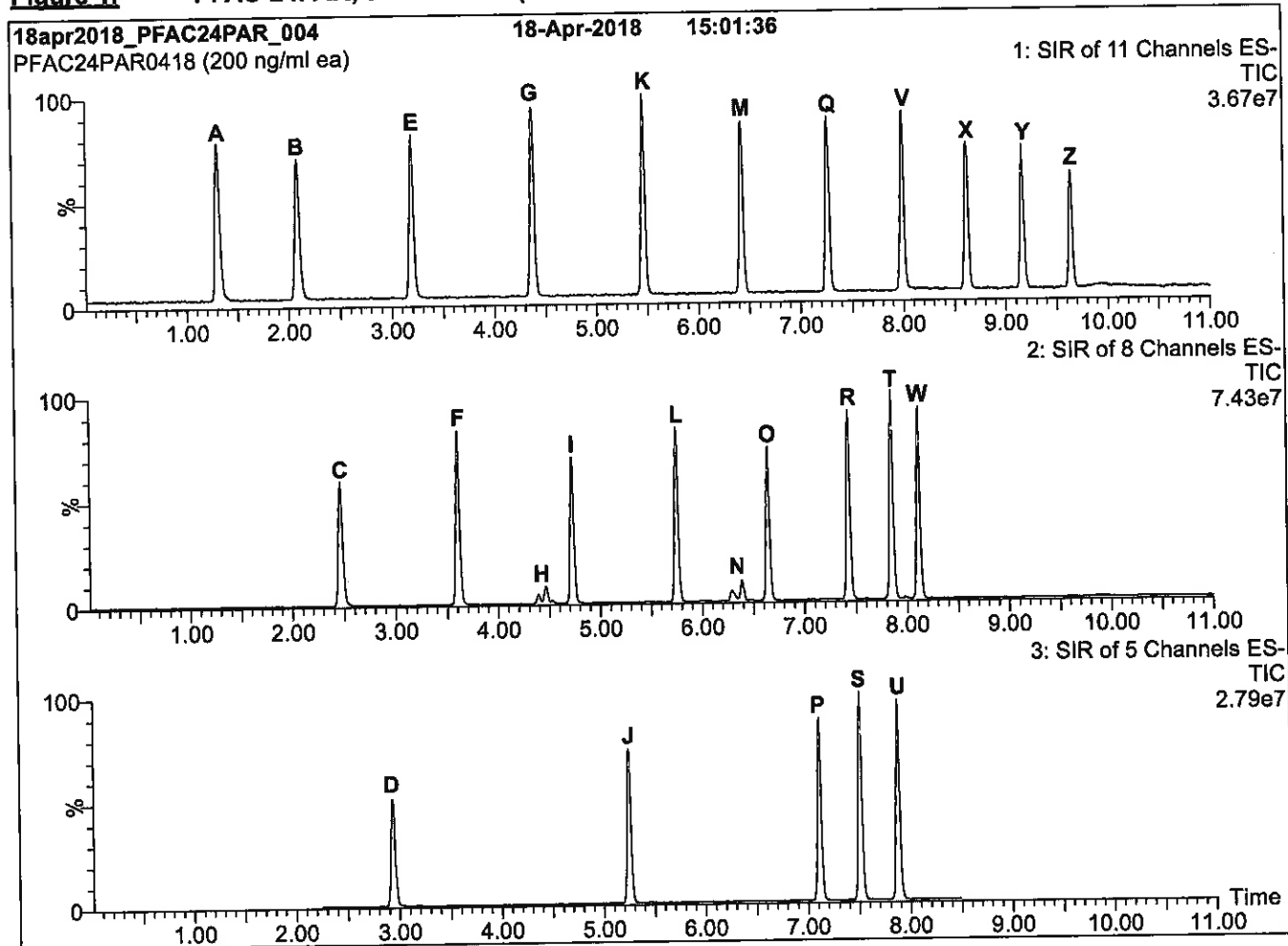
Certified By:


 B.G. Chittim, General Manager

Date: 04/24/2018

(mm/dd/yyyy)

Figure 1: PFAC-24PAR; LC/MS Data (Total Ion Current Chromatogram; SIR)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Waters Xevo TQ-S micro MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 10 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 15 min

Flow: 300 μ l/min

MS Parameters

Experiment: SIR

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = variable (2-38)
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)

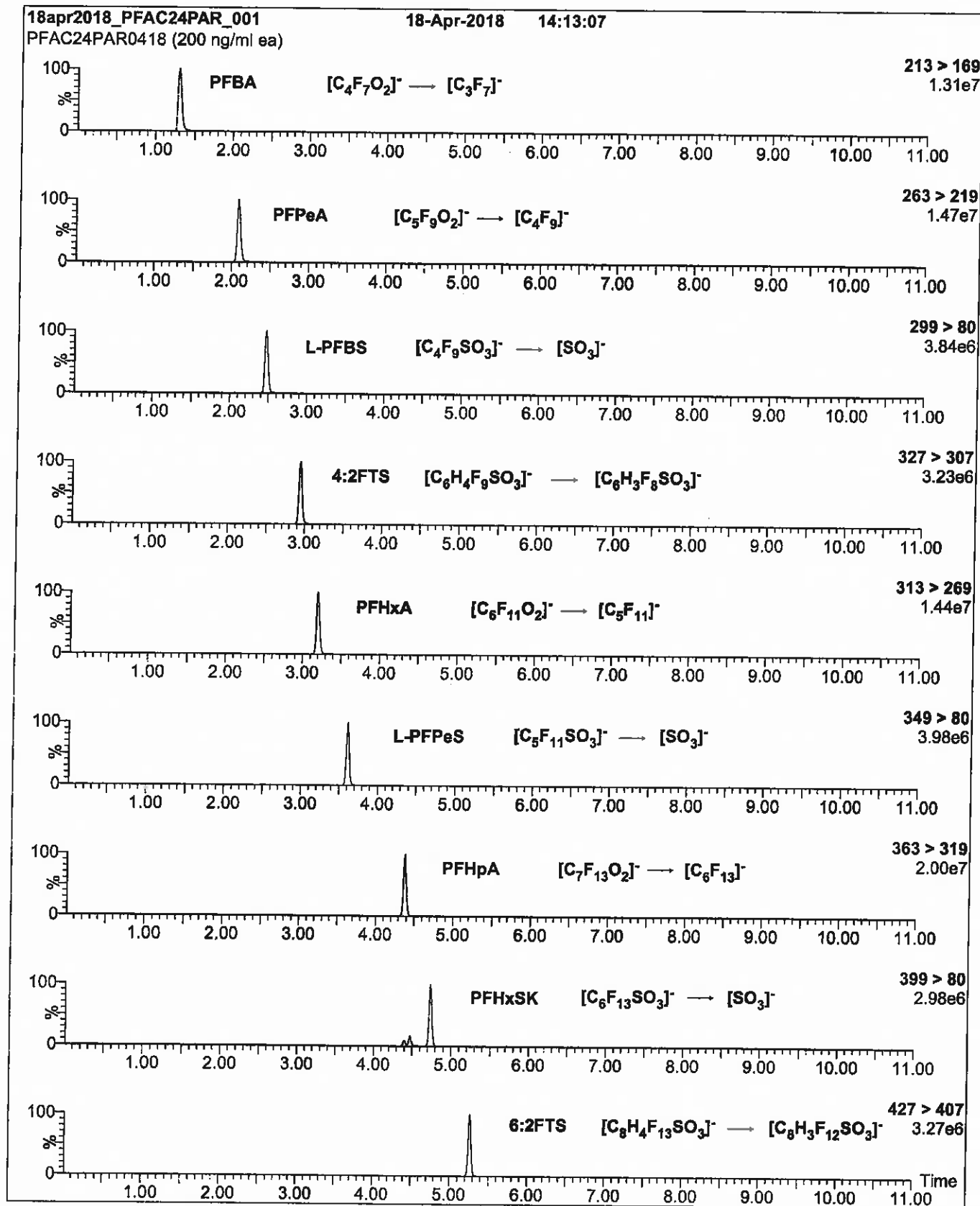


Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)

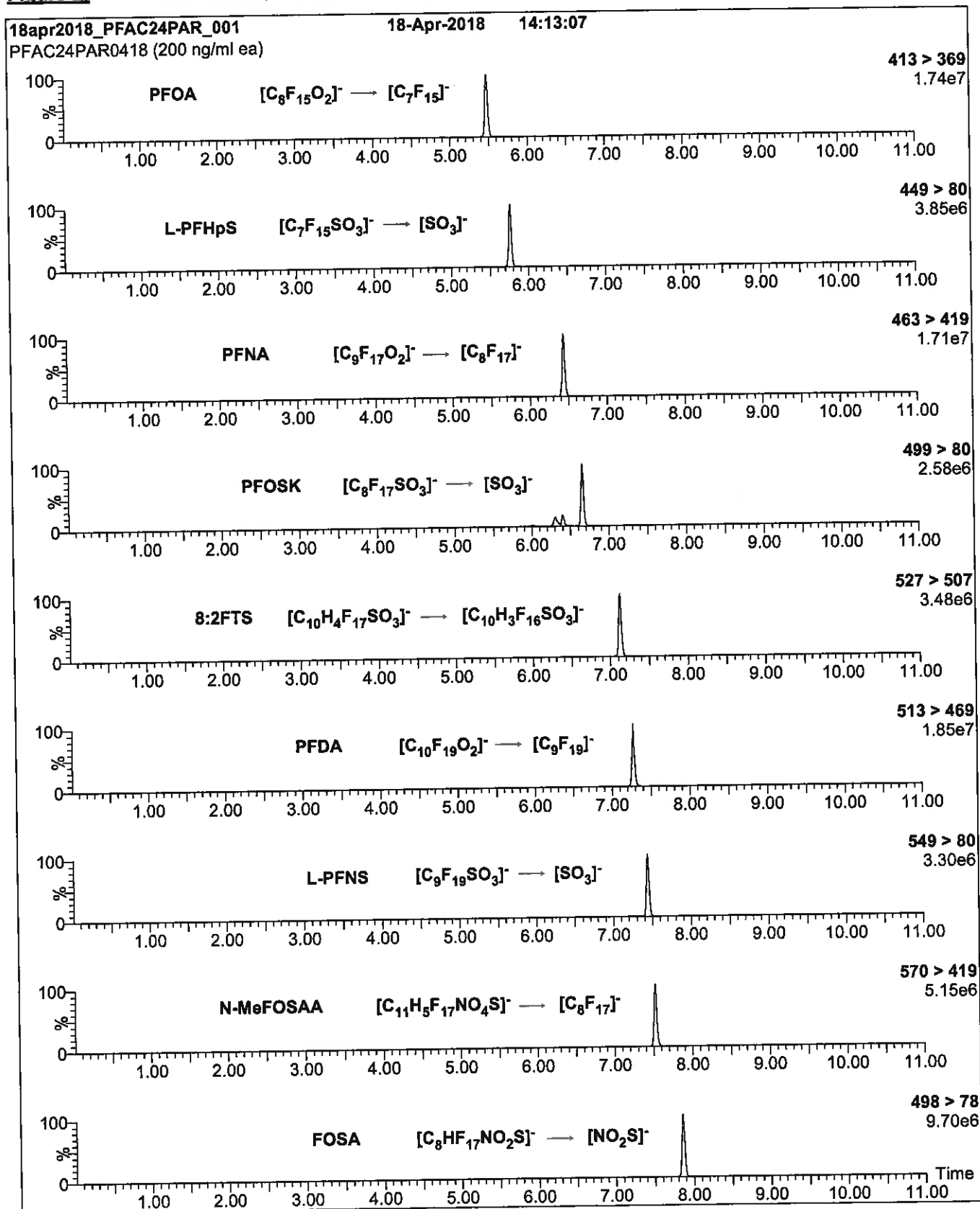
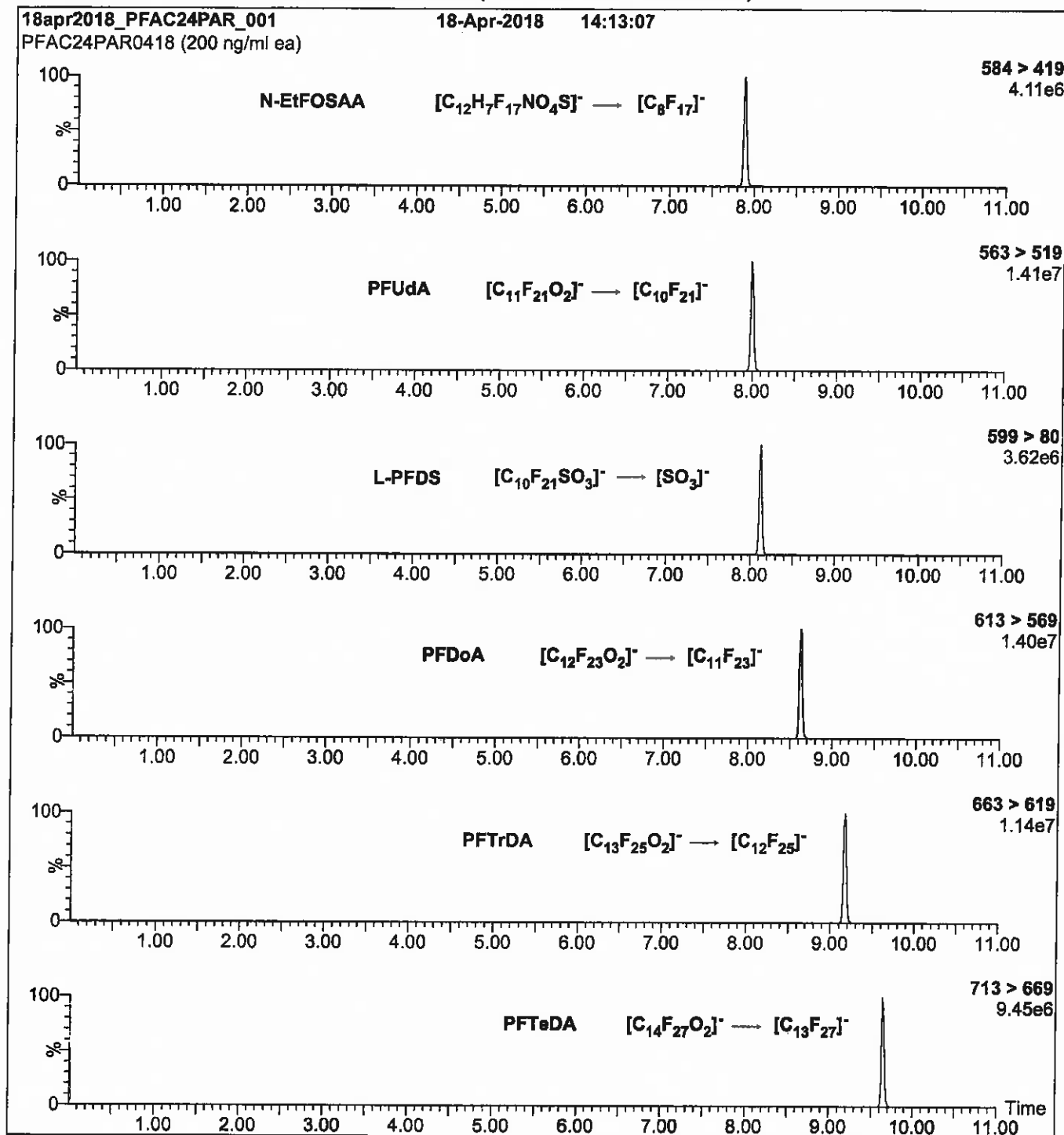


Figure 2: PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: On-column (PFAC-24PAR)

Mobile phase: Same as Figure 1

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.47e-3

Collision Energy (eV) = 8-64 (variable)

Reagent

LCPFBA_00008

P: 9/21/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0517

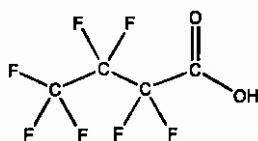
COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4



MOLECULAR FORMULA:

$C_4HF_7O_2$

MOLECULAR WEIGHT:

214.04

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 05/30/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

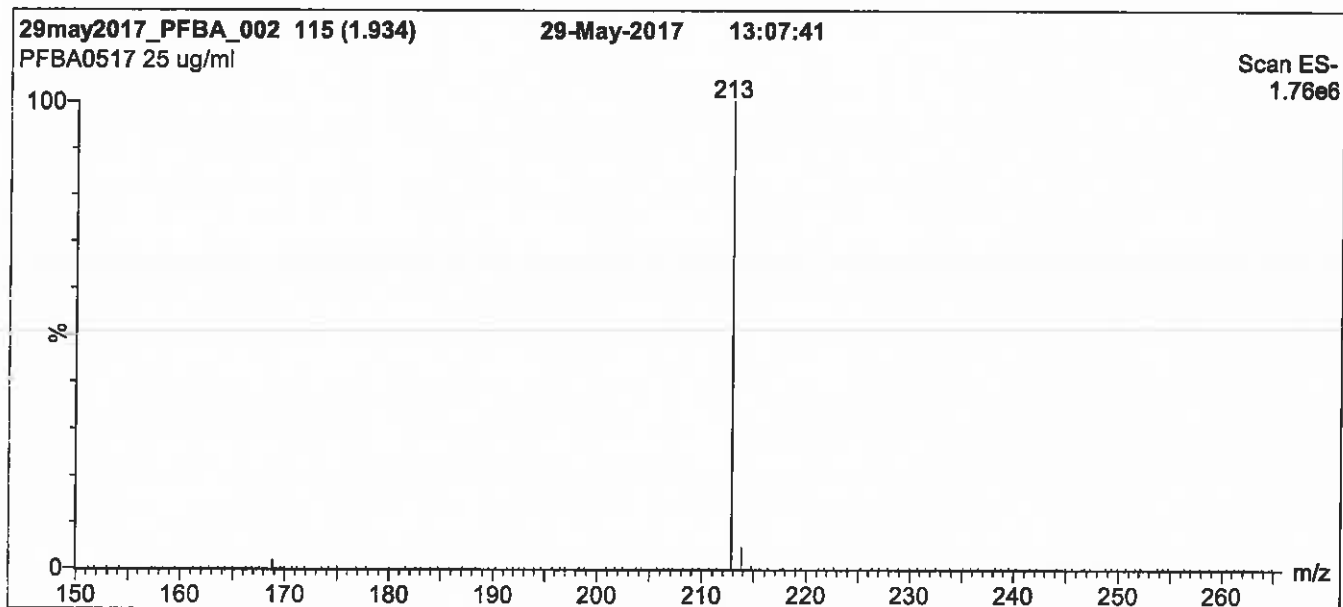
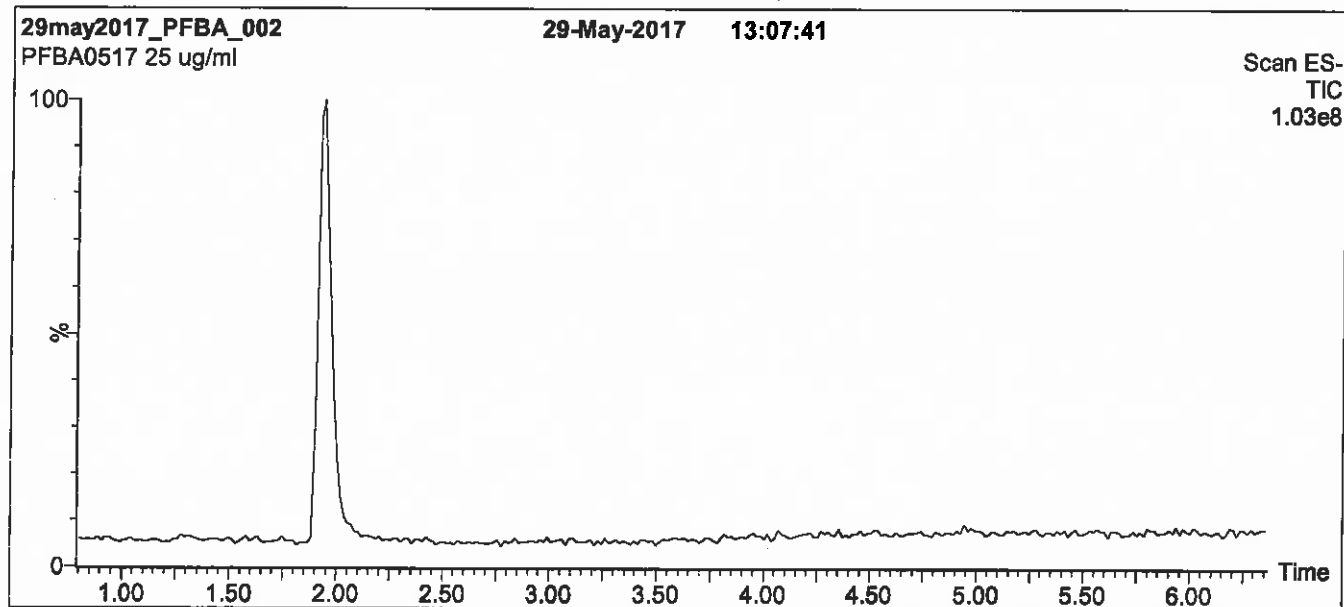
QUALITY MANAGEMENT:

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: PFBA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

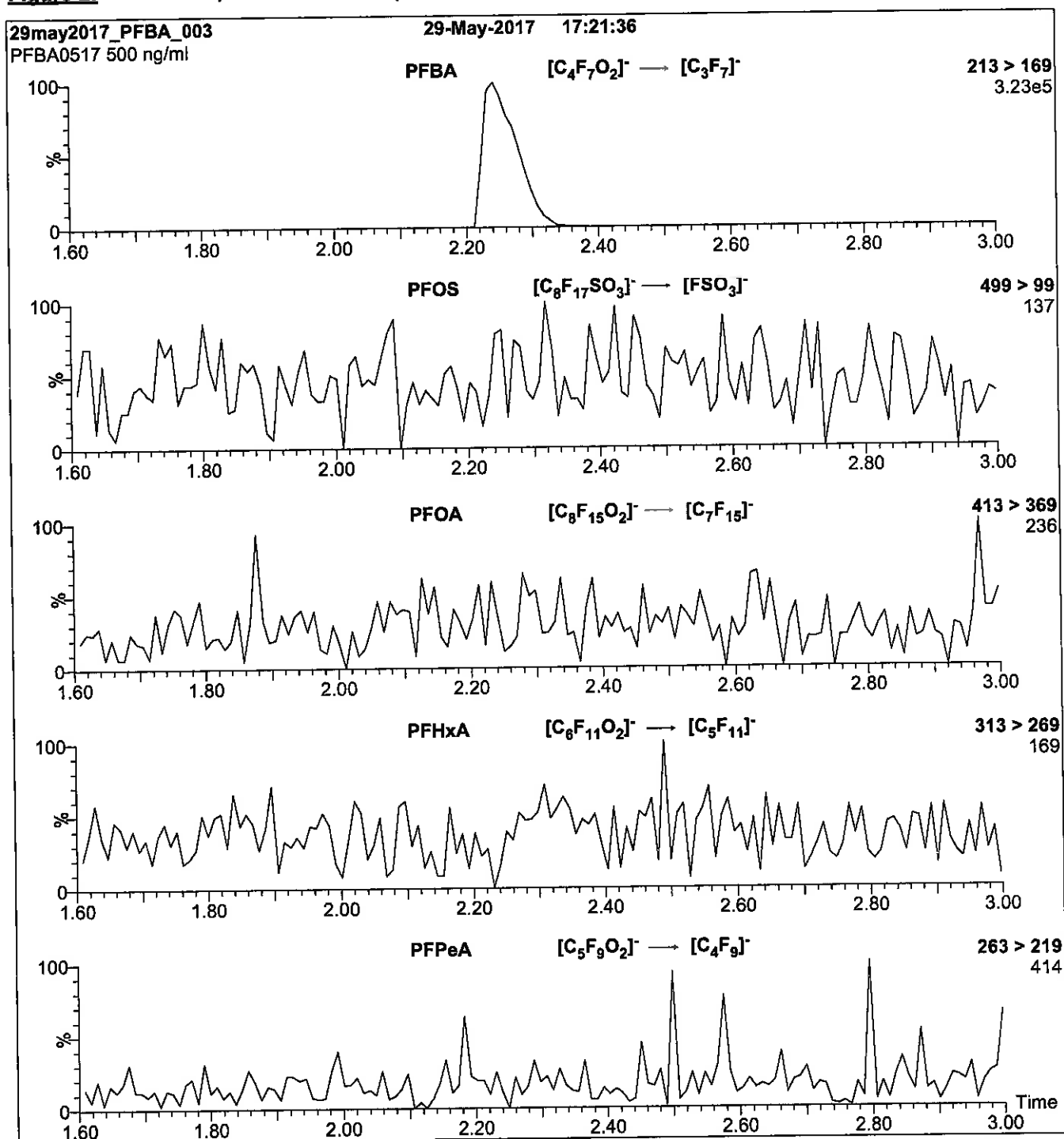
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00009

D: 2/16/18 SN



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

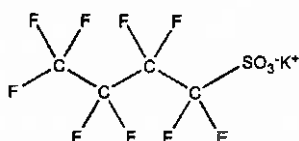
LOT NUMBER: LPFBS0917

COMPOUND:

Potassium perfluoro-1-butanesulfonate

STRUCTURE:

CAS #: 29420-49-3



MOLECULAR FORMULA:

C₄F₉SO₃K

MOLECULAR WEIGHT: 338.19

CONCENTRATION:

50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)

SOLVENT(S): Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/21/2017

EXPIRY DATE: (mm/dd/yyyy)

09/21/2022

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:


B.G. Chittim, General Manager

Date: 09/22/2017
(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

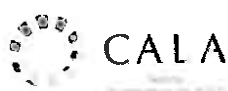
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

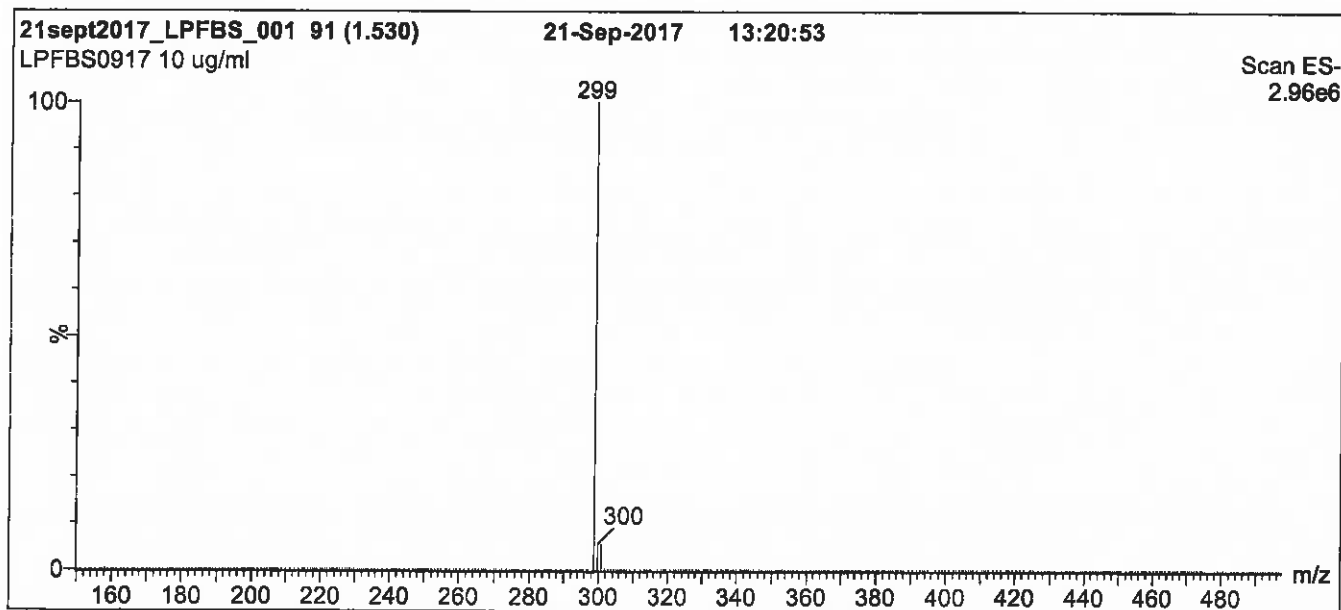
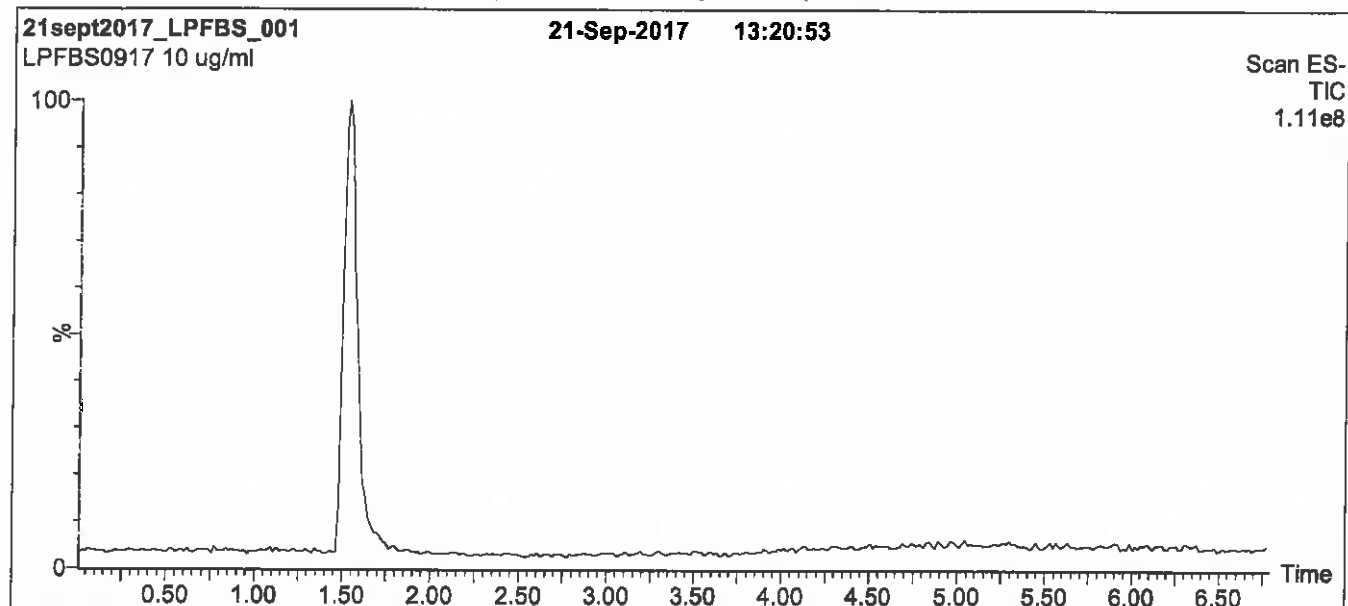
QUALITY MANAGEMENT:

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: L-PFBS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min: and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

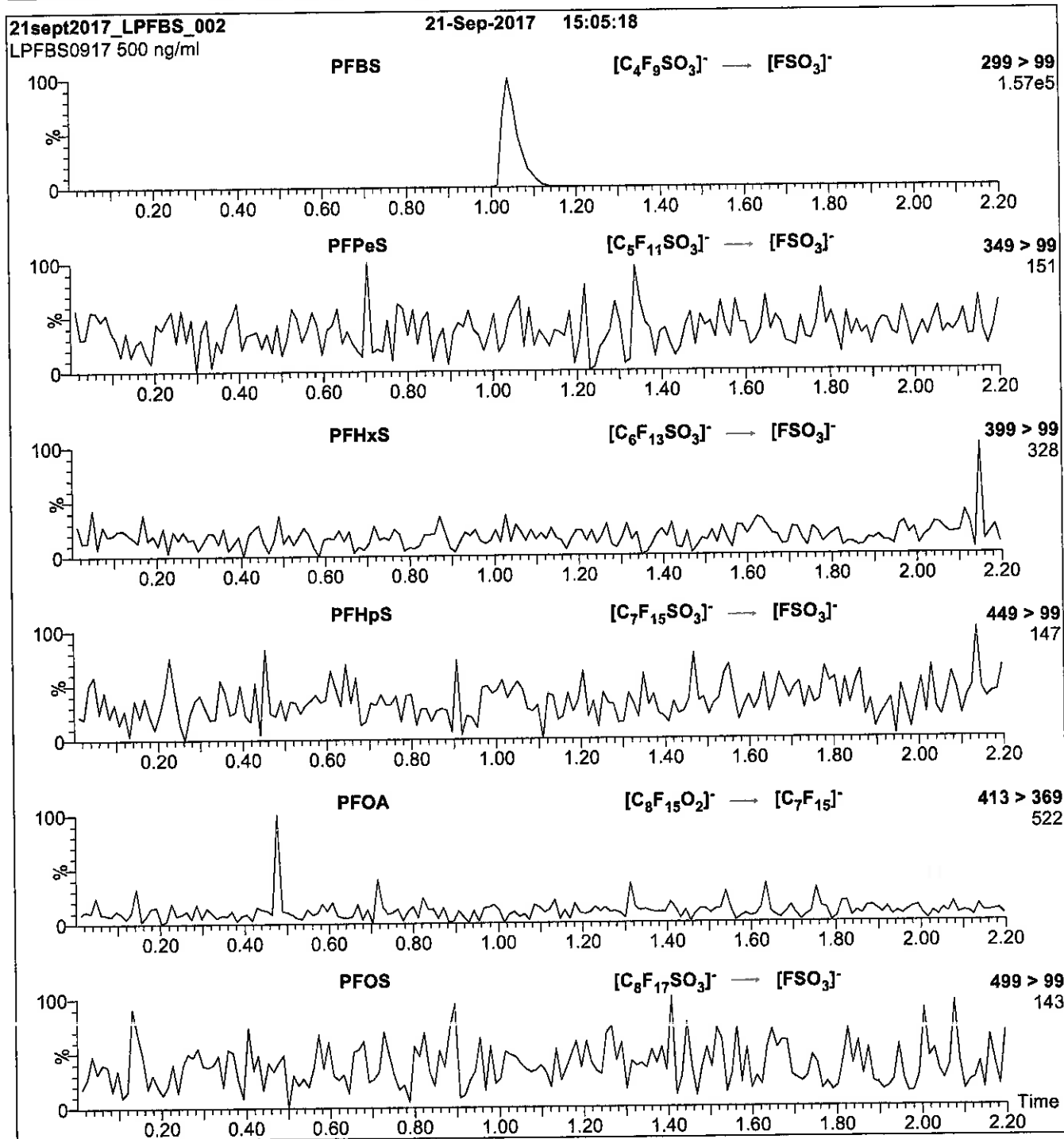
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3

Collision Energy (eV) = 25

Reagent

LCPFDA_00008

n: 9/2/17 skv



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0517

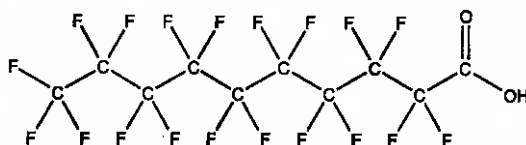
COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2



MOLECULAR FORMULA:

$C_{10}H_2F_{18}O_2$

MOLECULAR WEIGHT:

514.08

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>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:

B.G. Chittim, General Manager

Date: 05/30/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

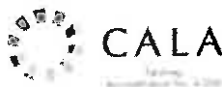
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

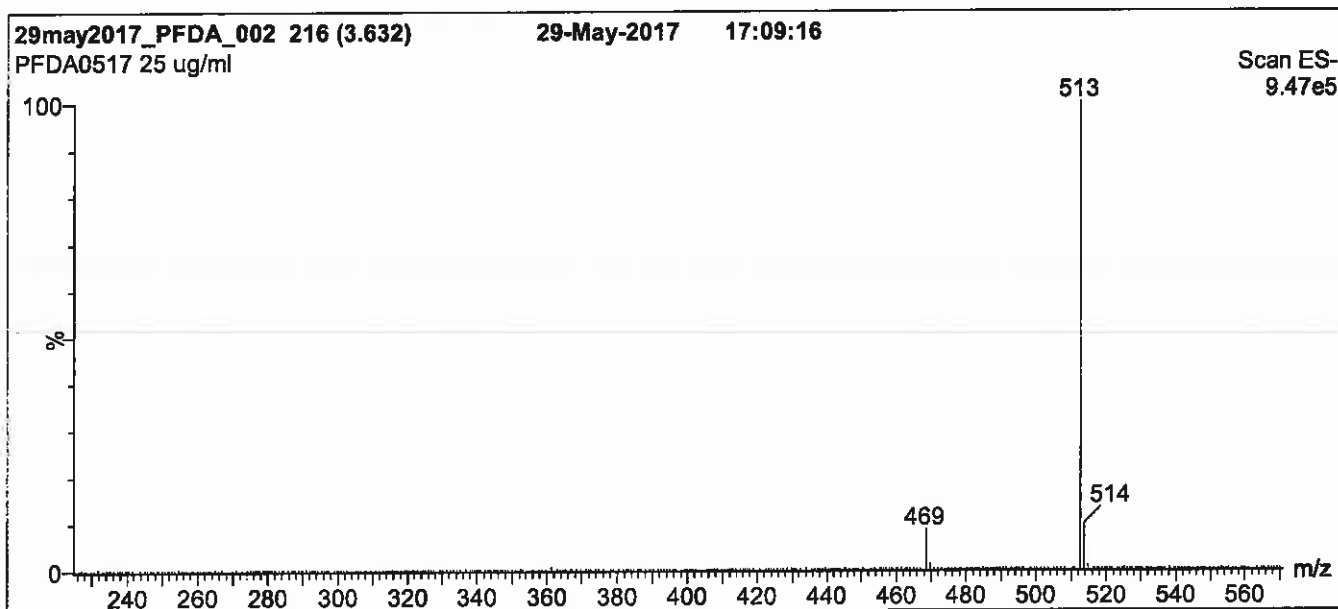
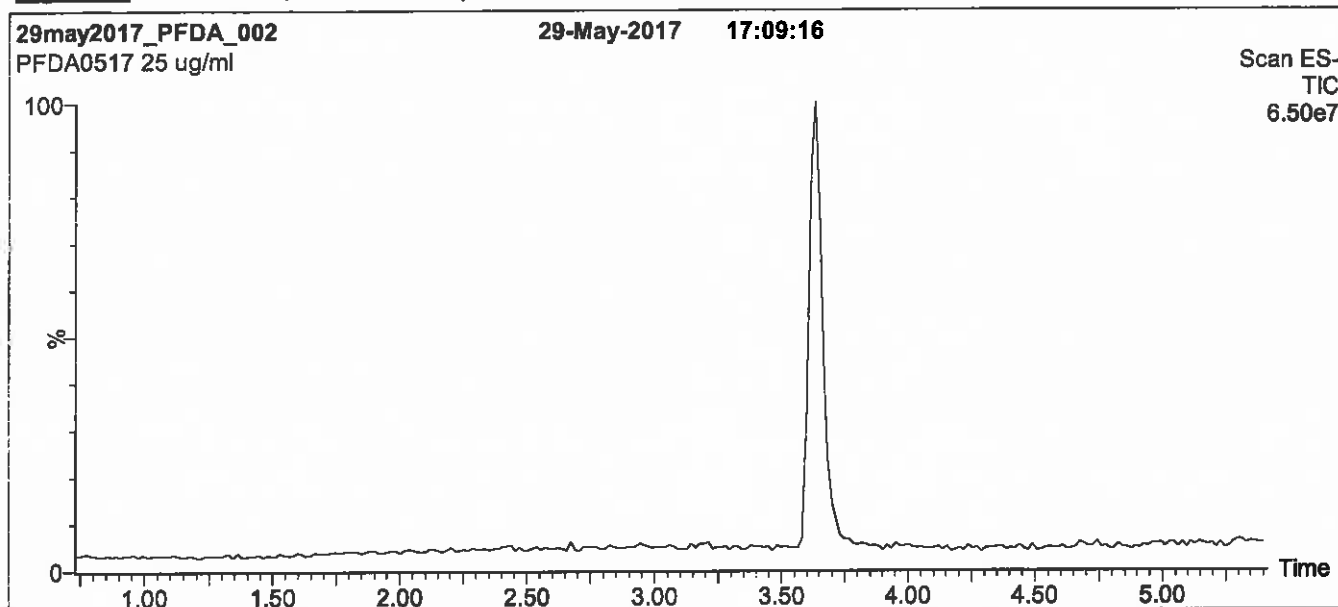
QUALITY MANAGEMENT:

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: PFDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

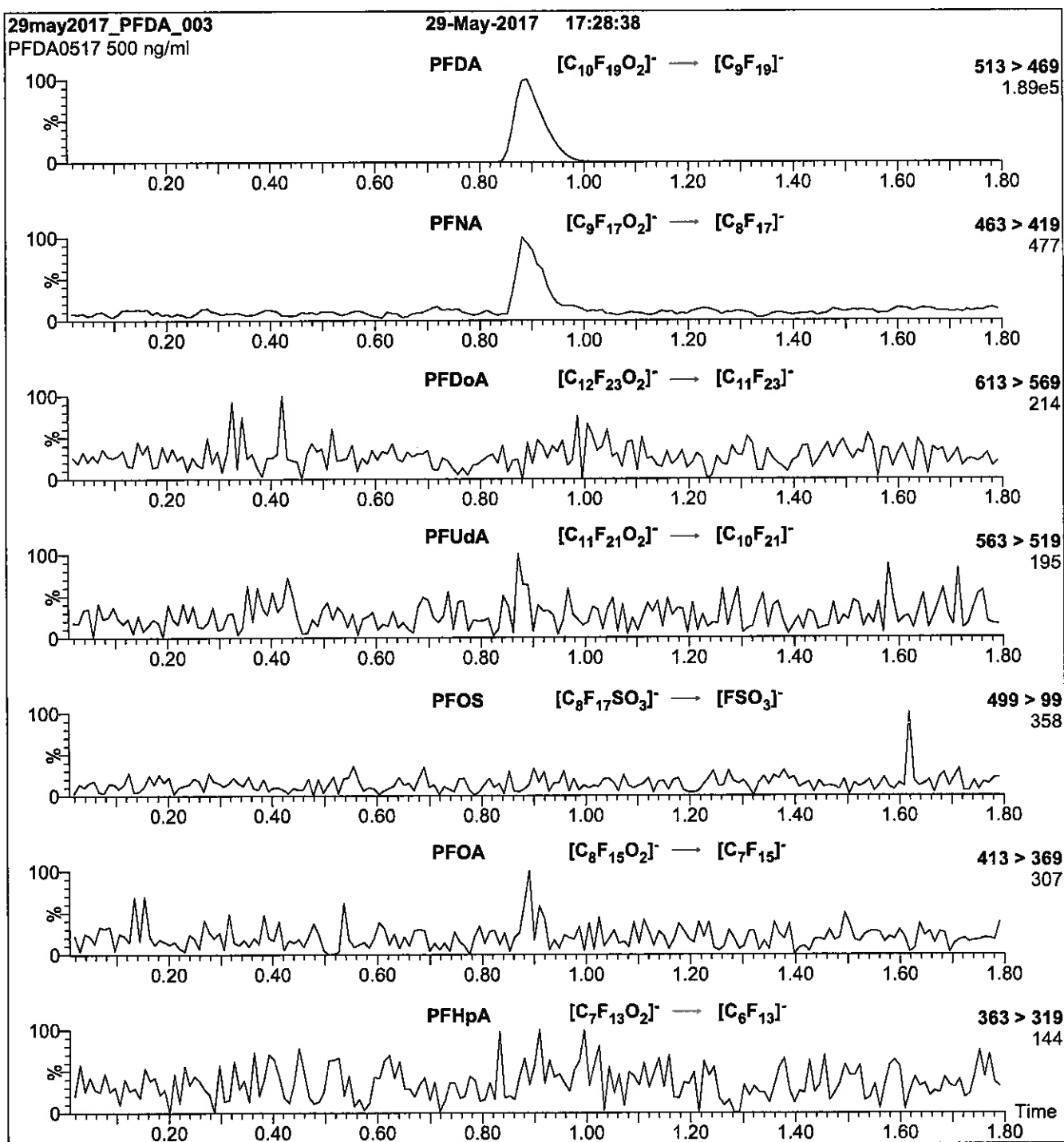
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00010

P: 10/20/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFD0A

LOT NUMBER:

PFD0A0517

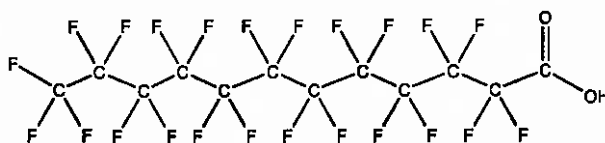
COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1



MOLECULAR FORMULA:

$C_{12}H_{23}O_2$

MOLECULAR WEIGHT:

614.10

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 05/30/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

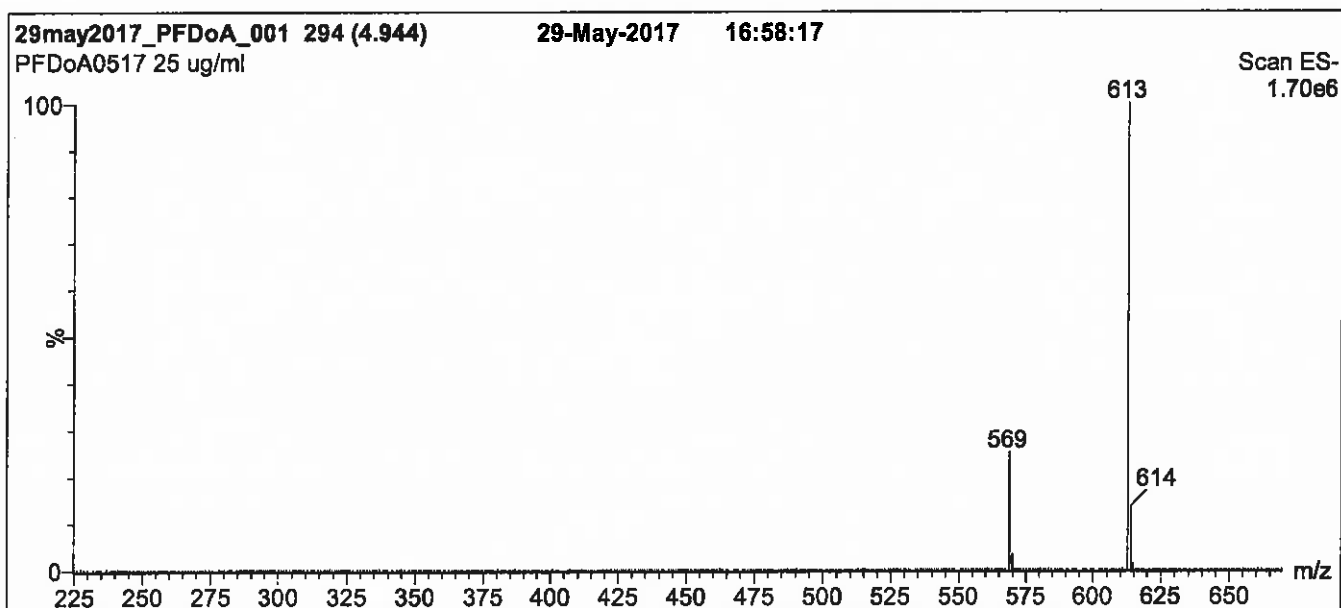
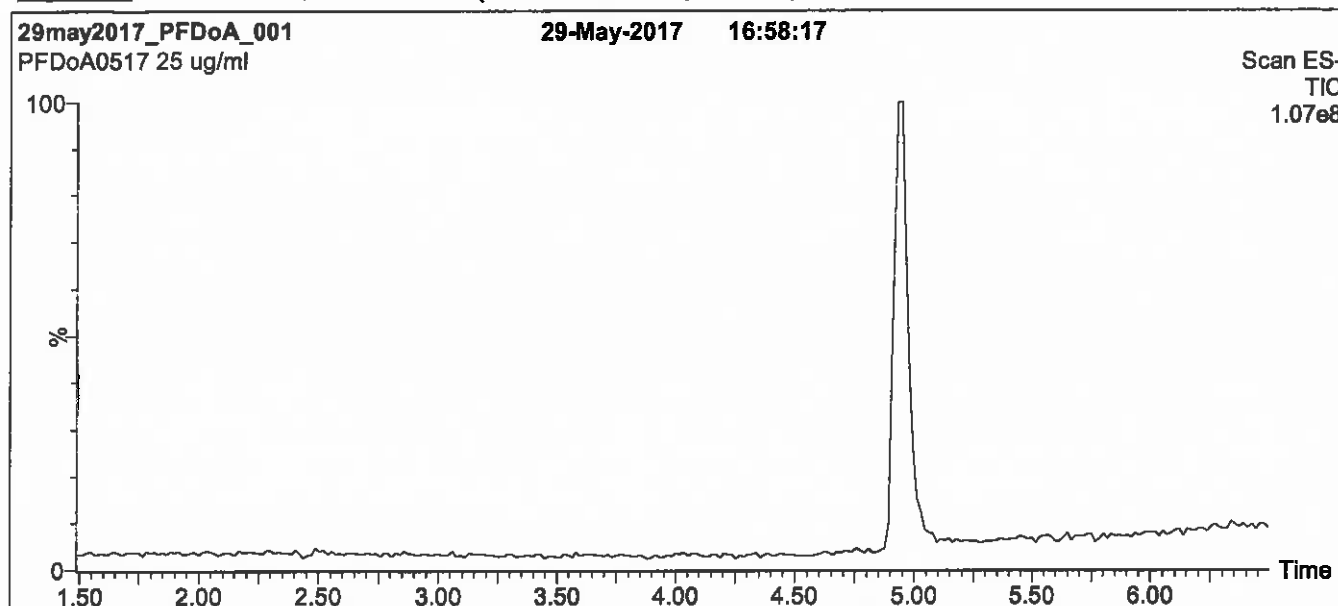
QUALITY MANAGEMENT:

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: PFDoA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

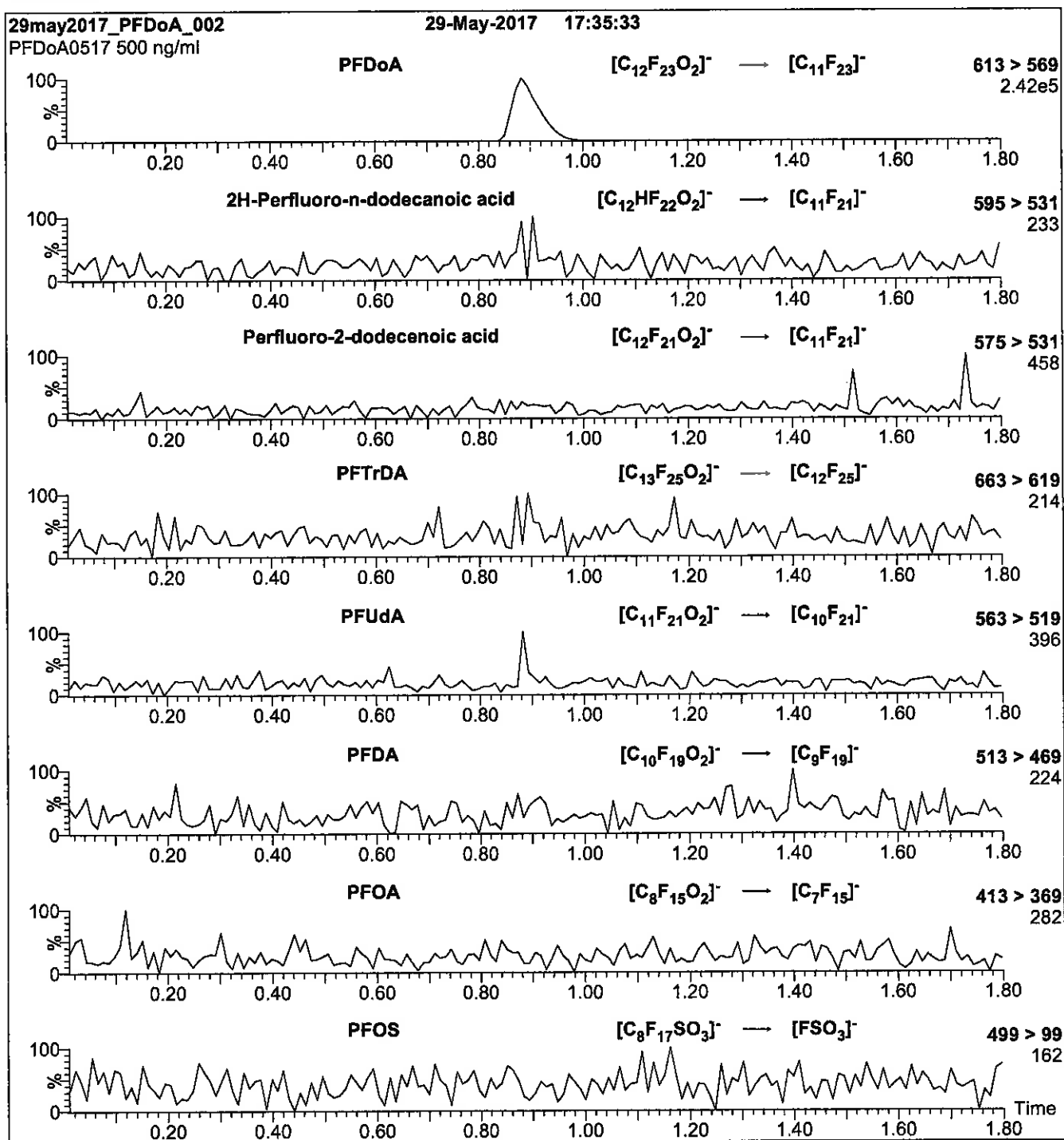
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFDaA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCPFDoS_00004

2: 7/19/18 can



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

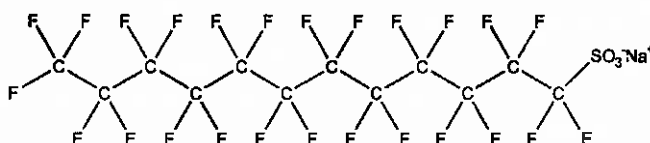
PRODUCT CODE:
COMPOUND:

L-PFDoS
Sodium perfluoro-1-dodecanesulfonate

LOT NUMBER: LPFDoS0916

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:
CONCENTRATION:

$C_{12}F_{25}SO_3Na$
 $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt)
 $48.4 \pm 2.4 \mu\text{g/ml}$ (PFDoS anion)

MOLECULAR WEIGHT: 722.14
SOLVENT(S): Methanol

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 ~ 0.7% of sodium perfluoro-1-tetradecanesulfonate and ~ 0.7% of perfluoro-n-dodecanoic acid (PFDoA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/17/2016

(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

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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

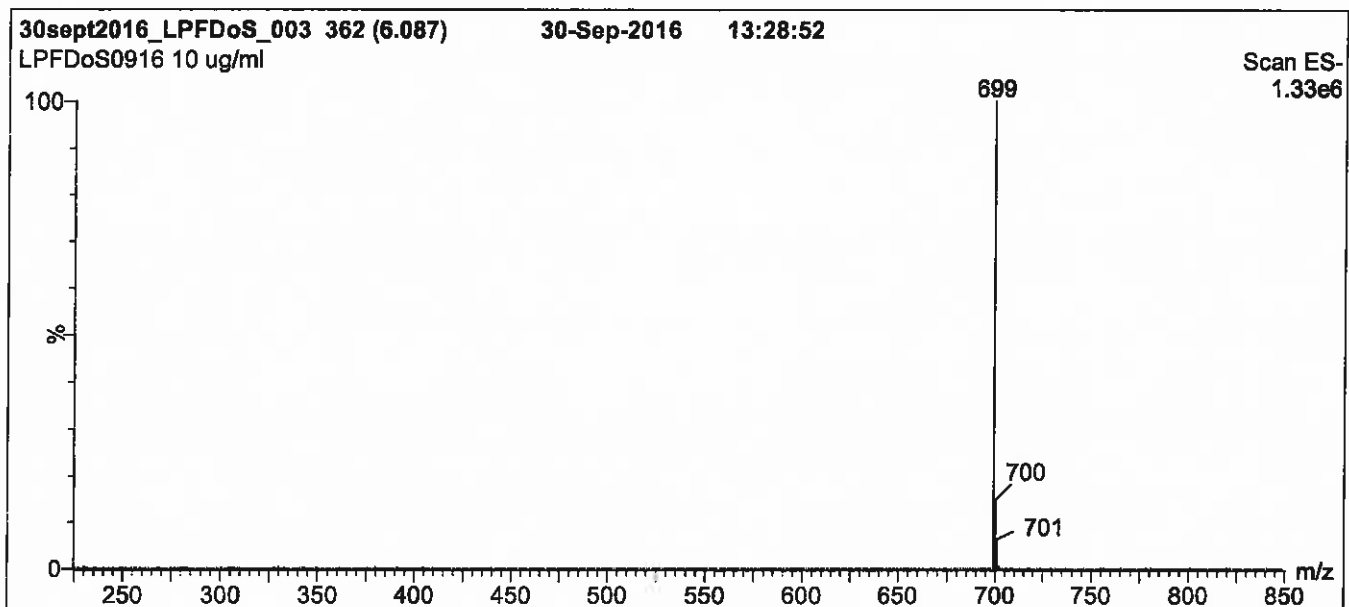
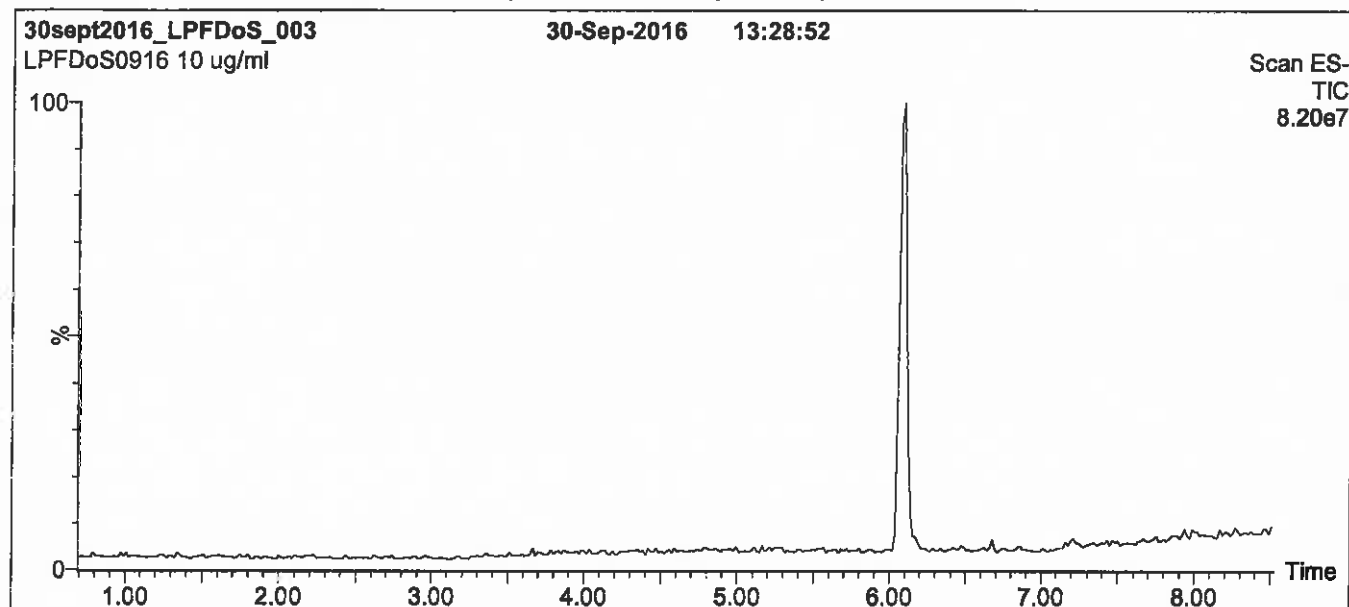
QUALITY MANAGEMENT:

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: L-PFDoS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)

Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

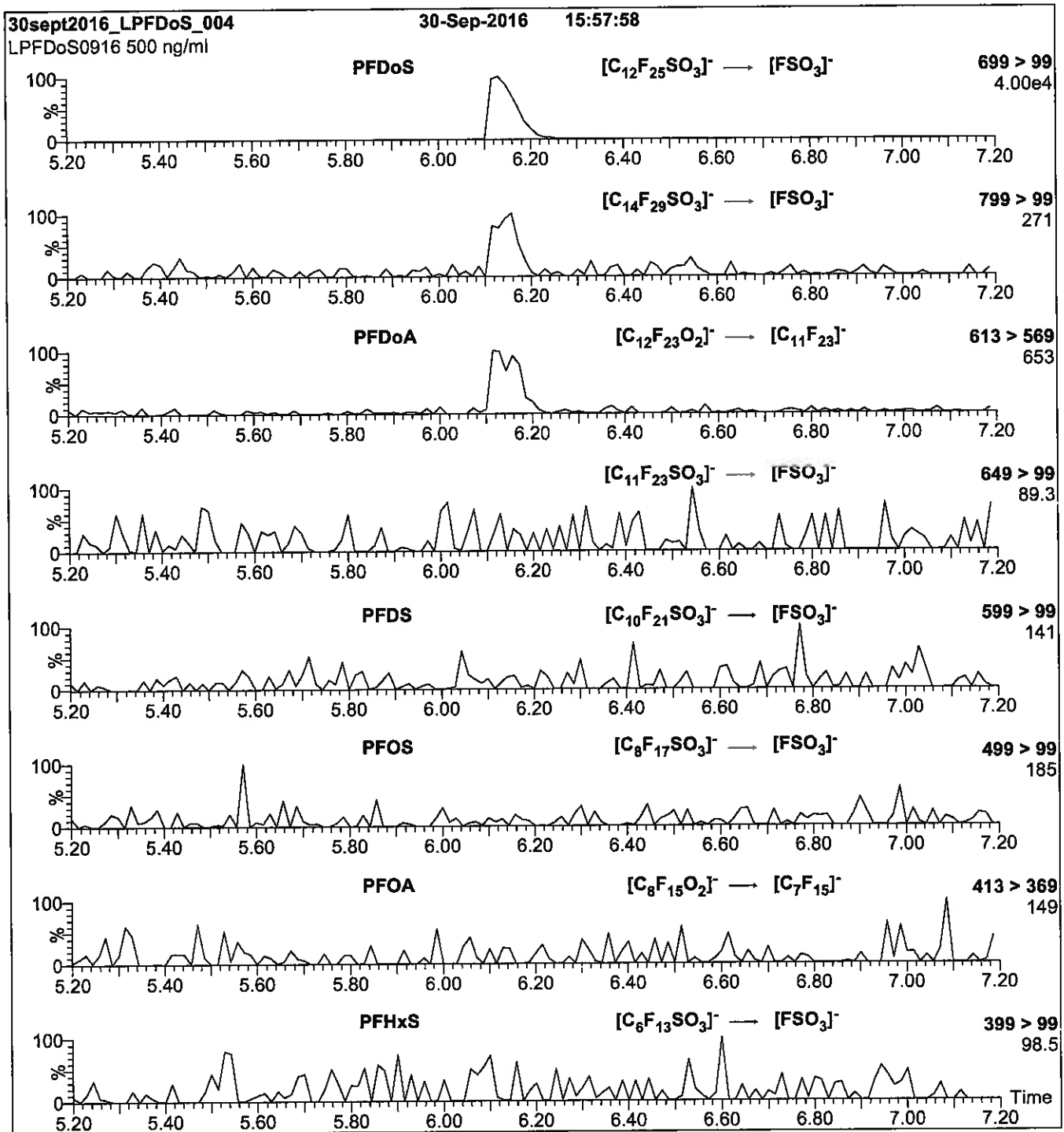
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 80.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

Figure 2: L-PFDoS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFDoS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 50

Reagent

LCPFDS_00008



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFDS

LOT NUMBER:

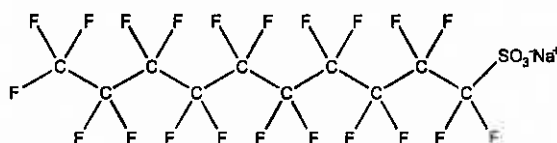
LPFDS1117

COMPOUND:

Sodium perfluoro-1-decanesulfonate

STRUCTURE:**CAS #:**

2806-15-7

**MOLECULAR FORMULA:** $C_{10}F_{21}SO_3Na$ **MOLECULAR WEIGHT:**

622.13

CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt)**SOLVENT(S):**

Methanol

 $48.2 \pm 2.4 \mu\text{g/ml}$ (PFDS anion)**CHEMICAL PURITY:**

>98%

LAST TESTED: (mm/dd/yyyy)

11/08/2017

EXPIRY DATE: (mm/dd/yyyy)

11/08/2022

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 ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**Certified By:**

B.G. Chittim, General Manager
Date: 11/16/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

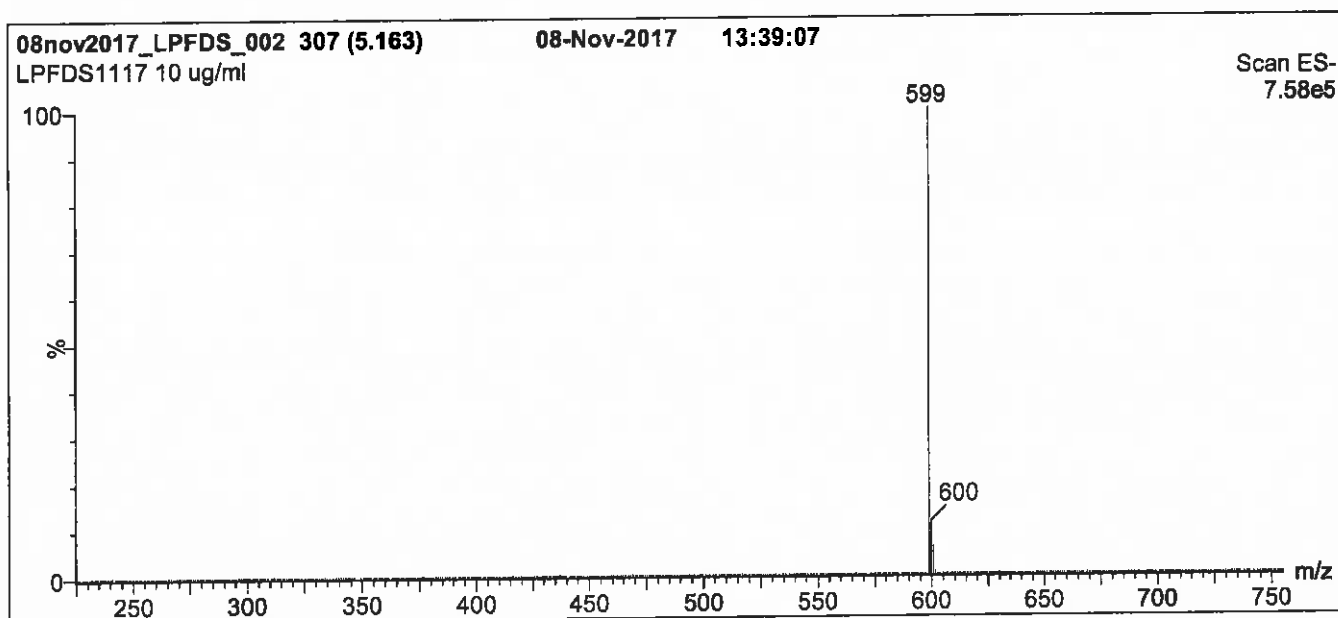
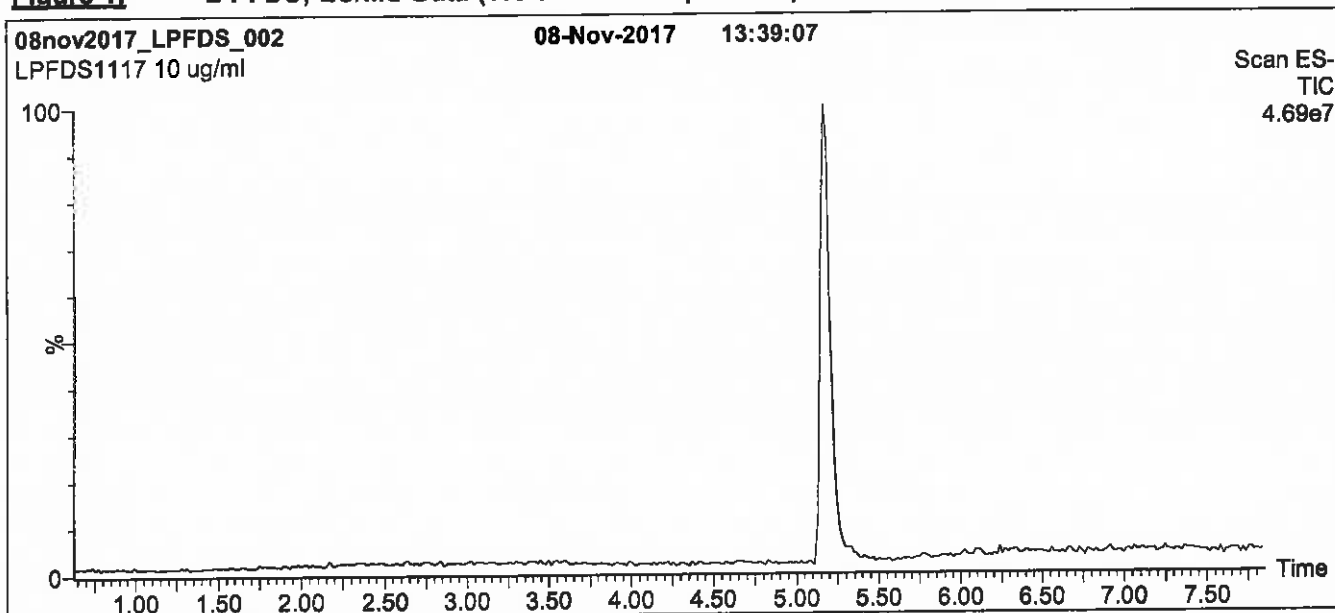
QUALITY MANAGEMENT:

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: L-PFDS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

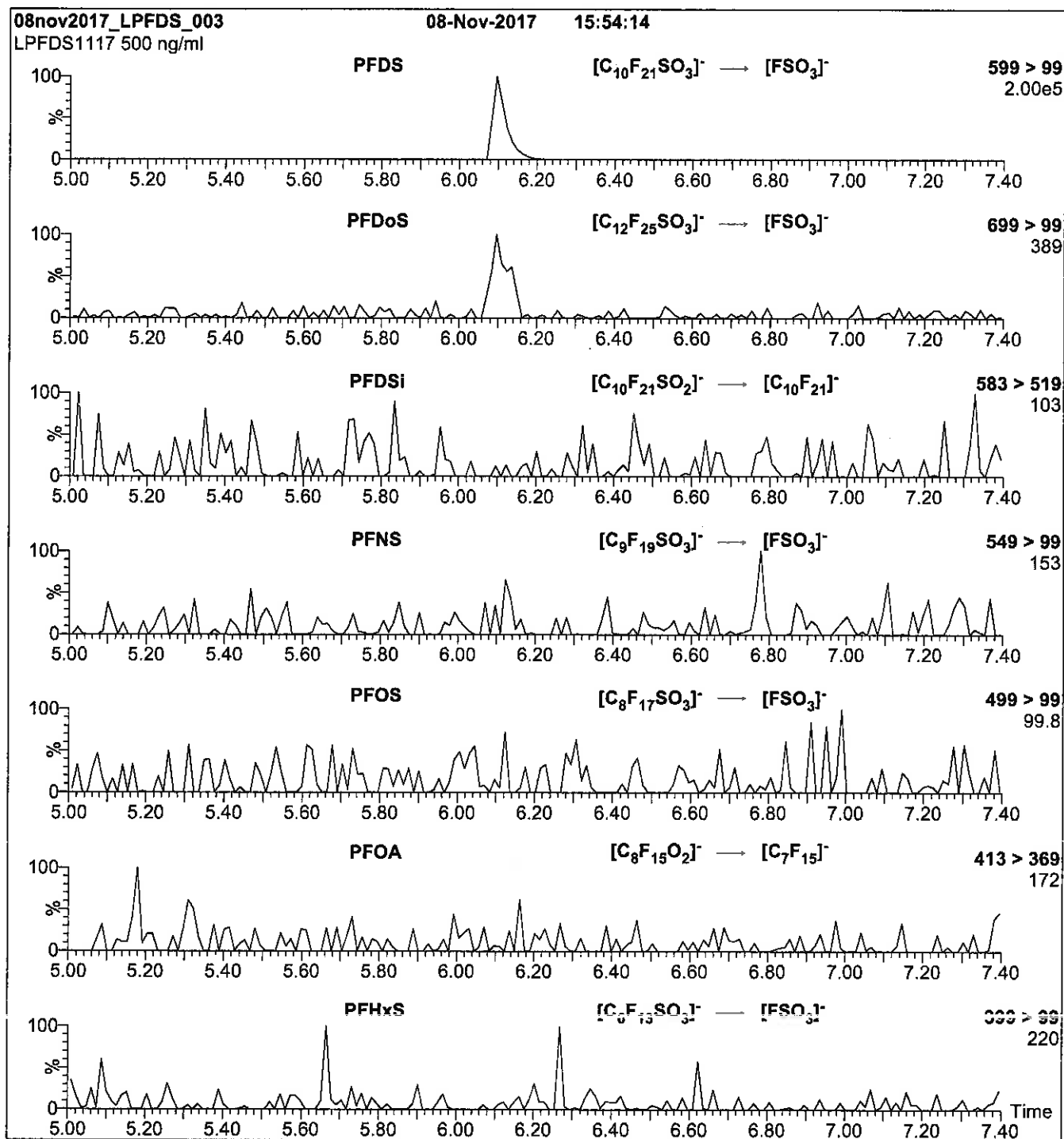
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: L-PFDS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFDS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00011



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHpA

LOT NUMBER:

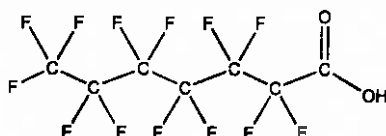
PFHpA0917

COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:**CAS #:**

375-85-9

**MOLECULAR FORMULA:** $C_7H_{13}O_2$ **MOLECULAR WEIGHT:**

364.06

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

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 acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 09/29/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

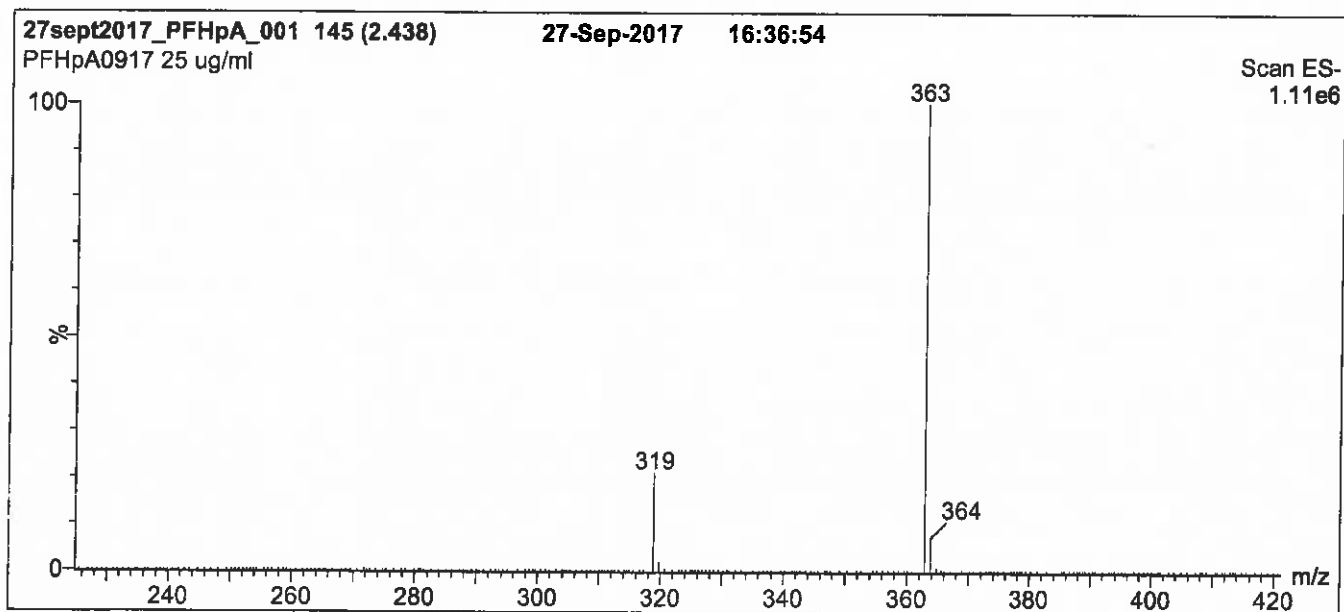
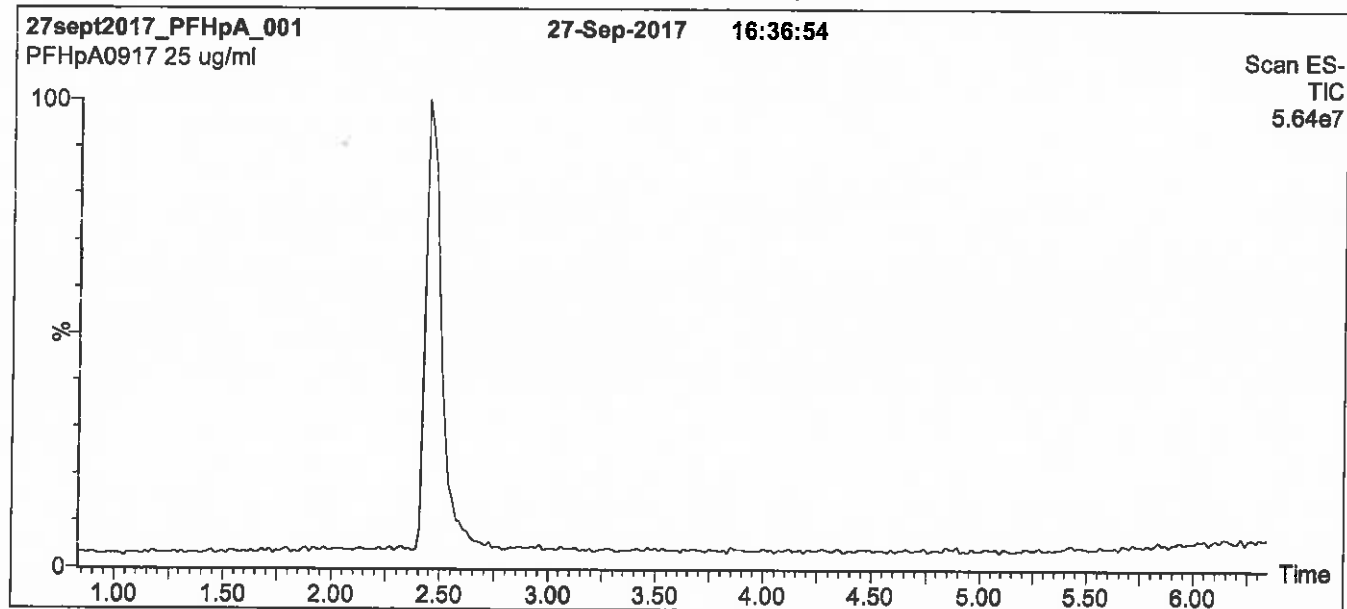
QUALITY MANAGEMENT:

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: PFHpA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

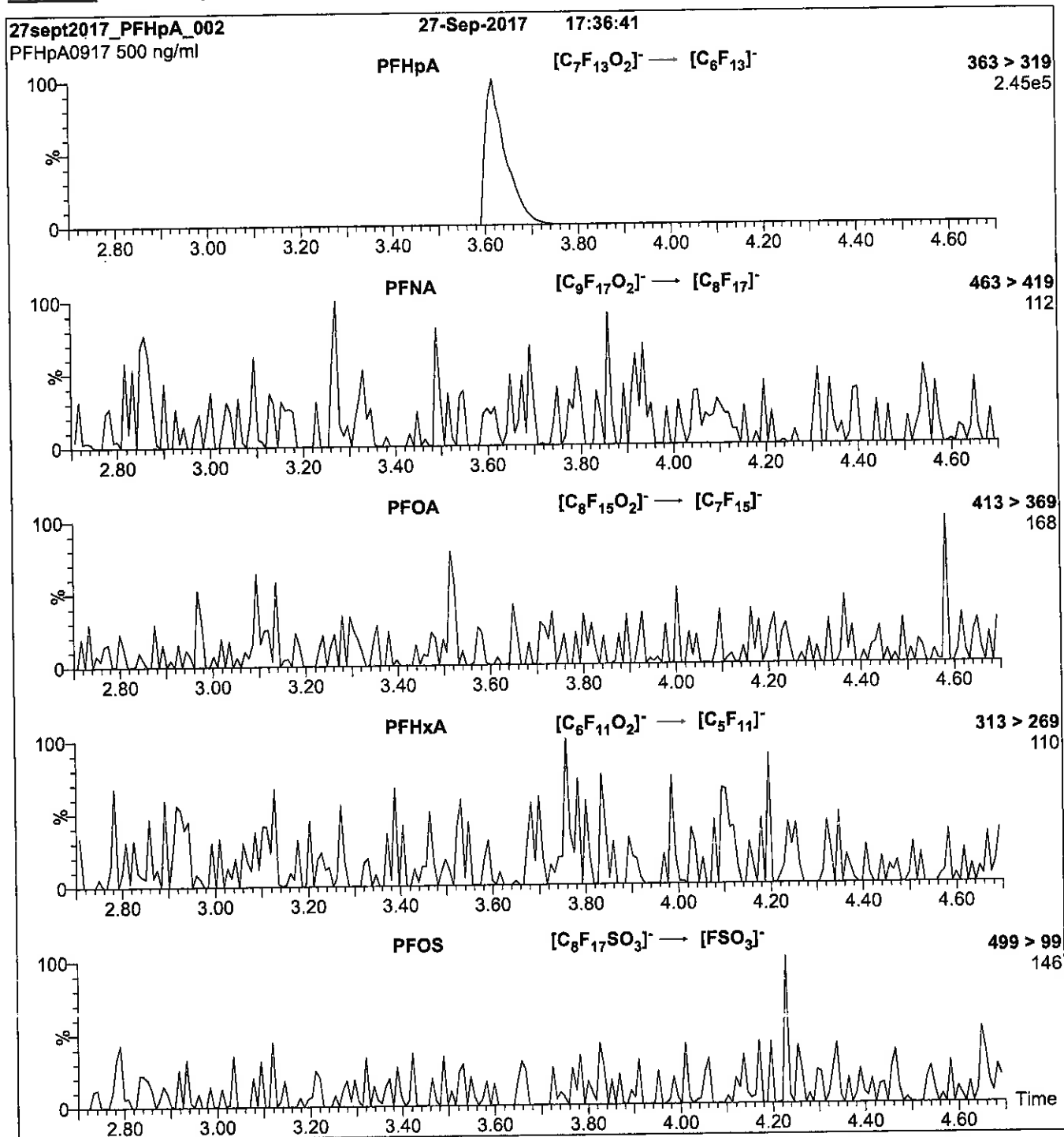
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = $3.43e-3$
Collision Energy (eV) = 11

Reagent

LCPFHpSA_00003

RS 9/21/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFHpS

LOT NUMBER:

LPFHpS0817

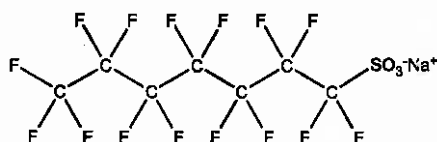
COMPOUND:

Sodium perfluoro-1-heptanesulfonate

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

$C_7F_{15}SO_3Na$

MOLECULAR WEIGHT:

472.10

CONCENTRATION:

$50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt)

SOLVENT(S):

Methanol

$47.6 \pm 2.4 \mu\text{g/ml}$ (PFHpS anion)

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 ($C_8F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 09/07/2017

(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

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

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

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:

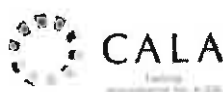
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

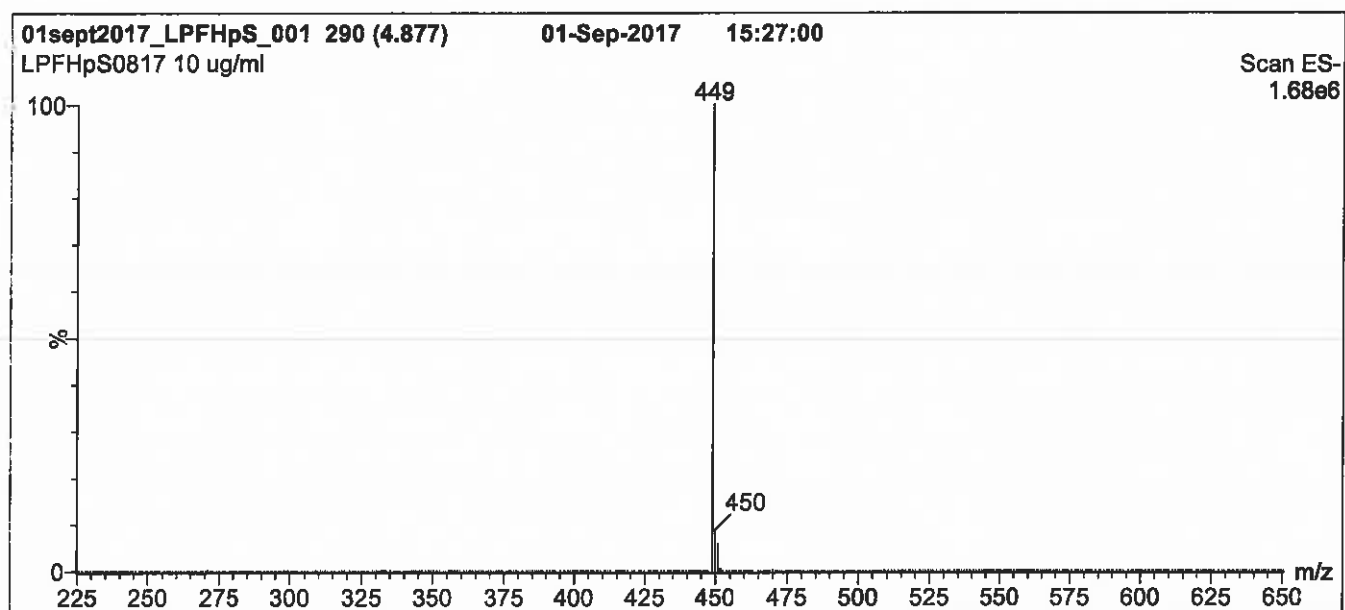
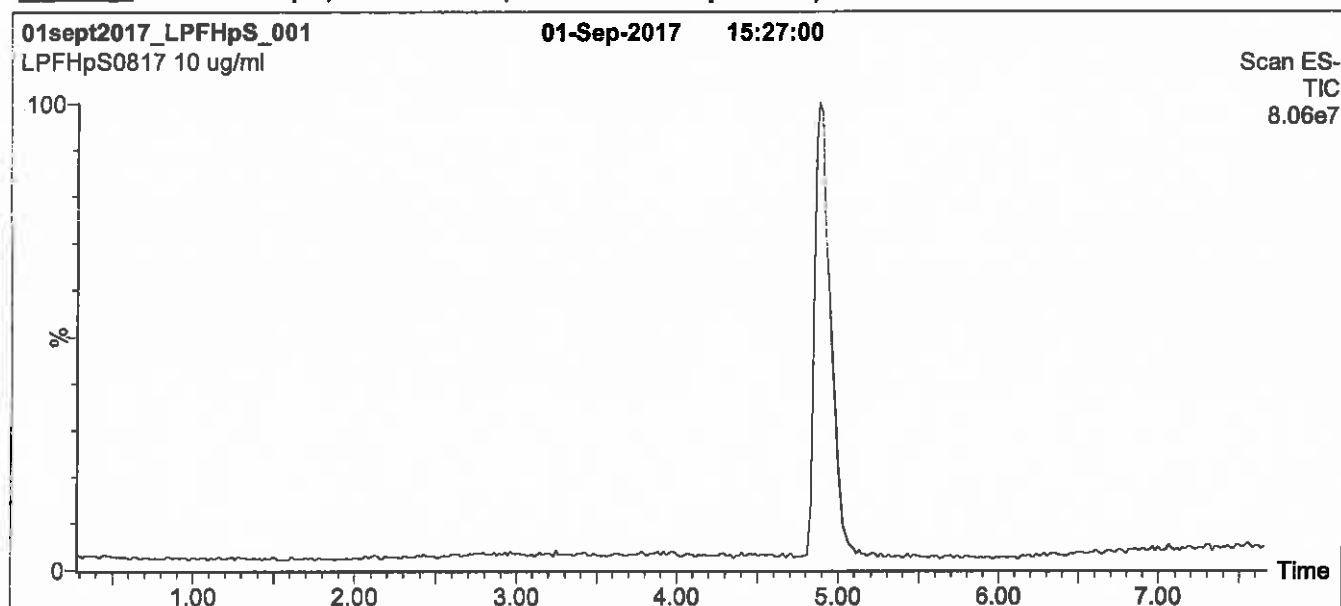
QUALITY MANAGEMENT:

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: L-PFHpS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

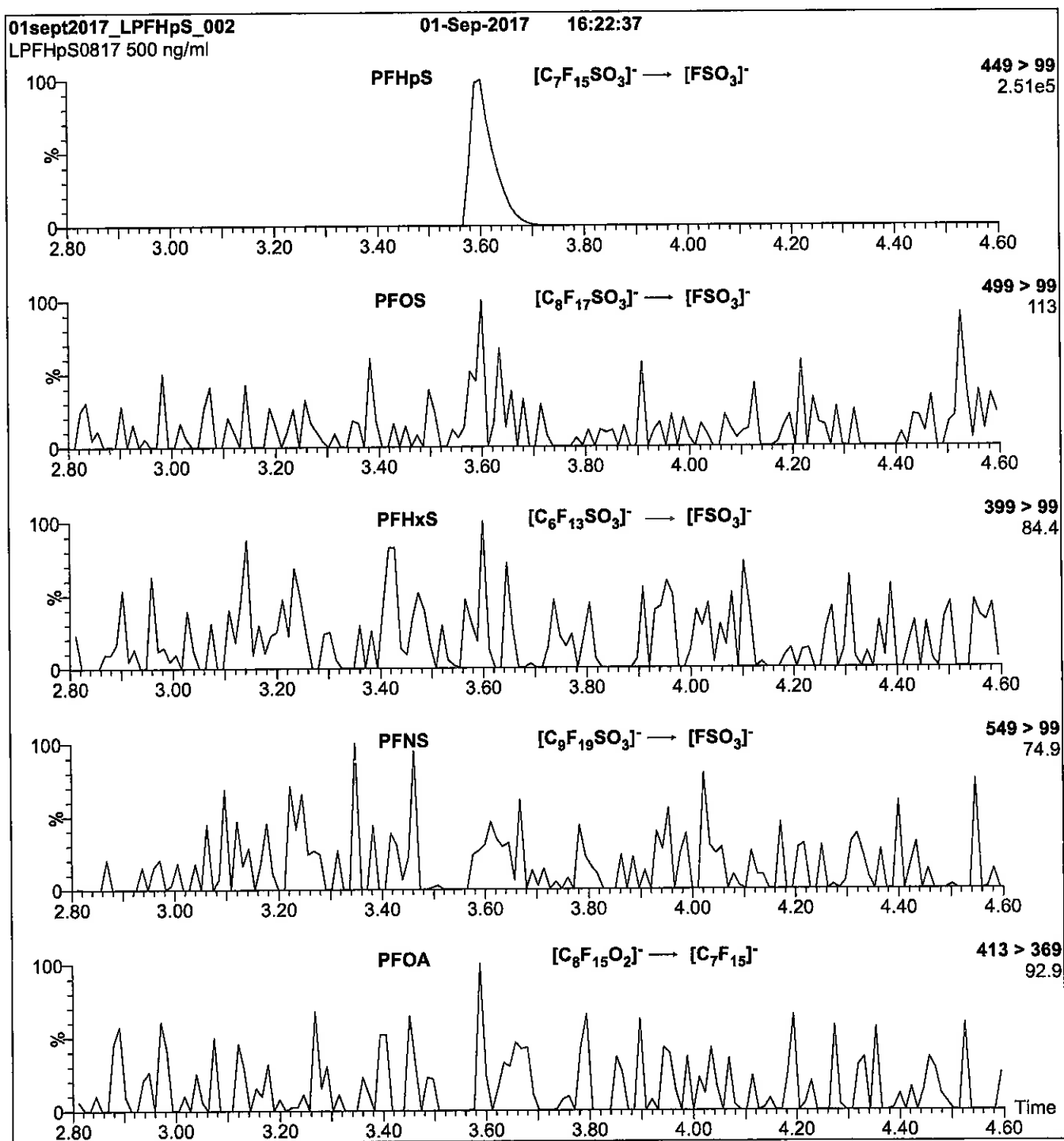
Capillary Voltage (kV) = 2.00

Cone Voltage (V) = 60.00

Cone Gas Flow (l/hr) = 60

Desolvation Gas Flow (l/hr) = 750

Figure 2: L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFHpS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3

Collision Energy (eV) = 35

Reagent

LCPFHxA_00010

r: 2/16/18 Spd



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFHxA

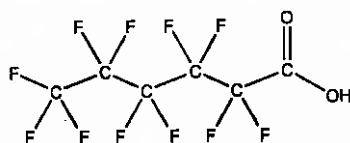
COMPOUND:

Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA0917

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA:

$C_6H_2F_{11}O_2$

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

MOLECULAR WEIGHT: 314.05

SOLVENT(S): Methanol

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 acid to the methyl ester.
- Contains ~ 1.0% of branched isomers.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 11/01/2017
(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

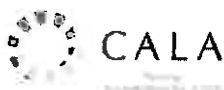
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

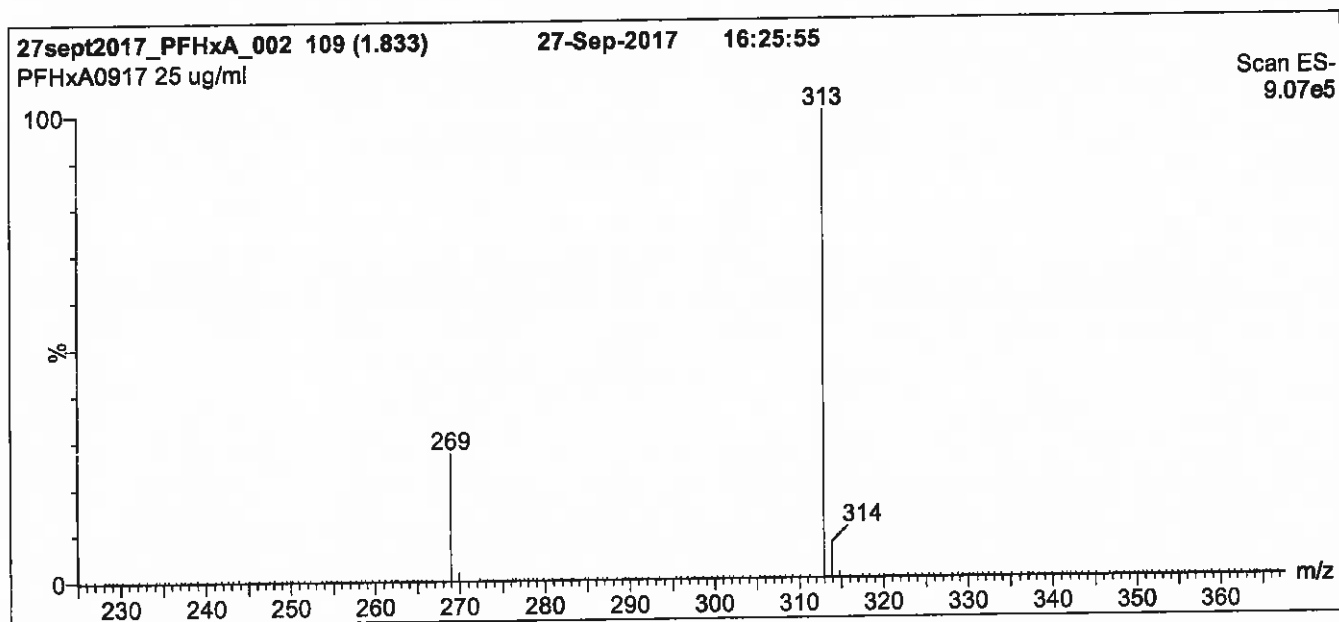
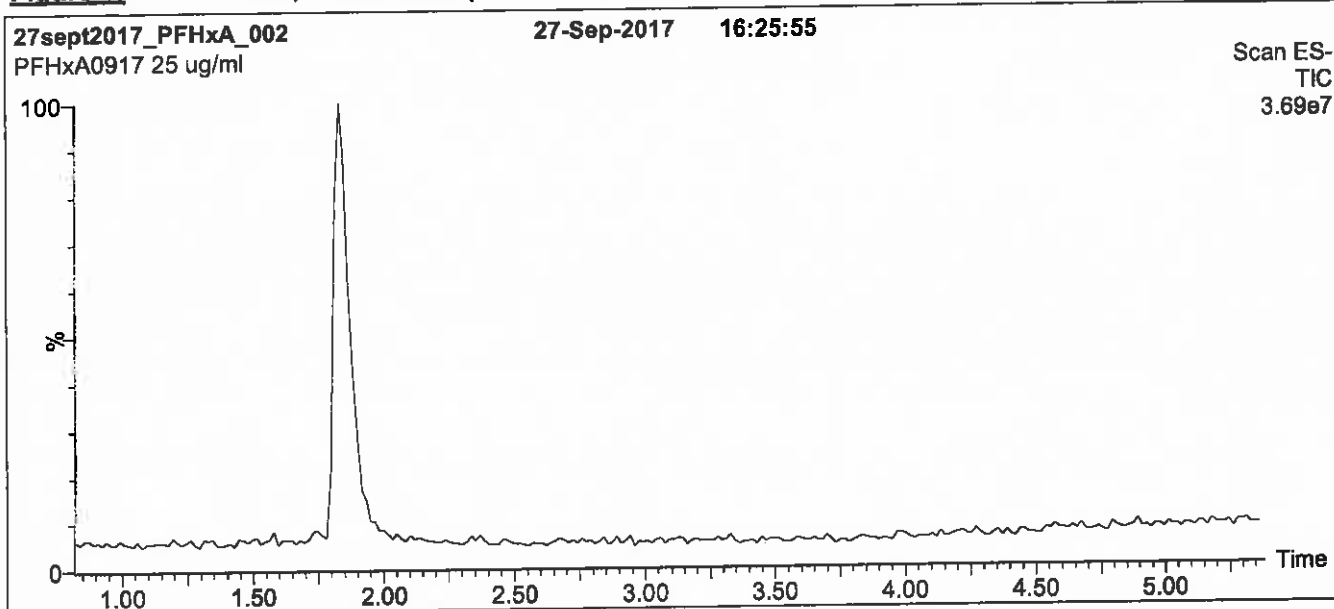
QUALITY MANAGEMENT:

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: PFHxA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

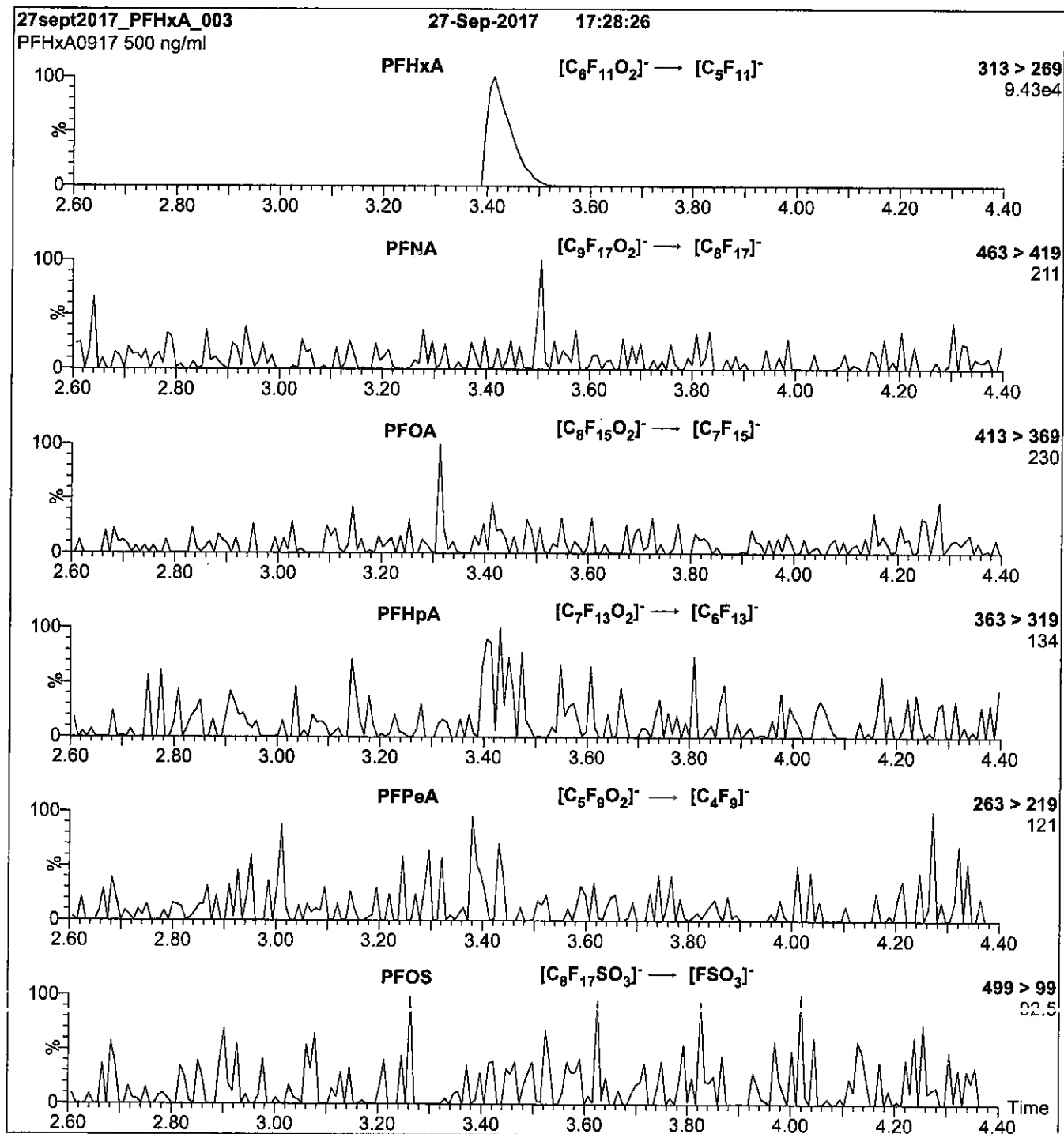
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCPFHxDA_00010

r: 9/21/17 sd



WELLINGTON LABORATORIES

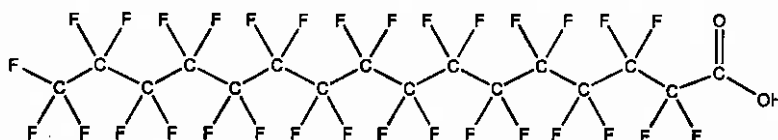
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA
COMPOUND: Perfluoro-n-hexadecanoic acid

LOT NUMBER: PFHxDA0717

STRUCTURE:

CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}H_{31}O_2$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$

MOLECULAR WEIGHT: 814.13
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
(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

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

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

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.

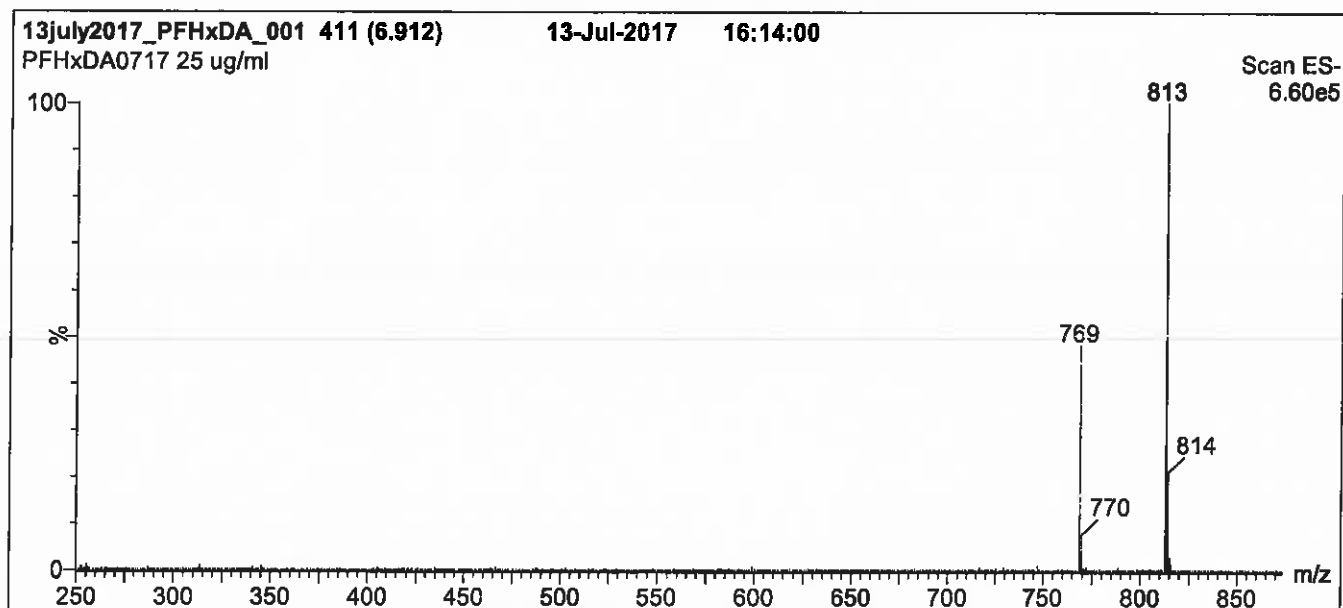
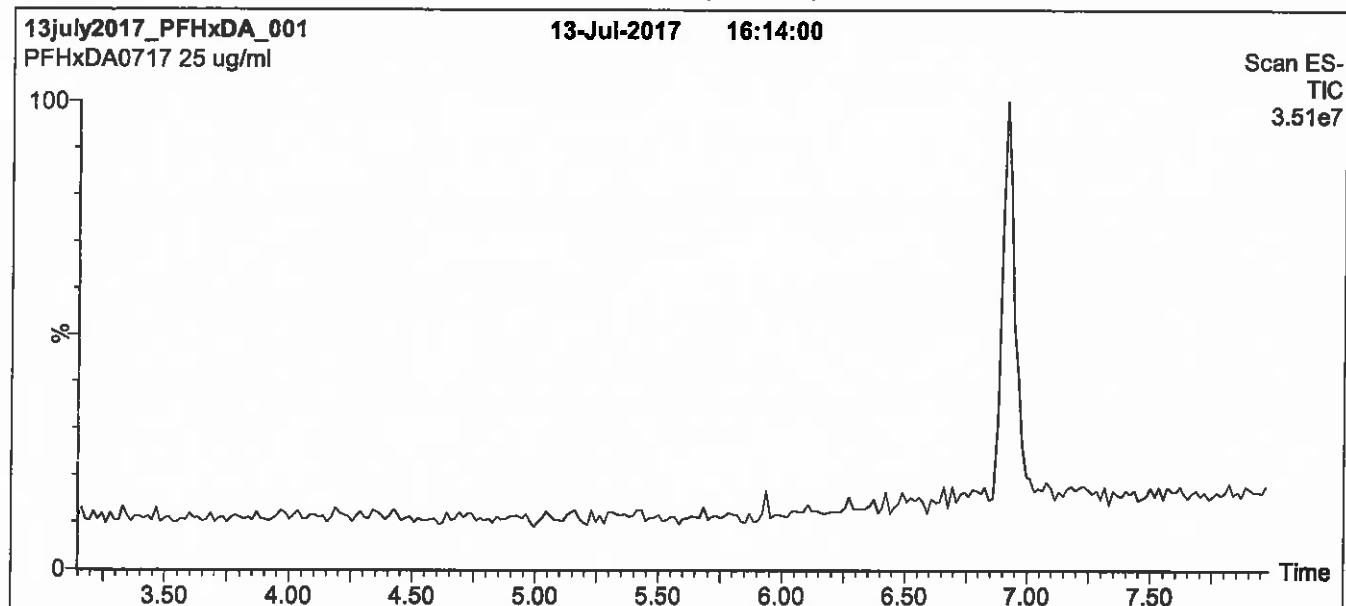
QUALITY MANAGEMENT:

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: PFHxDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

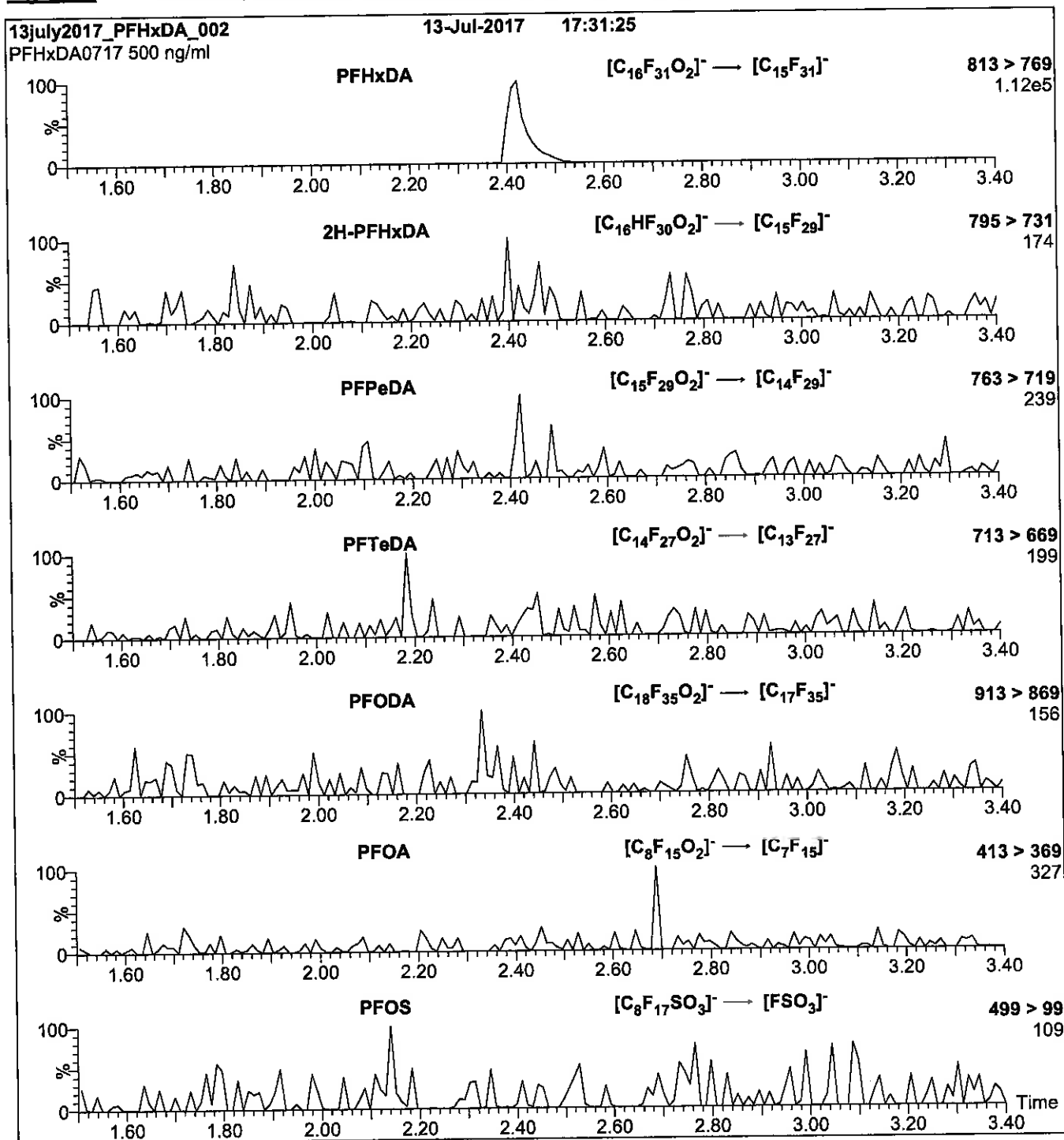
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.13e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00006



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE: br-PFHxSK
LOT NUMBER: brPFHxSK0117
CONCENTRATION: 50.0 ± 2.5 µg/ml (total potassium salt)
 45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S): Methanol
DATE PREPARED: (mm/dd/yyyy) 01/03/2017
LAST TESTED: (mm/dd/yyyy) 01/04/2017
EXPIRY DATE: (mm/dd/yyyy) 01/04/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥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 (SIR)
 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

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 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

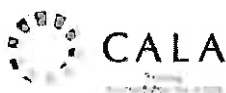
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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

Table A: br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F -NMR)*

Isomer	Name	Structure	Percent Composition by ^{19}F -NMR
1	Potassium perfluoro-1-hexanesulfonate	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{SO}_3^-\text{K}^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\text{CF}_3\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\text{CF}_3\text{C}(\text{CF}_3)_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

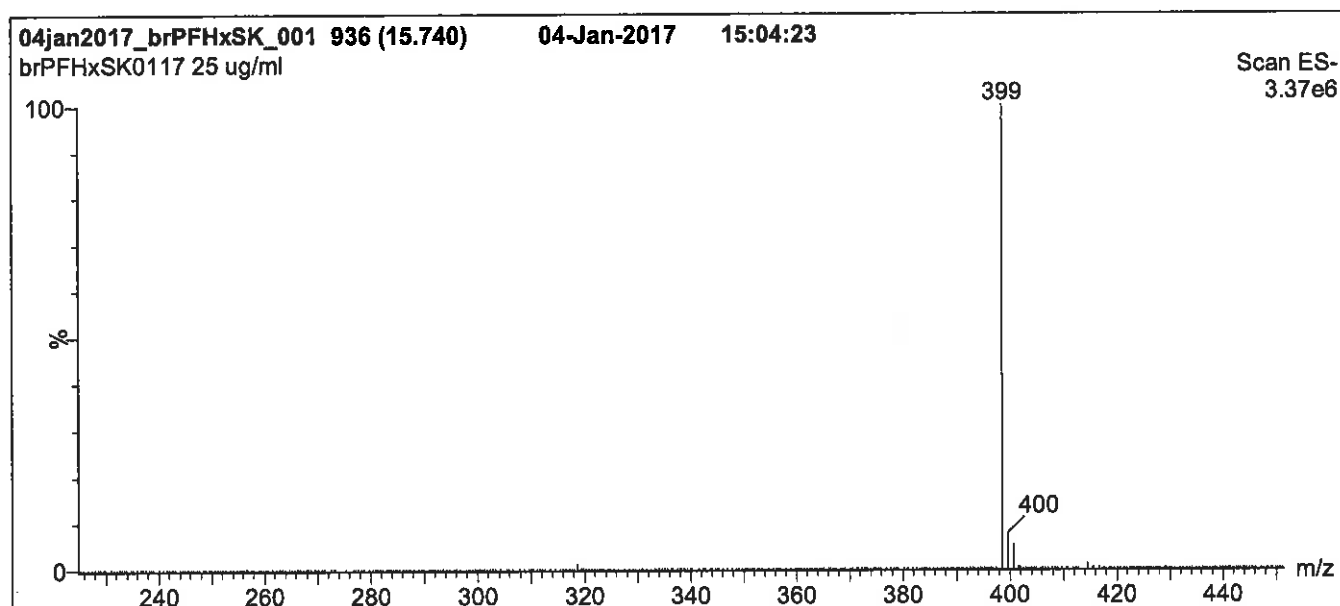
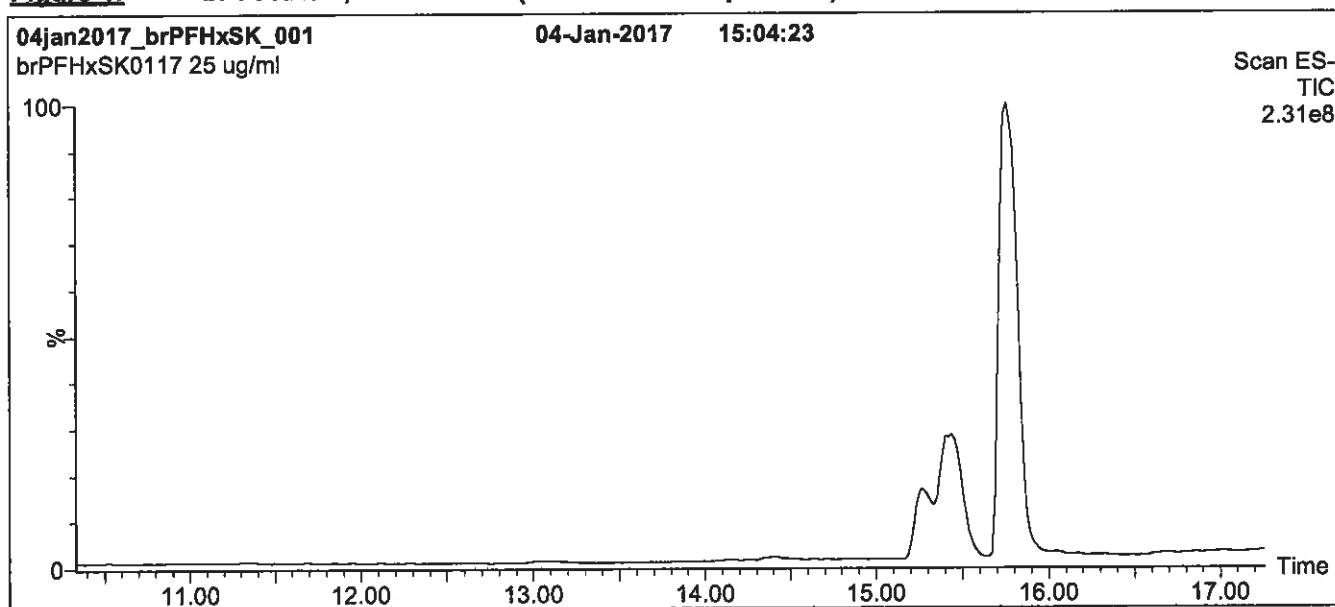
Certified By:


B.G. Chittim

Date: 01/20/2017

(mm/dd/yyyy)

Figure 1: br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc 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

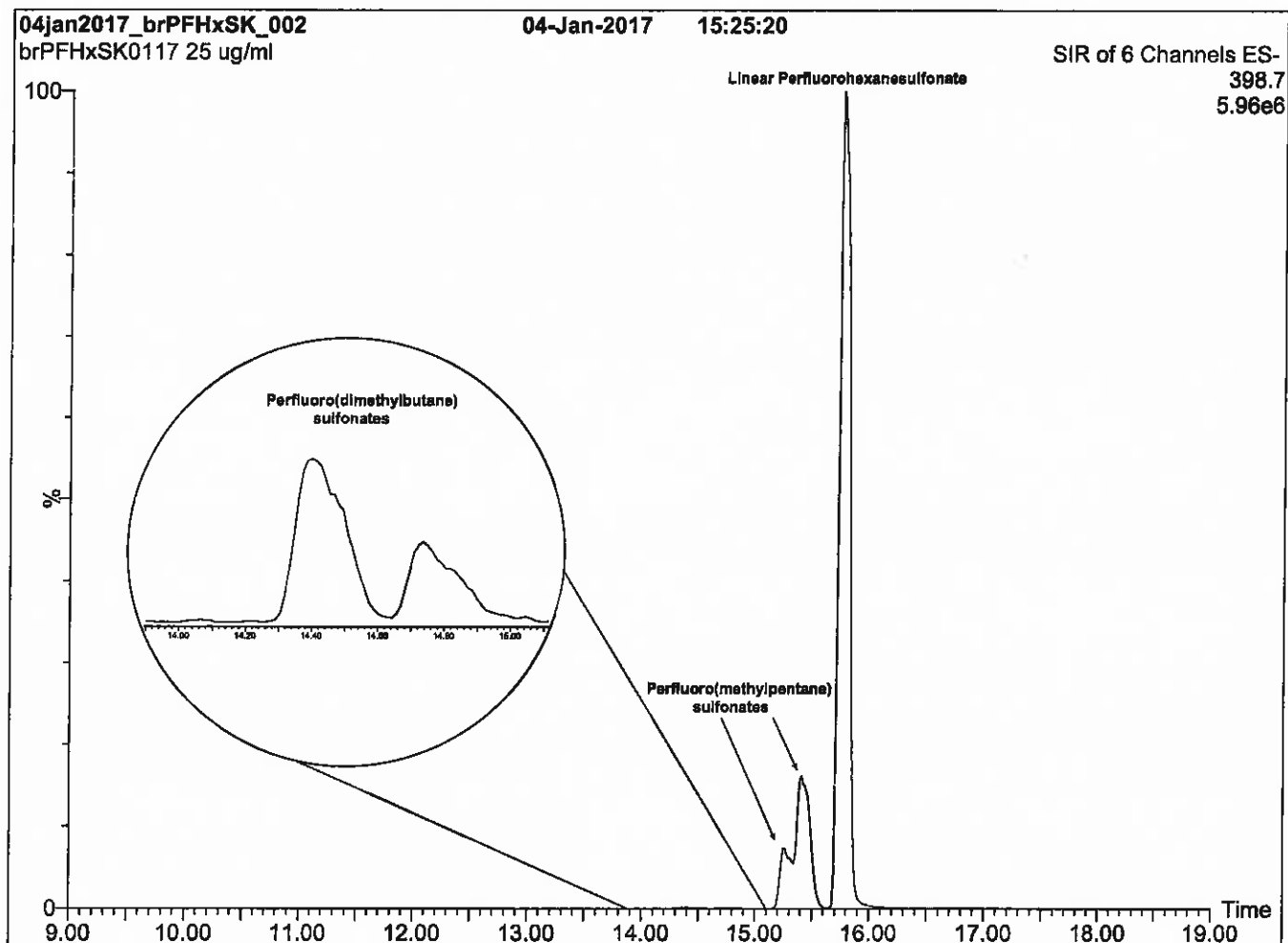
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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 2: br-PFHxSK; 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc 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

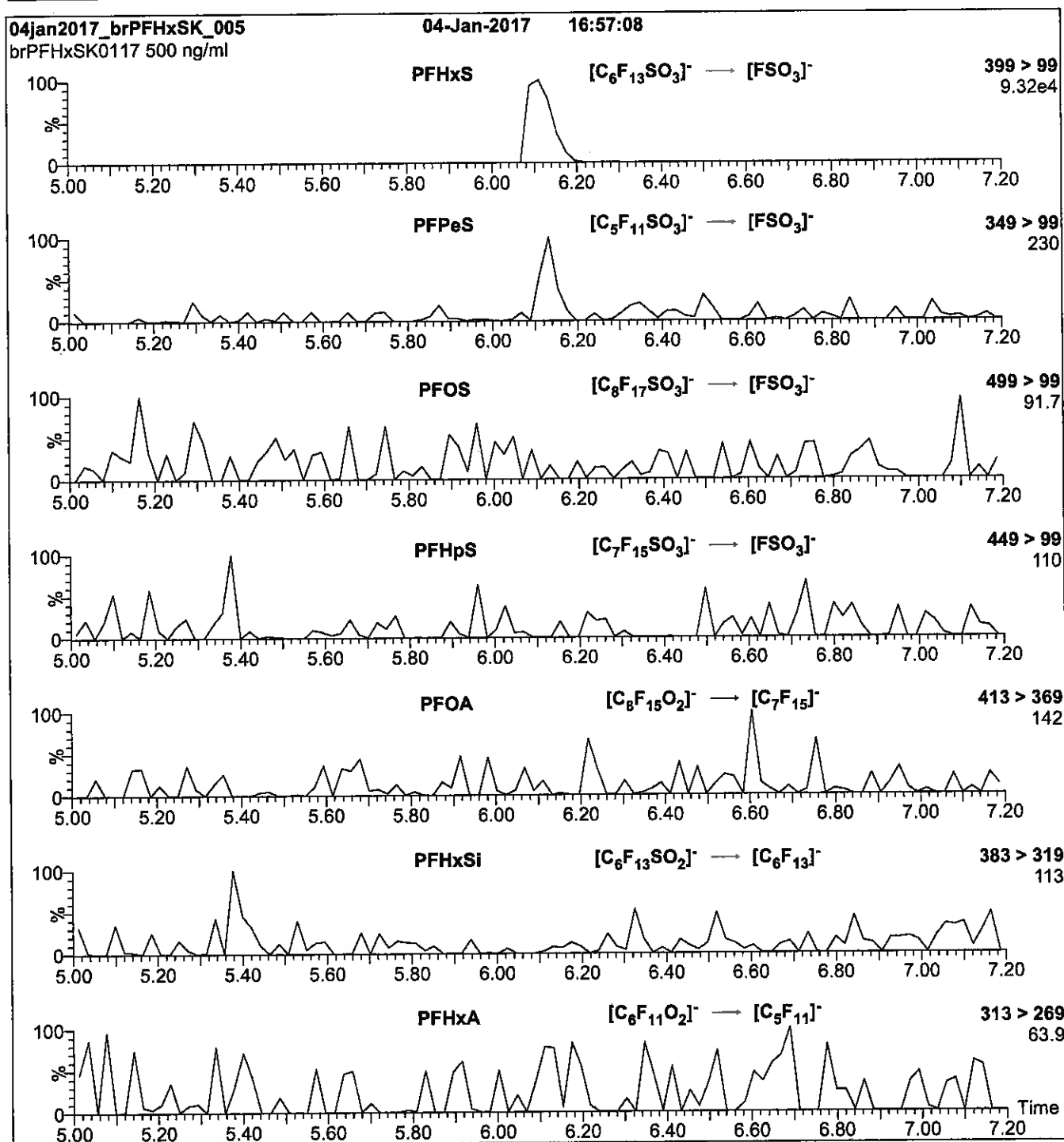
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (15-62)
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 3:

Injection: Direct loop injection
10 μ l (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00010

17-2/16/18 SW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFNA

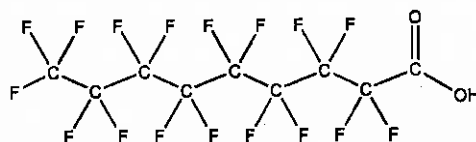
COMPOUND:

Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA0717

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA:

$C_9H_{17}O_2$

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

MOLECULAR WEIGHT: 464.08

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 Manager

Date: 07/24/2017
(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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).

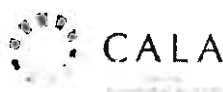
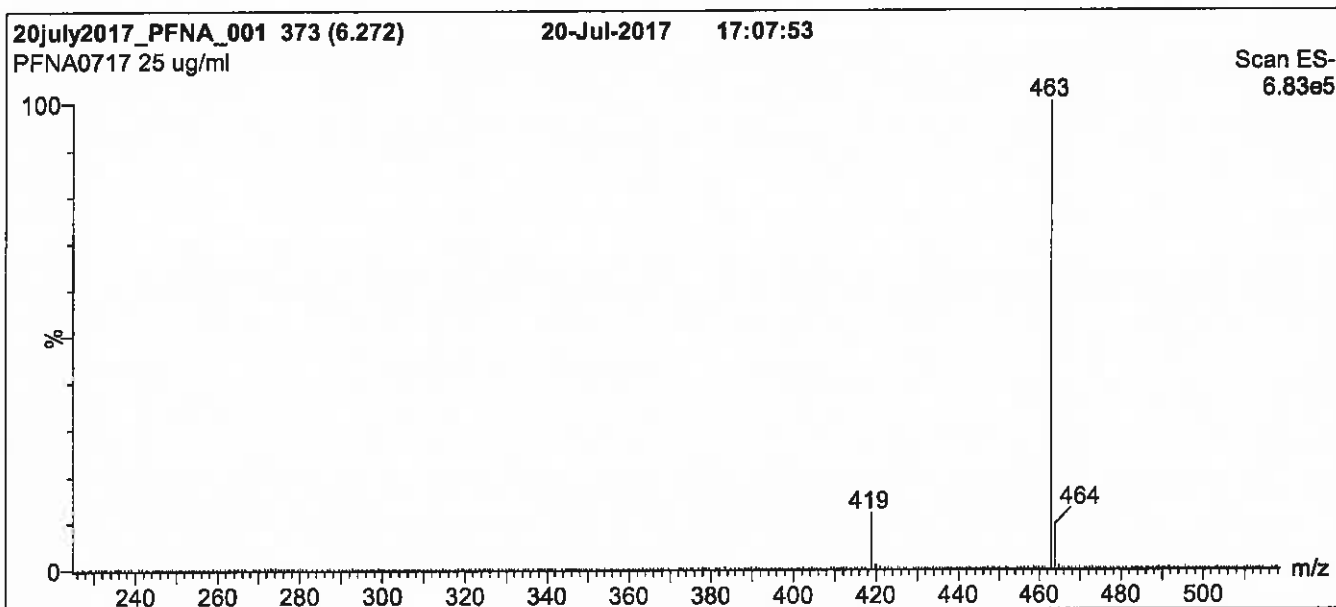
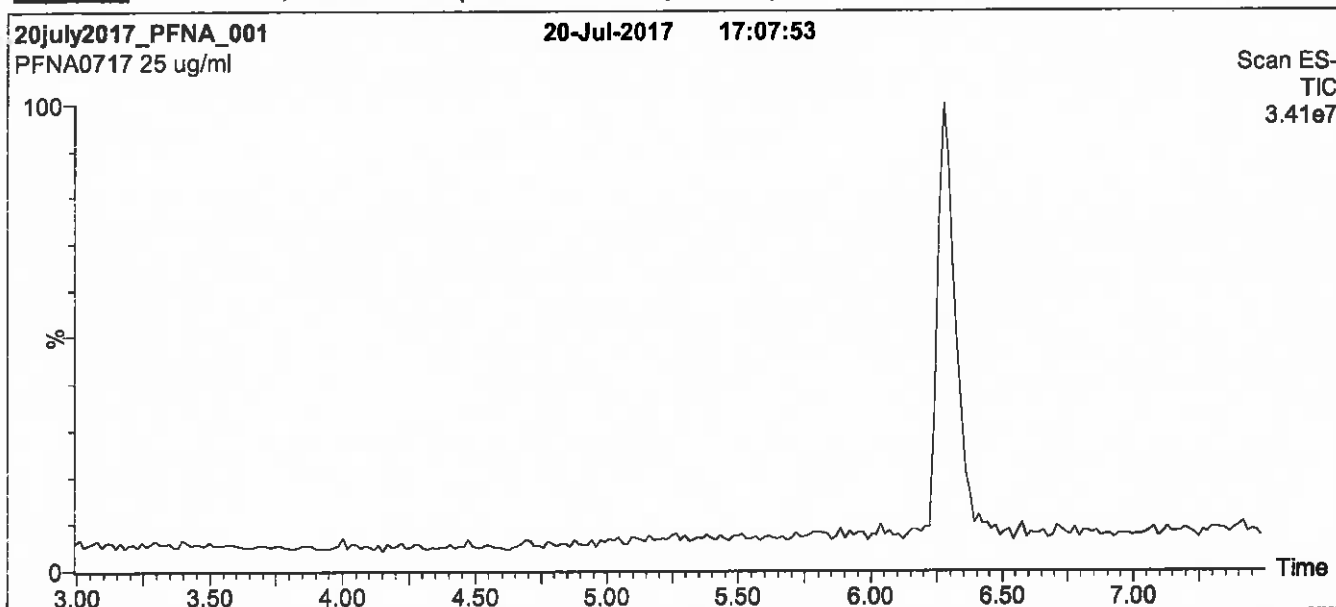


Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

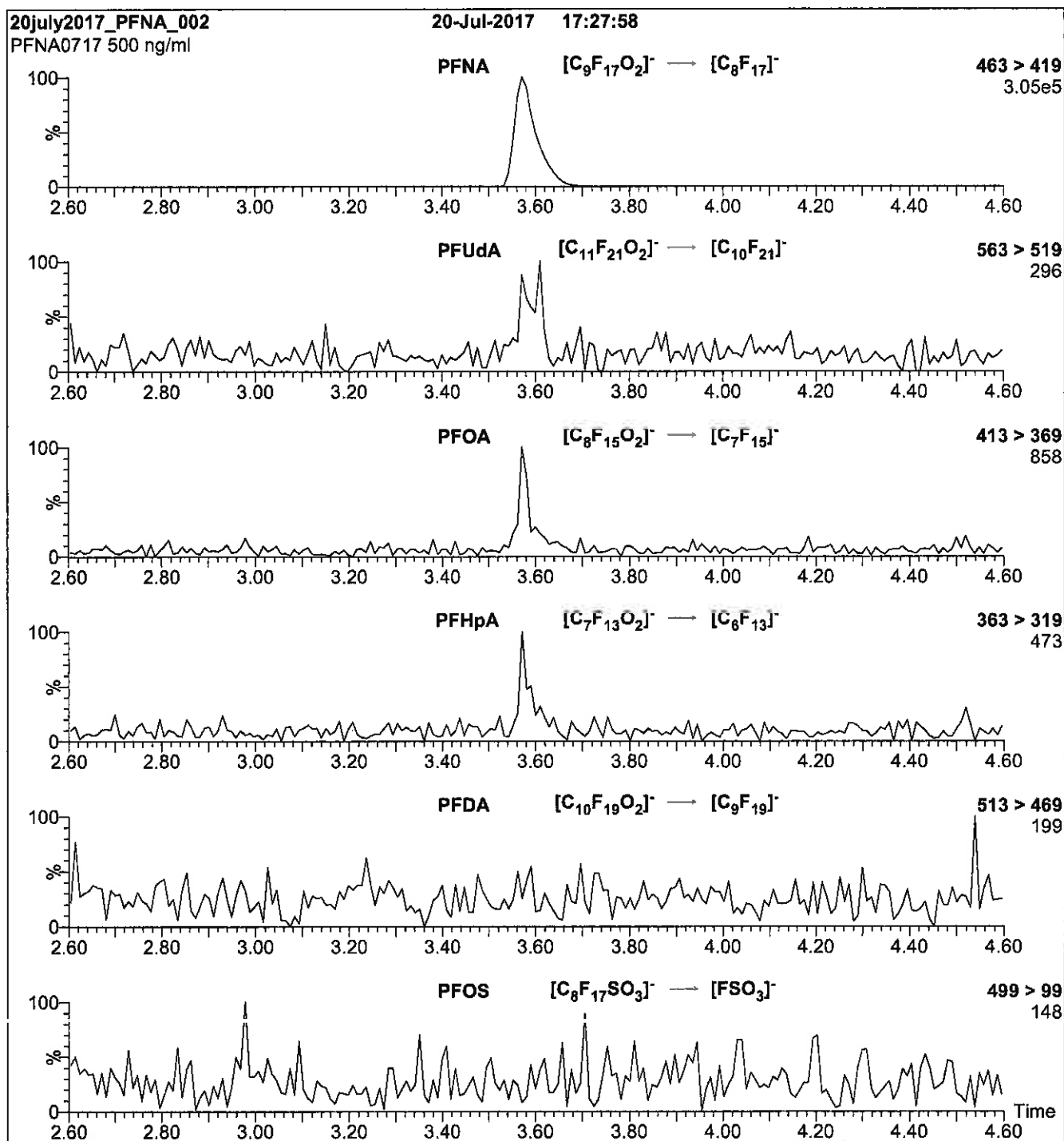
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFNS_00003



1106804
ID: LCPFNS_00003
Exp: 09/27/22 Prod: SKV
L-PFNS at 48.0ug/mL

r: 12/4/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFNS

COMPOUND:

Sodium perfluoro-1-nonanesulfonate

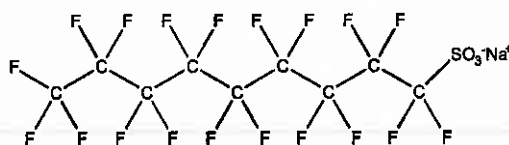
LOT NUMBER:

LPFNS0917

STRUCTURE:

CAS #:

98789-57-2



MOLECULAR FORMULA:

$C_9F_{19}SO_3Na$

CONCENTRATION:

$50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt)
 $48.0 \pm 2.4 \mu\text{g/ml}$ (PFNS anion)

MOLECULAR WEIGHT:

572.12

SOLVENT(S):

Methanol

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 09/28/2017

(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

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

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

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:

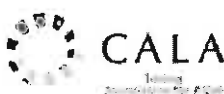
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

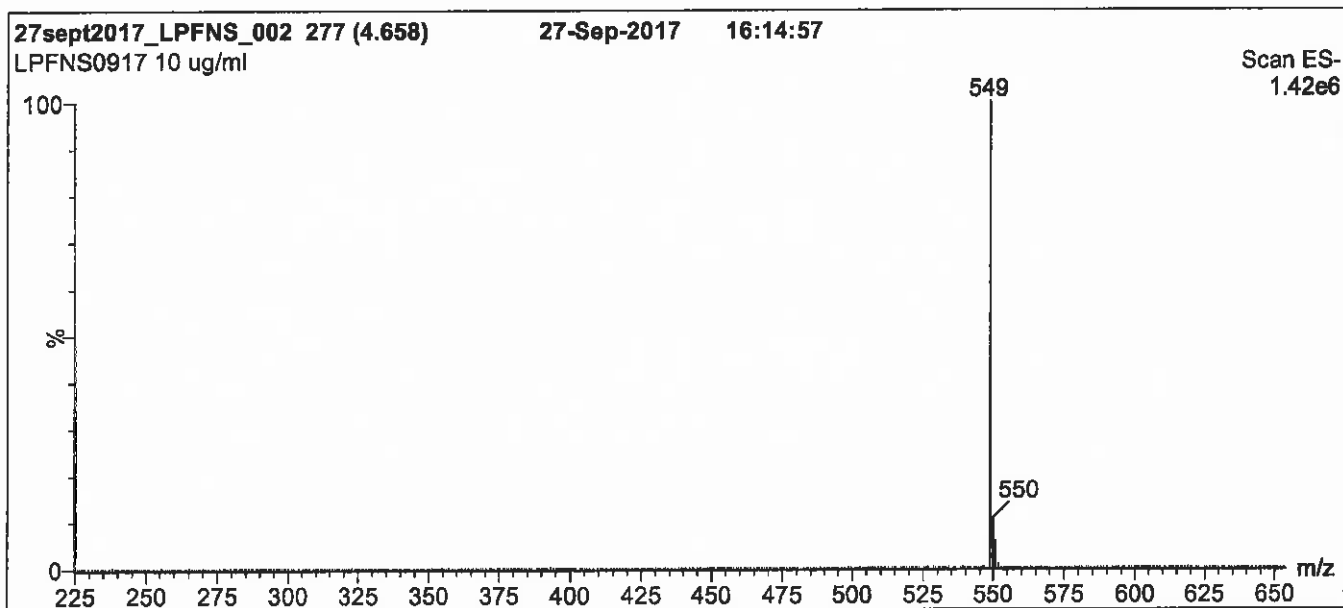
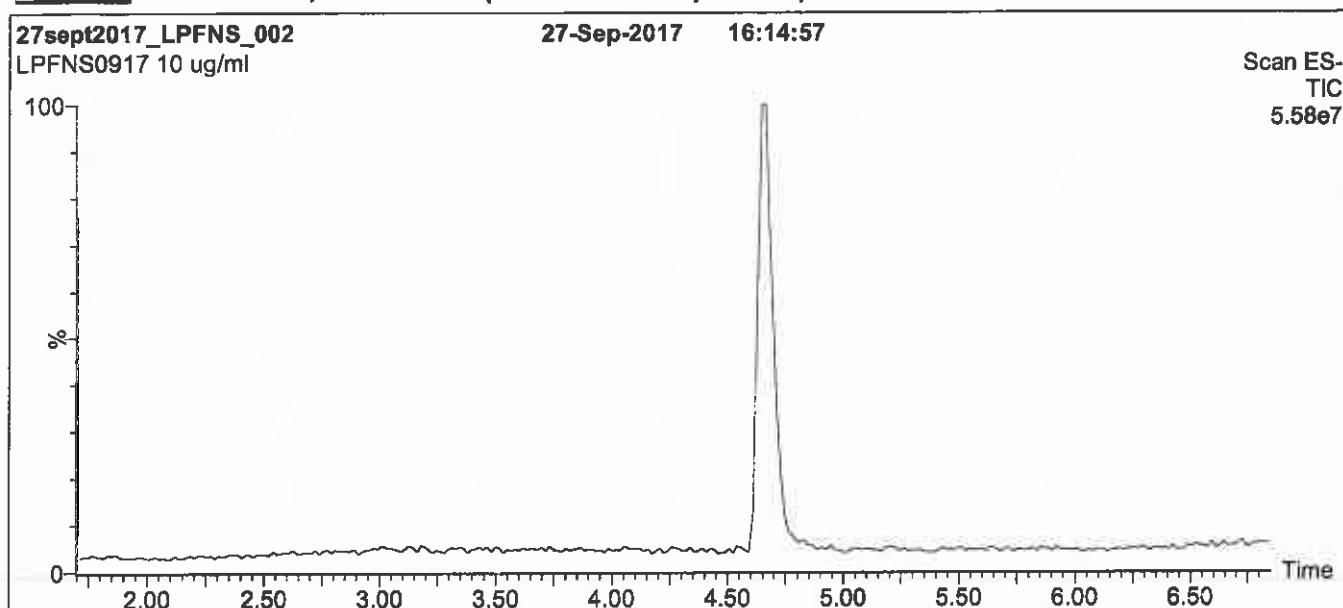
QUALITY MANAGEMENT:

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: L-PFNS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

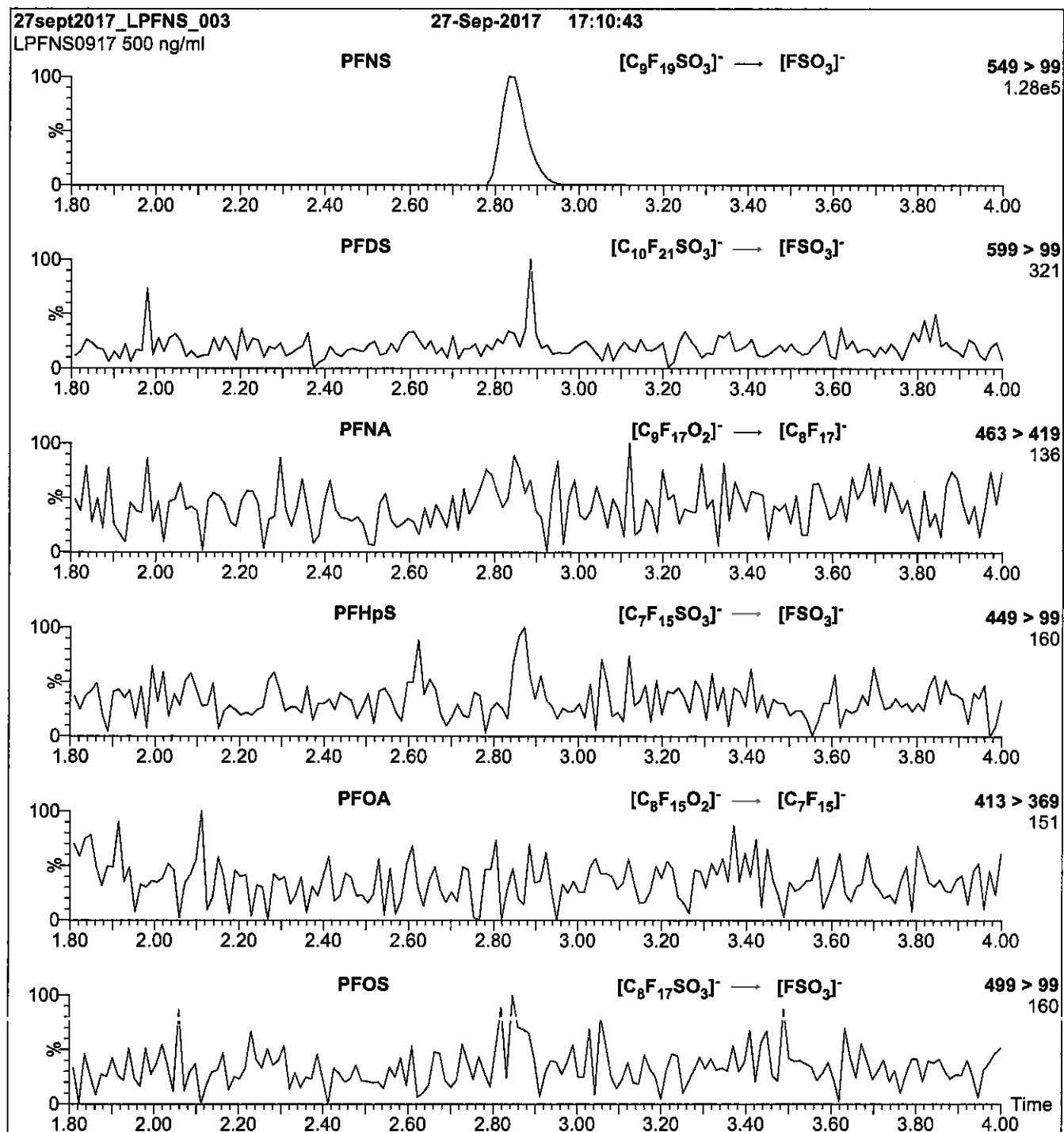
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: L-PFNS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 45

Reagent

LCPFOA_00011

P: 10/2017 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFOA

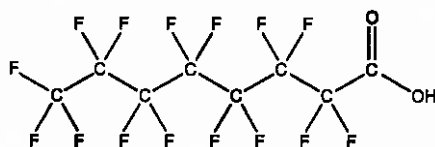
LOT NUMBER: PFOA0917

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA:

$C_8H_{15}O_2$

MOLECULAR WEIGHT: 414.07

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S): Methanol

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 acid 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

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

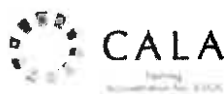
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

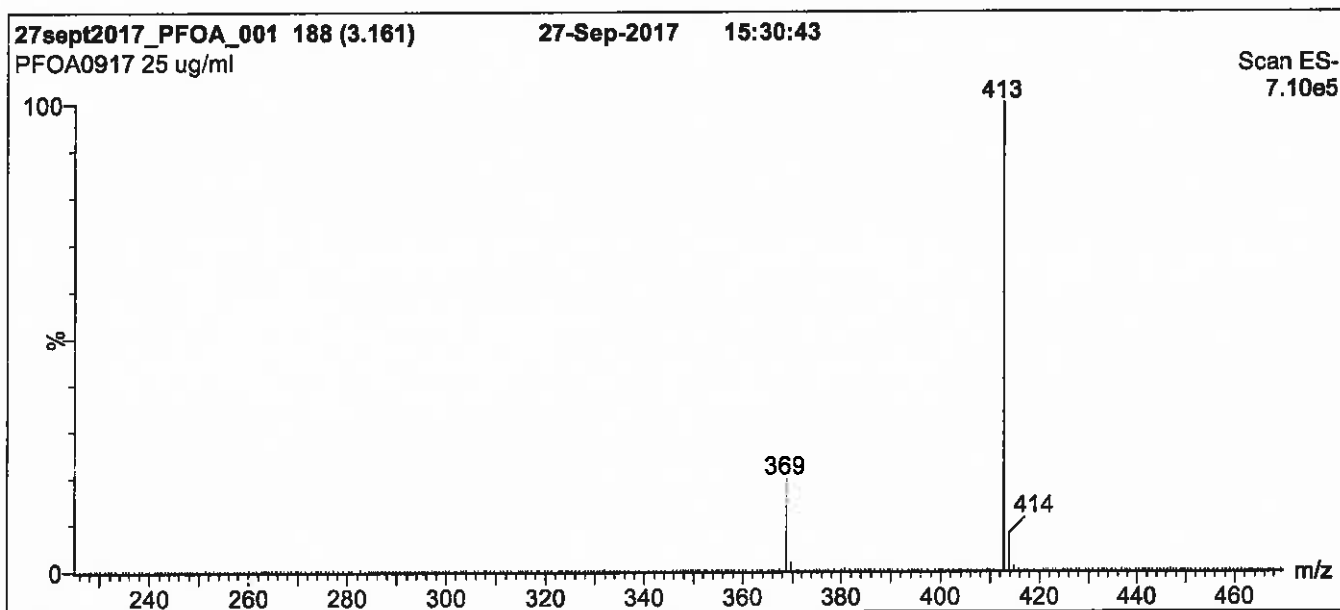
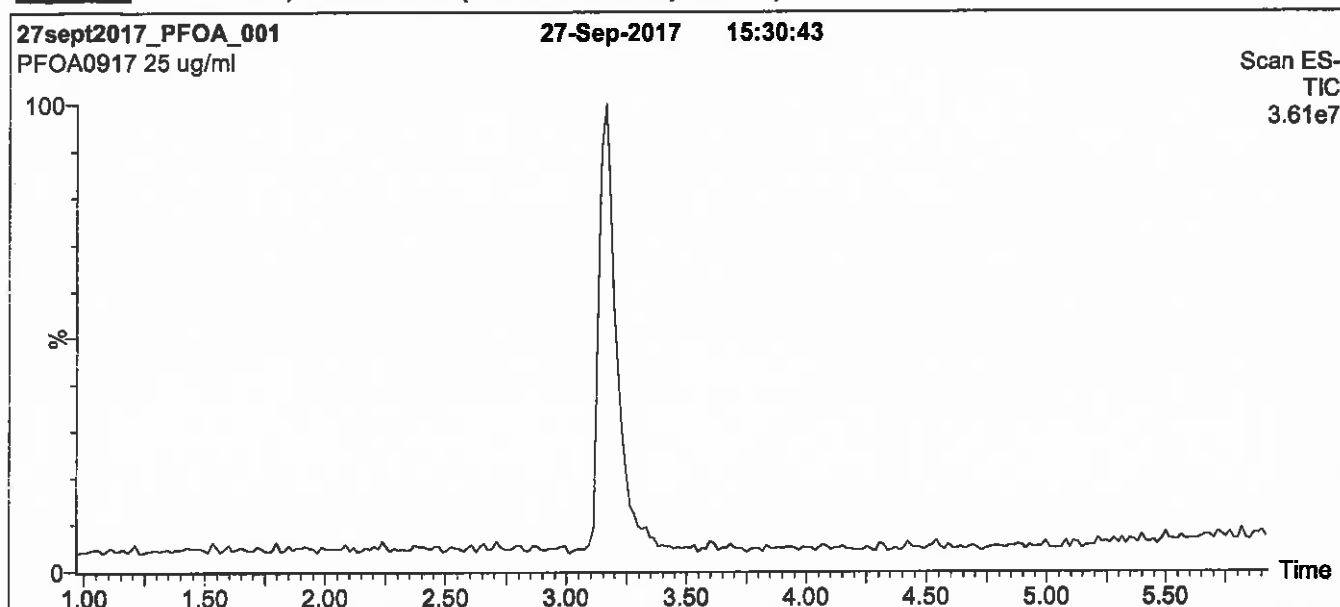
QUALITY MANAGEMENT:

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: PFOA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

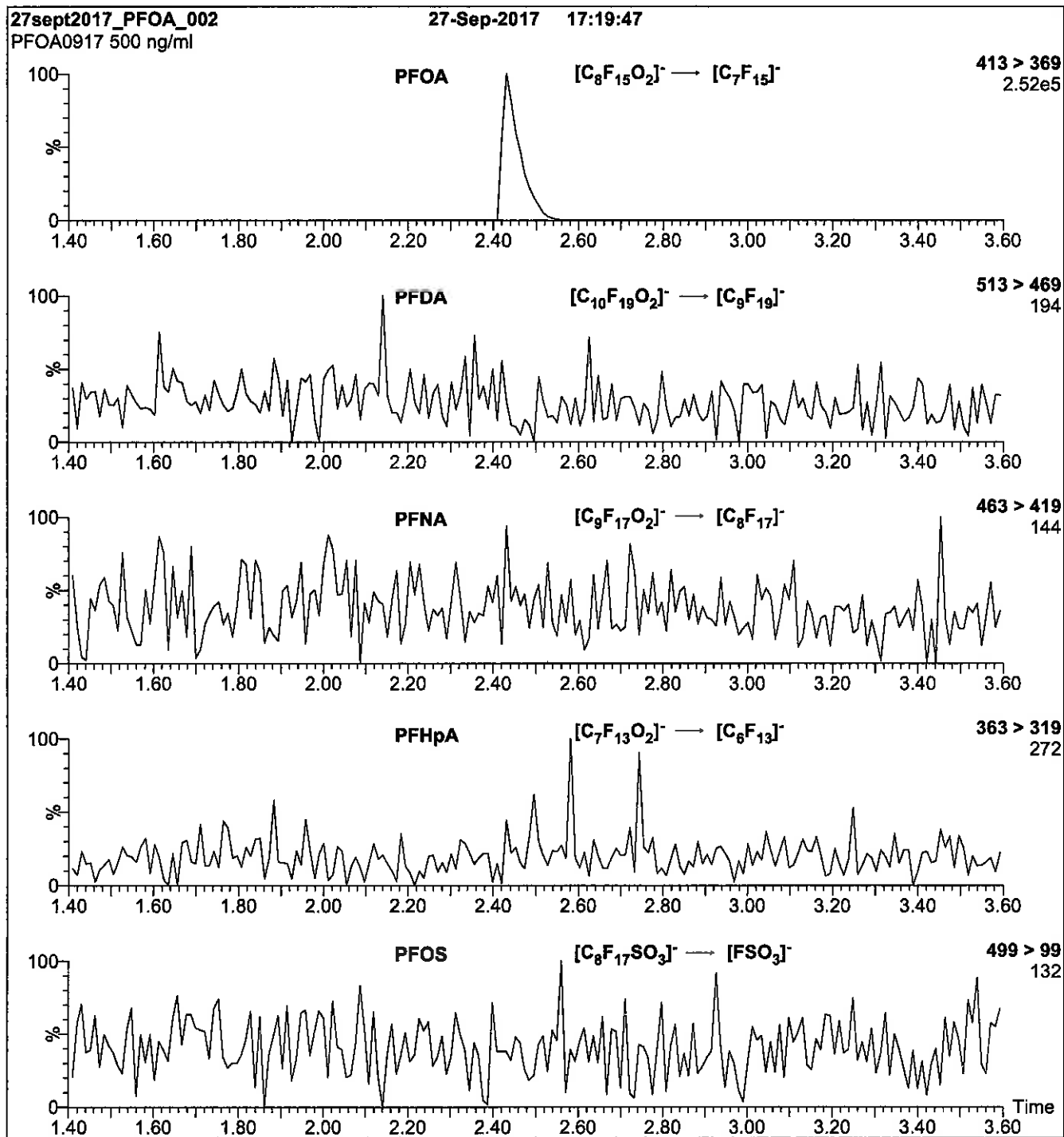
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

LCPFODA_00010

m. 9/2/17 SW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0717

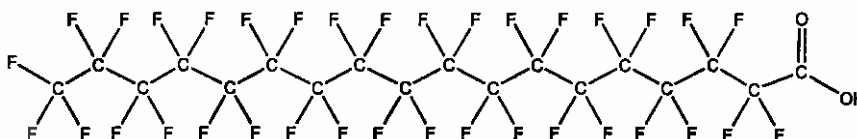
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

$C_{18}H_{30}O_2$

MOLECULAR WEIGHT:

914.14

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

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

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

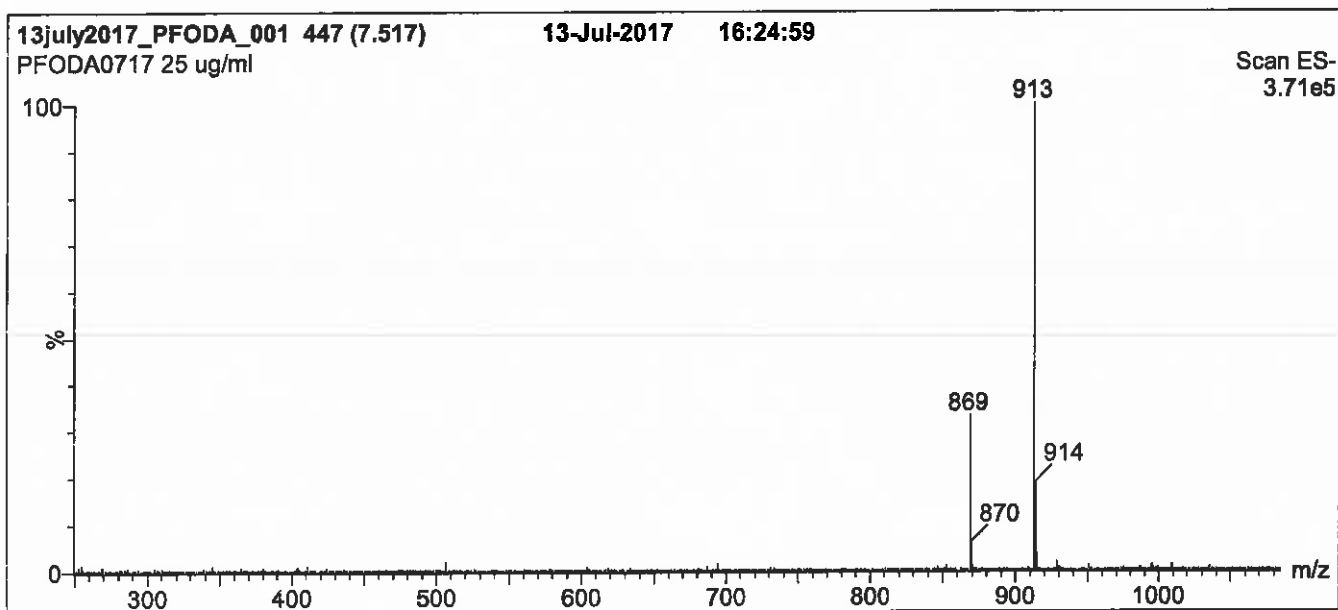
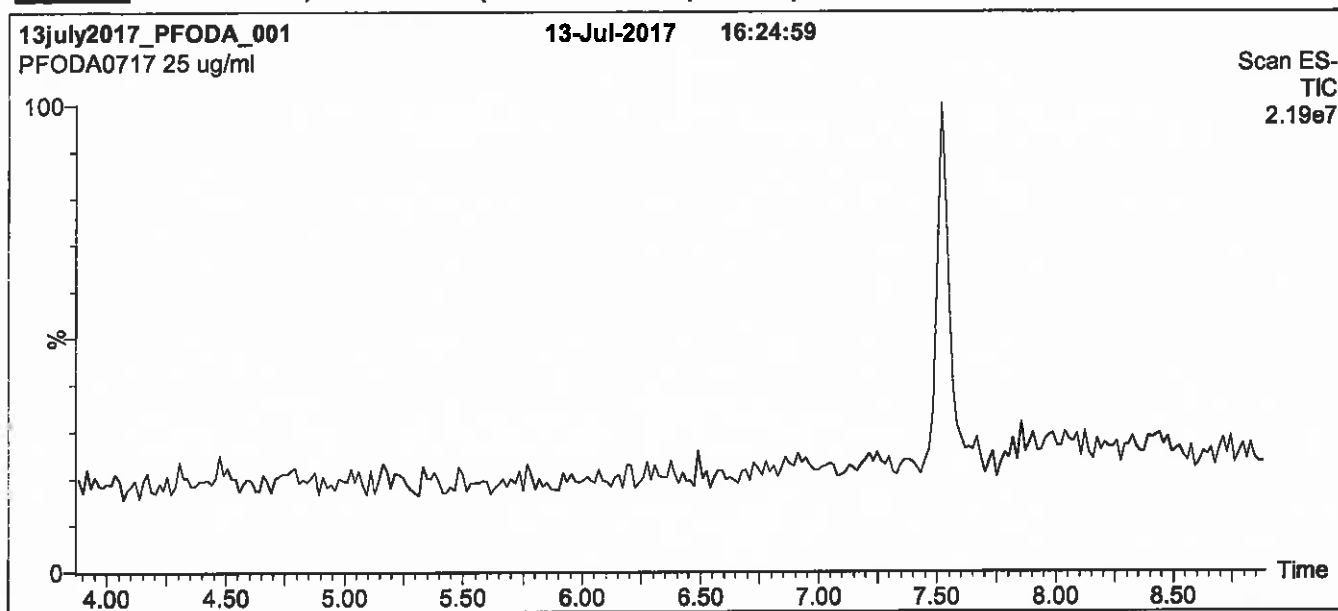
QUALITY MANAGEMENT:

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: PFODA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

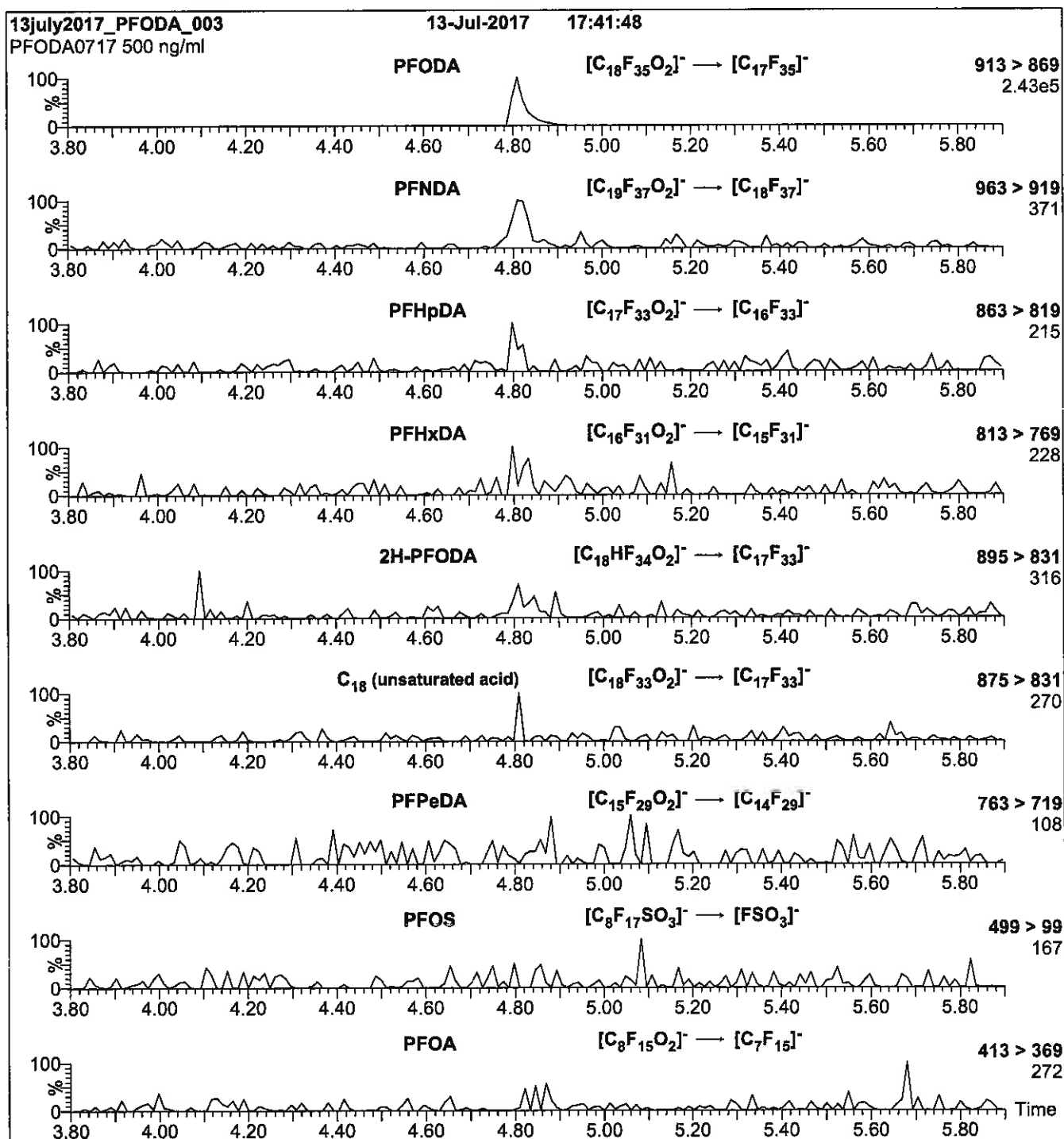
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00007

P: 10/20/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK0117
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt) 46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/09/2017
LAST TESTED: (mm/dd/yyyy)	01/12/2017
EXPIRY DATE: (mm/dd/yyyy)	01/12/2022
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

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 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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

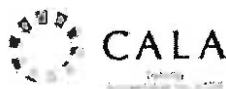
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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****

Table A: br-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 CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃ ⁻)K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃ ⁻)CF ₃ K ⁺ CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(SO ₃ ⁻)CF ₂ CF ₃ K ⁺ CF ₃	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(SO ₃ ⁻)CF ₂ CF ₂ CF ₃ K ⁺ CF ₃	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(SO ₃ ⁻)CF ₂ CF ₂ CF ₂ CF ₃ K ⁺ CF ₃	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(SO ₃ ⁻)CF ₂ CF ₂ CF ₂ CF ₂ CF ₃ K ⁺ CF ₃	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CCF ₂ CF 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 CF(SO ₃ ⁻)CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF(SO ₃ ⁻)CF(SO ₃ ⁻)CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

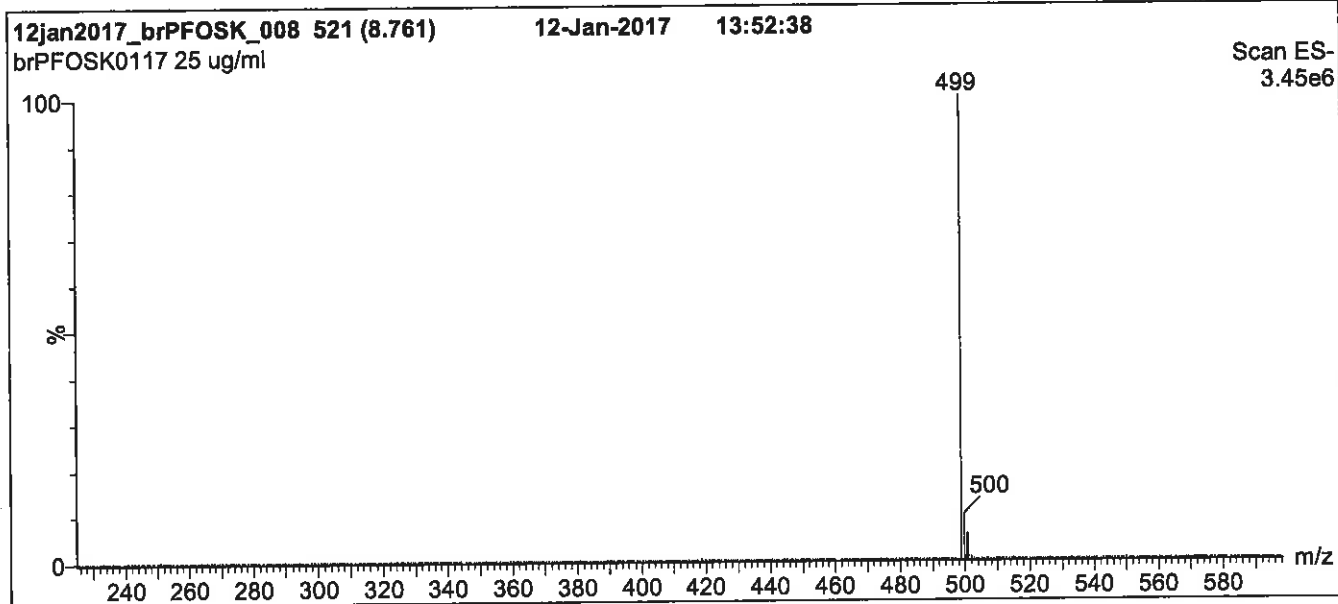
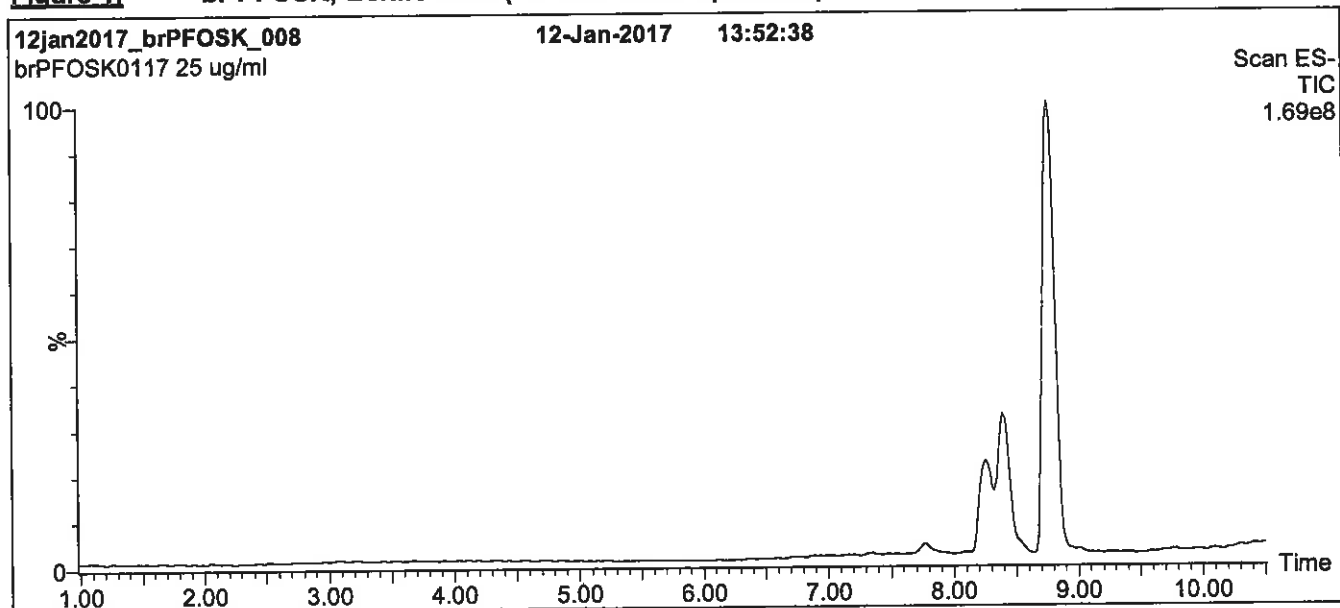
Certified By:


B.G. Chittim

Date: 01/20/2017

(mm/dd/yyyy)

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

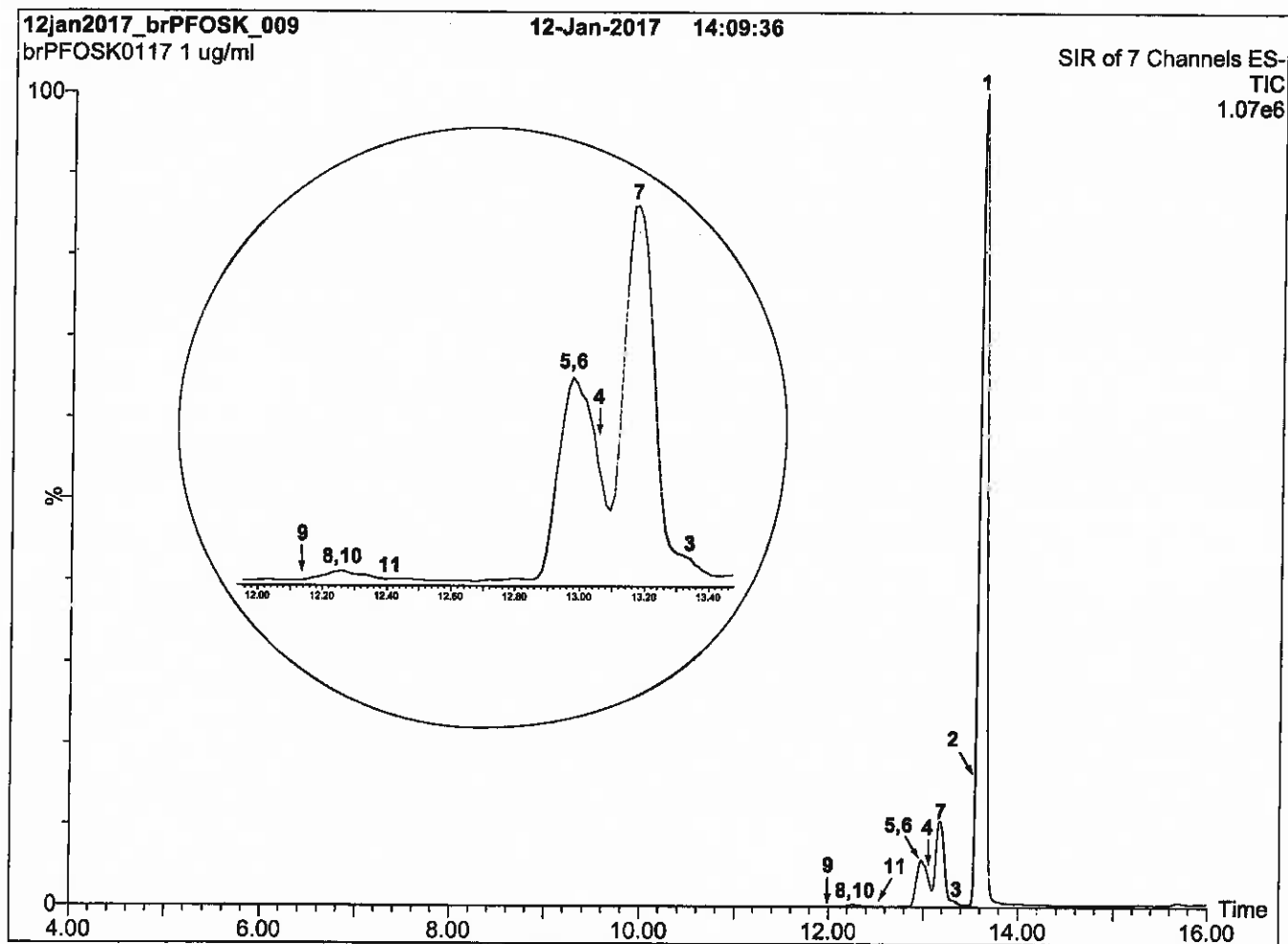
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: br-PFOSK; LC/MS Data (SIR)



Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

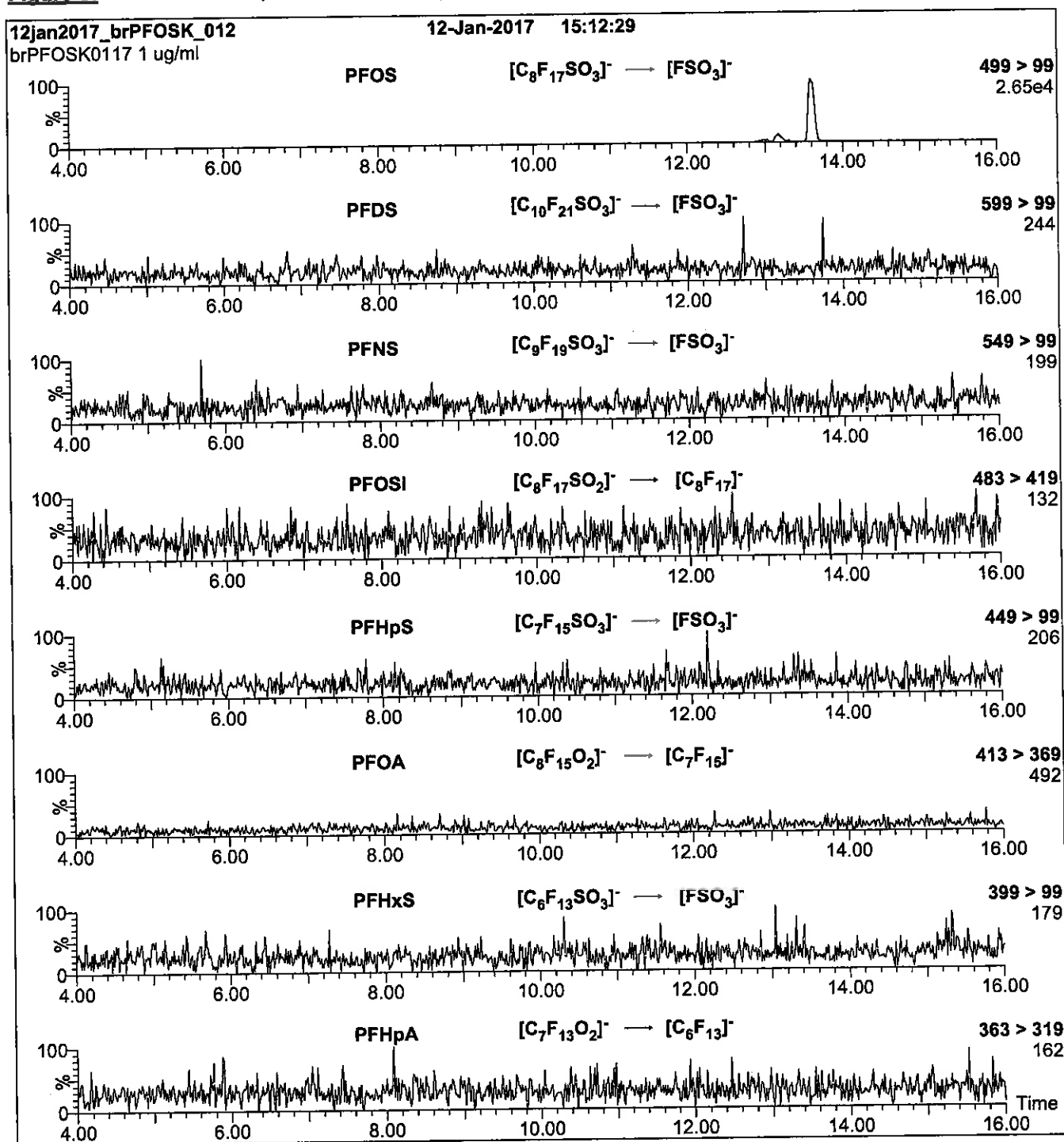
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc 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 μ l/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)



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00013

r: 2/16/16 SK



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

FOSA-I

LOT NUMBER:

FOSA0817I

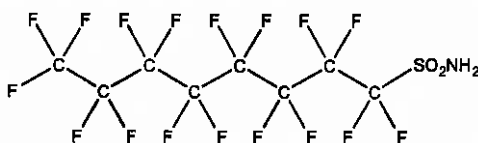
COMPOUND:

Perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

754-91-6



MOLECULAR FORMULA:

C₈H₂F₁₇NO₂S

MOLECULAR WEIGHT:

499.14

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Isopropanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/01/2017

EXPIRY DATE: (mm/dd/yyyy)

09/01/2022

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 09/14/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

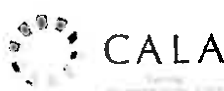
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

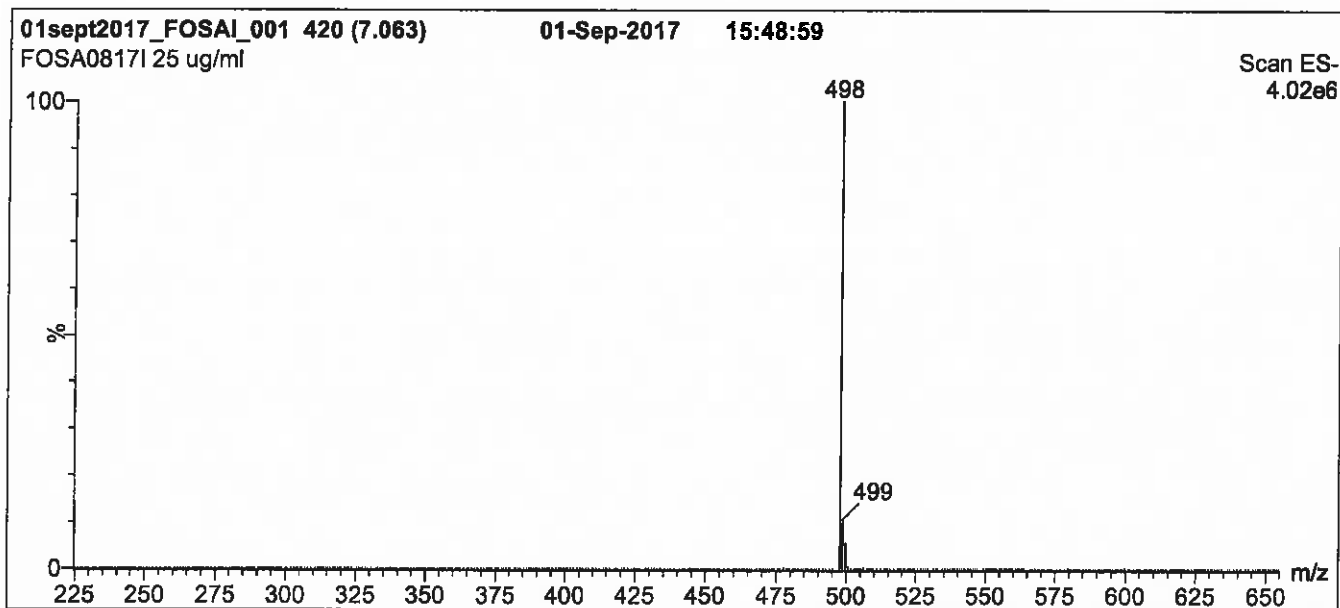
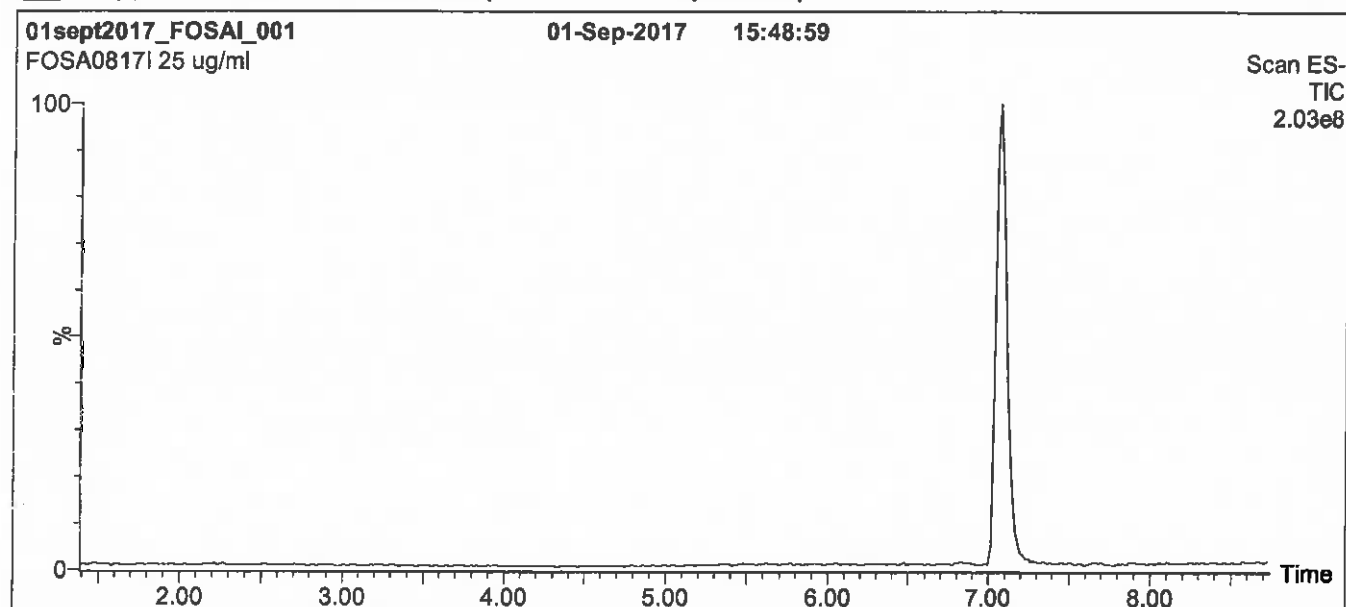
QUALITY MANAGEMENT:

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: FOSA-I; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

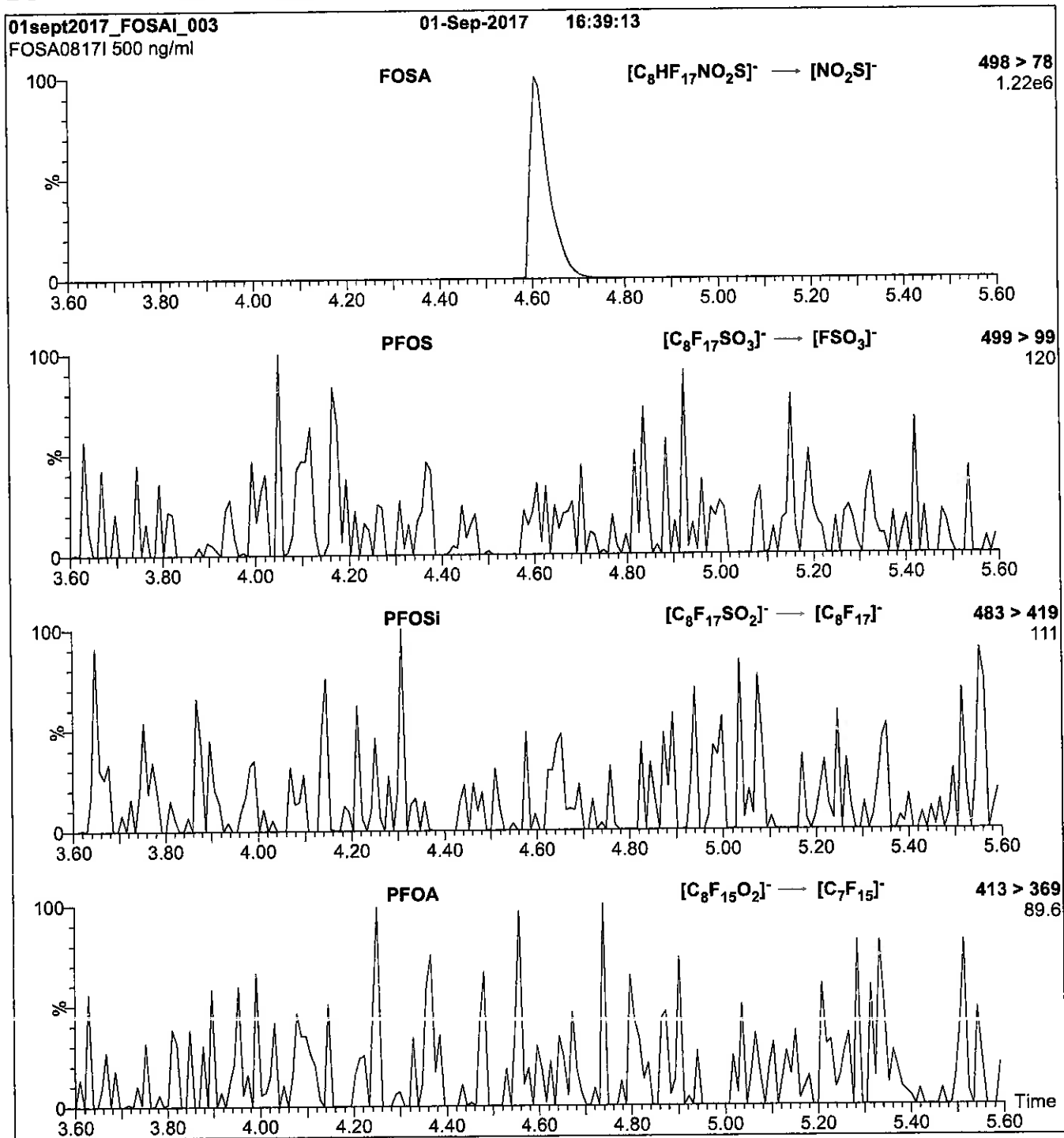
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00010

R: 11/20/17 SN



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFPeA

LOT NUMBER:

PFPeA0617

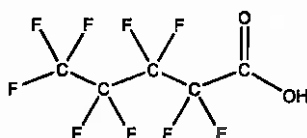
COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:

CAS #:

2706-90-3



MOLECULAR FORMULA:

$C_5HF_9O_2$

MOLECULAR WEIGHT:

264.05

CONCENTRATION:

$50 \pm 2.5 \mu\text{g/ml}$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/14/2017

EXPIRY DATE: (mm/dd/yyyy)

06/14/2022

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 ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 06/16/2017

(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

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. 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

$x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

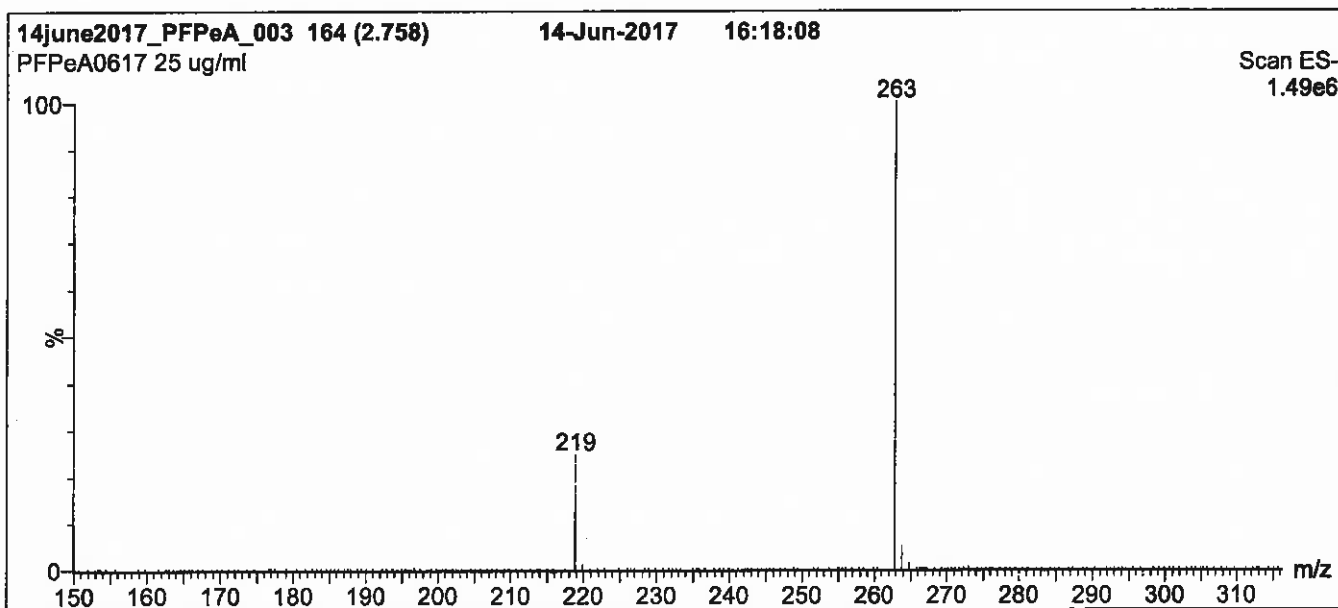
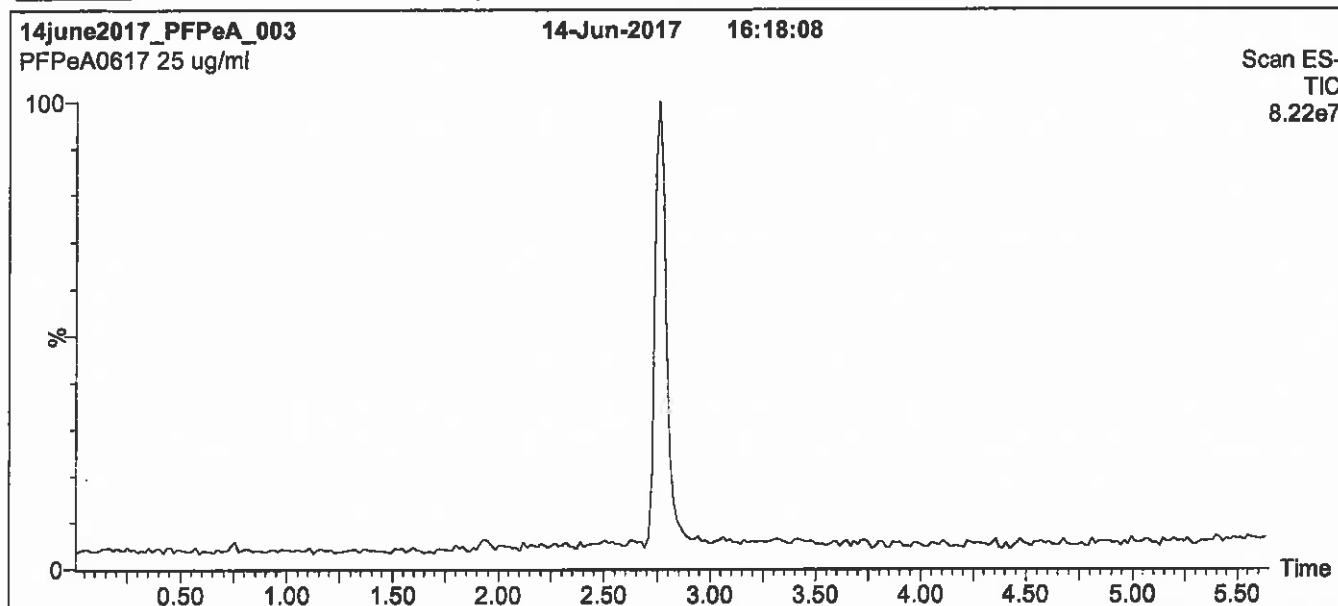
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

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: PFPeA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

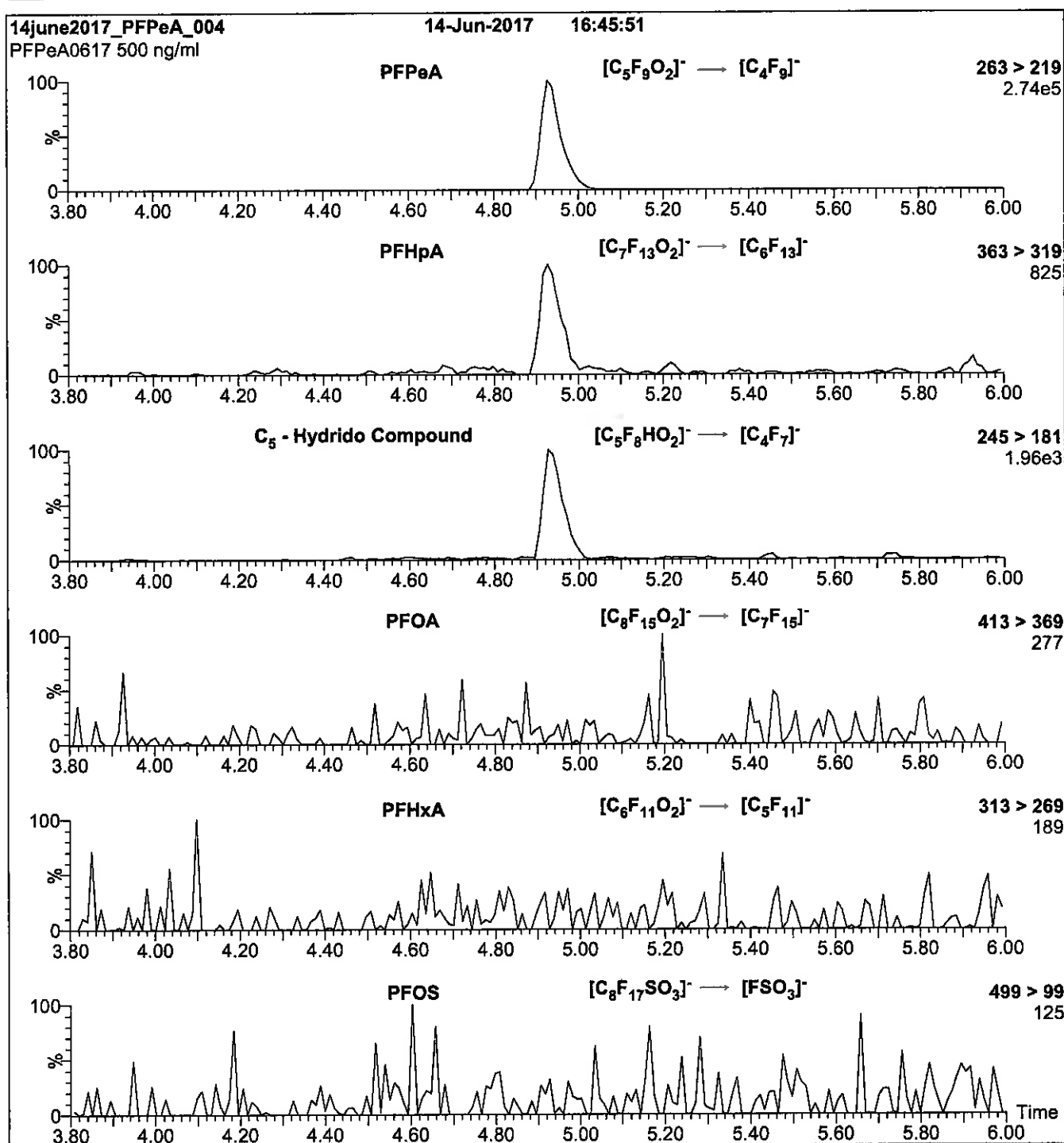
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 9

Reagent

LCFPeS_00003



1106801

ID: LCPFPeS_00003

Exp: 01/11/22 Pppl: SKV

PF-1-pentanesulfonate Na

P: 12/4/17 SKV



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFPeS

LOT NUMBER:

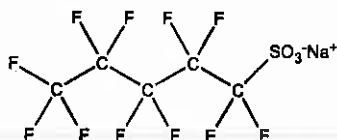
LPFPeS0117

COMPOUND:

Sodium perfluoro-1-pentanesulfonate

STRUCTURE:**CAS #:**

630402-22-1

**MOLECULAR FORMULA:** $C_5F_{11}SO_3Na$ **MOLECULAR WEIGHT:**

372.09

CONCENTRATION: $50.0 \pm 2.5 \mu\text{g/ml}$ (Na salt)
 $46.9 \pm 2.3 \mu\text{g/ml}$ (PFPeS anion)**SOLVENT(S):**

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/11/2017

EXPIRY DATE: (mm/dd/yyyy)

01/11/2022

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 09/06/2017

(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

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

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

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:

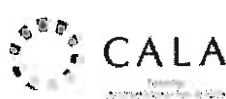
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

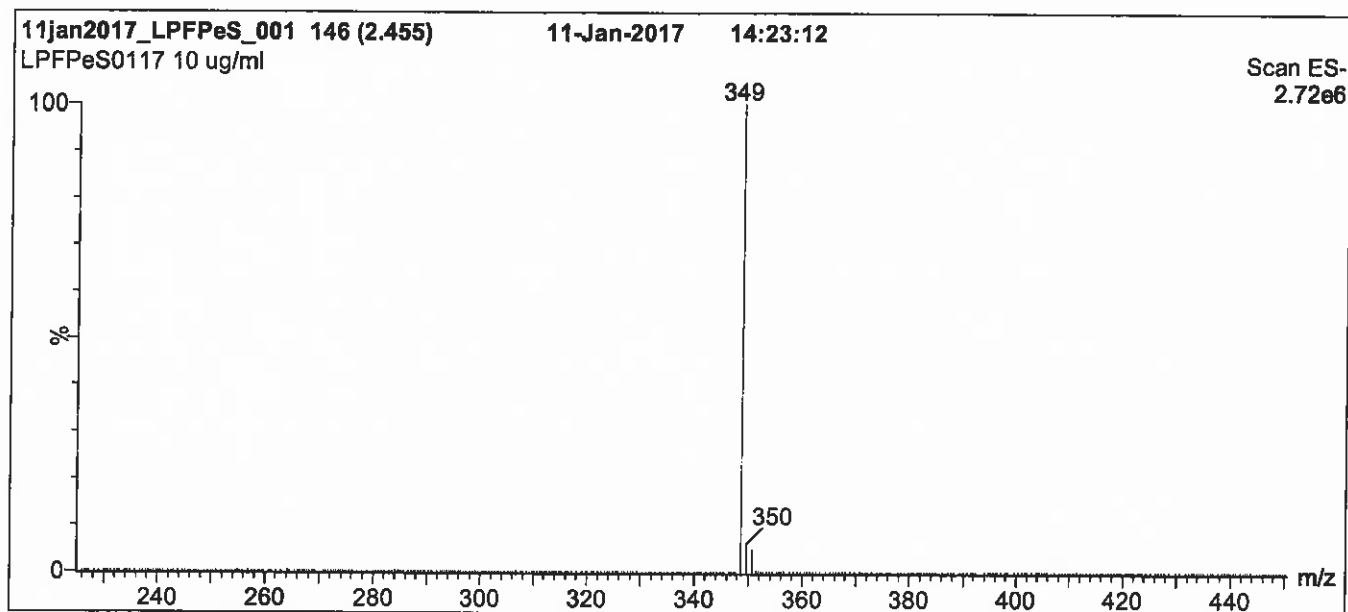
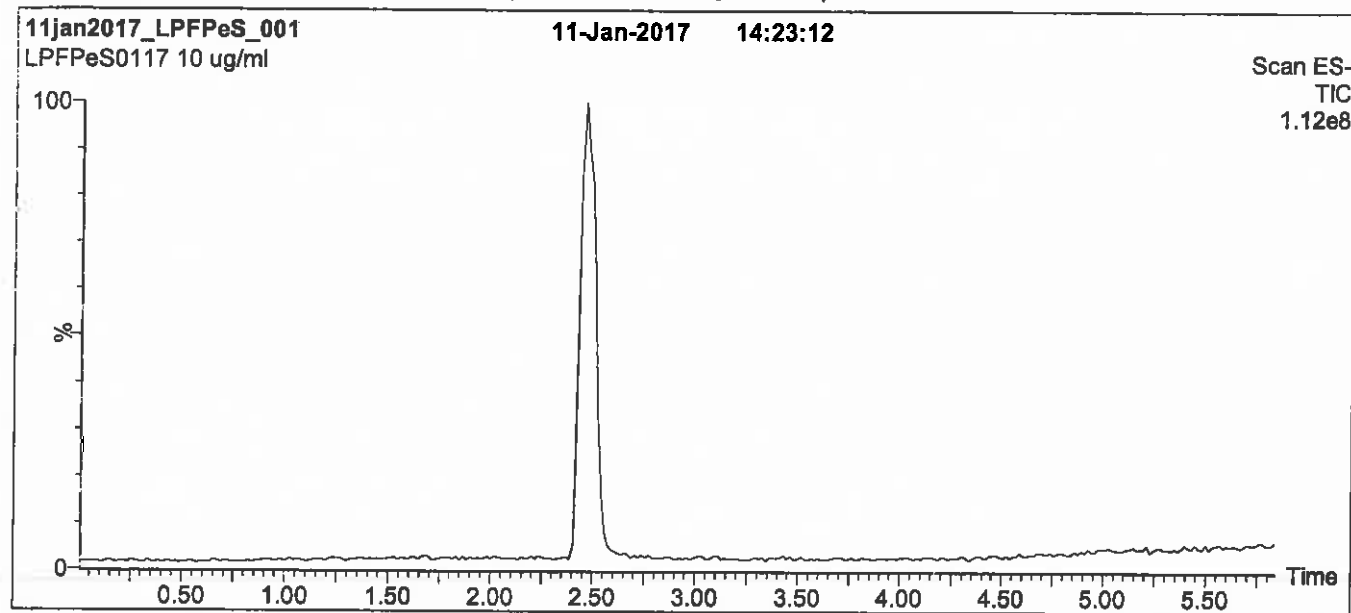
QUALITY MANAGEMENT:

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: L-PFPeS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions over 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

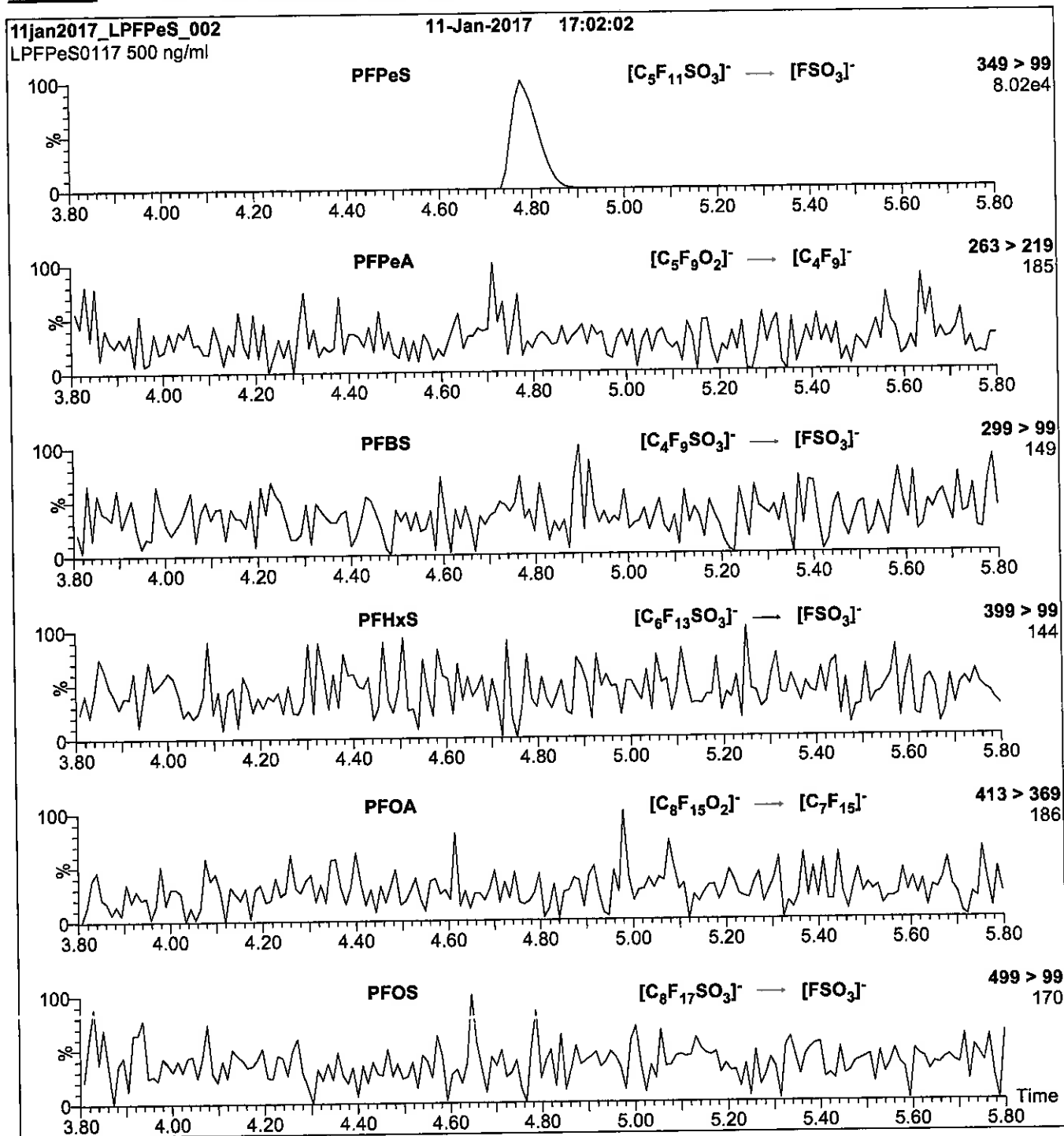
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 50.00

Cone Gas Flow (l/hr) = 60

Desolvation Gas Flow (l/hr) = 750

Figure 2: L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml L-PFPeS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 30

Reagent

LCPFTeDA_00009



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

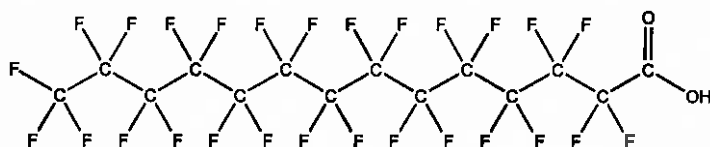
PFTeDA0916

COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:**CAS #:**

376-06-7

**MOLECULAR FORMULA:** $C_{14}H_{27}O_2$ **MOLECULAR WEIGHT:**

714.11

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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 PFDa ($C_{12}H_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}H_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/05/2016

(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

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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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.

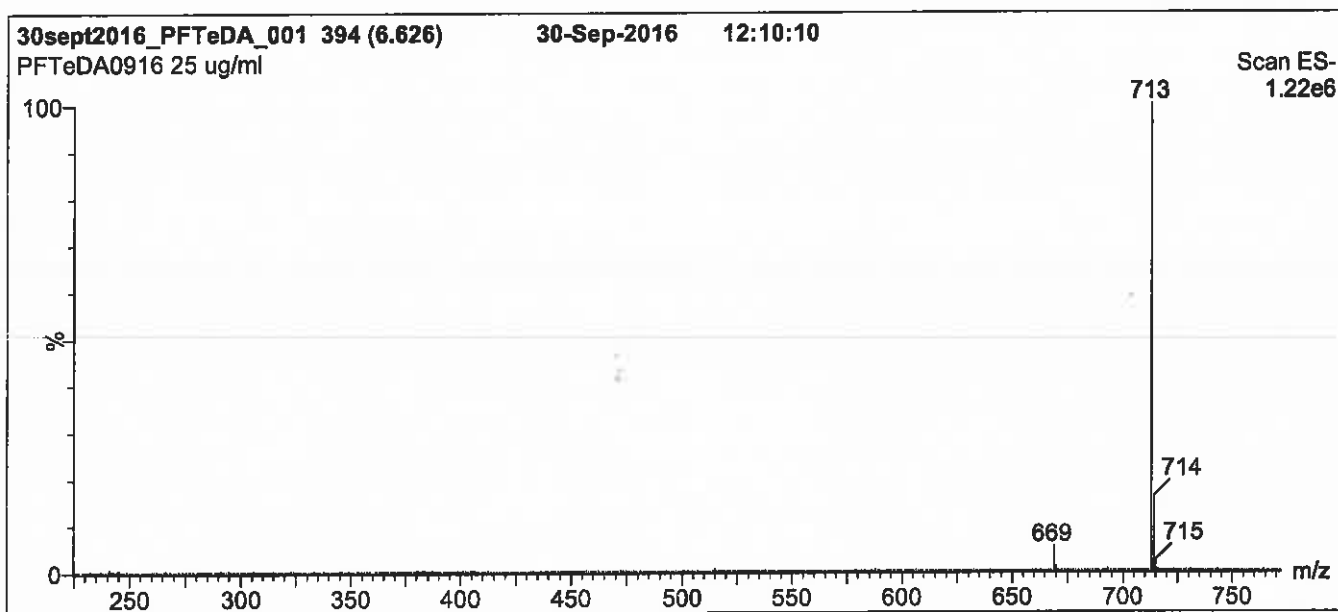
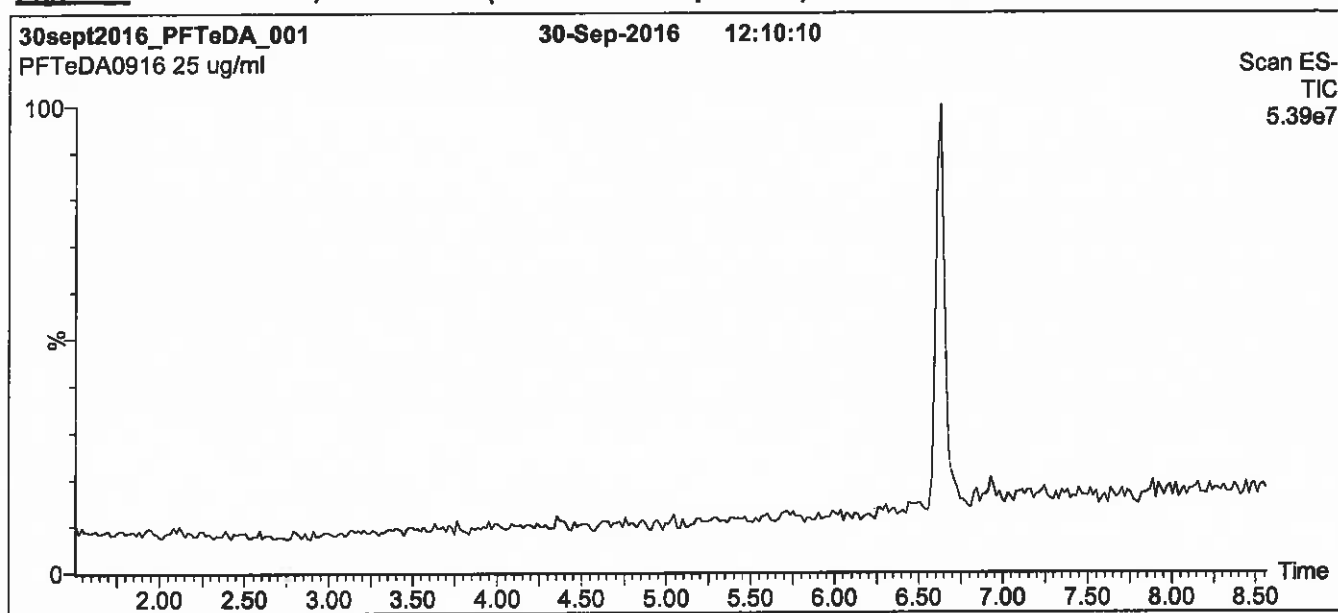
QUALITY MANAGEMENT:

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)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

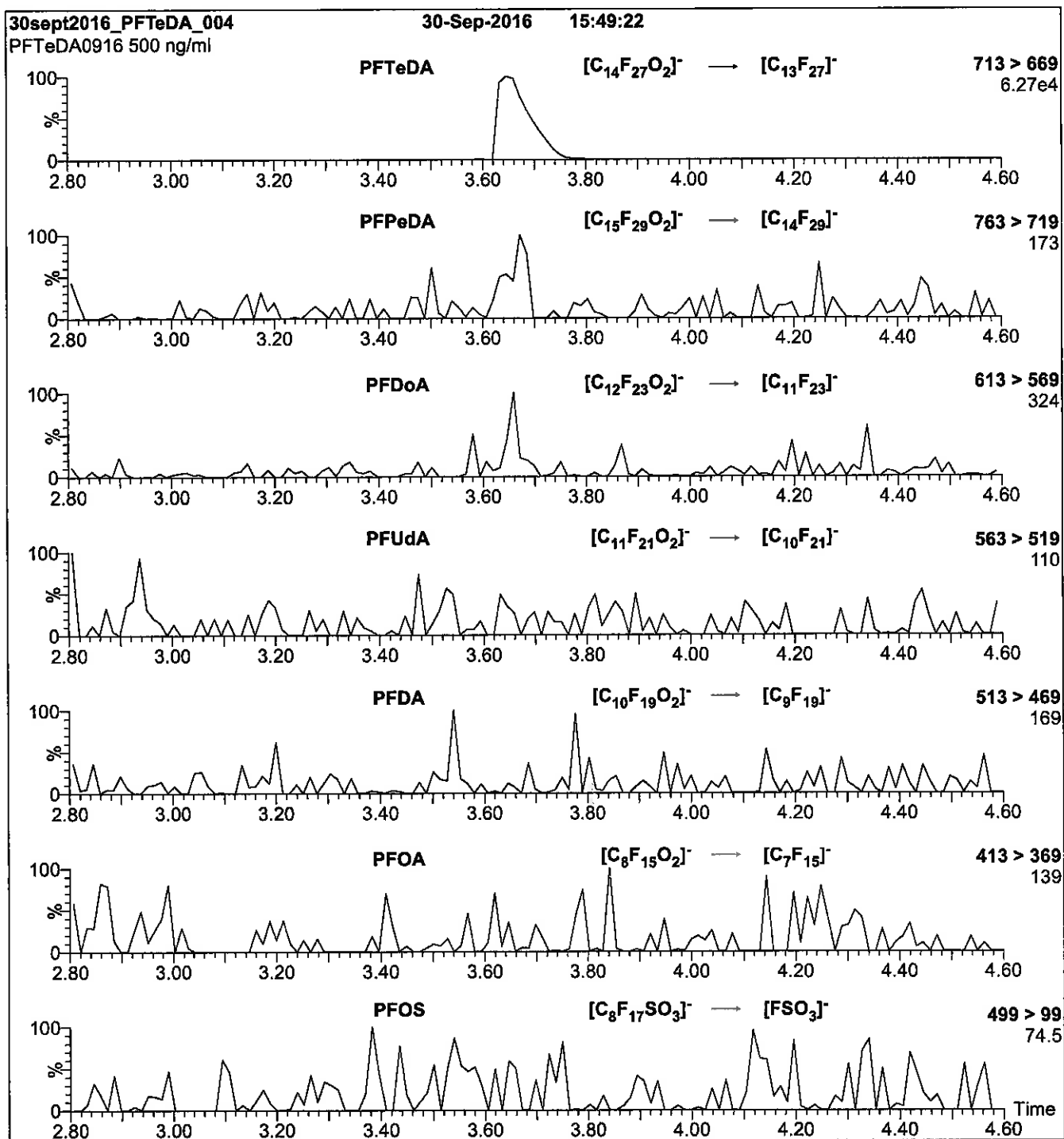
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFT_rDA_00009

R: 9/21/17 S&V



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTTrDA

LOT NUMBER:

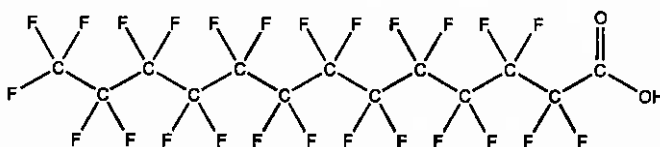
PFTTrDA0517

COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:**CAS #:**

72629-94-8

**MOLECULAR FORMULA:** $C_{13}HF_{25}O_2$ **MOLECULAR WEIGHT:**

664.11

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/02/2017

EXPIRY DATE: (mm/dd/yyyy)

05/02/2022

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 PFUDA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim, General Manager

Date: 05/04/2017

(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

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

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

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:

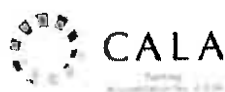
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

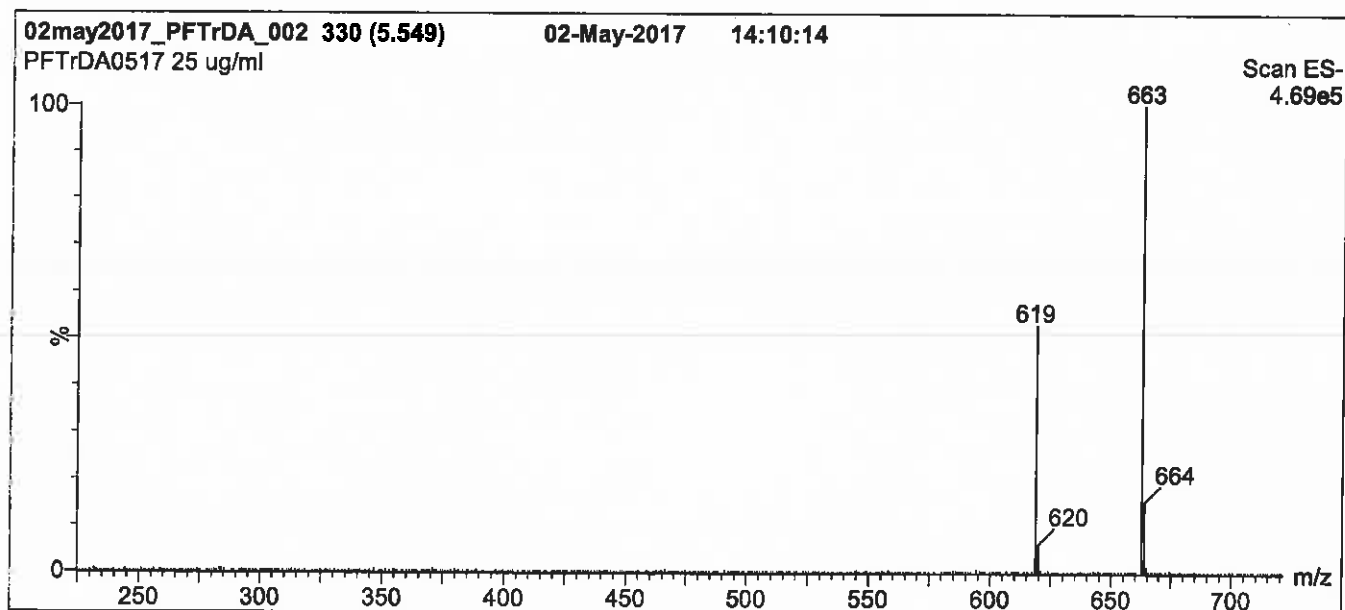
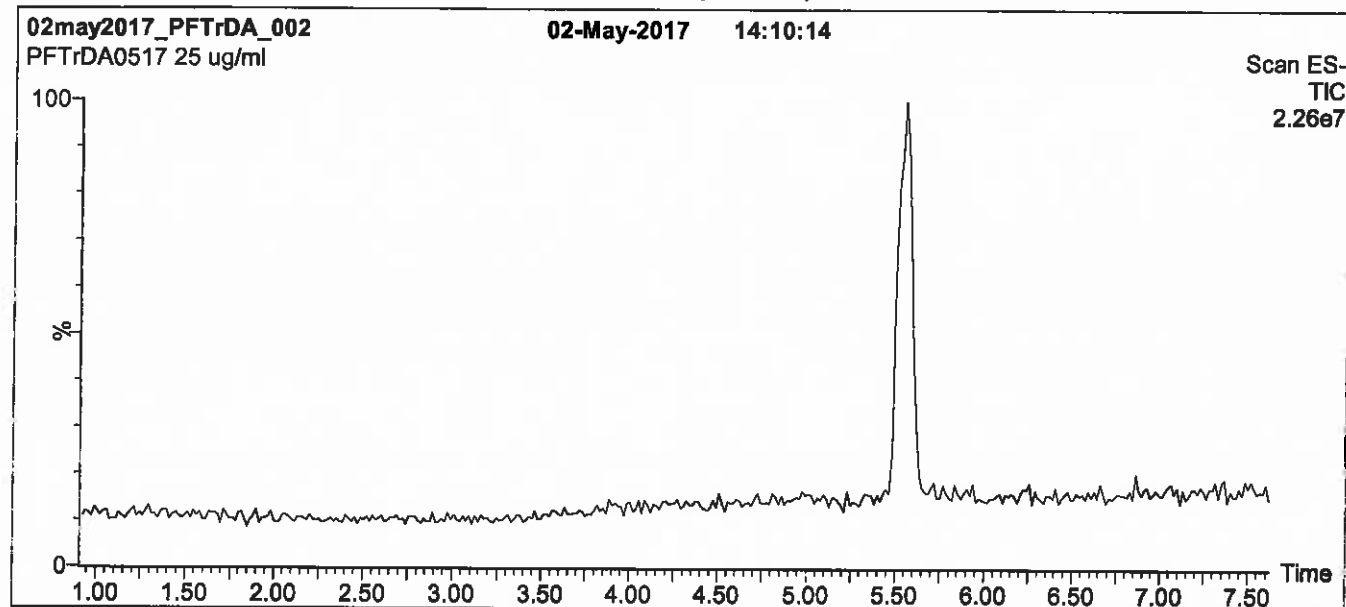
QUALITY MANAGEMENT:

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: PFTTrDA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

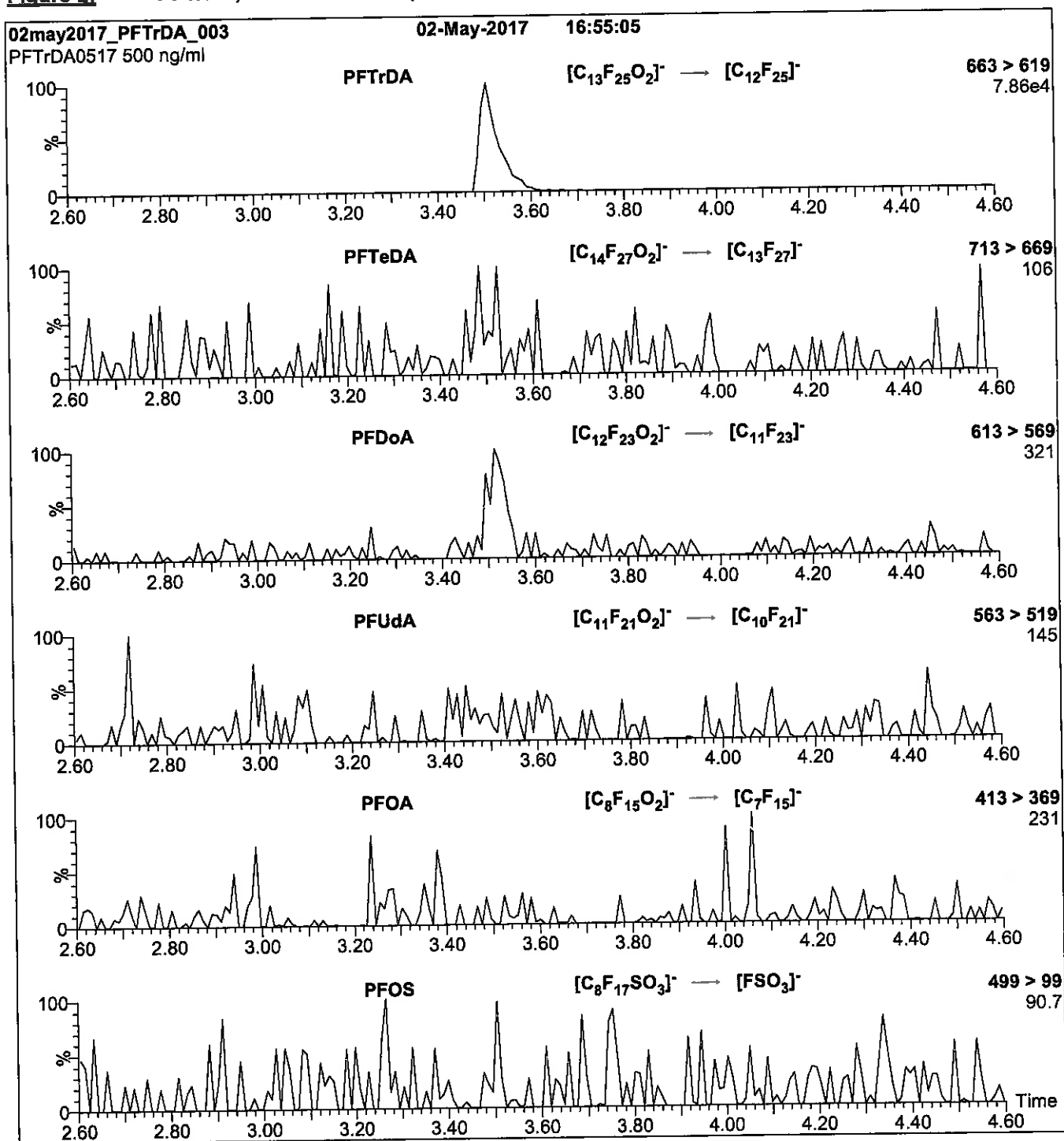
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFTTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00008

r. 9/21/17 SW



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFUdA

LOT NUMBER:

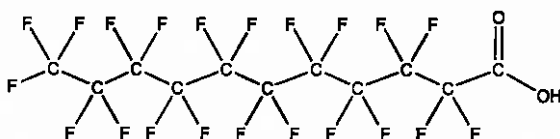
PFUdA1016

COMPOUND:

Perfluoro-n-undecanoic acid

STRUCTURE:**CAS #:**

2058-94-8

**MOLECULAR FORMULA:** $C_{11}HF_{21}O_2$ **MOLECULAR WEIGHT:**

564.09

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **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: 10/19/2016

(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

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 $x_1, x_2, \dots, x_n$ on which it depends is:

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

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:

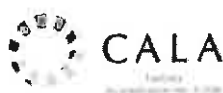
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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.

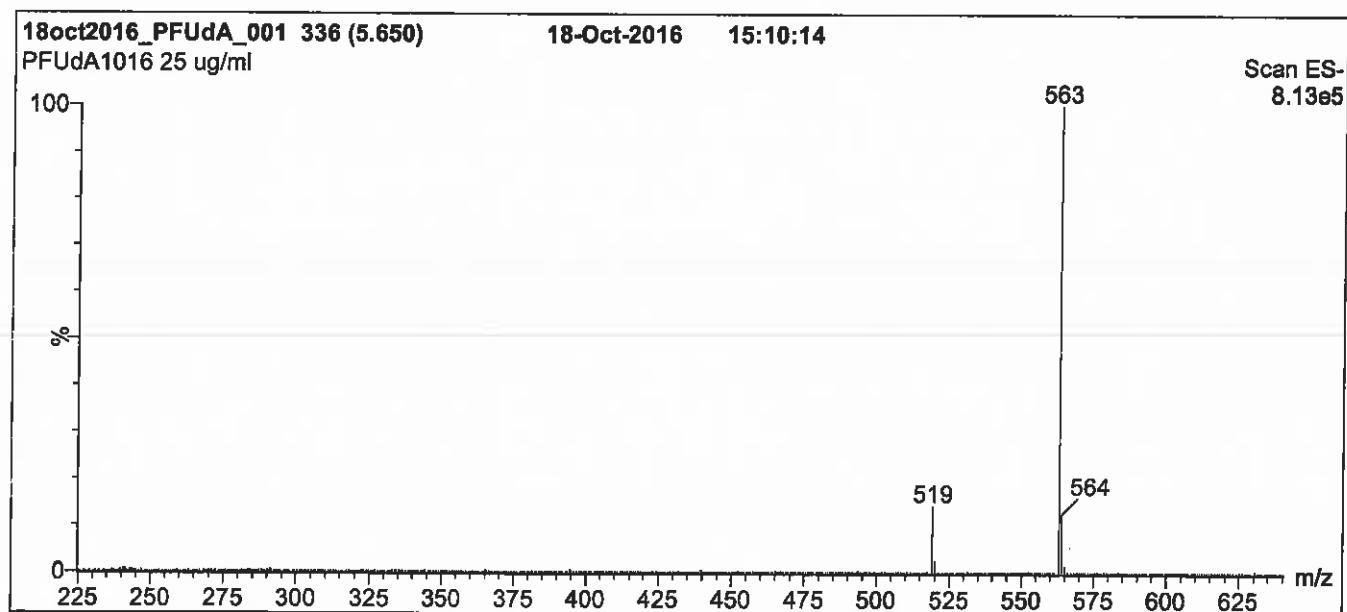
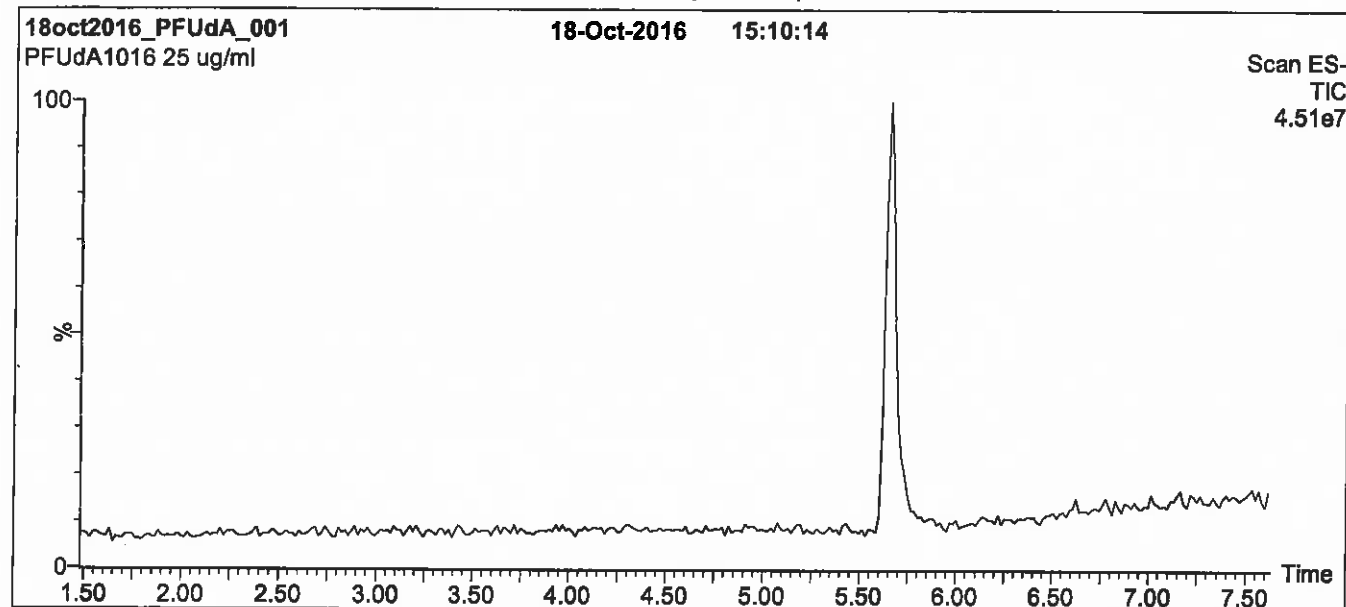
QUALITY MANAGEMENT:

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)



Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro micro API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)

Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

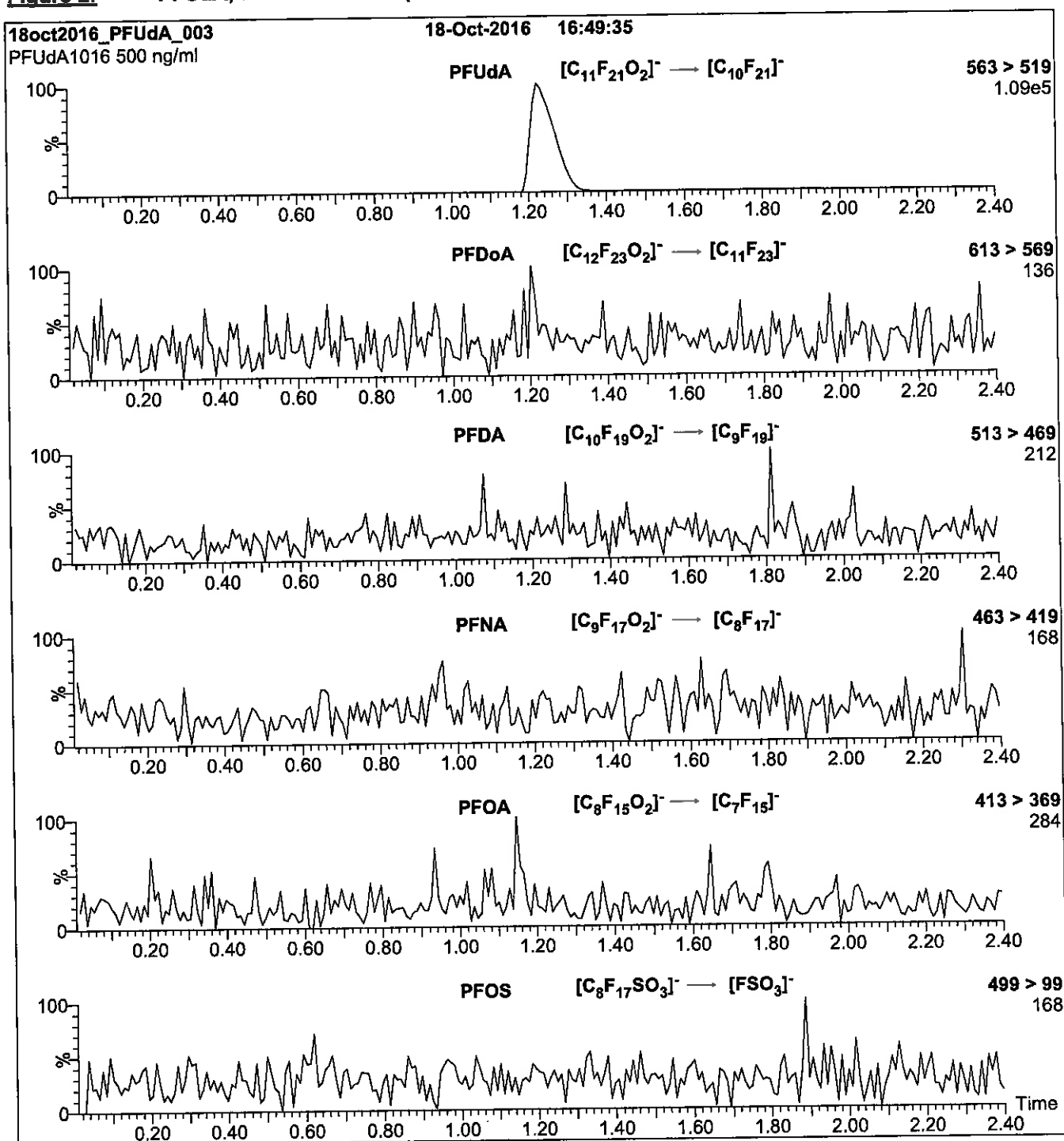
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = 15.00

Cone Gas Flow (l/hr) = 65

Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 11

Method PFC DOD

Fluorinated Hydrocarbons (LC/MS) by
Method PFAS_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Matrix: Water Level: Low
 GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-032-TPI	320-41704-1	104	104	102	98	102	93	90	99
TP-PFC-032-TPI DL	320-41704-1 DL	85	83	77	85	81	78	87	83
TP-PFC-032-MID CARBON	320-41704-2	94	86	84	86	87	83	93	83
TP-PFC-032-TPE	320-41704-3	93	86	81	86	85	84	94	85
TP-PFC-032-TPE-D	320-41704-4	90	81	83	81	82	80	89	80
	MB 320-238978/1-A	94	91	84	85	88	85	94	92
	LCS 320-238978/2-A	91	86	81	83	83	83	88	83
	LCSD 320-238978/3-A	94	87	86	86	82	83	88	83

	<u>QC LIMITS</u>
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

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-032-TPI	320-41704-1	98	102	103	111	112	113
TP-PFC-032-TPI DL	320-41704-1 DL	80	79	82	89	82	85
TP-PFC-032-MID CARBON	320-41704-2	85	84	86	88	86	86
TP-PFC-032-TPE	320-41704-3	87	86	86	94	85	96
TP-PFC-032-TPE-D	320-41704-4	81	83	84	85	88	87
	MB 320-238978/1-A	90	85	89	89	86	101
	LCS 320-238978/2-A	86	81	83	90	85	87
	LCSD 320-238978/3-A	83	81	85	87	90	87

	<u>QC LIMITS</u>
PFOS = 13C4 PFOS	50-150
PFOSA = 13C8 FOSA	50-150
PFDA = 13C2 PFDA	50-150
PFUnA = 13C2 PFUnA	50-150
PFDoA = 13C2 PFDoA	50-150
PFTDA = 13C2-PFTeDA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.10LLA_008.d
 Lab ID: LCS 320-238978/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	38.9	97	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	38.6	97	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	38.7	97	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	39.7	99	80-113	
Perfluorooctanoic acid (PFOA)	40.0	39.4	98	80-107	
Perfluorononanoic acid (PFNA)	40.0	40.9	102	83-113	
Perfluorodecanoic acid (PFDA)	40.0	40.4	101	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	32.3	81	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	39.0	98	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	39.5	99	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	38.9	97	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	37.2	105	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.7	92	81-106	M
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.9	102	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.6	99	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	39.1	101	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	39.0	98	85-114	
13C8 FOSA	100	81.2	81	50-150	
13C4 PFBA	100	90.7	91	50-150	
13C5 PFPeA	100	85.7	86	50-150	
13C2 PFHxA	100	83.0	83	50-150	
13C4-PFHpA	100	82.8	83	50-150	
13C4 PFOA	100	88.4	88	50-150	
13C5 PFNA	100	83.1	83	50-150	
13C2 PFDA	100	82.7	83	50-150	
13C2 PFUnA	100	90.2	90	50-150	
13C2 PFDoA	100	84.6	85	50-150	
18O2 PFHxS	94.6	78.3	83	50-150	
13C2-PFTeDA	100	87.4	87	50-150	
13C4 PFOS	95.6	81.8	86	50-150	
13C3-PFBS	93.0	75.1	81	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.10LLA_009.d
 Lab ID: LCSD 320-238978/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorobutanoic acid (PFBA)	40.0	38.6	96	1	30	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	38.4	96	1	30	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	38.8	97	0	30	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	39.3	98	1	30	80-113	
Perfluorooctanoic acid (PFOA)	40.0	39.0	97	1	30	80-107	
Perfluorononanoic acid (PFNA)	40.0	40.5	101	1	30	83-113	
Perfluorodecanoic acid (PFDA)	40.0	39.9	100	1	30	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	31.3	78	3	30	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	38.0	95	3	30	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	38.8	97	2	30	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	39.5	99	1	30	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.3	97	8	30	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.8	93	0	30	81-106	M
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.0	105	3	30	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	38.2	103	4	30	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	39.8	103	2	30	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	40.2	101	3	30	85-114	
13C8 FOSA	100	81.3	81			50-150	
13C4 PFBA	100	93.6	94			50-150	
13C5 PFPeA	100	87.2	87			50-150	
13C2 PFHxA	100	85.6	86			50-150	
13C4-PFHpA	100	82.2	82			50-150	
13C4 PFOA	100	88.4	88			50-150	
13C5 PFNA	100	82.6	83			50-150	
13C2 PFDA	100	84.8	85			50-150	
13C2 PFUnA	100	87.3	87			50-150	
13C2 PFDoA	100	89.7	90			50-150	
18O2 PFHxS	94.6	78.1	83			50-150	
13C2-PFTeDA	100	87.2	87			50-150	
13C4 PFOS	95.6	79.3	83			50-150	
13C3-PFBS	93.0	80.4	86			50-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab File ID: 2018.08.10LLA_007.d Lab Sample ID: MB 320-238978/1-A
 Matrix: Water Date Extracted: 08/09/2018 10:23
 Instrument ID: A8_N Date Analyzed: 08/10/2018 08:23
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-238978/2-A	2018.08.10L LA 008.d	08/10/2018 08:31
	LCSD 320-238978/3-A	2018.08.10L LA 009.d	08/10/2018 08:39
TP-PFC-032-TPI	320-41704-1	2018.08.10L LA 010.d	08/10/2018 08:47
TP-PFC-032-MID CARBON	320-41704-2	2018.08.10L LA 011.d	08/10/2018 08:55
TP-PFC-032-TPE	320-41704-3	2018.08.10L LA 012.d	08/10/2018 09:03
TP-PFC-032-TPE-D	320-41704-4	2018.08.10L LA 013.d	08/10/2018 09:10
TP-PFC-032-TPI DL	320-41704-1 DL	2018.08.10L LAAAX 080.d	08/10/2018 20:12

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Sample No.: IC 320-238193/5 Date Analyzed: 08/06/2018 11:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.06LLICAL_00 Heated Purge: (Y/N) N
 Calibration ID: 40493

	13PFOA					
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT	3997336	2.57				
UPPER LIMIT	5996004	2.77				
LOWER LIMIT	1998668	2.37				
LAB SAMPLE ID	CLIENT SAMPLE ID					
ICB 320-238193/9		4092642	2.57			
ICV 320-238193/10		3797956	2.57			
CCV 320-239237/3 CCVIS		4246064	2.62			
CCV 320-239308/3 CCVIS		3907854	2.62			

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Sample No.: CCV 320-239237/3 Date Analyzed: 08/10/2018 08:15
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.10LLA_006.d Heated Purge: (Y/N) N
 Calibration ID: 40493

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		4246064	2.62				
UPPER LIMIT		6369096	2.82				
LOWER LIMIT		2123032	2.42				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-239237/1		4272227	2.62				
CCVL 320-239237/2		4051626	2.61				
MB 320-238978/1-A		4588938	2.62				
LCS 320-238978/2-A		4563448	2.62				
LCSD 320-238978/3-A		4625875	2.63				
320-41704-1	TP-PFC-032-TPI	3821614	2.62				
320-41704-2	TP-PFC-032-MID CARBON	4635340	2.62				
320-41704-3	TP-PFC-032-TPE	4804596	2.62				
320-41704-4	TP-PFC-032-TPE-D	4916577	2.63				
CCV 320-239237/14		4039296	2.61				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Sample No.: CCV 320-239308/3 Date Analyzed: 08/10/2018 16:48
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.10LLAAX_04 Heated Purge: (Y/N) N
 Calibration ID: 40493

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3907854	2.62				
UPPER LIMIT		5861781	2.82				
LOWER LIMIT		1953927	2.42				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-239308/1		4237844	2.61				
CCVL 320-239308/2		4312113	2.61				
CCV 320-239343/1		4178906	2.62				
320-41704-1 DL	TP-PFC-032-TPI DL	241238Q	2.62				
CCV 320-239343/4		3836135	2.63				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPI</u>	Lab Sample ID: <u>320-41704-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_010.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.9 (mL)</u>	Date Analyzed: <u>08/10/2018 08:47</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	68	M	1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		1.7	0.86	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	350	E	1.7	0.86	0.41
375-85-9	Perfluoroheptanoic acid (PFHpA)	62	M	1.7	1.3	0.53
335-67-1	Perfluorooctanoic acid (PFOA)	1300	E M	1.7	1.3	0.47
375-95-1	Perfluorononanoic acid (PFNA)	2.4		1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.78	J	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.66
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.72
375-73-5	Perfluorobutanesulfonic acid (PFBS)	50		1.7	0.86	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	370	E M	1.7	0.86	0.33
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.2		1.7	0.86	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	2.6	0.95
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPI</u>	Lab Sample ID: <u>320-41704-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_010.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.9(mL)</u>	Date Analyzed: <u>08/10/2018 08:47</u>
Con. Extract Vol.: <u>10.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	102		50-150
STL00992	13C4 PFBA	104		50-150
STL01893	13C5 PFPeA	104		50-150
STL00993	13C2 PFHxA	98		50-150
STL01892	13C4-PFHpA	102		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	99		50-150
STL00996	13C2 PFDA	103		50-150
STL00997	13C2 PFUnA	111		50-150
STL00998	13C2 PFDoA	112		50-150
STL00994	18O2 PFHxS	93		50-150
STL02116	13C2-PFTeDA	113		50-150
STL00991	13C4 PFOS	98		50-150
STL02337	13C3-PFBS	102		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_010.d
 Lims ID: 320-41704-C-1-A
 Client ID: TP-PFC-032-TPI
 Sample Type: Client
 Inject. Date: 10-Aug-2018 08:47:25 ALS Bottle#: 4 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41704-c-1-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 14:12:02 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK035

First Level Reviewer: hannigana

Date: 10-Aug-2018 14:01:03

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	1.406	1.411	-0.005	0.537	5515638	2.61		104	9474	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.406	1.413	-0.007	1.000	4103511	1.98			337	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.662	1.662	0.0	0.634	3786699	2.60		104	5514	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.662	1.668	-0.006	1.000	9861455	5.72			374	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.700	-0.006	1.000	3755736	1.44			202	
298.90 > 99.00	1.694	1.700	-0.006	1.000	1605016		2.34(1.25-3.74)		208	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.702	-0.008	0.647	79871	2.37		102	468	
D 7 13C2 PFHxA										
315.00 > 270.00	1.944	1.943	0.001	0.742	4059341	2.45		98.2	11397	
6 Perfluorohexanoic acid										E
313.00 > 269.00	1.944	1.949	-0.005	1.000	16876597	10.2			2069	E
313.00 > 119.00	1.944	1.949	-0.005	1.000	1383786		12.20(5.03-15.10)		3340	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.265	0.001	0.865	4155884	2.55		102	10000	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.266	2.269	-0.003	1.000	3180190	1.80			130	M
363.00 > 169.00	2.266	2.269	-0.003	1.000	1189313		2.67(1.13-3.40)		122	
D 11 18O2 PFHxS										
403.00 > 84.00	2.288	2.276	0.012	0.873	4604554	2.21		93.3	10258	
8 Perfluorohexanesulfonic acid										EM
399.00 > 80.00	2.288	2.280	0.008	1.000	22752382	10.8			4815	EM
399.00 > 99.00	2.288	2.280	0.008	1.000	7991536		2.85(1.50-4.49)		3637	M

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	2.620	2.619	0.001	1.000	3344175	2.24		89.5	5599	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.627	2.622	0.005	1.003	59130627	39.1			2093	EM
413.00 > 169.00	2.620	2.622	-0.002	1.000	40538652		1.46(0.84-2.52)		4110	EM
* 62 13C2-PFOA										
415.00 > 370.00	2.620	2.622	-0.002		3821614	2.50			5506	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.635	2.629	0.006	0.880	348195	0.2087			27.2	
449.00 > 99.00	2.635	2.629	0.006	0.880	109492		3.18(1.94-5.82)		51.9	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.142	3217823	2.35		98.2	3667	
D 19 13C5 PFNA										
468.00 > 423.00	3.000	2.992	0.008	1.145	3327373	2.48		99.3	7339	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.993	0.0	1.000	14017324	9.70			3526	E
499.00 > 99.00	2.993	2.993	0.0	1.000	3186465		4.40(2.31-6.93)		2975	E
20 Perfluorononanoic acid										
463.00 > 419.00	3.000	3.001	-0.001	1.000	98758	0.0704			16.8	
463.00 > 169.00	3.000	3.001	-0.001	1.000	23040		4.29(1.90-5.69)		13.3	
D 21 13C8 FOSA										
506.00 > 78.00	3.327	3.326	0.001	1.270	4632891	2.55		102	6664	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.327	3.334	-0.007	1.000	6697	0.003712			6.4	
D 23 13C2 PFDA										
515.00 > 470.00	3.356	3.355	0.001	1.281	3022624	2.57		103	6712	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.356	3.357	-0.001	1.000	27417	0.0226			11.9	
513.00 > 169.00	3.356	3.357	-0.001	1.000	5482		5.00(2.36-7.09)		9.9	
D 30 13C2 PFUnA										
565.00 > 520.00	3.683	3.682	0.001	1.406	2626470	2.78		111	7906	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.674	3.685	-0.011	0.998	9057	0.007672			6.0	
563.00 > 169.00	3.683	3.685	-0.002	1.000	1554		5.83(2.12-6.36)		10.1	
D 36 13C2 PFDoA										
615.00 > 570.00	3.979	3.987	-0.008	1.519	2804490	2.80		112	4825	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.987	3.991	-0.004	1.002	5707	0.004572			3.7	
613.00 > 169.00	3.979	3.991	-0.012	1.000	1682		3.39(2.13-6.40)		18.2	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.245	4.257	-0.012	1.067	11404	0.009454			5.1	R
663.00 > 169.00	4.255	4.257	-0.002	1.069	2540		4.49(1.25-3.76)		25.9	R
D 43 13C2-PFTeDA										
715.00 > 670.00	4.495	4.493	0.002	1.716	3592075	2.82		113	6909	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.495	4.497	-0.002	1.000	3221	0.009262			28.3	
713.00 > 219.00	4.495	4.497	-0.002	1.000	2063		1.56(0.71-2.13)		17.1	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_010.d

Injection Date: 10-Aug-2018 08:47:25

Instrument ID: A8_N

Lims ID: 320-41704-C-1-A

Lab Sample ID: 320-41704-1

Client ID: TP-PFC-032-TPI

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

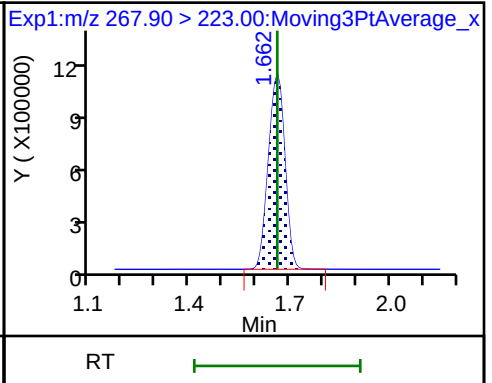
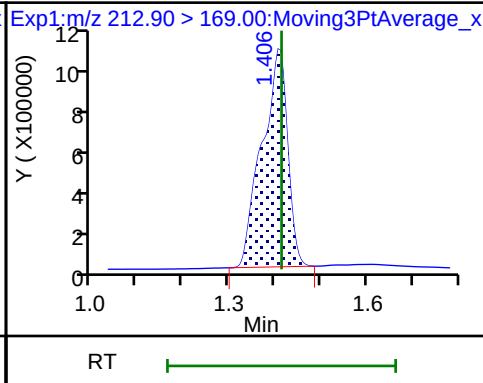
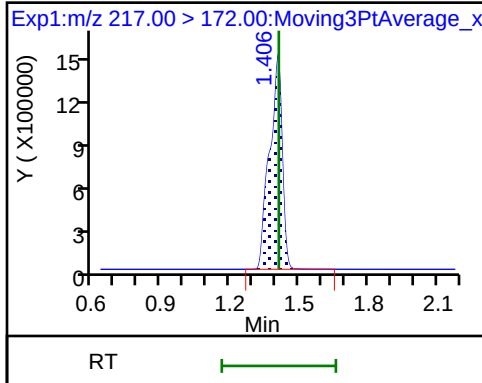
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

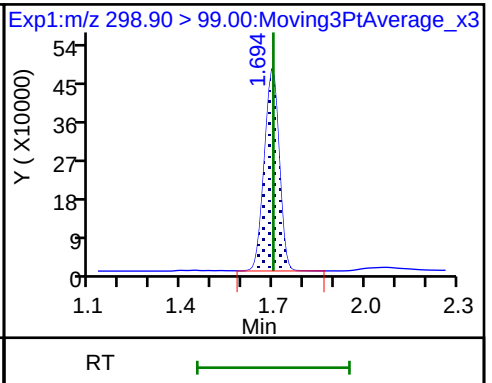
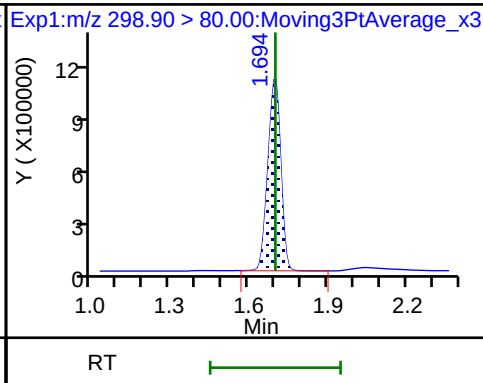
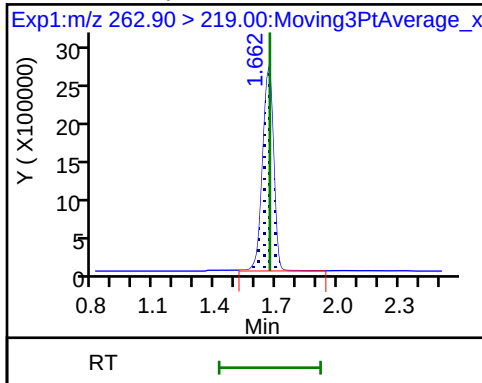
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

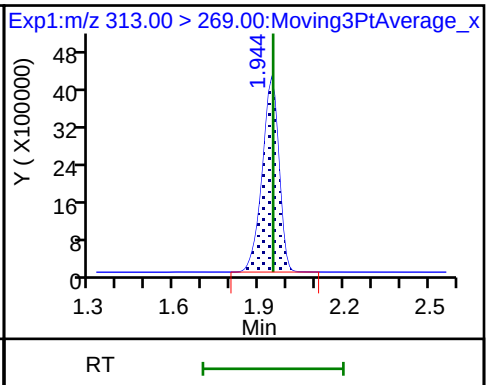
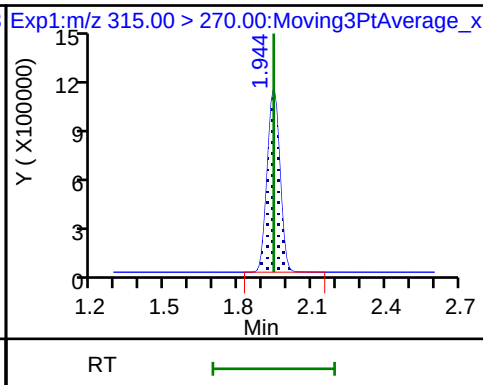
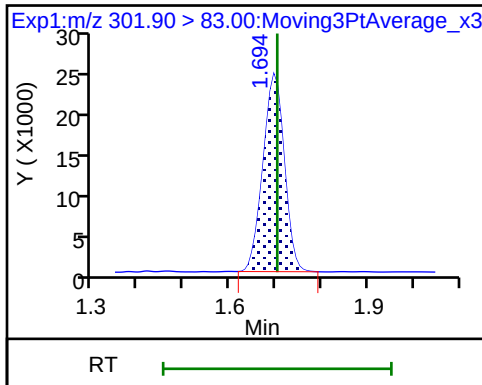
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

D 7 13C2 PFHxA

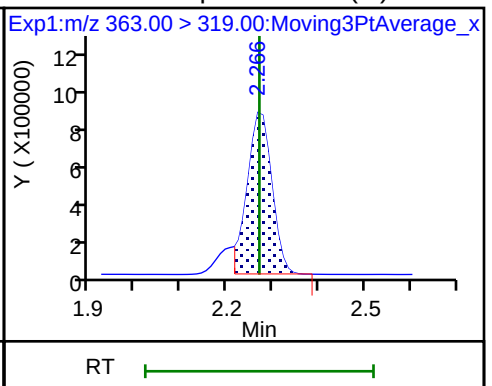
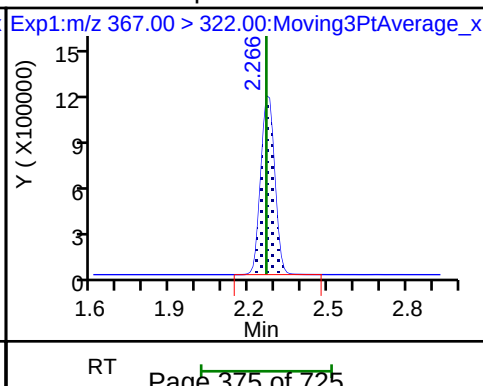
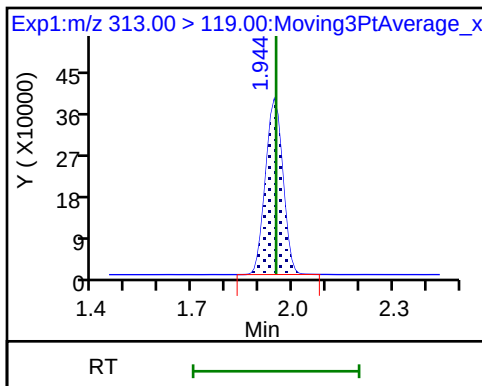
6 Perfluorohexanoic acid

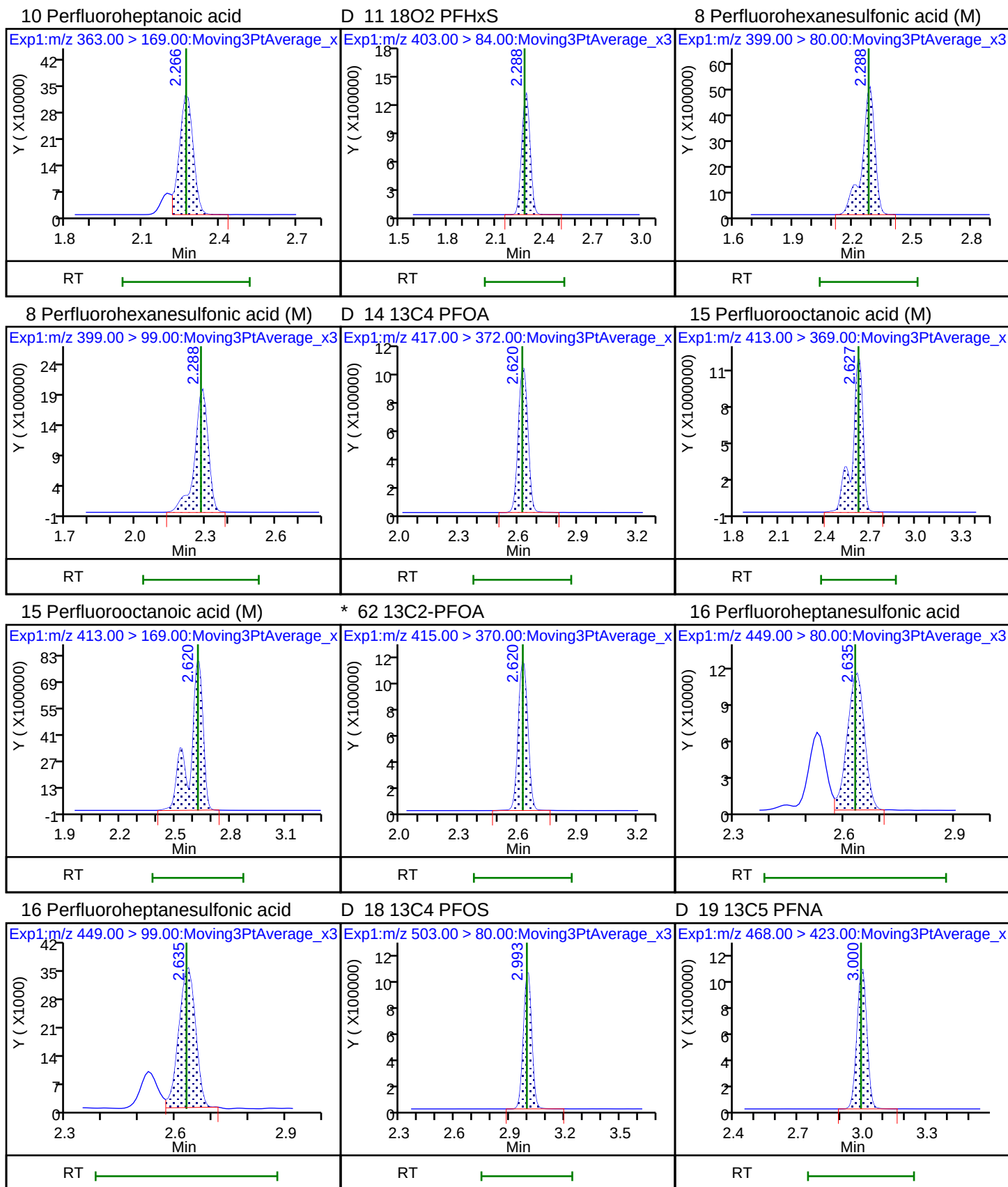


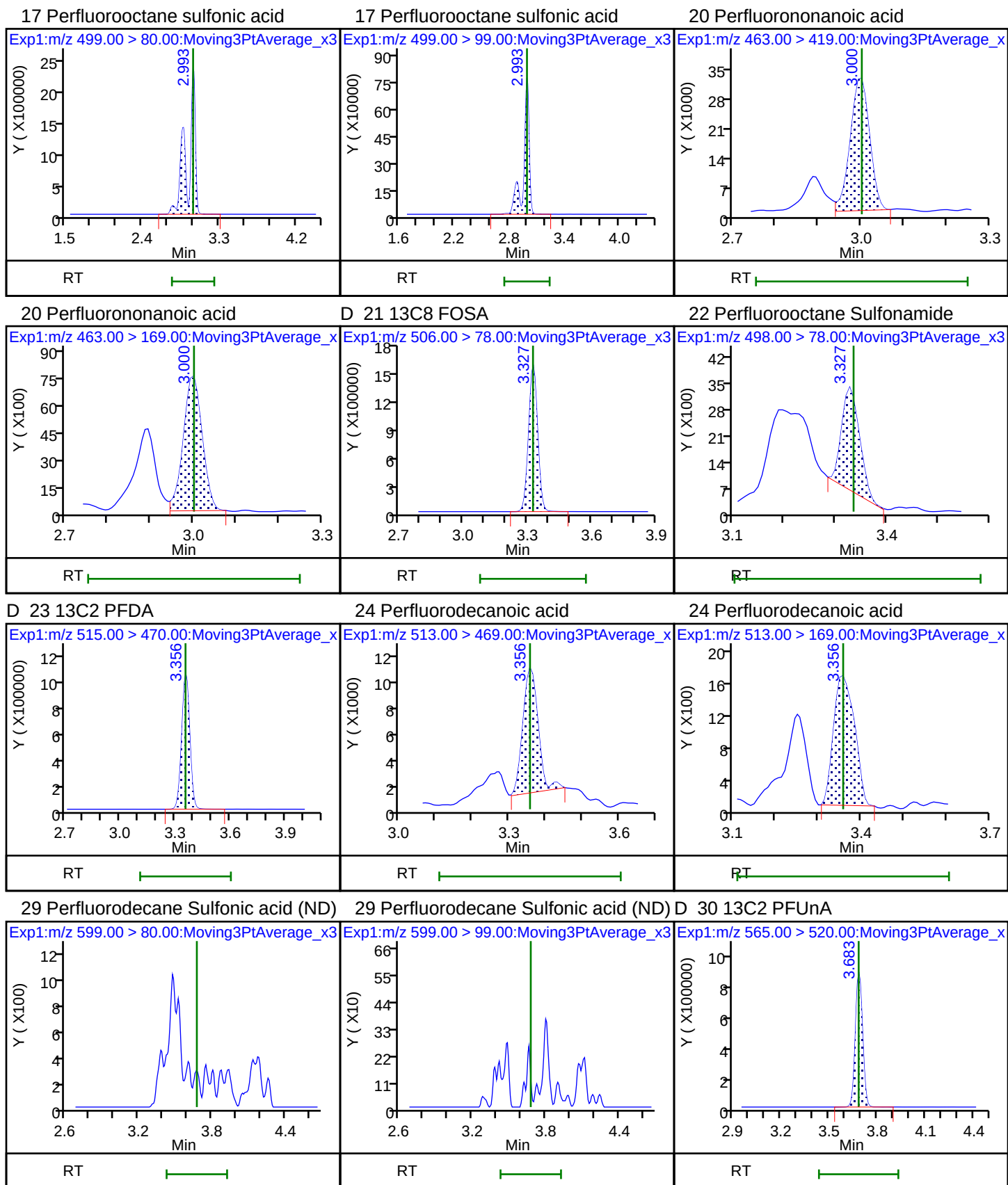
6 Perfluorohexanoic acid

D 9 13C4-PFHpA

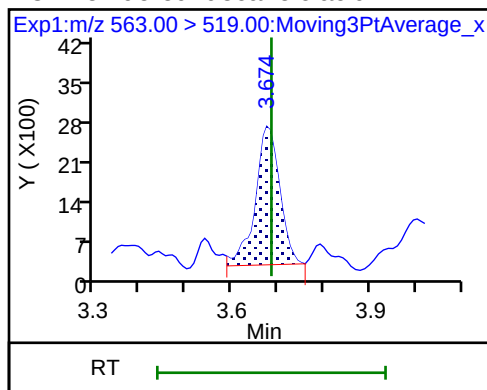
10 Perfluoroheptanoic acid (M)



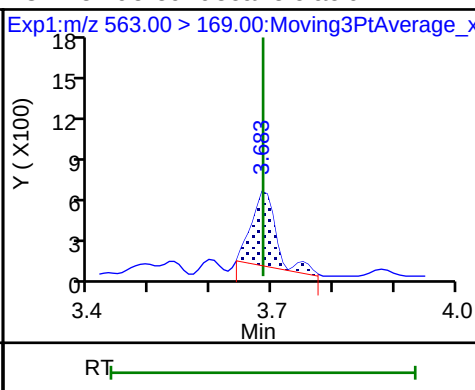




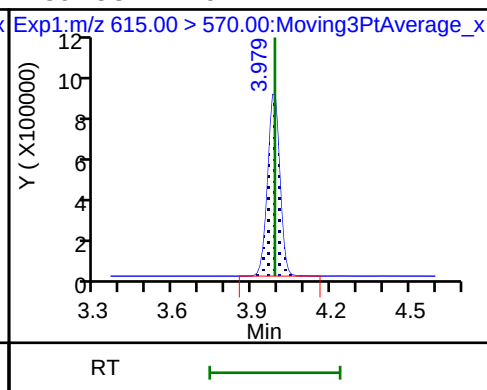
31 Perfluoroundecanoic acid



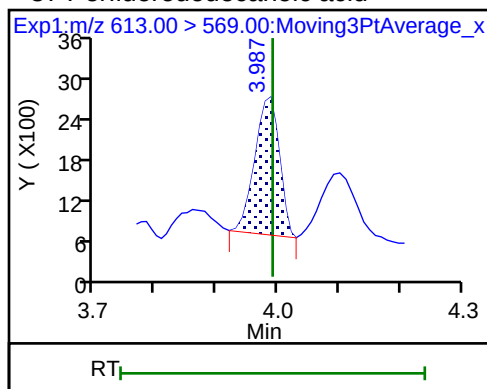
31 Perfluoroundecanoic acid



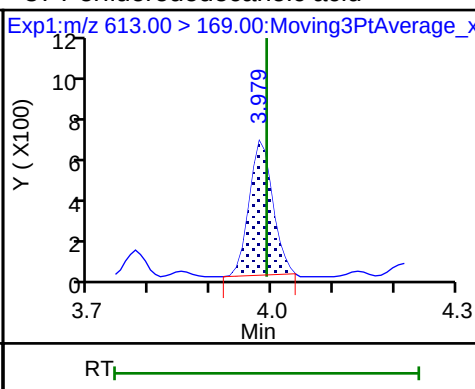
D 36 13C2 PFDaA



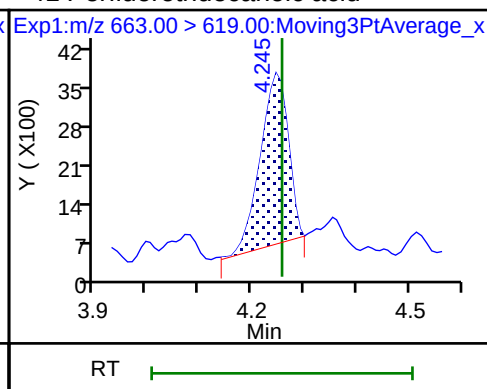
37 Perfluorododecanoic acid



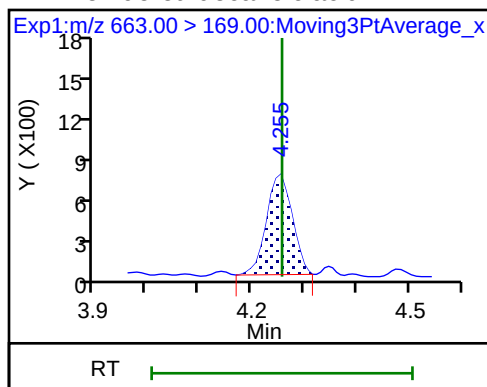
37 Perfluorododecanoic acid



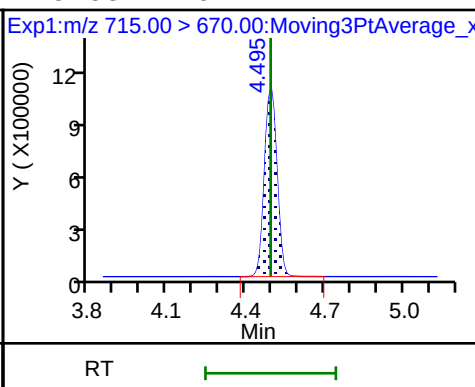
41 Perfluorotridecanoic acid



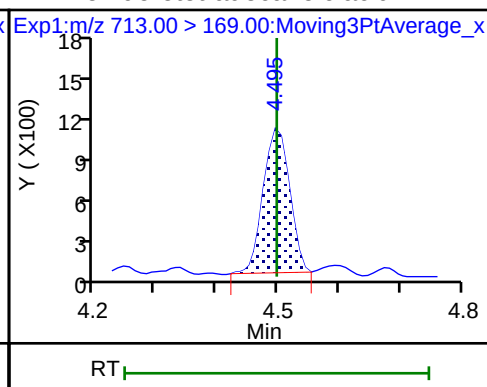
41 Perfluorotridecanoic acid



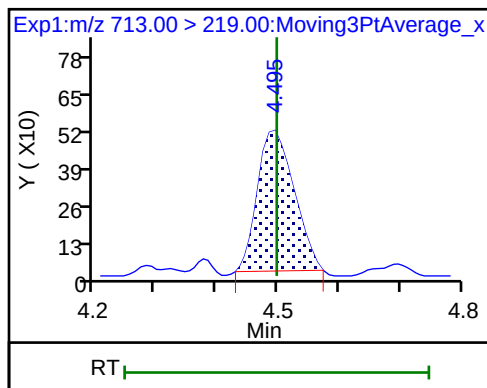
D 43 13C2-PFTeDA



42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid



TestAmerica Sacramento

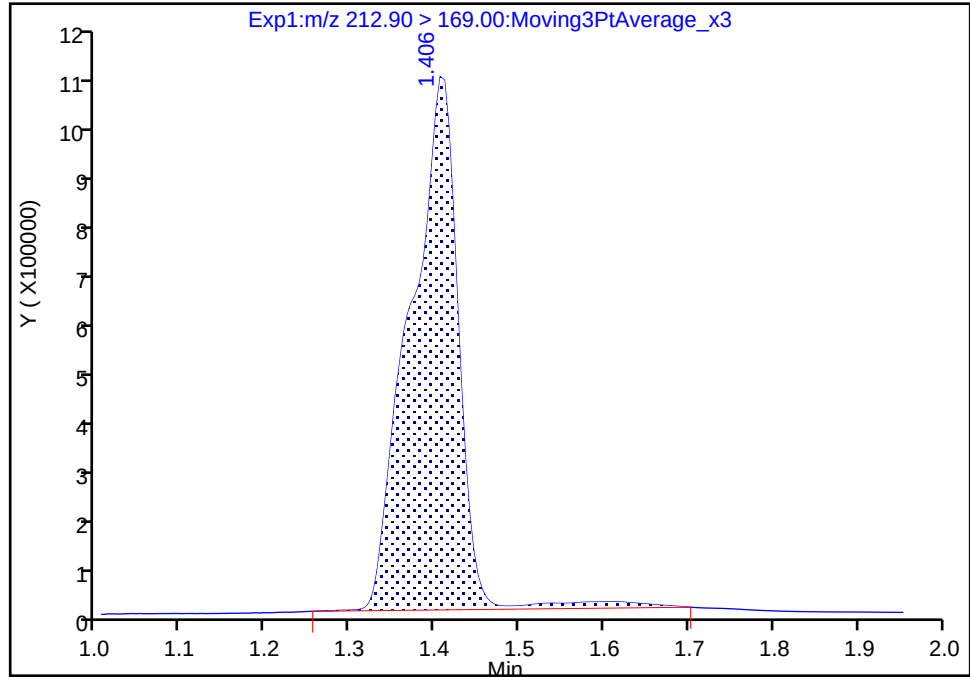
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_010.d				
Injection Date:	10-Aug-2018 08:47:25	Instrument ID:	A8_N		
Lims ID:	320-41704-C-1-A	Lab Sample ID:	320-41704-1		
Client ID:	TP-PFC-032-TPI				
Operator ID:	\\SACINSTLCMS01@tai.com	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

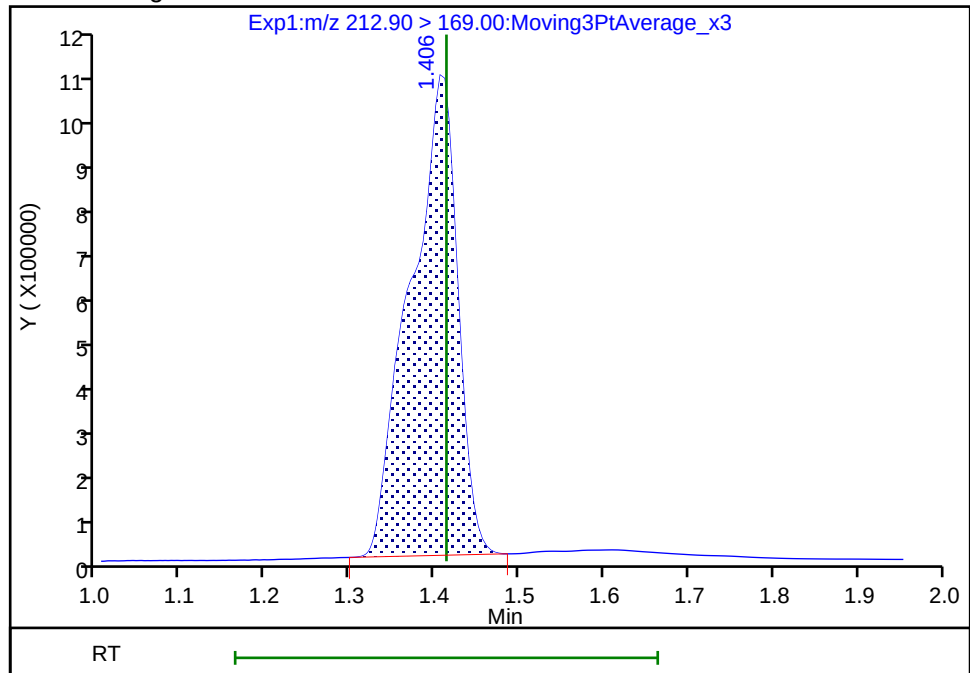
RT: 1.41
Area: 4261067
Amount: 2.057100
Amount Units: ng/ml

Processing Integration Results



RT: 1.41
Area: 4103511
Amount: 1.981037
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:00:40
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 379 of 725

TestAmerica Sacramento

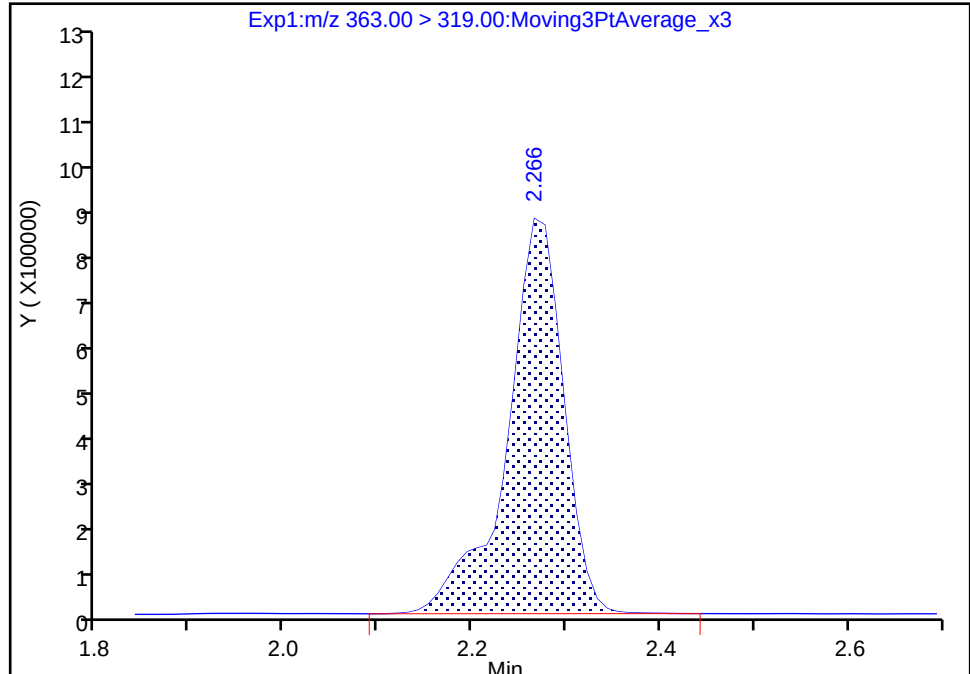
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_010.d				
Injection Date:	10-Aug-2018 08:47:25	Instrument ID:	A8_N		
Lims ID:	320-41704-C-1-A	Lab Sample ID:	320-41704-1		
Client ID:	TP-PFC-032-TPI				
Operator ID:	\\SACINSTLCMS01@tai.com	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

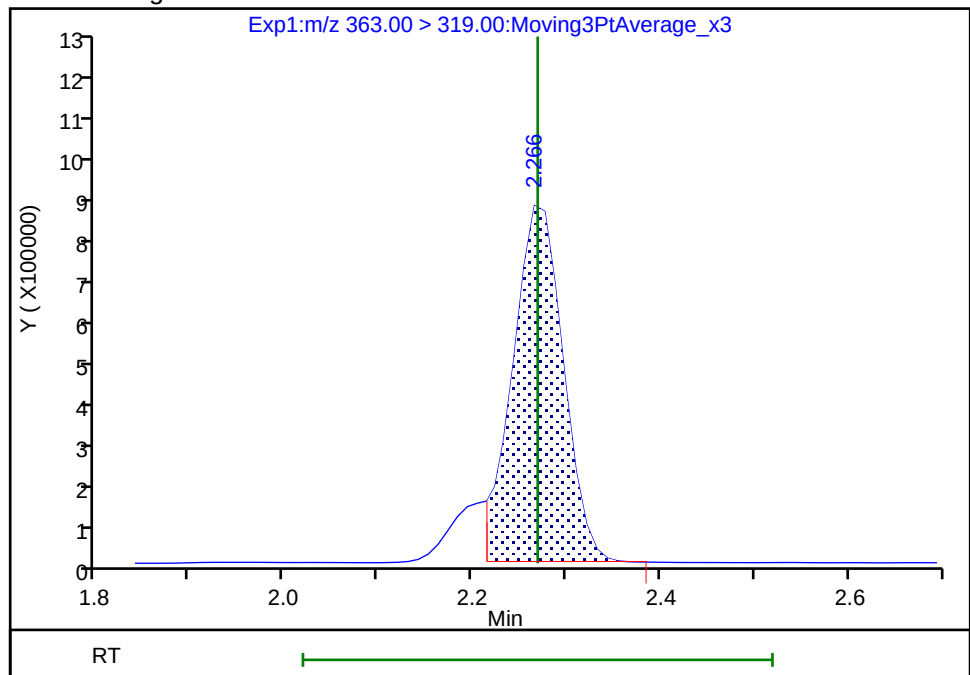
RT: 2.27
Area: 3590070
Amount: 2.033831
Amount Units: ng/ml

Processing Integration Results



RT: 2.27
Area: 3180190
Amount: 1.801628
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:00:59
Audit Action: Manually Integrated

Audit Reason: Split Peak
Page 380 of 725

TestAmerica Sacramento

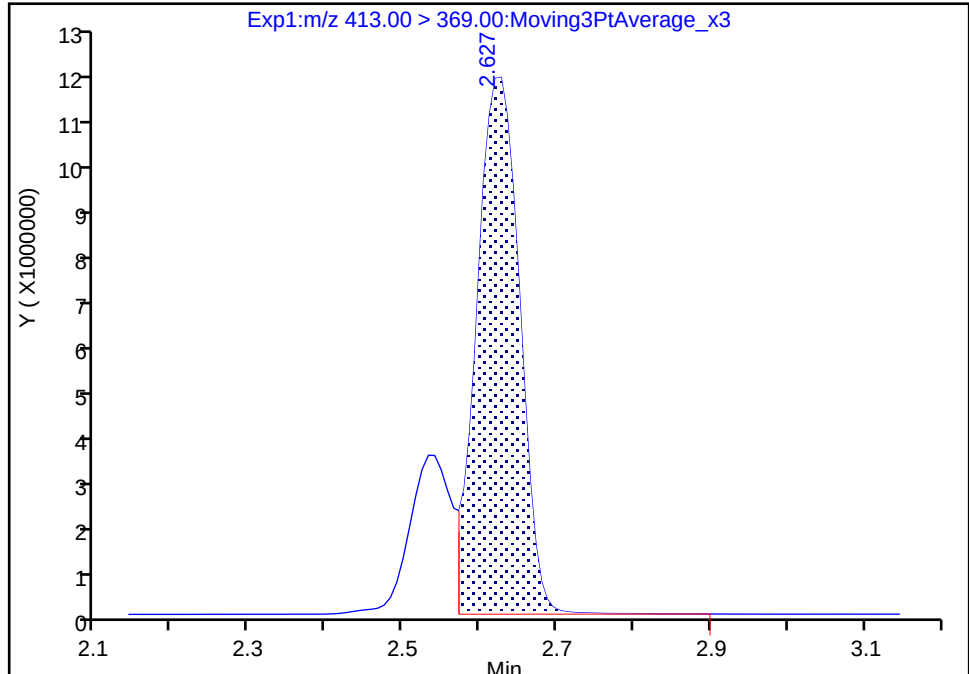
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_010.d				
Injection Date:	10-Aug-2018 08:47:25	Instrument ID:	A8_N		
Lims ID:	320-41704-C-1-A	Lab Sample ID:	320-41704-1		
Client ID:	TP-PFC-032-TPI				
Operator ID:	\\SACINSTLCMS01@tai.com	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector:	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

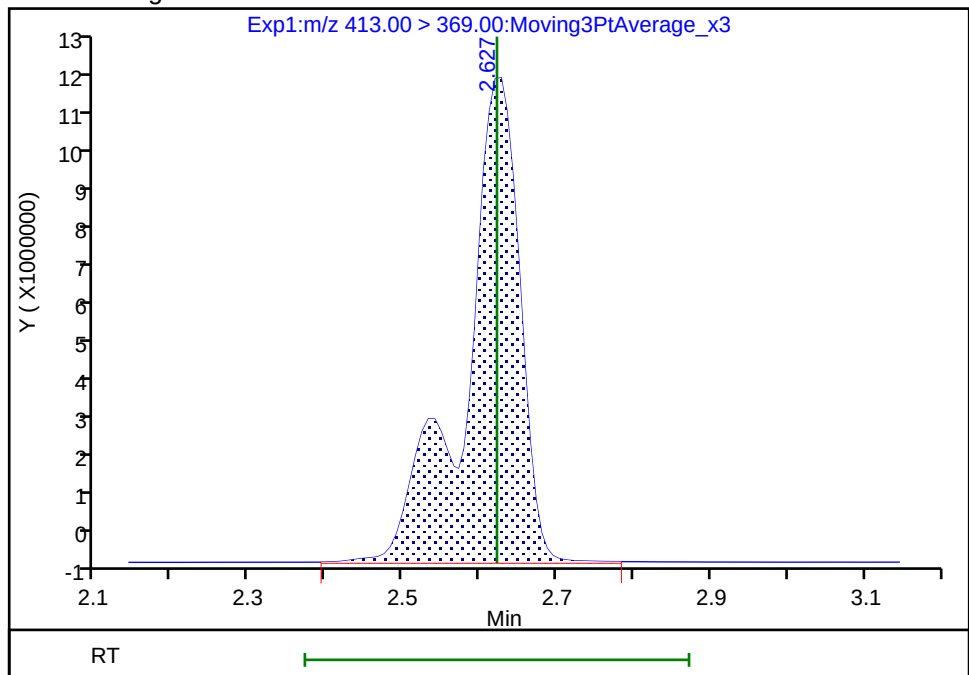
RT: 2.63
Area: 45366569
Amount: 29.994948
Amount Units: ng/ml

Processing Integration Results



RT: 2.63
Area: 59130627
Amount: 39.095310
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:01:48
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 381 of 725

TestAmerica Sacramento

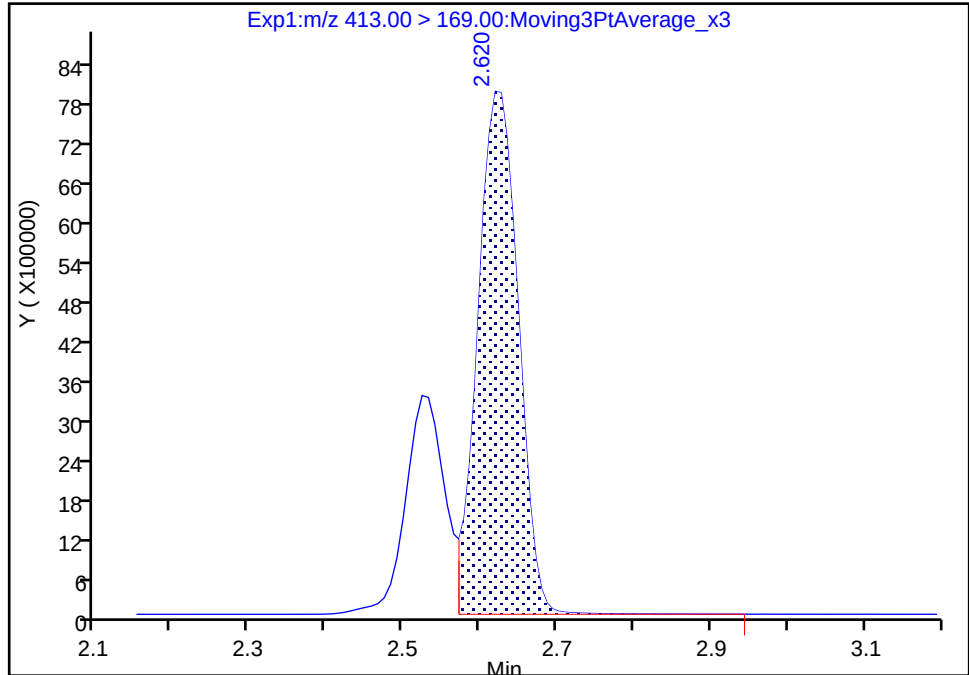
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_010.d				
Injection Date:	10-Aug-2018 08:47:25	Instrument ID:	A8_N		
Lims ID:	320-41704-C-1-A	Lab Sample ID:	320-41704-1		
Client ID:	TP-PFC-032-TPI				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector:	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

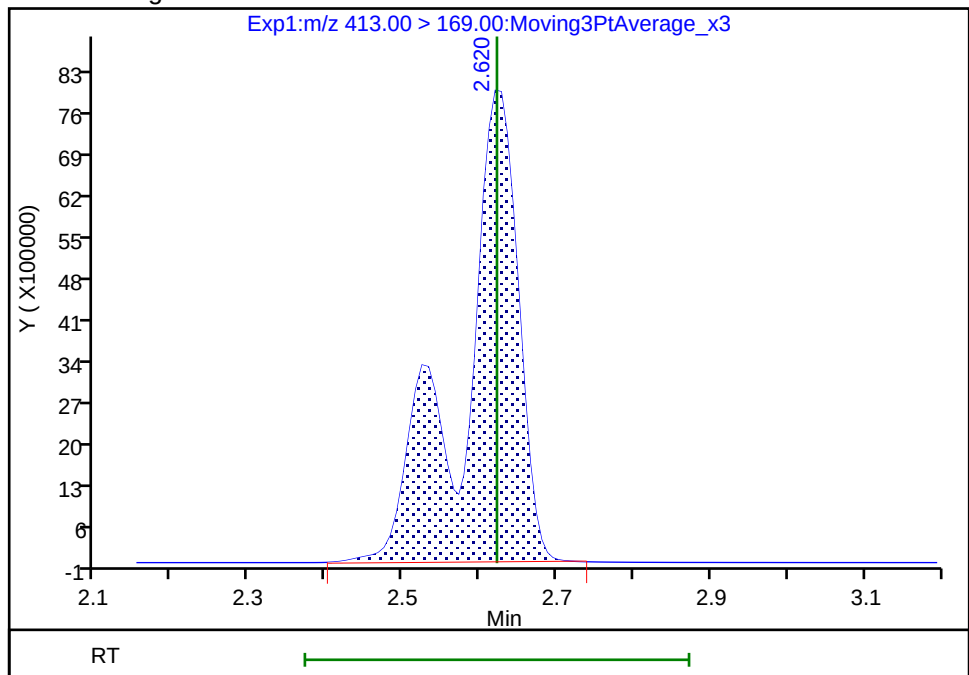
RT: 2.62
Area: 28967673
Amount: 29.994948
Amount Units: ng/ml

Processing Integration Results



RT: 2.62
Area: 40538652
Amount: 39.095310
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:01:54

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

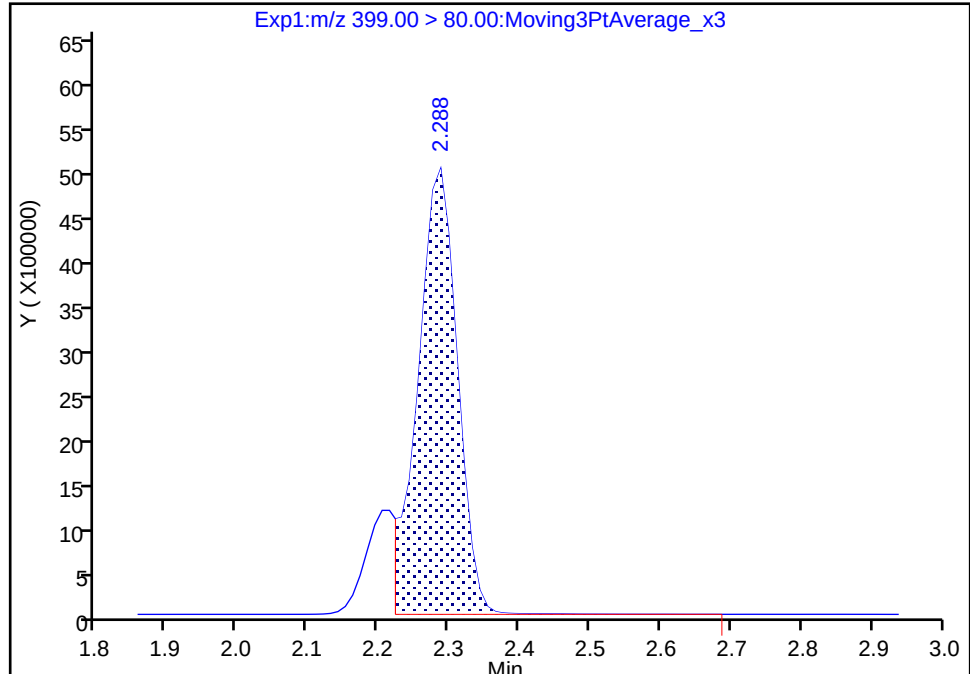
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_010.d
Injection Date: 10-Aug-2018 08:47:25 Instrument ID: A8_N
Lims ID: 320-41704-C-1-A Lab Sample ID: 320-41704-1
Client ID: TP-PFC-032-TPI
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

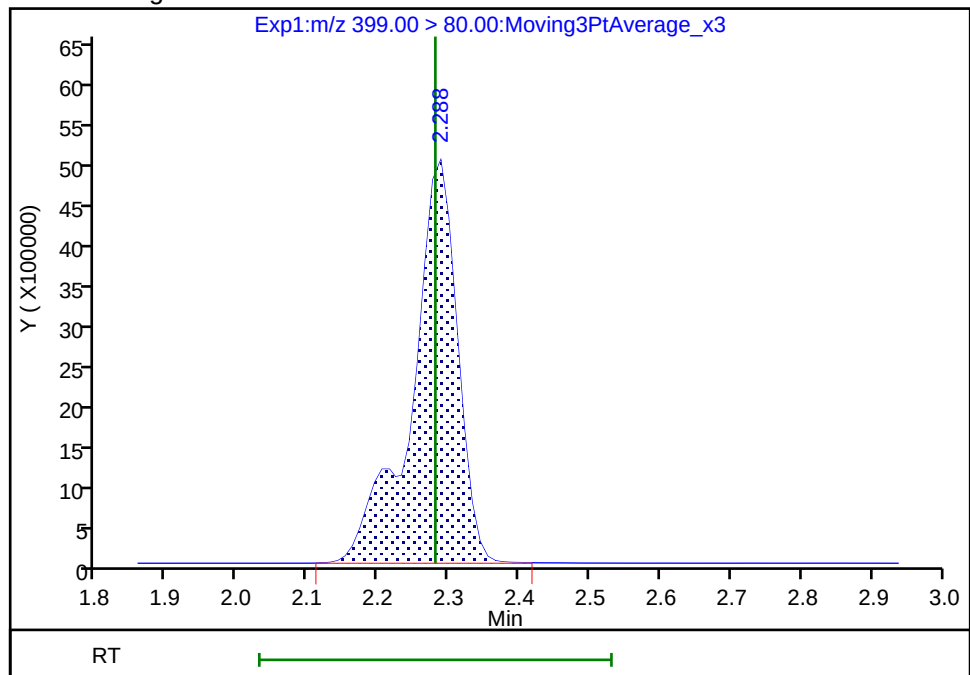
RT: 2.29
Area: 19505635
Amount: 9.241709
Amount Units: ng/ml

Processing Integration Results



RT: 2.29
Area: 22752382
Amount: 10.780008
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:01:29
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 383 of 725

TestAmerica Sacramento

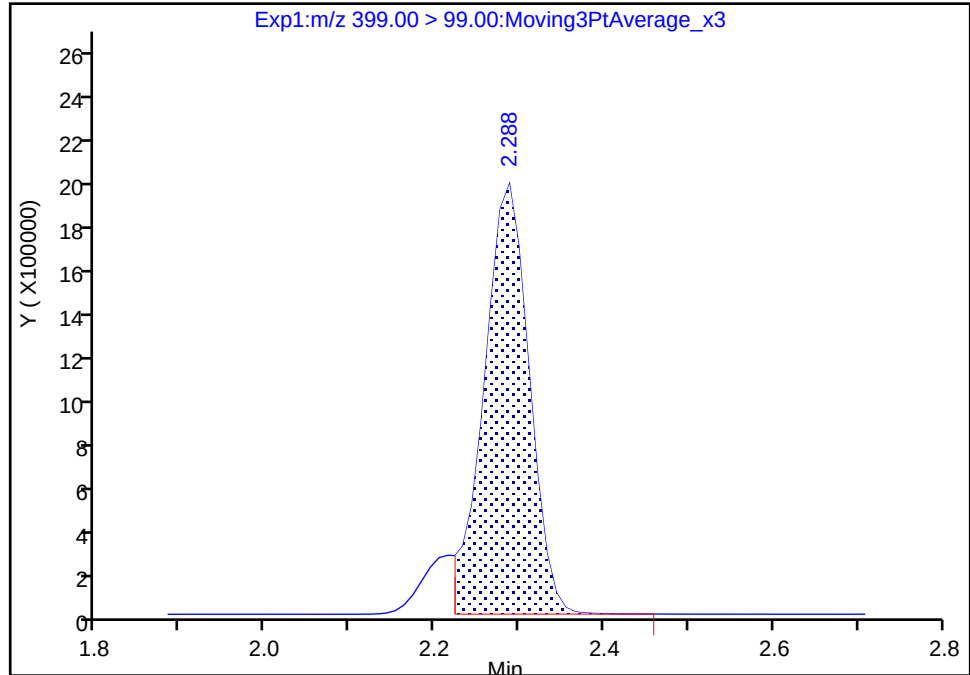
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_010.d				
Injection Date:	10-Aug-2018 08:47:25	Instrument ID:	A8_N		
Lims ID:	320-41704-C-1-A	Lab Sample ID:	320-41704-1		
Client ID:	TP-PFC-032-TPI				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

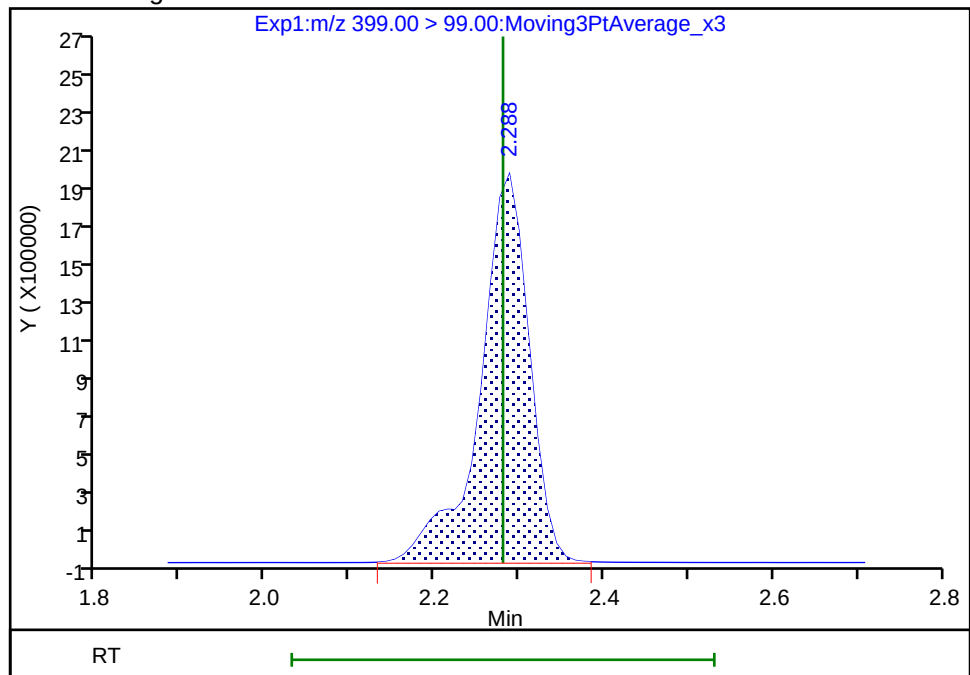
RT: 2.29
Area: 7235736
Amount: 9.241709
Amount Units: ng/ml

Processing Integration Results



RT: 2.29
Area: 7991536
Amount: 10.780008
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:01:37

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPI DL</u>	Lab Sample ID: <u>320-41704-1 DL</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLAAAX_080.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.9 (mL)</u>	Date Analyzed: <u>08/10/2018 20:12</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>20</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239343</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	69	D M	34	26	10
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	D	34	17	7.4
307-24-4	Perfluorohexanoic acid (PFHxA)	330	D	34	17	8.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	67	D M	34	26	11
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D M	34	26	9.3
375-95-1	Perfluorononanoic acid (PFNA)	26	U	34	26	9.0
335-76-2	Perfluorodecanoic acid (PFDA)	17	U	34	17	8.3
2058-94-8	Perfluoroundecanoic acid (PFUnA)	26	U	34	26	12
307-55-1	Perfluorododecanoic acid (PFDoA)	26	U	34	26	9.0
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	52	U	69	52	13
376-06-7	Perfluorotetradecanoic acid (PFTeA)	52	U	69	52	14
375-73-5	Perfluorobutanesulfonic acid (PFBS)	54	D	34	17	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	390	D M	34	17	6.6
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	9.2	J D	34	17	6.4
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	320	D	69	52	19
335-77-3	Perfluorodecanesulfonic acid (PFDS)	26	U	34	26	9.7
754-91-6	Perfluorooctane Sulfonamide (FOSA)	52	U	69	52	22

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPI DL</u>	Lab Sample ID: <u>320-41704-1 DL</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLAAAX_080.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.9(mL)</u>	Date Analyzed: <u>08/10/2018 20:12</u>
Con. Extract Vol.: <u>10.00(mL)</u>	Dilution Factor: <u>20</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239343</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	85		50-150
STL01893	13C5 PFPeA	83		50-150
STL00993	13C2 PFHxA	85		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	83		50-150
STL00996	13C2 PFDA	82		50-150
STL00997	13C2 PFUnA	89		50-150
STL00998	13C2 PFDoA	82		50-150
STL00994	18O2 PFHxS	78		50-150
STL02116	13C2-PFTeDA	85		50-150
STL00991	13C4 PFOS	80		50-150
STL02337	13C3-PFBS	77		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_080.d
 Lims ID: 320-41704-C-1-A
 Client ID: TP-PFC-032-TPI
 Sample Type: Client
 Inject. Date: 10-Aug-2018 20:12:20 ALS Bottle#: 49 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 20.0000
 Sample Info: 320-41704-c-1-a 20X
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 16-Aug-2018 12:58:06 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: mongkols Date: 16-Aug-2018 12:55:15

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	1.409	1.406	0.003	0.538	283893	0.1062		85.0	665	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.409	1.414	-0.005	1.000	214774	0.1007			22.4	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.660	1.655	0.005	0.634	190372	0.1034		82.7	676	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.660	1.660	0.0	1.000	500085	0.2886			36.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.684	1.696	-0.012	0.644	3786	0.0889		76.5	25.7	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.692	1.700	-0.008	1.005	193786	0.0783			17.0	
298.90 > 99.00	1.692	1.700	-0.008	1.005	85937		2.25(1.25-3.74)		18.2	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.934	0.005	0.741	222970	0.1068		85.4	942	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.939	0.0	1.000	883472	0.4853			299	
313.00 > 119.00	1.939	1.939	0.0	1.000	76516		11.55(5.03-15.10)		223	
D 9 13C4-PFHpA										
367.00 > 322.00	2.269	2.256	0.013	0.867	207908	0.1011		80.9	1216	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.269	2.269	0.0	1.000	171357	0.0970			34.5	M
363.00 > 169.00	2.269	2.269	0.0	1.000	61716		2.78(1.13-3.40)		63.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.278	0.002	0.872	243808	0.0925		78.2	1336	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.280	2.280	0.0	1.000	1250498	0.5595			1578	M
399.00 > 99.00	2.280	2.280	0.0	1.000	381295		3.28(1.50-4.49)		583	

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	2.613	0.011	1.003	204696	0.1085		86.8	1188	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.624	2.622	0.002	1.000	4788673	2.59			346	M
413.00 > 169.00	2.624	2.622	0.002	1.000	2875159		1.67(0.84-2.52)		3176	M
* 62 13C2-PFOA										
415.00 > 370.00	2.616	2.622	-0.006		241238	0.1250			1200	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.624	2.630	-0.006	0.878	22780	0.0133			26.2	
449.00 > 99.00	2.624	2.630	-0.006	0.878	5678		4.01(1.94-5.82)		16.2	
D 19 13C5 PFNA										
468.00 > 423.00	2.990	2.993	-0.003	1.143	176111	0.1041		83.2	1095	
D 18 13C4 PFOS										
503.00 > 80.00	2.990	2.993	-0.003	1.143	164794	0.0952		79.6	263	
20 Perfluorononanoic acid										
463.00 > 419.00	2.990	2.994	-0.004	1.000	7028	0.004736			2.0	
463.00 > 169.00	2.997	2.994	0.003	1.003	1702		4.13(1.90-5.69)		7.6	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.990	2.994	-0.004	1.000	687265	0.4641			660	
499.00 > 99.00	2.990	2.994	-0.004	1.000	159955		4.30(2.31-6.93)		671	
D 21 13C8 FOSA										
506.00 > 78.00	3.324	3.327	-0.003	1.271	225998	0.0985		78.8	881	
D 23 13C2 PFDA										
515.00 > 470.00	3.346	3.357	-0.011	1.279	152404	0.1026		82.1	764	
D 30 13C2 PFUnA										
565.00 > 520.00	3.681	3.684	-0.003	1.407	132414	0.1109		88.7	824	
D 36 13C2 PFDaA										
615.00 > 570.00	3.978	3.981	-0.003	1.520	130058	0.1030		82.4	431	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.484	4.491	-0.007	1.714	169946	0.1056		84.5	627	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_080.d

Injection Date: 10-Aug-2018 20:12:20

Instrument ID: A8_N

Lims ID: 320-41704-C-1-A

Lab Sample ID:

Client ID: TP-PFC-032-TPI

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 49

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 20.0000

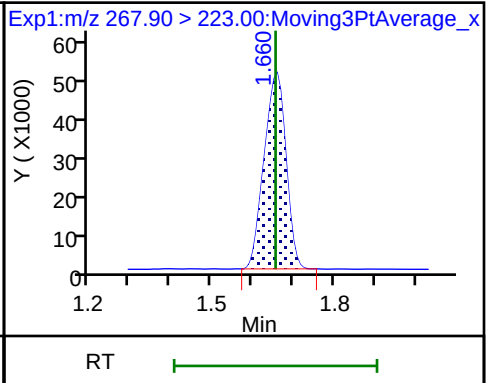
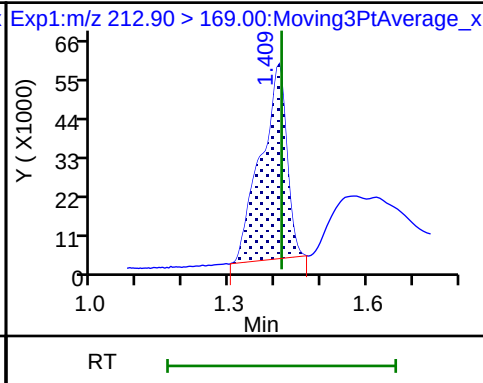
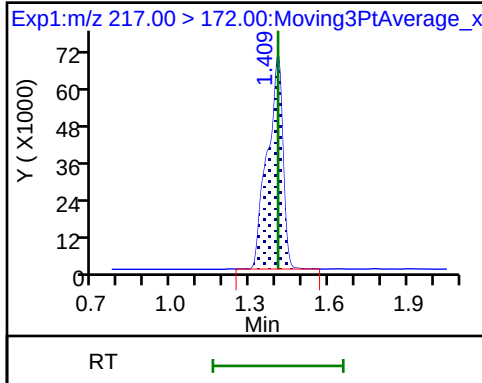
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

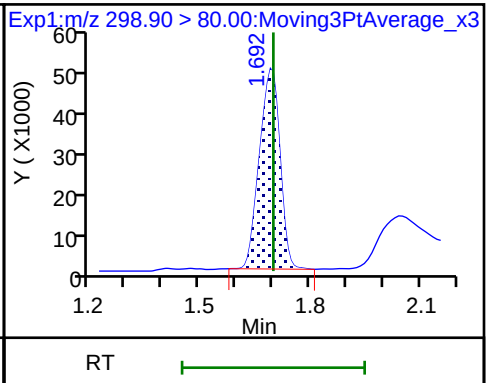
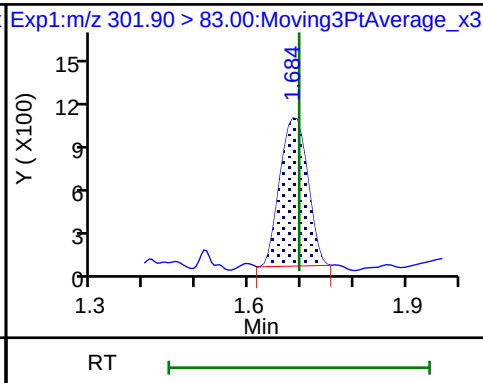
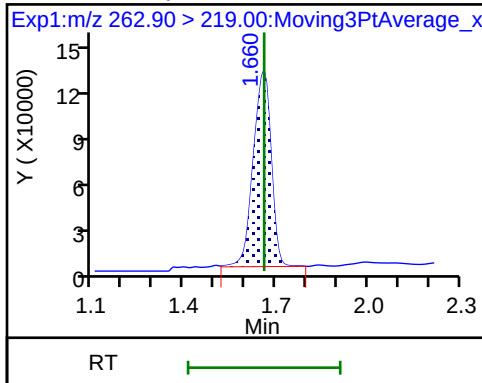
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

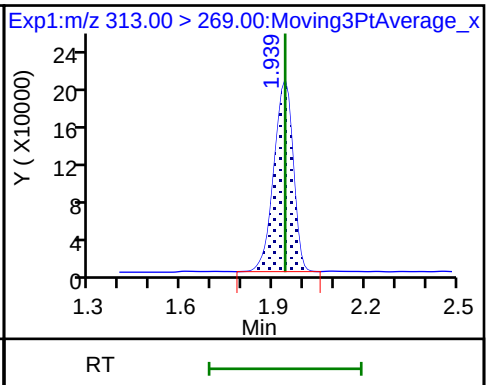
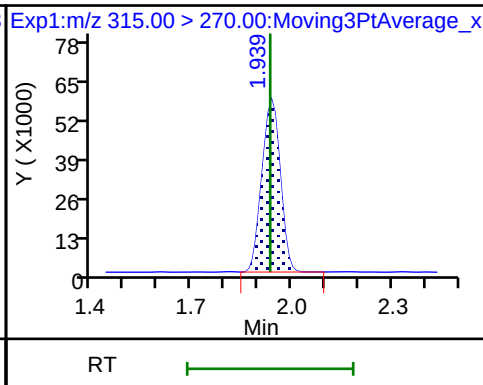
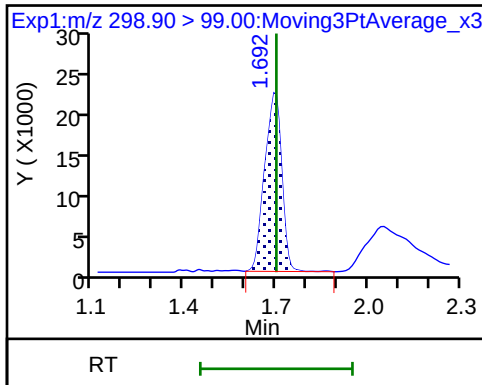
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

D 7 13C2 PFHxA

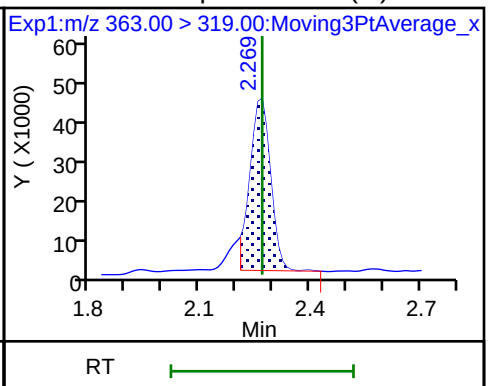
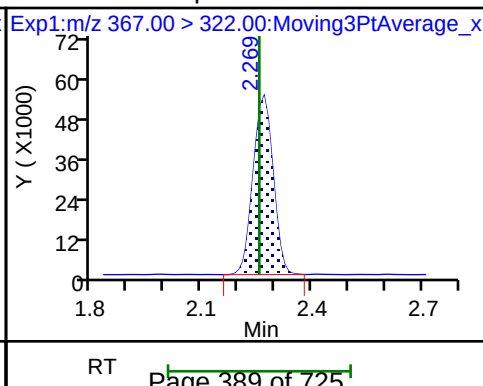
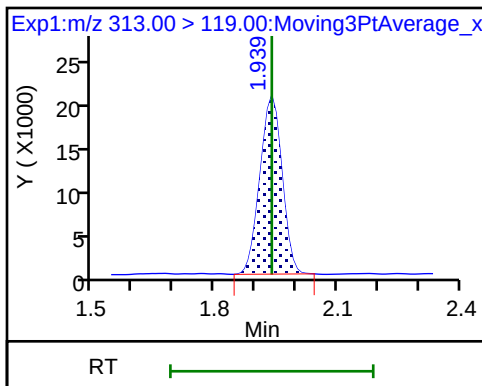
6 Perfluorohexanoic acid

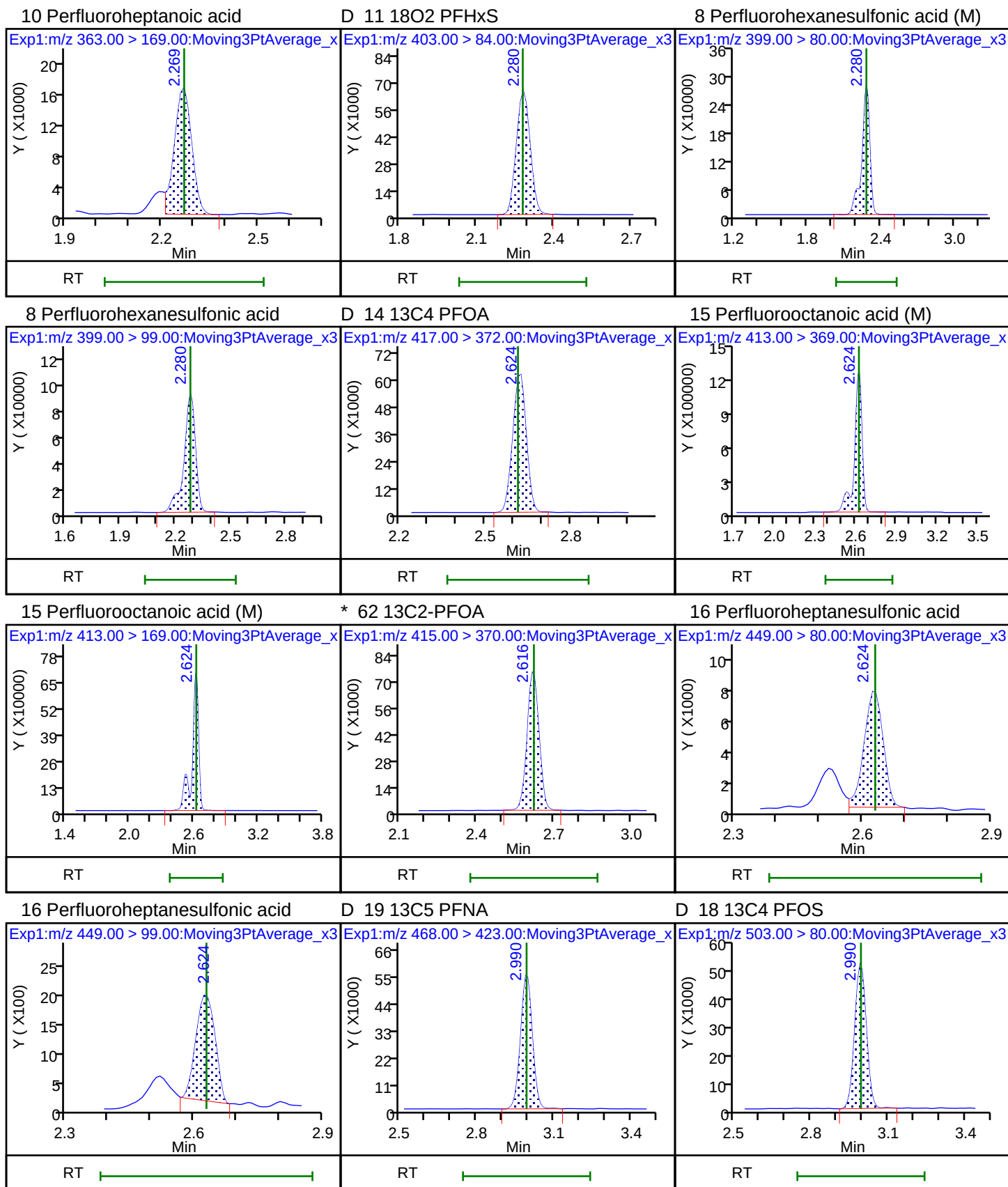


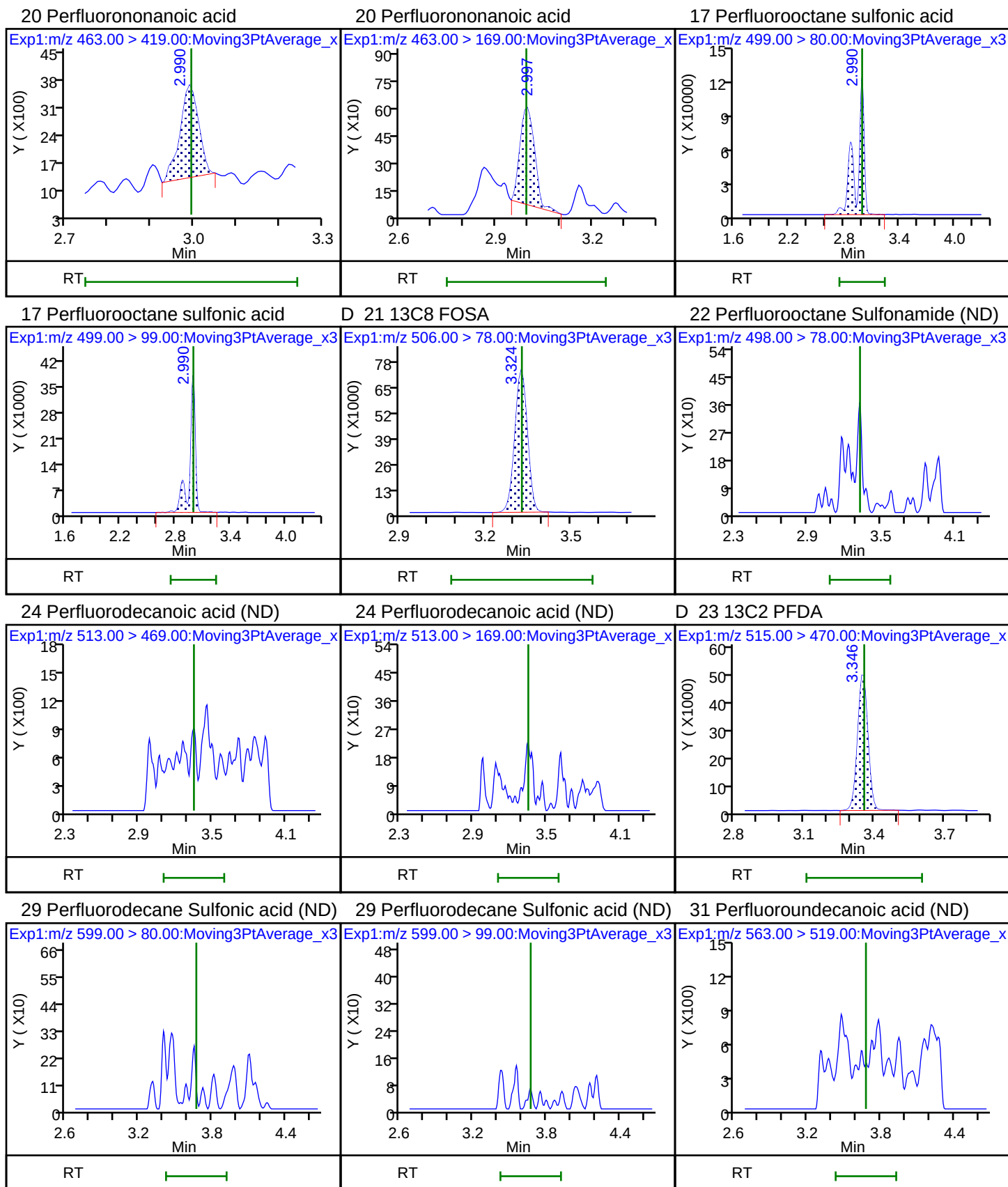
6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid (M)



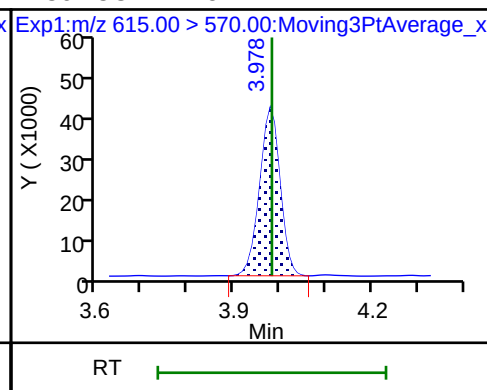
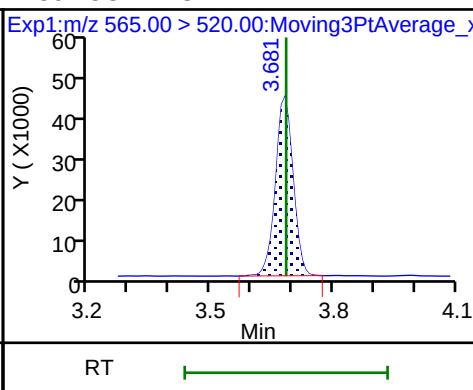
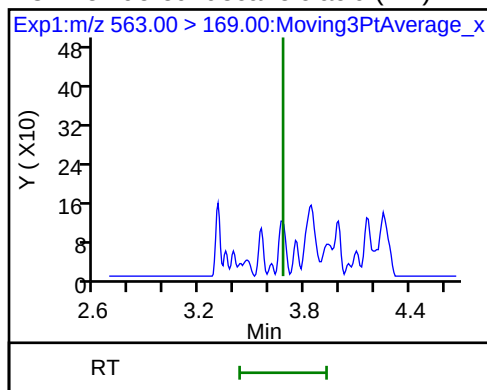




31 Perfluoroundecanoic acid (ND)

D 30 13C2 PFUnA

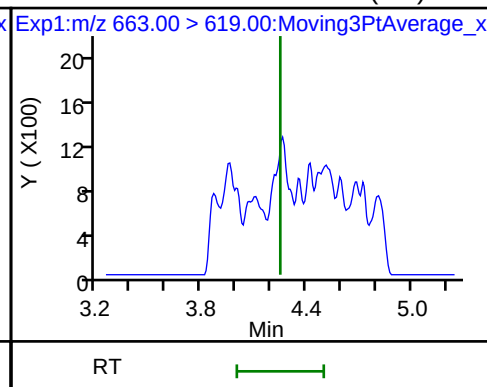
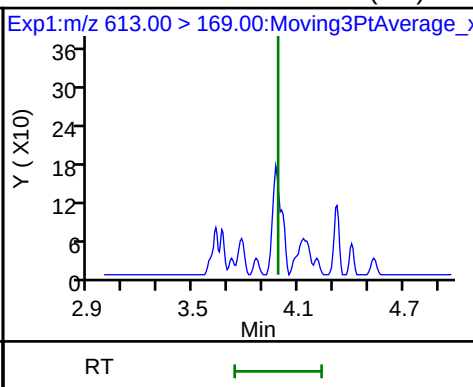
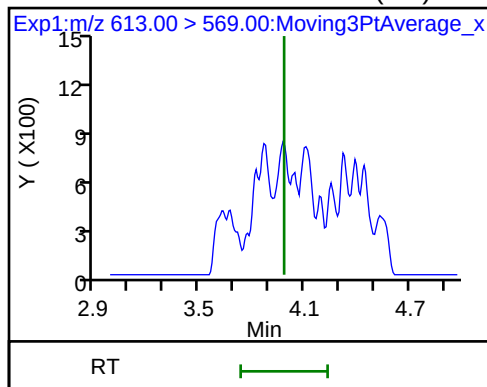
D 36 13C2 PFDaA



37 Perfluorododecanoic acid (ND)

D 37 13C2 PFDoA

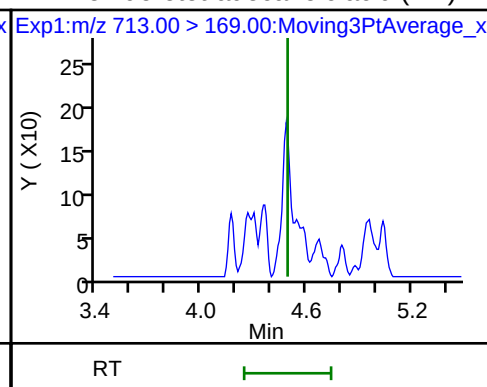
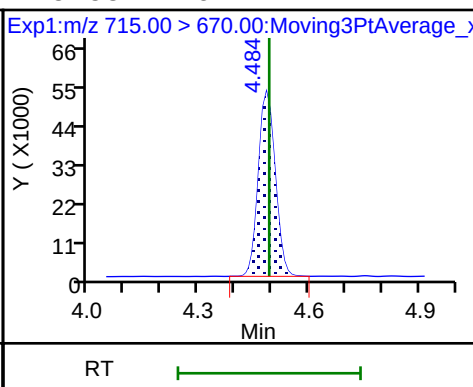
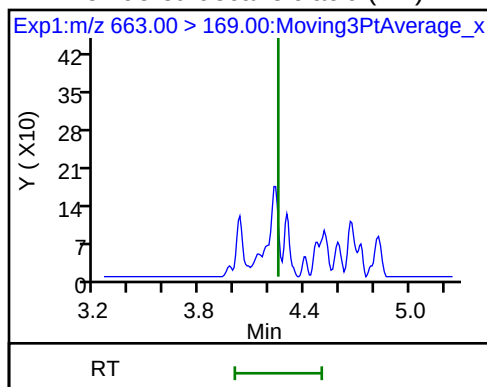
D 41 13C2 PFTrDA



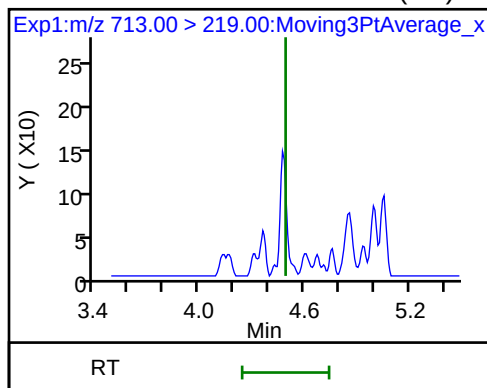
41 Perfluorotridecanoic acid (ND)

D 43 13C2-PFTeDA

D 42 13C2 PFTeDA



42 Perfluorotetradecanoic acid (ND)



TestAmerica Sacramento

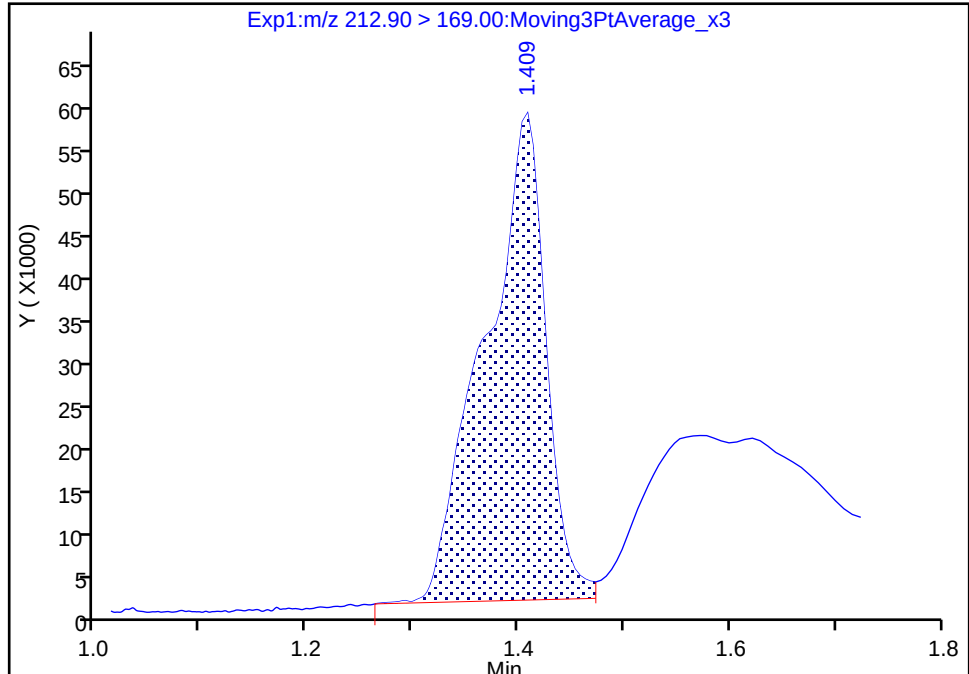
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_080.d
Injection Date: 10-Aug-2018 20:12:20 Instrument ID: A8_N
Lims ID: 320-41704-C-1-A Lab Sample ID:
Client ID: TP-PFC-032-TPI
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 49 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

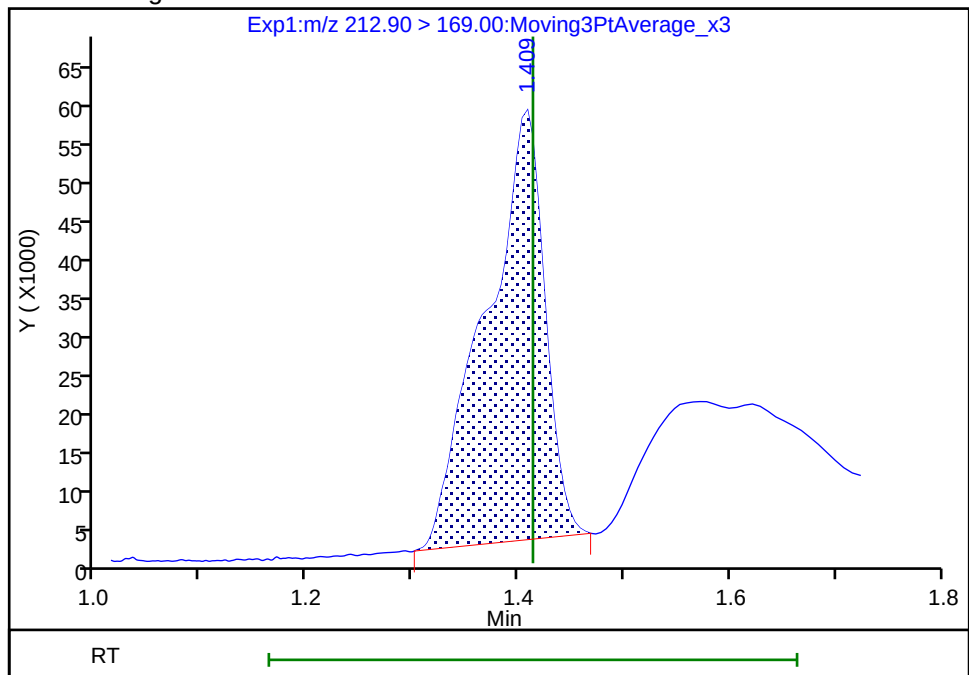
RT: 1.41
Area: 226882
Amount: 0.106402
Amount Units: ng/ml

Processing Integration Results



RT: 1.41
Area: 214774
Amount: 0.100723
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 16-Aug-2018 12:54:27

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

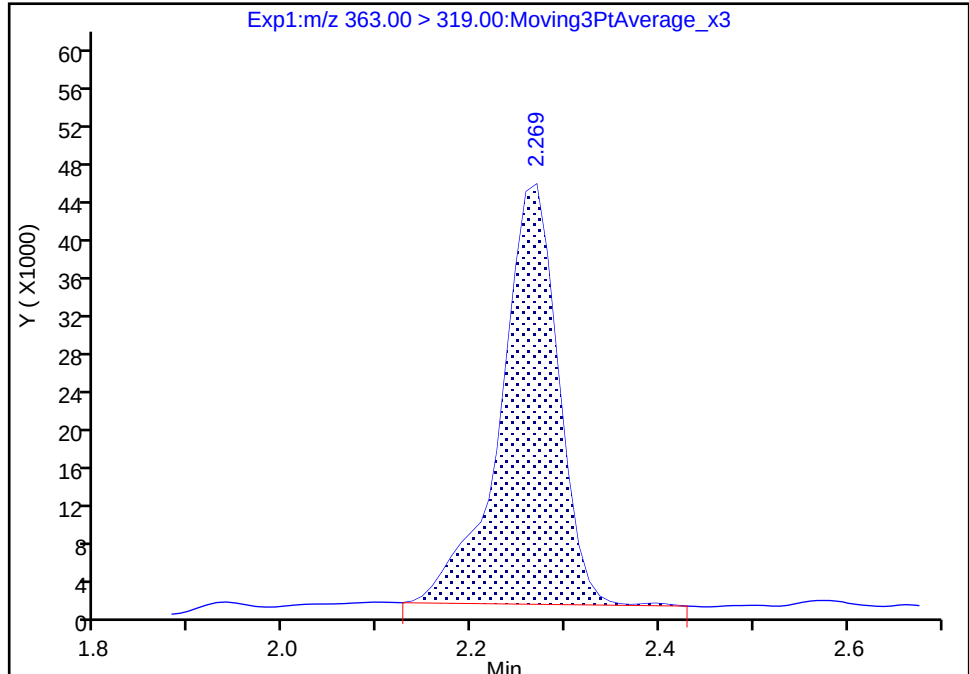
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_080.d
Injection Date: 10-Aug-2018 20:12:20 Instrument ID: A8_N
Lims ID: 320-41704-C-1-A Lab Sample ID:
Client ID: TP-PFC-032-TPI
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 49 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

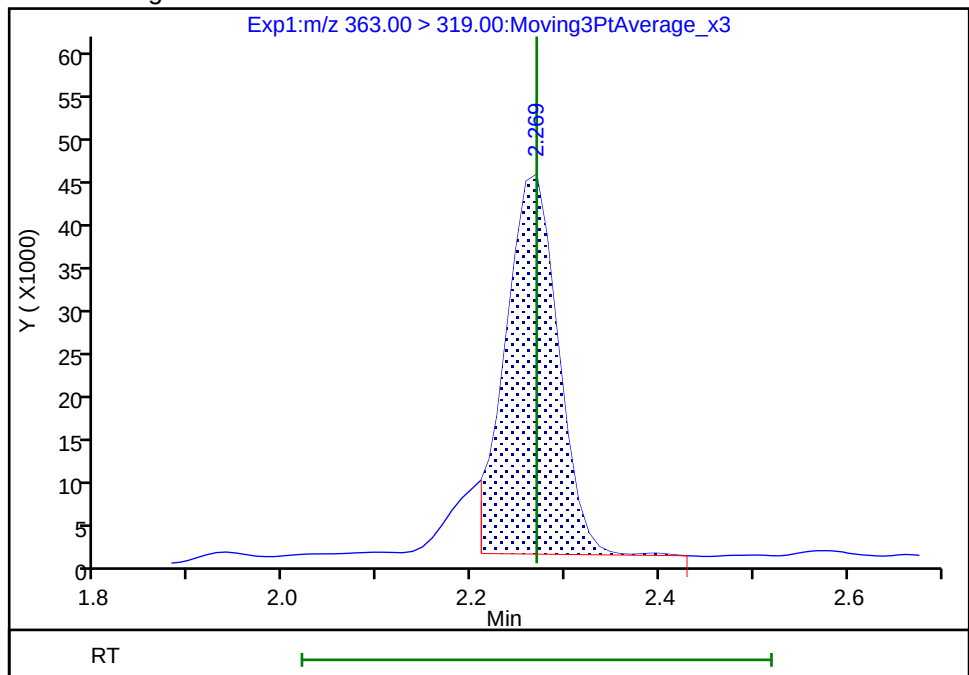
RT: 2.27
Area: 189340
Amount: 0.107205
Amount Units: ng/ml

Processing Integration Results



RT: 2.27
Area: 171357
Amount: 0.097023
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 16-Aug-2018 12:54:38
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 394 of 725

TestAmerica Sacramento

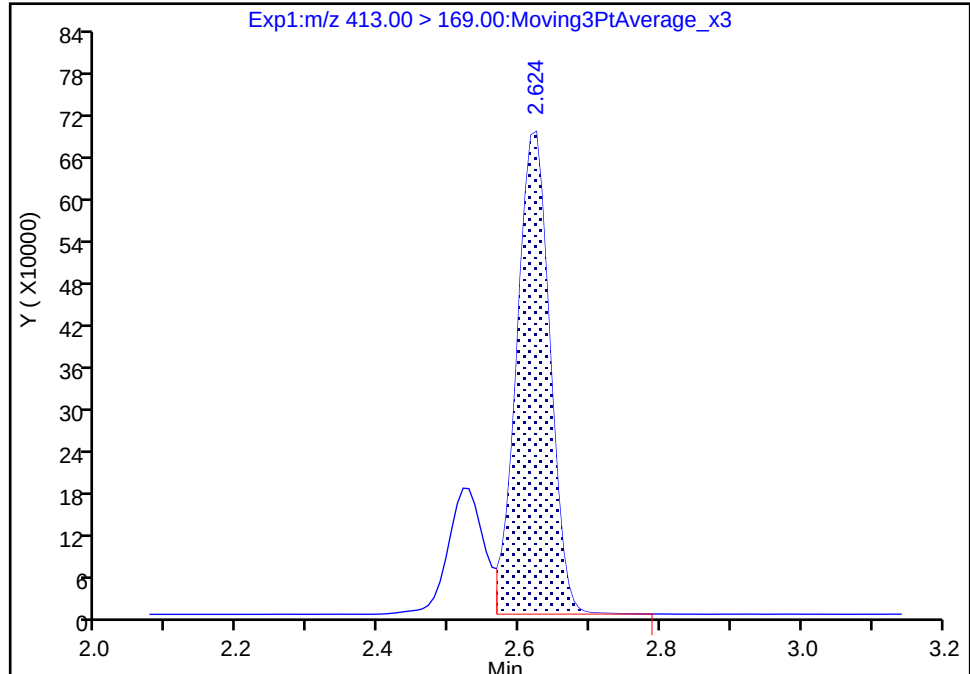
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_080.d
Injection Date: 10-Aug-2018 20:12:20 Instrument ID: A8_N
Lims ID: 320-41704-C-1-A Lab Sample ID:
Client ID: TP-PFC-032-TPI
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 49 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

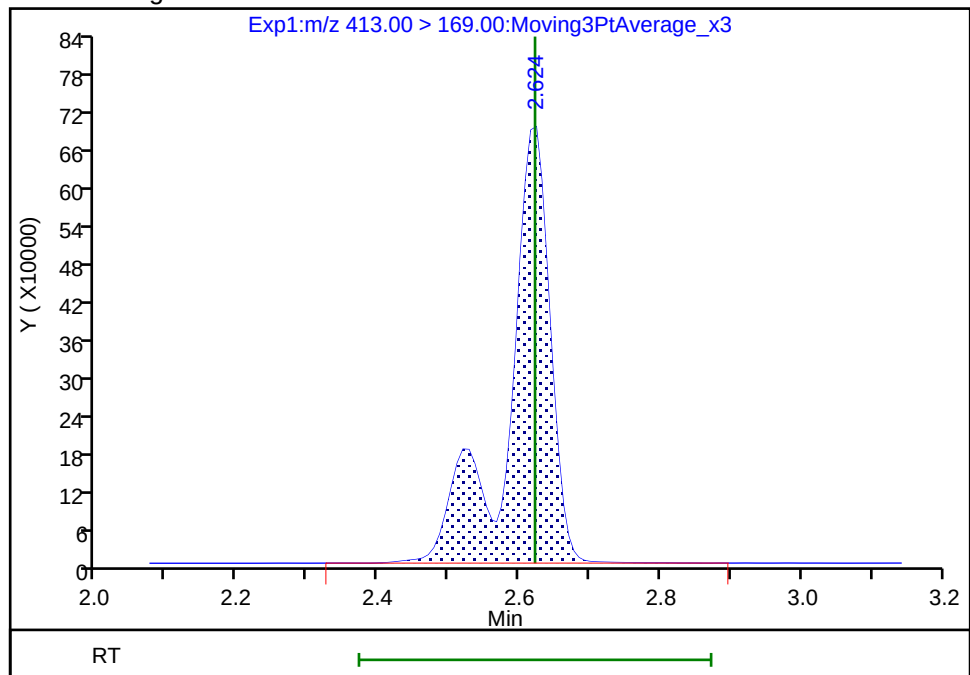
RT: 2.62
Area: 2238785
Amount: 2.252081
Amount Units: ng/ml

Processing Integration Results



RT: 2.62
Area: 2875159
Amount: 2.586289
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

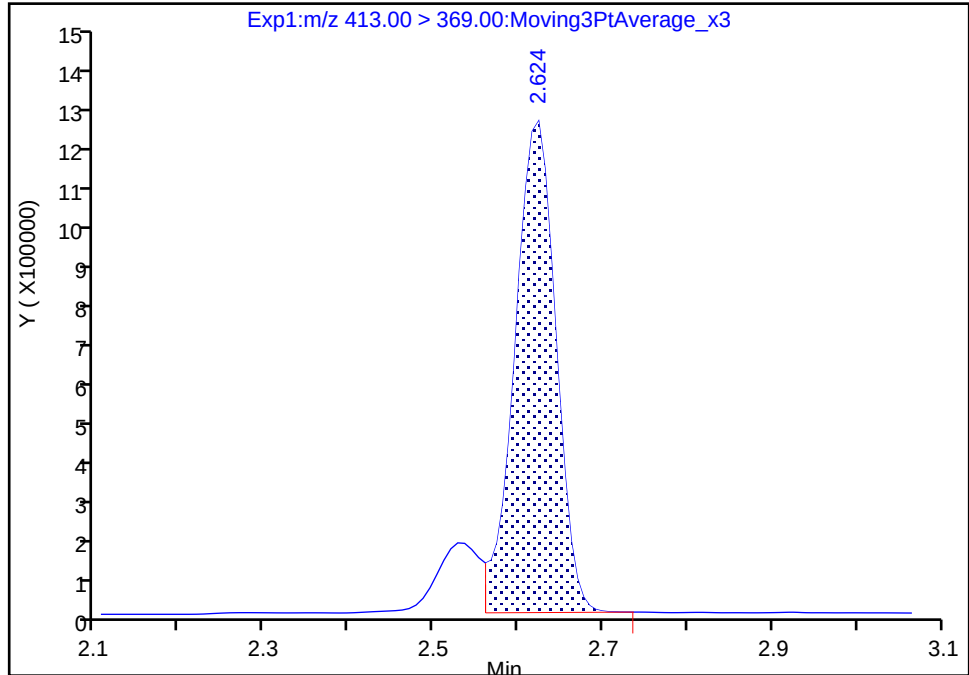
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_080.d		
Injection Date:	10-Aug-2018 20:12:20	Instrument ID:	A8_N
Lims ID:	320-41704-C-1-A	Lab Sample ID:	
Client ID:	TP-PFC-032-TPI		
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	49
Injection Vol:	2.0 ul	Dil. Factor:	20.0000
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL
Column:		Detector:	EXP1
		Worklist Smp#:	2

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

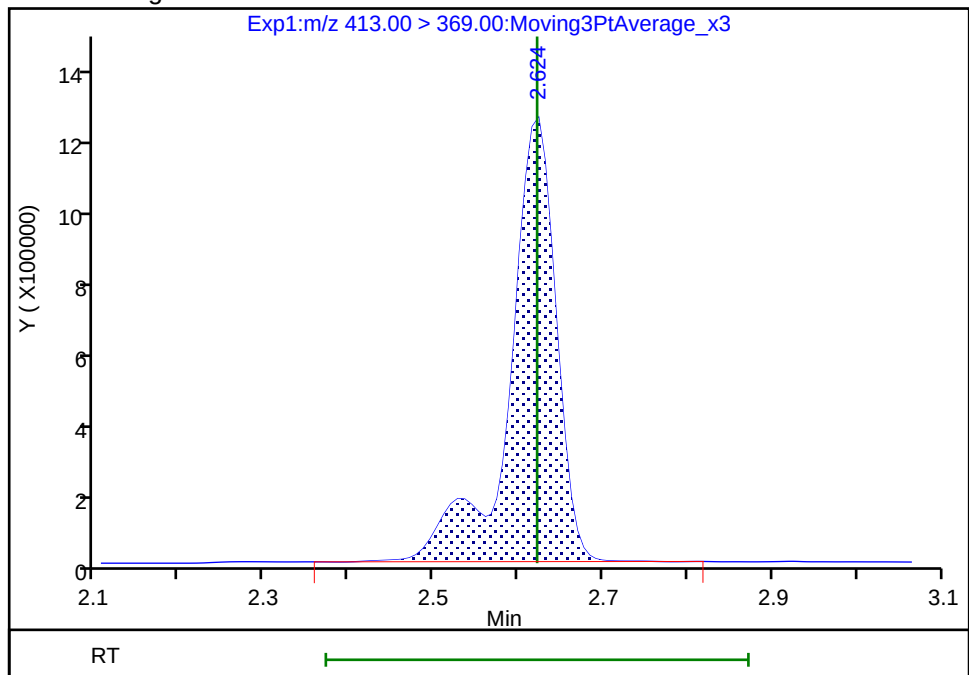
RT: 2.62
Area: 4169866
Amount: 2.252081
Amount Units: ng/ml

Processing Integration Results



RT: 2.62
Area: 4788673
Amount: 2.586289
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 16-Aug-2018 12:55:04

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

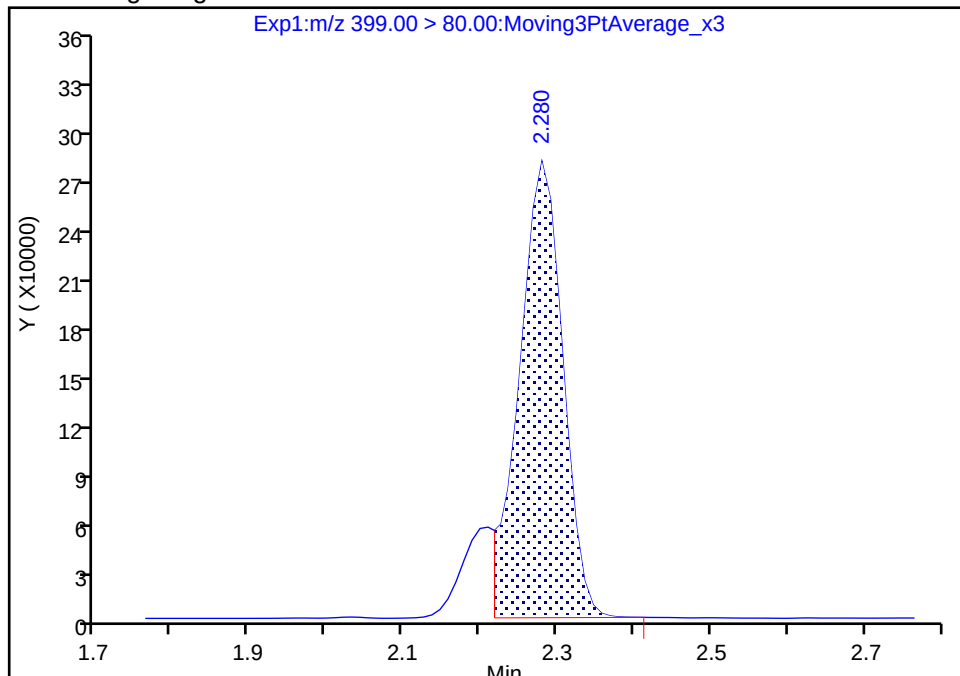
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_080.d
Injection Date: 10-Aug-2018 20:12:20 Instrument ID: A8_N
Lims ID: 320-41704-C-1-A Lab Sample ID:
Client ID: TP-PFC-032-TPI
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 49 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 20.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

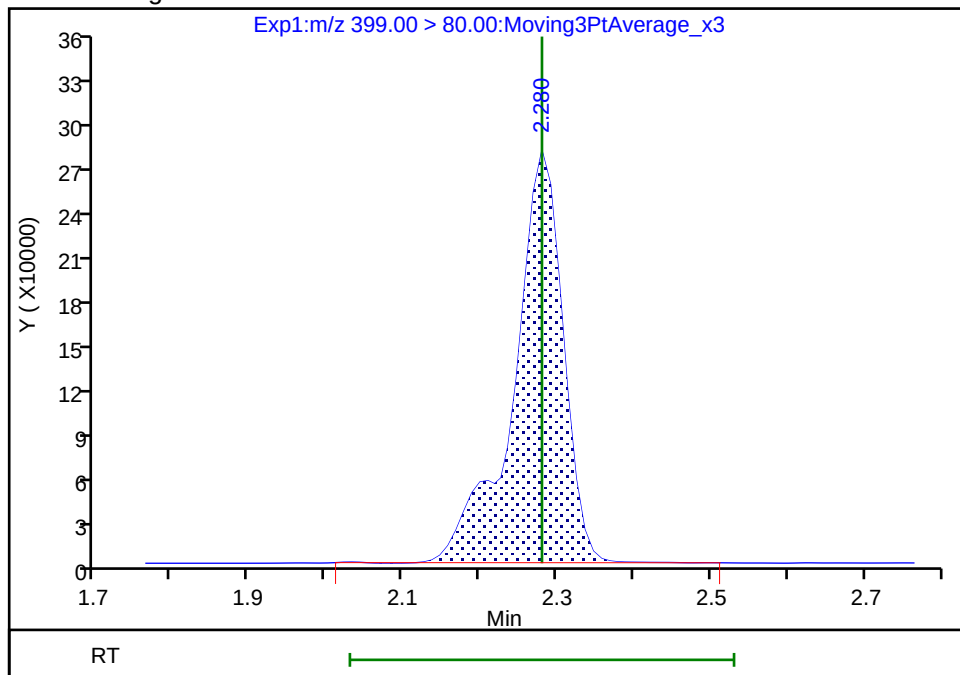
RT: 2.28
Area: 1092814
Amount: 0.488932
Amount Units: ng/ml

Processing Integration Results



RT: 2.28
Area: 1250498
Amount: 0.559480
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 16-Aug-2018 12:54:55

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-MID CARBON</u>	Lab Sample ID: <u>320-41704-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_011.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:10</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.8 (mL)</u>	Date Analyzed: <u>08/10/2018 08:55</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	280		1.7	0.86	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	230		1.7	0.86	0.41
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.6		1.7	1.3	0.53
335-67-1	Perfluorooctanoic acid (PFOA)	38	M	1.7	1.3	0.47
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.86	U	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	2.6	0.66
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	2.6	0.72
375-73-5	Perfluorobutanesulfonic acid (PFBS)	9.3		1.7	0.86	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.7	M	1.7	0.86	0.33
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.86	U	1.7	0.86	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	0.95
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-MID CARBON</u>	Lab Sample ID: <u>320-41704-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_011.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:10</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.8 (mL)</u>	Date Analyzed: <u>08/10/2018 08:55</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	84		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	86		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	87		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	83		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	88		50-150
STL00998	13C2 PFDoA	86		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	86		50-150
STL00991	13C4 PFOS	85		50-150
STL02337	13C3-PFBS	84		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_011.d
 Lims ID: 320-41704-A-2-A
 Client ID: TP-PFC-032-MID CARBON
 Sample Type: Client
 Inject. Date: 10-Aug-2018 08:55:14 ALS Bottle#: 5 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41704-a-2-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 13-Aug-2018 08:26:34 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK048

First Level Reviewer: hannigana

Date: 13-Aug-2018 08:26:34

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	1.406	1.411	-0.005	0.537	6056810	2.36		94.4	10248	
2 Perfluorobutyric acid										
212.90 > 169.00	1.406	1.413	-0.007	1.000	7461083	3.28			686	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.662	-0.008	0.631	3786861	2.14		85.7	8334	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.662	1.668	-0.006	1.005	14017838	8.13			1127	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.700	-0.006	1.000	699039	0.2685			49.3	
298.90 > 99.00	1.694	1.700	-0.006	1.000	314707		2.22(1.25-3.74)		55.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.702	-0.008	0.647	79682	1.95		83.8	512	
D 7 13C2 PFHxA										
315.00 > 270.00	1.944	1.943	0.001	0.742	4291427	2.14		85.6	14438	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.933	1.949	-0.016	0.995	11475611	6.55			3098	R
313.00 > 119.00	1.944	1.949	-0.005	1.000	727865		15.77(5.03-15.10)		1958	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.265	0.001	0.865	4289876	2.17		86.9	12824	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.269	-0.003	1.000	293635	0.1612			21.2	
363.00 > 169.00	2.266	2.269	-0.003	1.000	103330		2.84(1.13-3.40)		30.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.277	2.276	0.001	0.869	4960834	1.96		82.8	9600	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.277	2.280	-0.003	1.000	180825	0.0795			191	M
399.00 > 99.00	2.277	2.280	-0.003	1.000	58462		3.09(1.50-4.49)		55.3	M

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	2.620	2.619	0.001	1.000	4223430	2.33		93.2	8567	
* 62 13C2-PFOA										
415.00 > 370.00	2.620	2.622	-0.002		4635340	2.50			9862	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.620	2.622	-0.002	1.000	2097843	1.10			116	M
413.00 > 169.00	2.524	2.622	-0.098	0.964	1466598		1.43(0.84-2.52)		1164	M
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.142	3374062	2.03		84.9	4243	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.142	3384914	2.08		83.3	11242	
D 21 13C8 FOSA										
506.00 > 78.00	3.327	3.326	0.001	1.270	4637981	2.10		84.2	8361	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.334	3.334	0.0	1.002	1853	0.001026			16.8	
D 23 13C2 PFDA										
515.00 > 470.00	3.356	3.355	0.001	1.281	3054306	2.14		85.6	7178	
D 30 13C2 PFUnA										
565.00 > 520.00	3.683	3.682	0.001	1.406	2524553	2.20		88.0	6295	
D 36 13C2 PFDaA										
615.00 > 570.00	3.978	3.987	-0.009	1.519	2615558	2.16		86.3	4907	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.493	4.493	0.0	1.715	3303775	2.14		85.5	5292	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_011.d

Injection Date: 10-Aug-2018 08:55:14

Instrument ID: A8_N

Lims ID: 320-41704-A-2-A

Lab Sample ID: 320-41704-2

Client ID: TP-PFC-032-MID CARBON

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

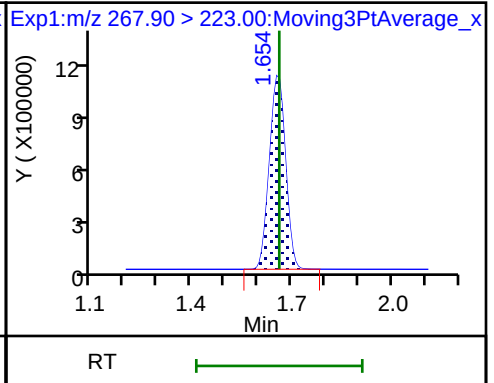
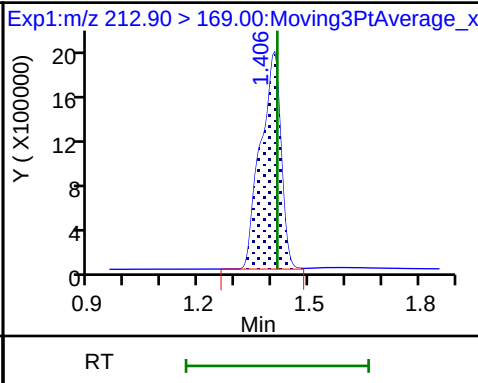
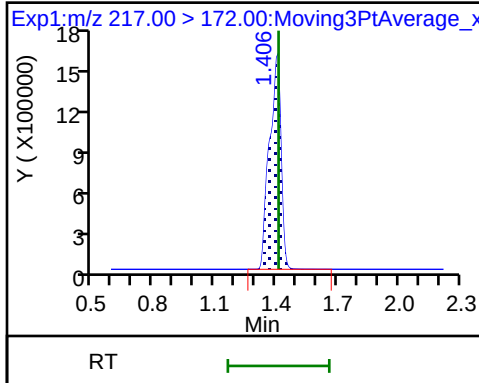
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

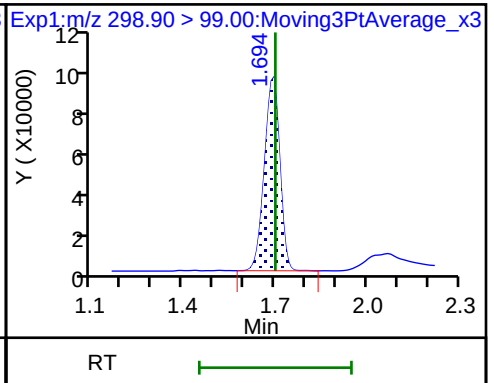
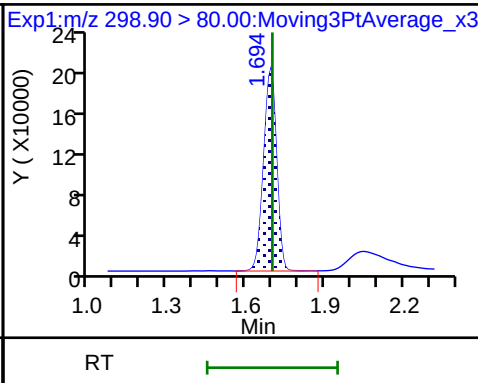
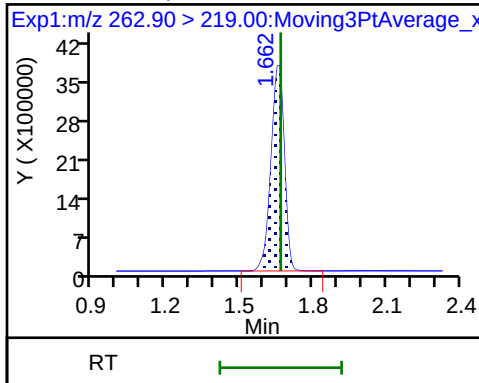
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

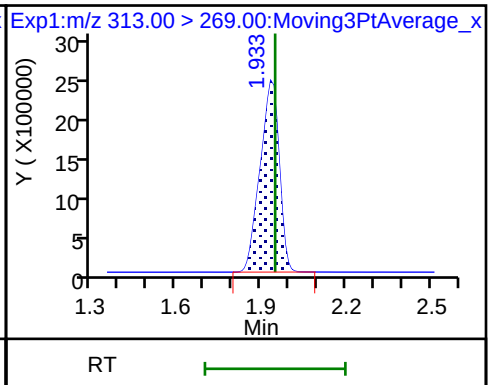
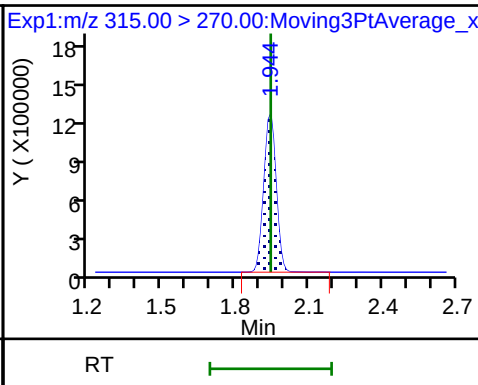
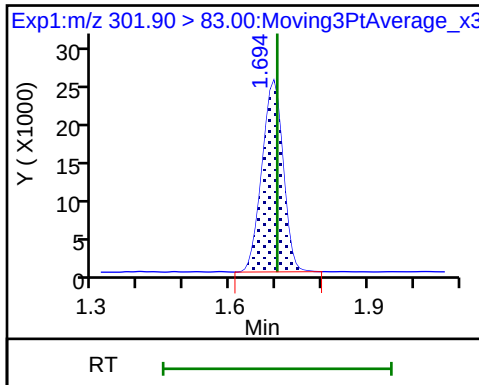
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

D 7 13C2 PFHxA

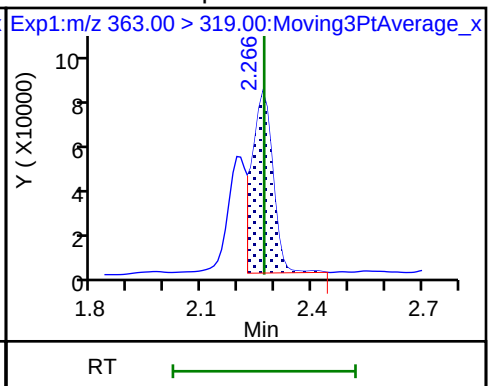
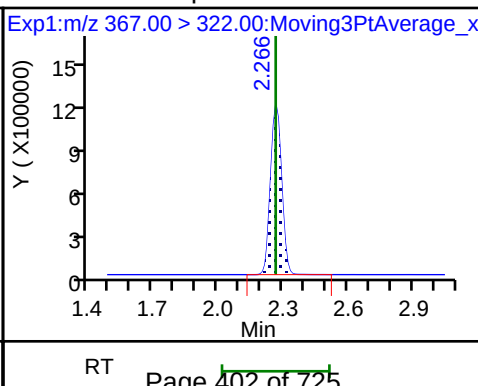
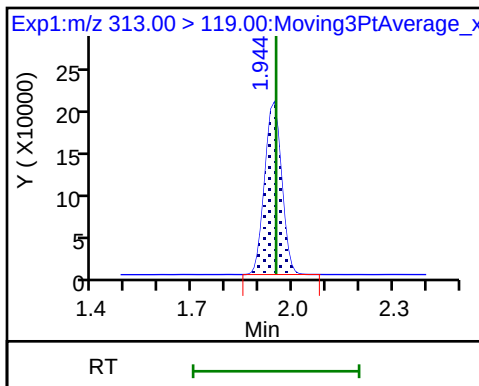
6 Perfluorohexanoic acid

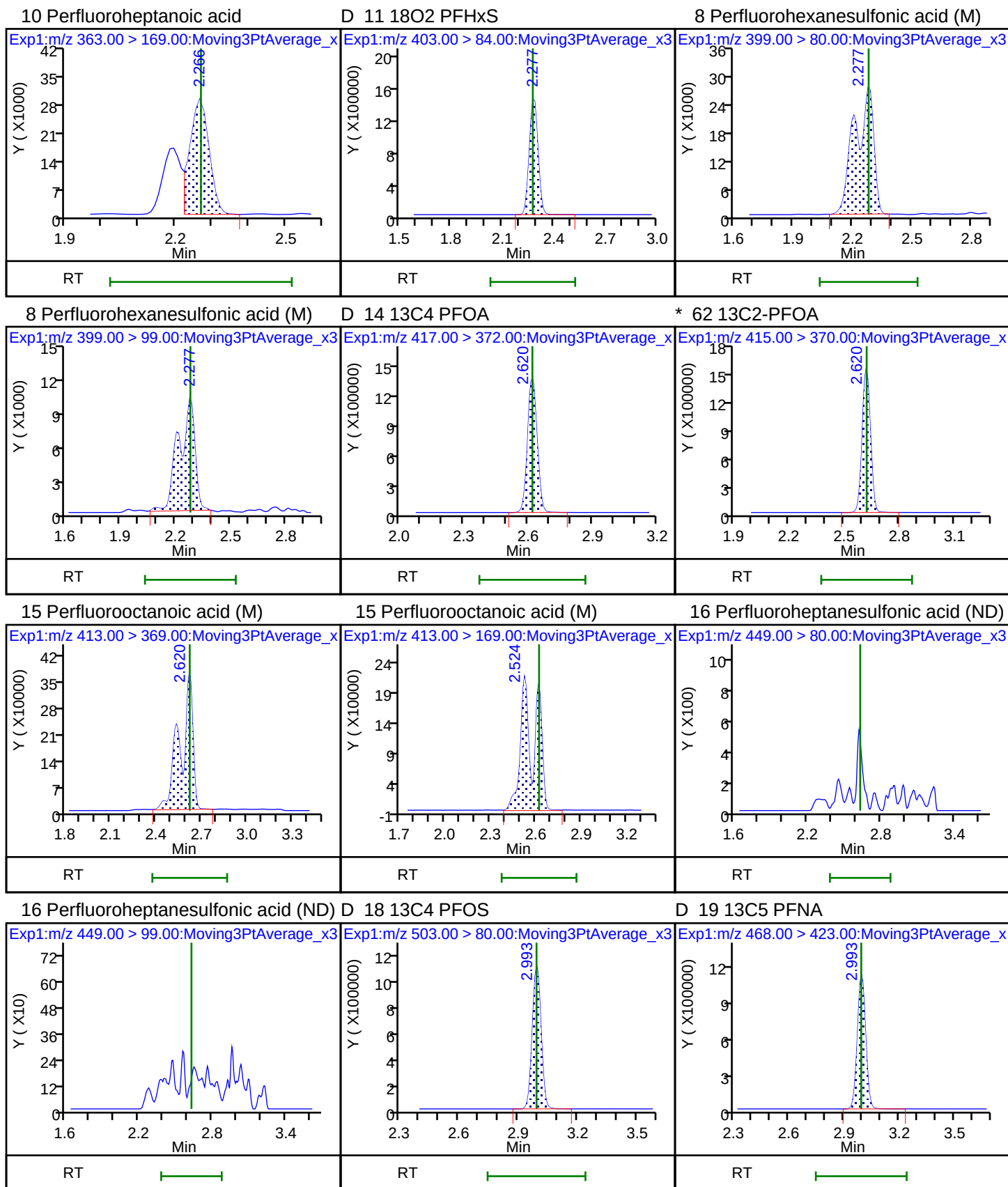


6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

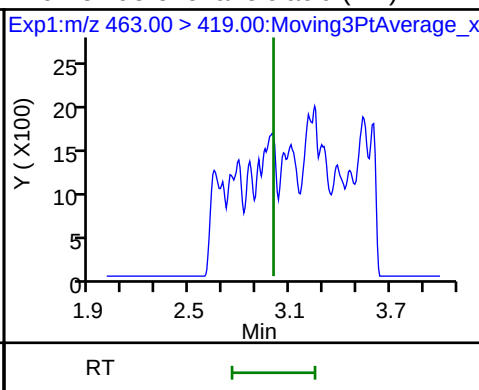
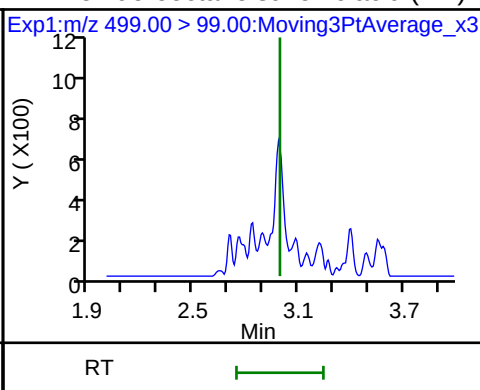
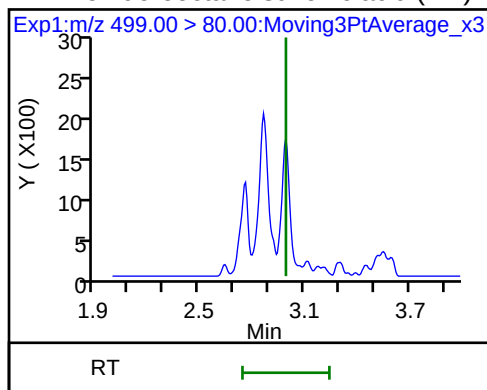




17 Perfluorooctane sulfonic acid (ND)

17 Perfluorooctane sulfonic acid (ND)

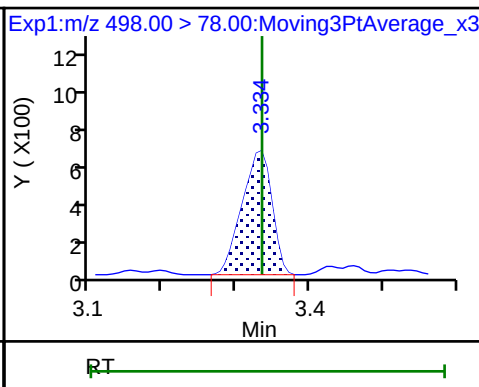
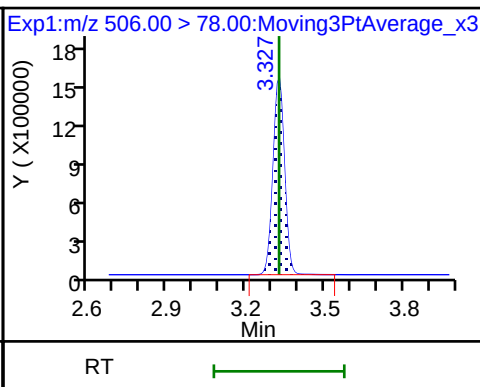
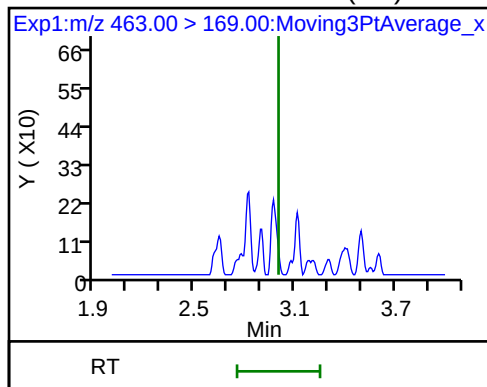
20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)

D 21 13C8 FOSA

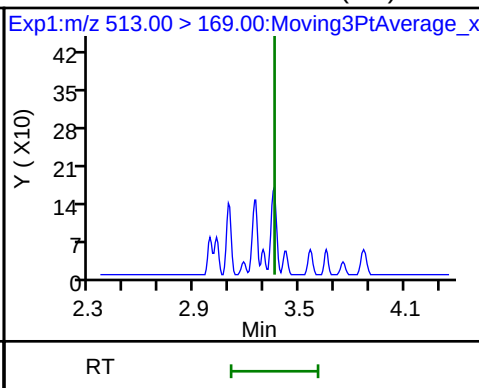
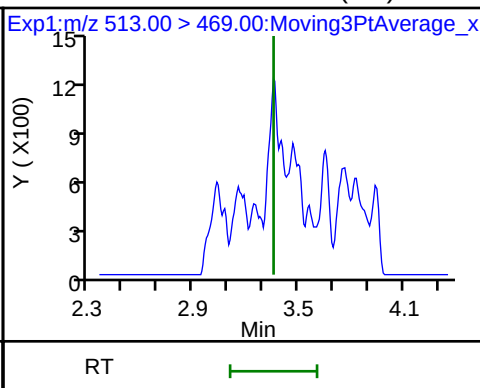
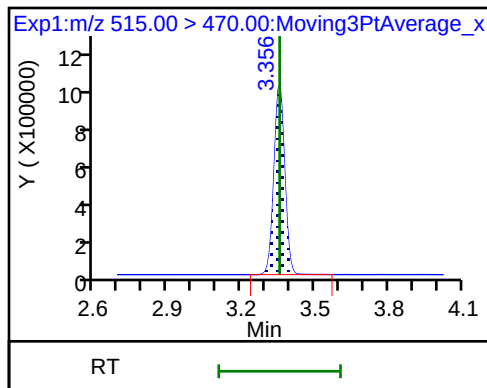
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid (ND)

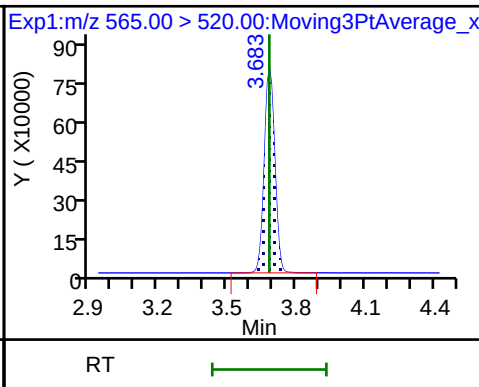
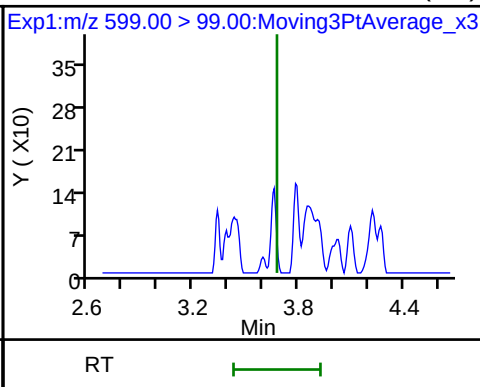
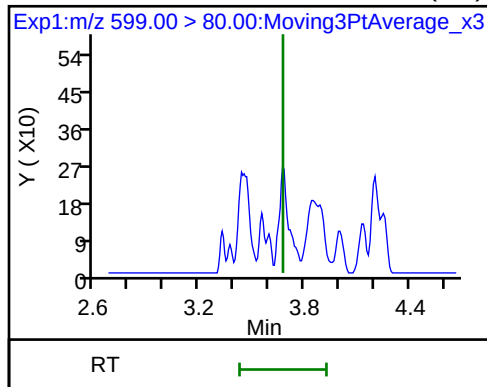
24 Perfluorodecanoic acid (ND)



29 Perfluorodecane Sulfonic acid (ND)

29 Perfluorodecane Sulfonic acid (ND)

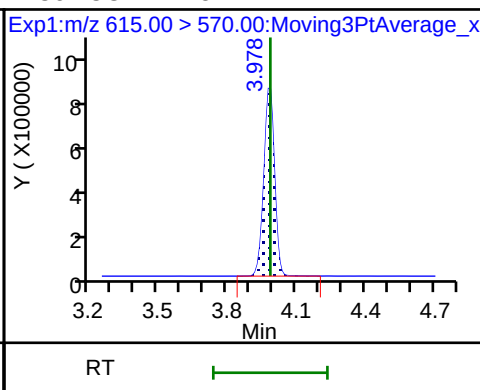
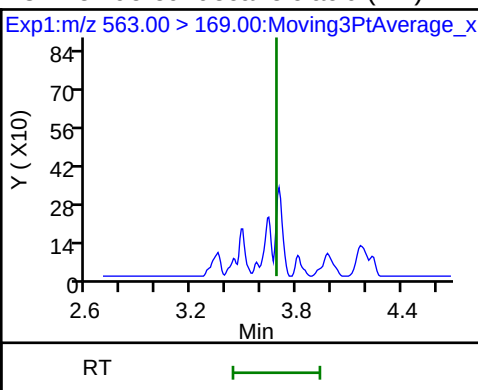
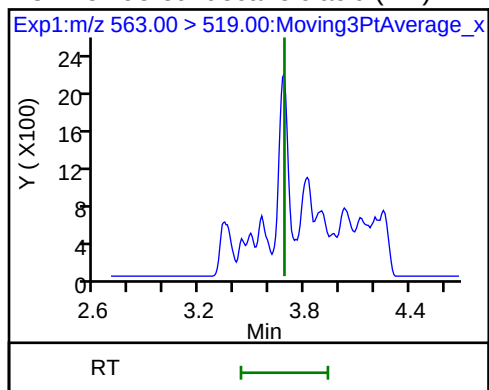
D 30 13C2 PFUnA



31 Perfluoroundecanoic acid (ND)

31 Perfluoroundecanoic acid (ND)

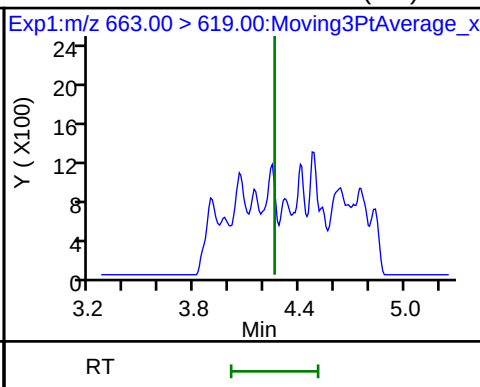
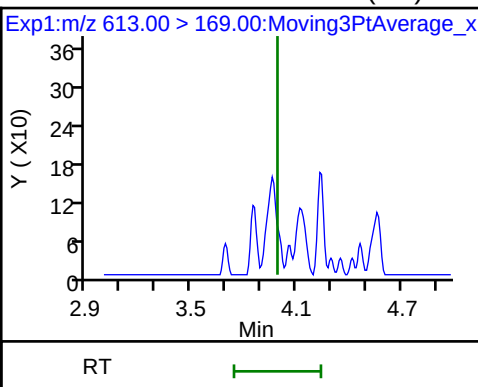
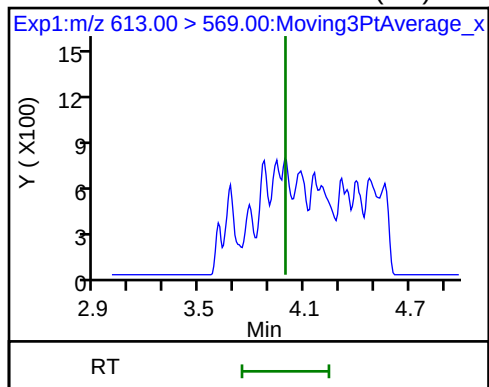
D 36 13C2 PFDaA



37 Perfluorododecanoic acid (ND)

37 Perfluorododecanoic acid (ND)

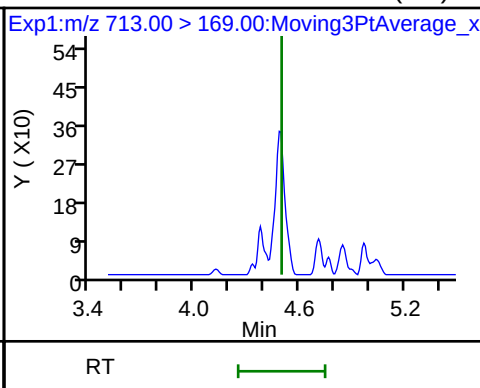
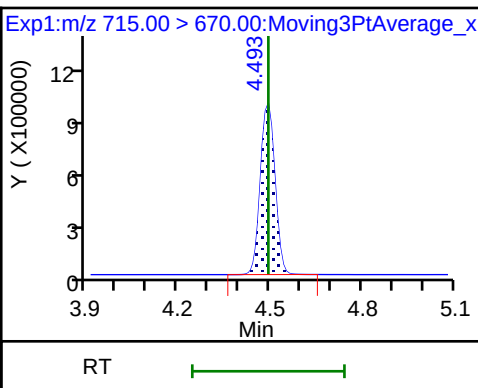
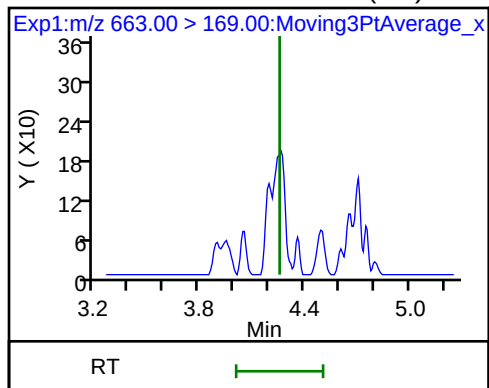
41 Perfluorotridecanoic acid (ND)



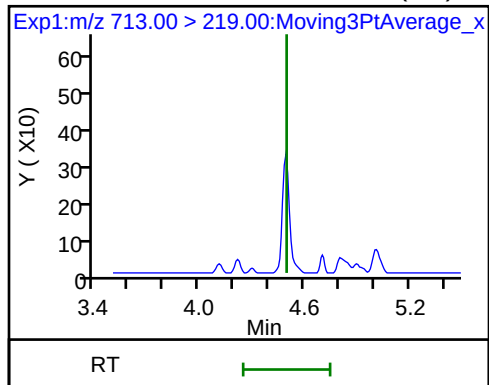
41 Perfluorotridecanoic acid (ND)

D 43 13C2-PFTeDA

42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



TestAmerica Sacramento

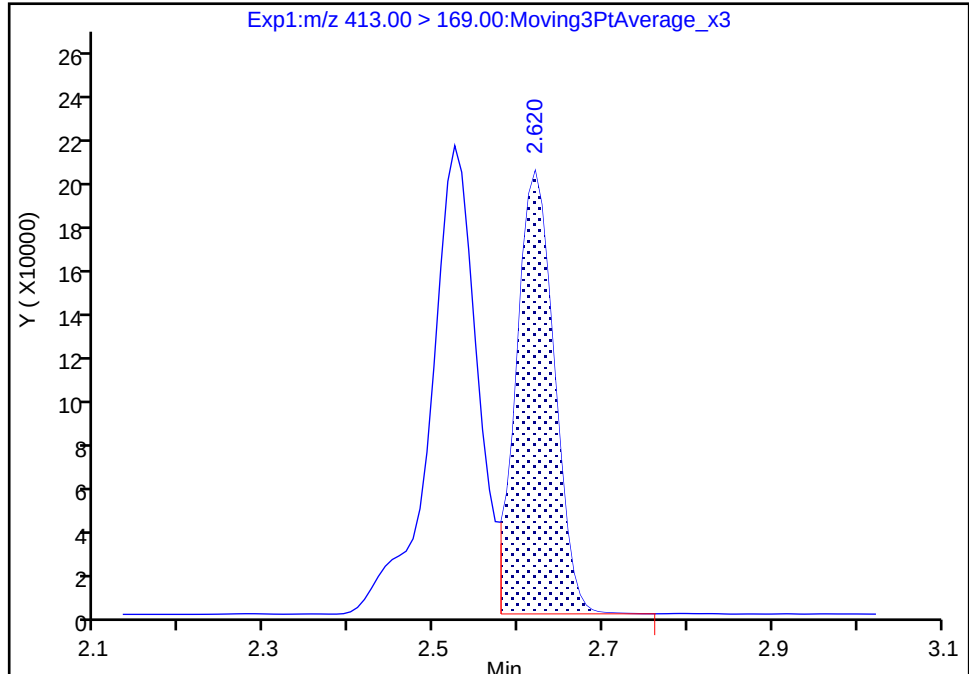
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_011.d				
Injection Date:	10-Aug-2018 08:55:14	Instrument ID:	A8_N		
Lims ID:	320-41704-A-2-A	Lab Sample ID:	320-41704-2		
Client ID:	TP-PFC-032-MID CARBON				
Operator ID:	\\SACINSTLCMS01@tai.com	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector:	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

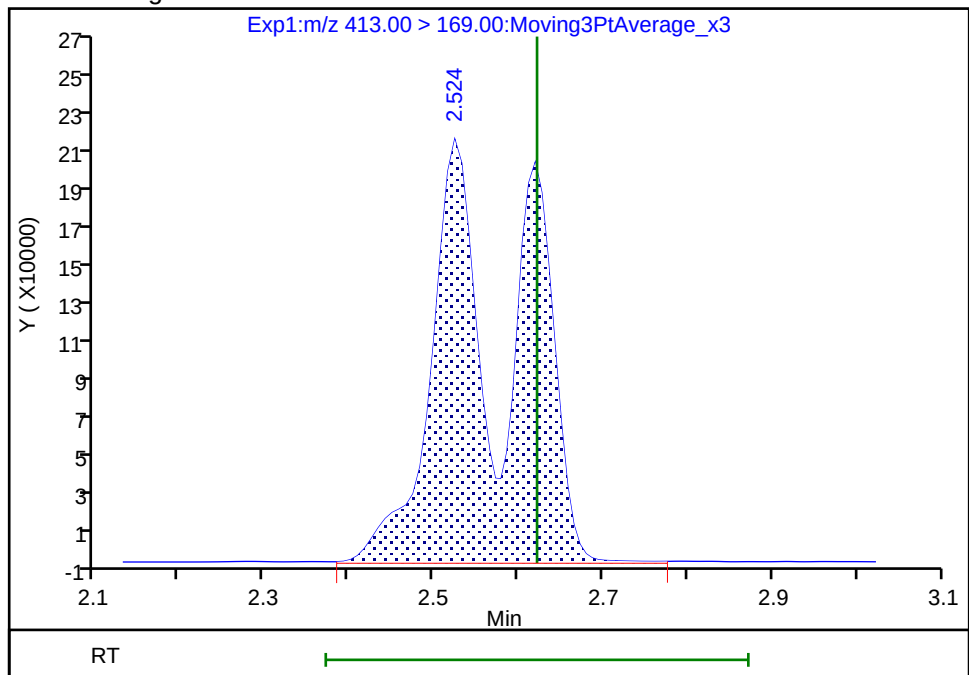
RT: 2.62
Area: 624915
Amount: 0.598965
Amount Units: ng/ml

Processing Integration Results



RT: 2.52
Area: 1466598
Amount: 1.098269
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 13-Aug-2018 08:26:12
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 406 of 725

TestAmerica Sacramento

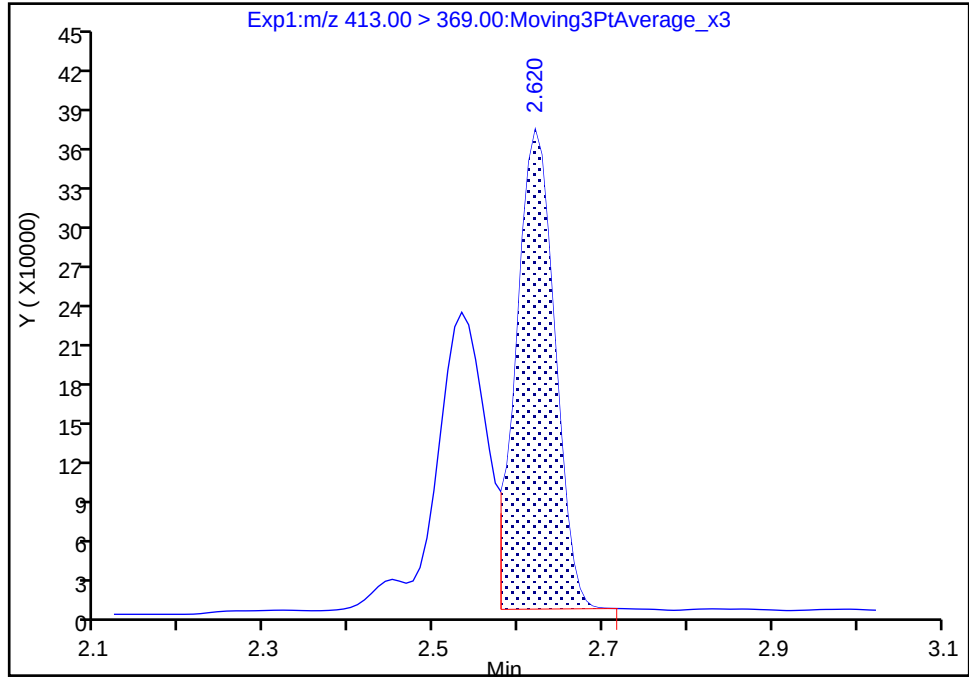
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_011.d				
Injection Date:	10-Aug-2018 08:55:14	Instrument ID:	A8_N		
Lims ID:	320-41704-A-2-A	Lab Sample ID:	320-41704-2		
Client ID:	TP-PFC-032-MID CARBON				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

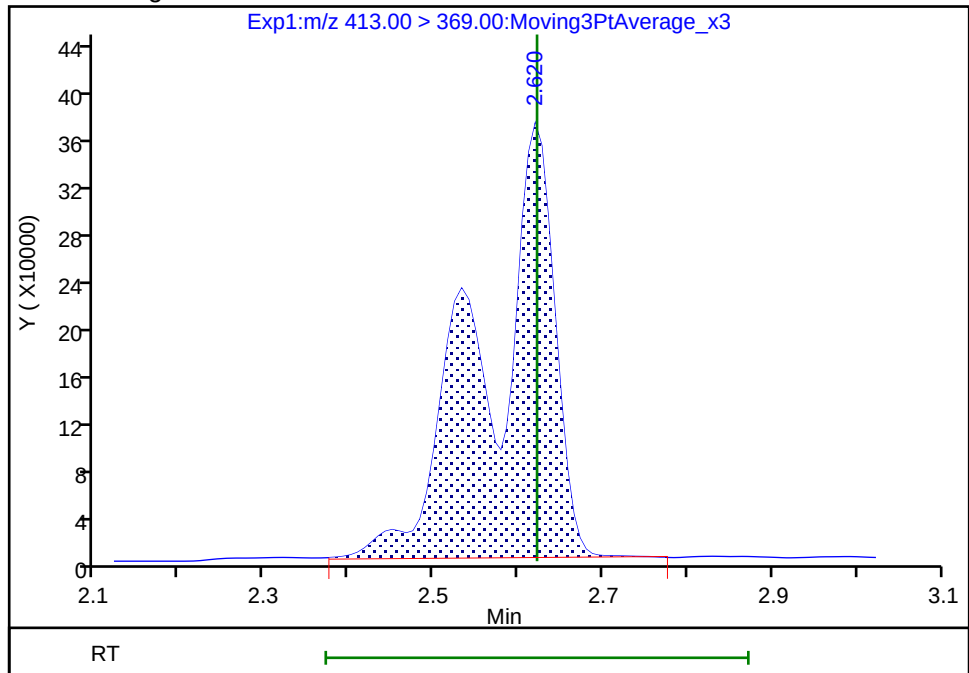
RT: 2.62
Area: 1144104
Amount: 0.598965
Amount Units: ng/ml

Processing Integration Results



RT: 2.62
Area: 2097843
Amount: 1.098269
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 13-Aug-2018 08:26:31

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

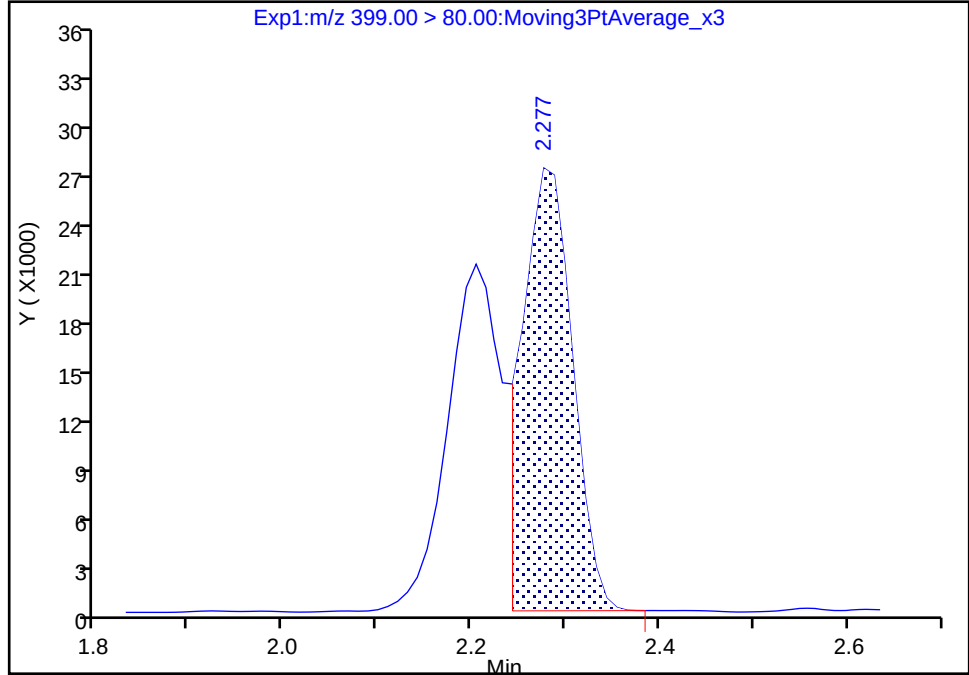
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_011.d				
Injection Date:	10-Aug-2018 08:55:14	Instrument ID:	A8_N		
Lims ID:	320-41704-A-2-A	Lab Sample ID:	320-41704-2		
Client ID:	TP-PFC-032-MID CARBON				
Operator ID:	\\SACINSTLCMS01@tai.com	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

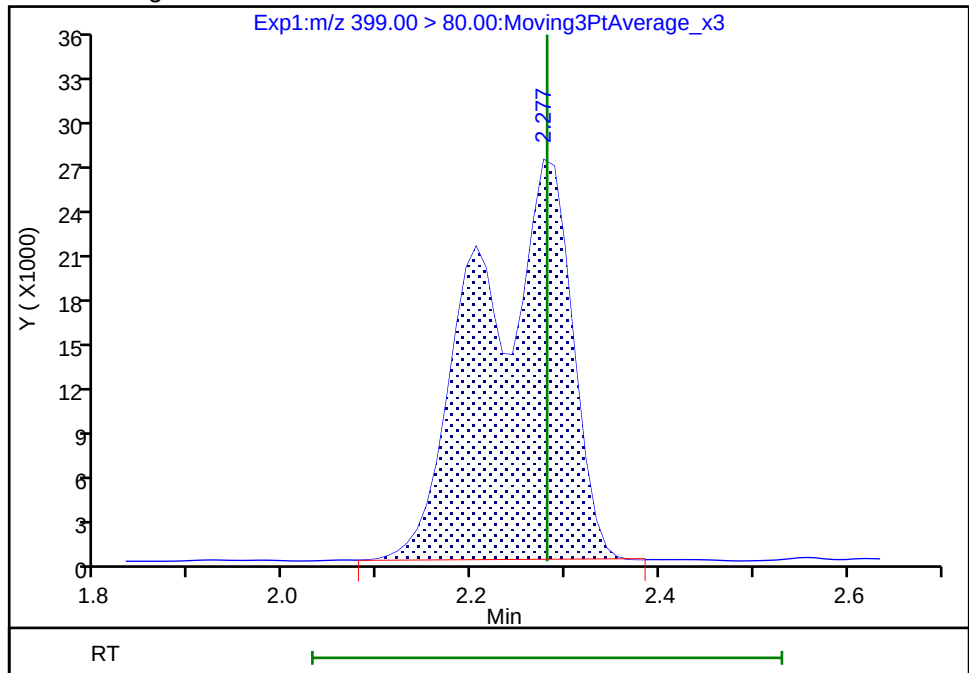
RT: 2.28
Area: 97241
Amount: 0.042764
Amount Units: ng/ml

Processing Integration Results



RT: 2.28
Area: 180825
Amount: 0.079521
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:03:33

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

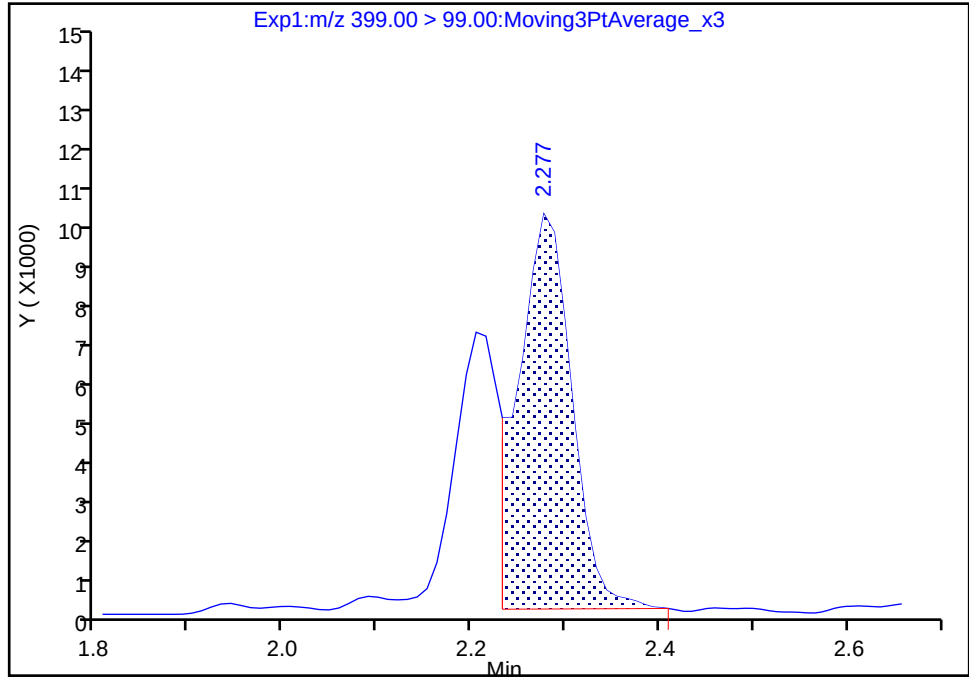
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_011.d				
Injection Date:	10-Aug-2018 08:55:14	Instrument ID:	A8_N		
Lims ID:	320-41704-A-2-A	Lab Sample ID:	320-41704-2		
Client ID:	TP-PFC-032-MID CARBON				
Operator ID:	\SACINSTLCMS01@tai.com	ALS Bottle#:	5	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

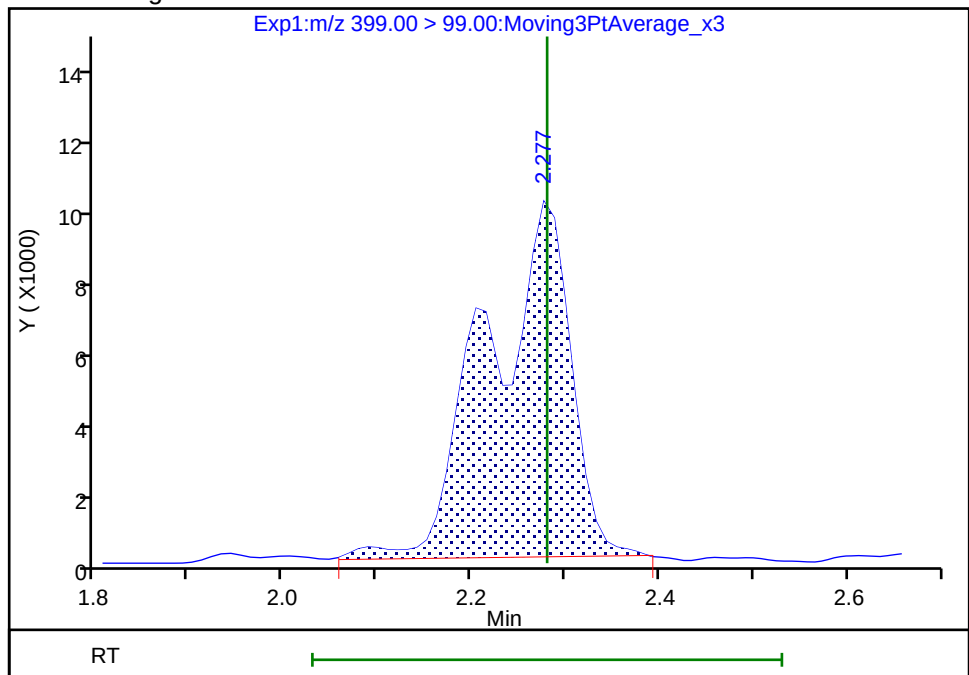
RT: 2.28
Area: 36931
Amount: 0.042764
Amount Units: ng/ml

Processing Integration Results



RT: 2.28
Area: 58462
Amount: 0.079521
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:03:39

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPE</u>	Lab Sample ID: <u>320-41704-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_012.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:15</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>281.3 (mL)</u>	Date Analyzed: <u>08/10/2018 09:03</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		1.8	1.3	0.52
2706-90-3	Perfluoropentanoic acid (PFPeA)	240		1.8	0.89	0.38
307-24-4	Perfluorohexanoic acid (PFHxA)	130		1.8	0.89	0.42
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.2	J	1.8	1.3	0.54
335-67-1	Perfluorooctanoic acid (PFOA)	5.6	M	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.8	1.3	0.46
335-76-2	Perfluorodecanoic acid (PFDA)	0.89	U	1.8	0.89	0.43
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	1.3	0.64
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	1.3	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	2.7	0.68
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	2.7	0.74
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.3		1.8	0.89	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.58	J M	1.8	0.89	0.34
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.89	U	1.8	0.89	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	0.98
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	1.3	0.50
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	2.7	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPE</u>	Lab Sample ID: <u>320-41704-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_012.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:15</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>281.3 (mL)</u>	Date Analyzed: <u>08/10/2018 09:03</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	86		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	86		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	85		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	18O2 PFHxS	84		50-150
STL02116	13C2-PFTeDA	96		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	81		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_012.d
 Lims ID: 320-41704-B-3-A
 Client ID: TP-PFC-032-TPE
 Sample Type: Client
 Inject. Date: 10-Aug-2018 09:03:04 ALS Bottle#: 6 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41704-b-3-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 14:14:19 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK035

First Level Reviewer: hannigana

Date: 10-Aug-2018 14:04:51

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	1.403	1.411	-0.008	0.535	6183679	2.32		92.9	9819	
2 Perfluorobutyric acid										
212.90 > 169.00	1.403	1.413	-0.010	1.000	7971572	3.43			716	
D 3 13C5-PFPeA										
267.90 > 223.00	1.660	1.662	-0.002	0.633	3929907	2.14		85.8	9334	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.660	1.668	-0.008	1.000	12305025	6.88			939	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.692	1.700	-0.008	1.000	238859	0.0916			16.2	
298.90 > 99.00	1.692	1.700	-0.008	1.000	121816		1.96(1.25-3.74)		19.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.702	-0.010	0.645	79793	1.88		81.0	505	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.943	-0.005	0.739	4472059	2.15		86.0	17319	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.939	1.949	-0.011	1.000	6667773	3.65			1815	R
313.00 > 119.00	1.939	1.949	-0.011	1.000	381458		17.48(5.03-15.10)		1170	
D 9 13C4-PFHpA										
367.00 > 322.00	2.269	2.265	0.004	0.866	4344325	2.12		84.9	6673	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.269	2.269	0.0	1.000	59762	0.0324			6.9	
363.00 > 169.00	2.269	2.269	0.0	1.000	21498		2.78(1.13-3.40)		10.0	
D 11 18O2 PFHxS										
403.00 > 84.00	2.291	2.276	0.015	0.874	5206709	1.98		83.9	13285	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.280	2.280	0.0	0.995	38922	0.0163			55.8	M
399.00 > 99.00	2.280	2.280	0.0	0.995	12413		3.14(1.50-4.49)		14.6	

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	2.622	2.619	0.003	1.000	4404587	2.35		93.8	10301	
* 62 13C2-PFOA										
415.00 > 370.00	2.622	2.622	0.0		4804596	2.50			8565	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.536	2.622	-0.086	0.967	314881	0.1581			13.0	M
413.00 > 169.00	2.528	2.622	-0.094	0.964	231263		1.36(0.84-2.52)		316	M
D 18 13C4 PFOS										
503.00 > 80.00	2.994	2.992	0.002	1.142	3568899	2.07		86.6	3909	
D 19 13C5 PFNA										
468.00 > 423.00	2.994	2.992	0.002	1.142	3570859	2.12		84.7	6641	
D 21 13C8 FOSA										
506.00 > 78.00	3.328	3.326	0.002	1.269	4925758	2.16		86.3	6362	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.320	3.334	-0.014	0.998	1066	0.000556			12.3	
D 23 13C2 PFDA										
515.00 > 470.00	3.357	3.355	0.002	1.280	3192204	2.16		86.3	6351	
D 30 13C2 PFUnA										
565.00 > 520.00	3.685	3.682	0.003	1.406	2794026	2.35		94.0	5604	
31 Perfluoroundecanoic acid										R
563.00 > 519.00	3.677	3.685	-0.008	0.998	8454	0.006732			6.5	R
563.00 > 169.00	3.694	3.685	0.009	1.002	1178		7.18(2.12-6.36)		12.6	
D 36 13C2 PFDaA										
615.00 > 570.00	3.983	3.987	-0.004	1.519	2675450	2.13		85.1	6199	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.489	4.493	-0.004	1.712	3840462	2.40		95.9	6087	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_012.d

Injection Date: 10-Aug-2018 09:03:04

Instrument ID: A8_N

Lims ID: 320-41704-B-3-A

Lab Sample ID: 320-41704-3

Client ID: TP-PFC-032-TPE

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

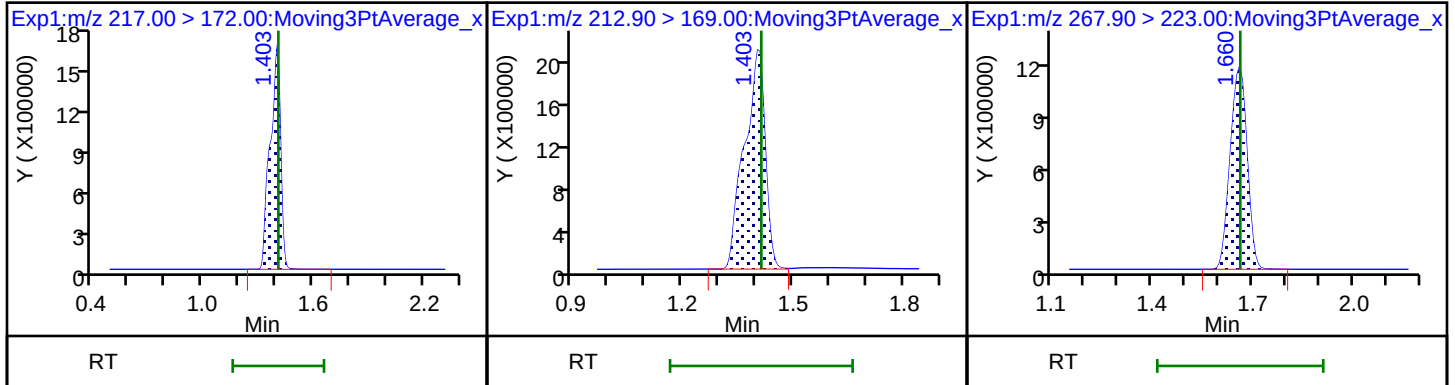
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

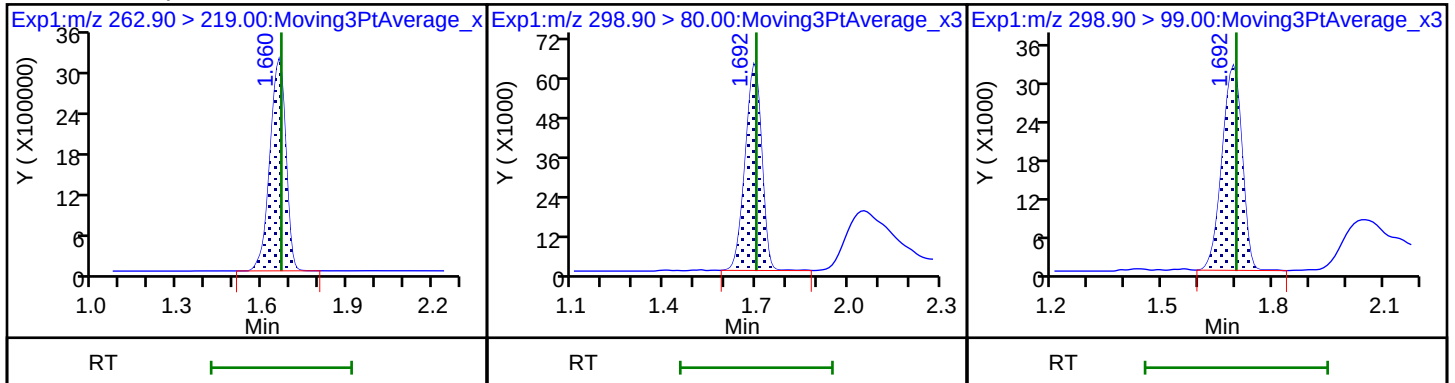
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

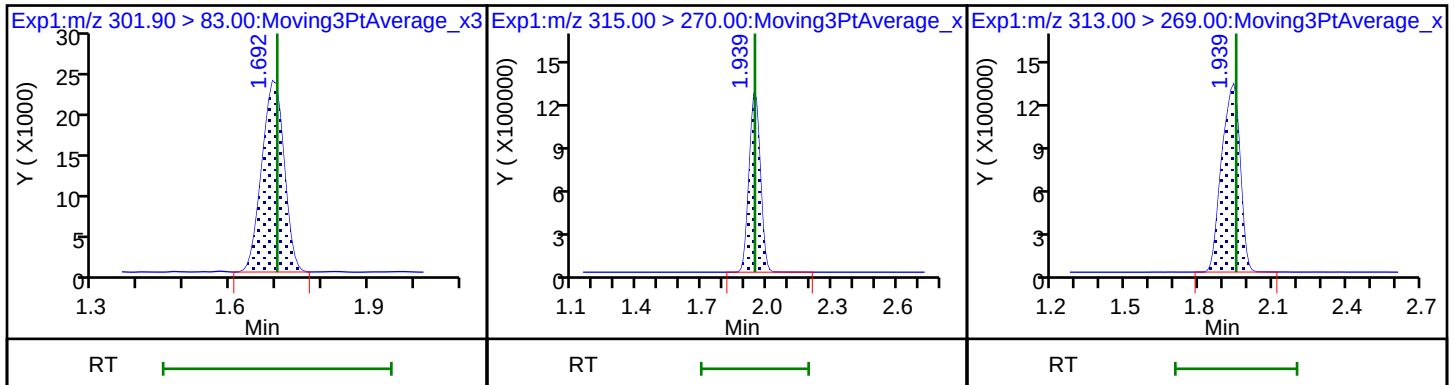
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

D 7 13C2 PFHxA

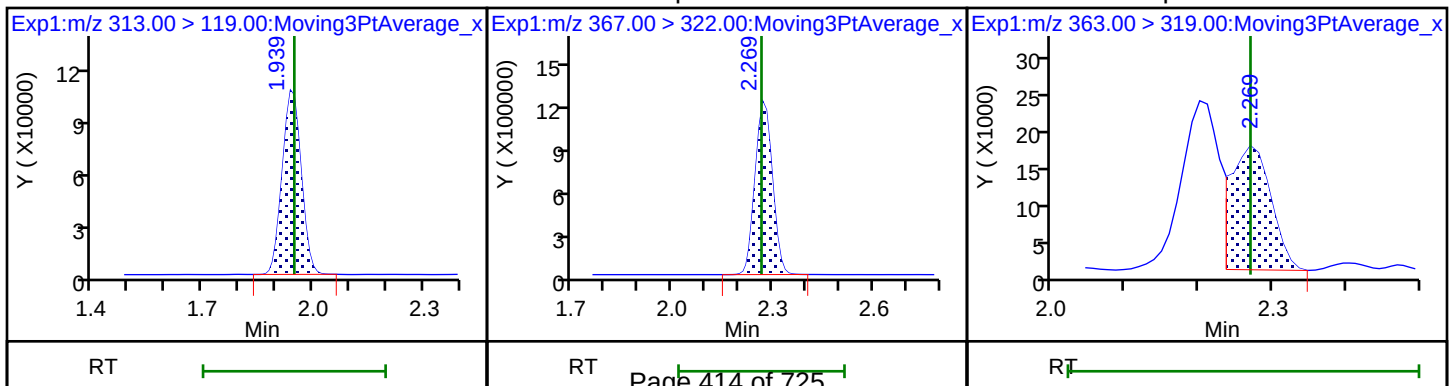
6 Perfluorohexanoic acid

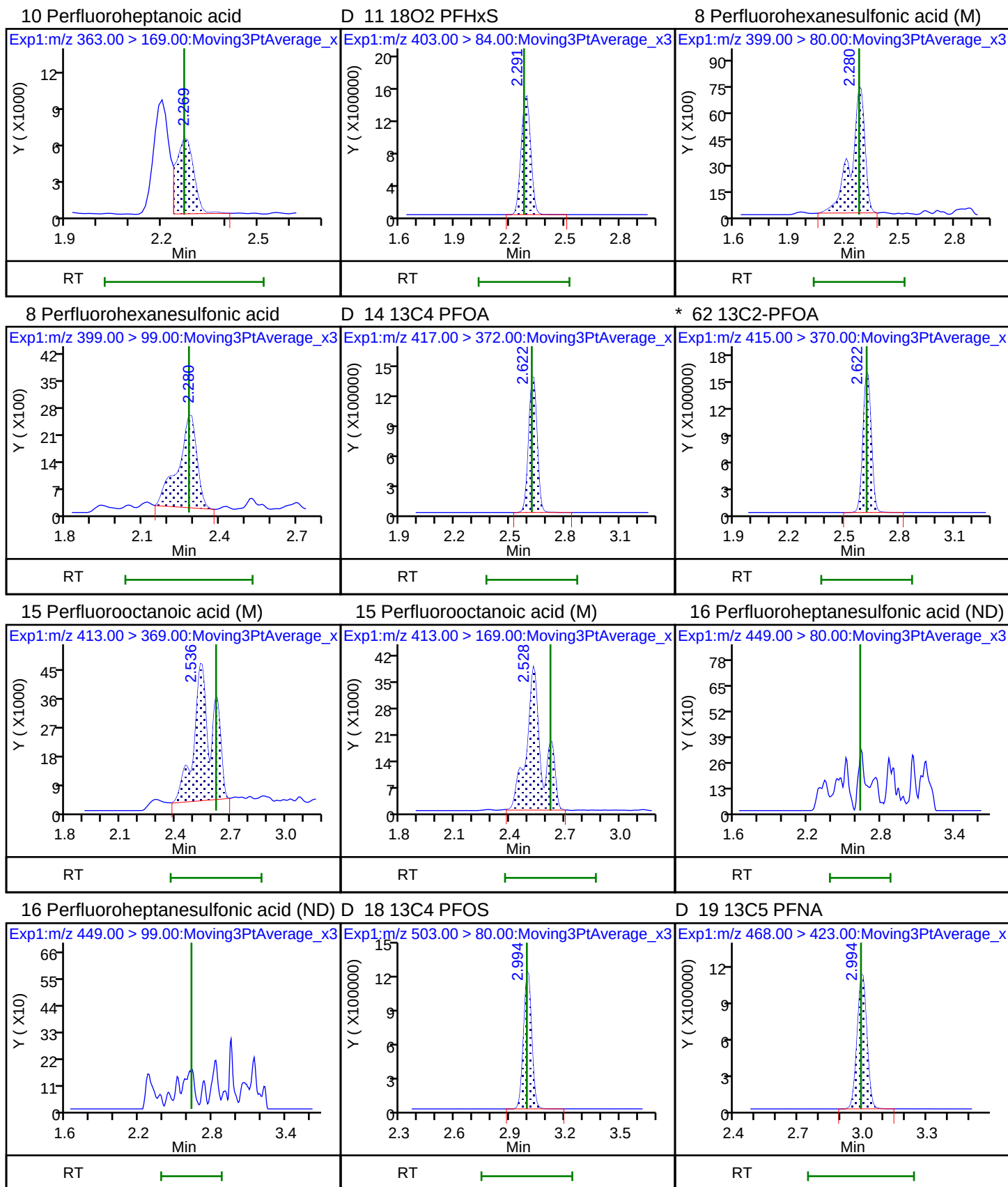


6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

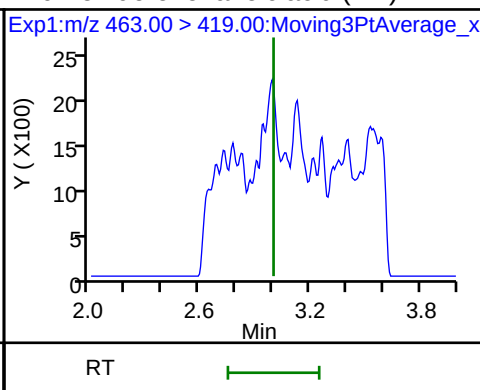
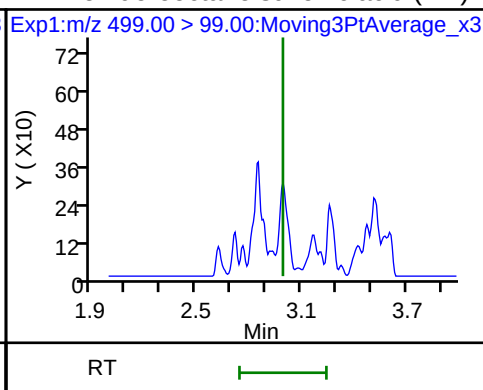
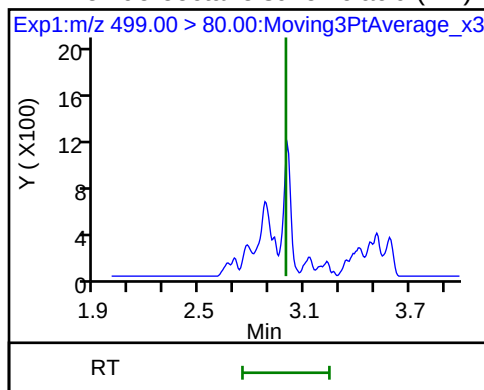




17 Perfluorooctane sulfonic acid (ND)

17 Perfluorooctane sulfonic acid (ND)

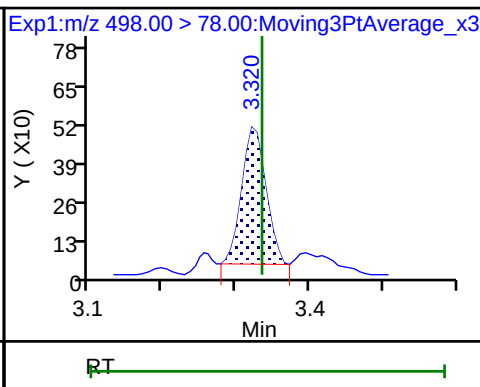
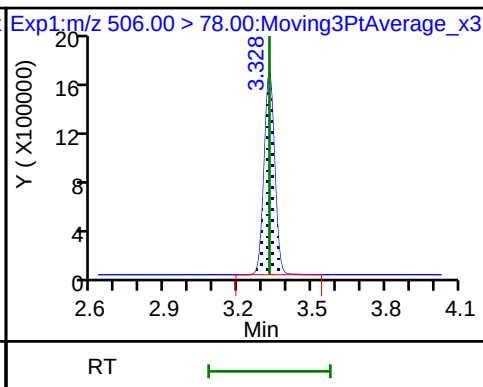
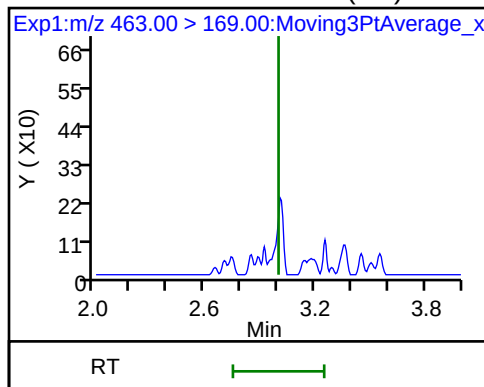
20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)

D 21 13C8 FOSA

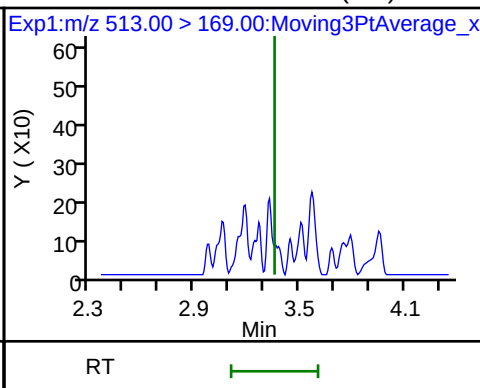
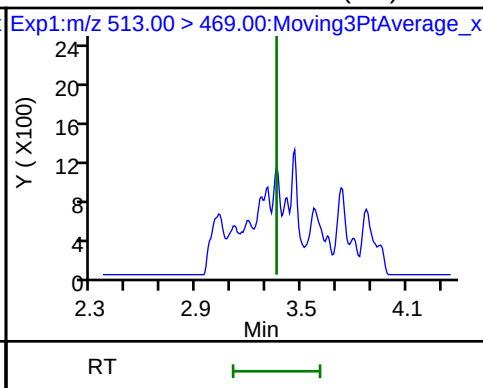
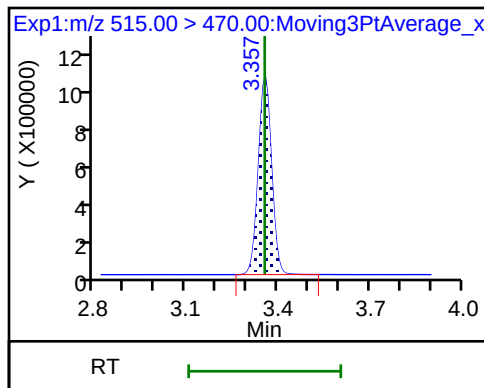
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid (ND)

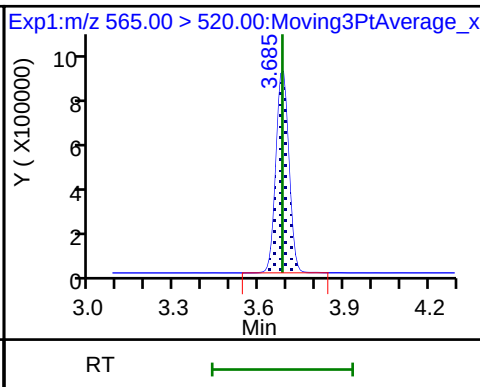
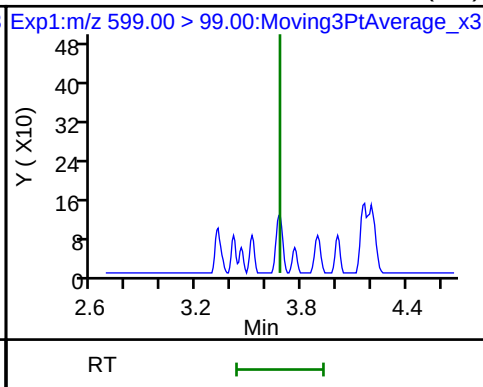
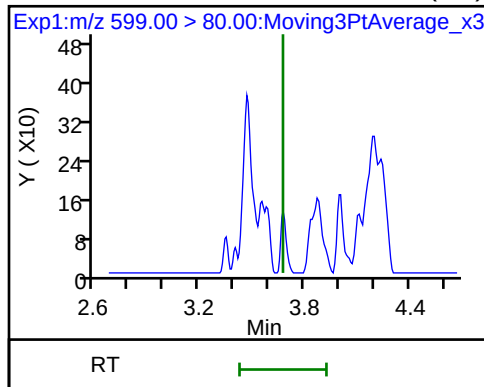
24 Perfluorodecanoic acid (ND)

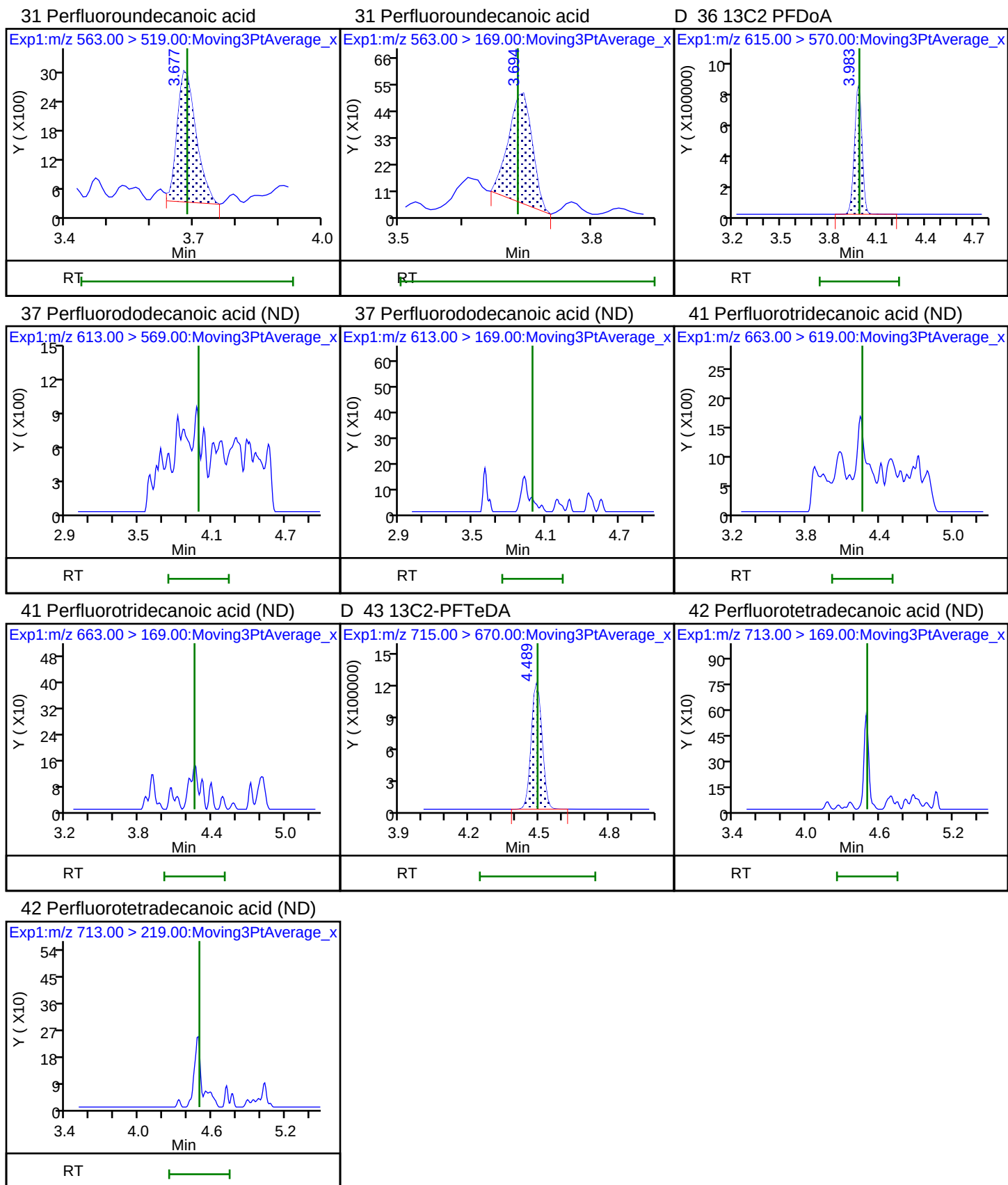


29 Perfluorodecane Sulfonic acid (ND)

29 Perfluorodecane Sulfonic acid (ND)

D 30 13C2 PFUnA





TestAmerica Sacramento

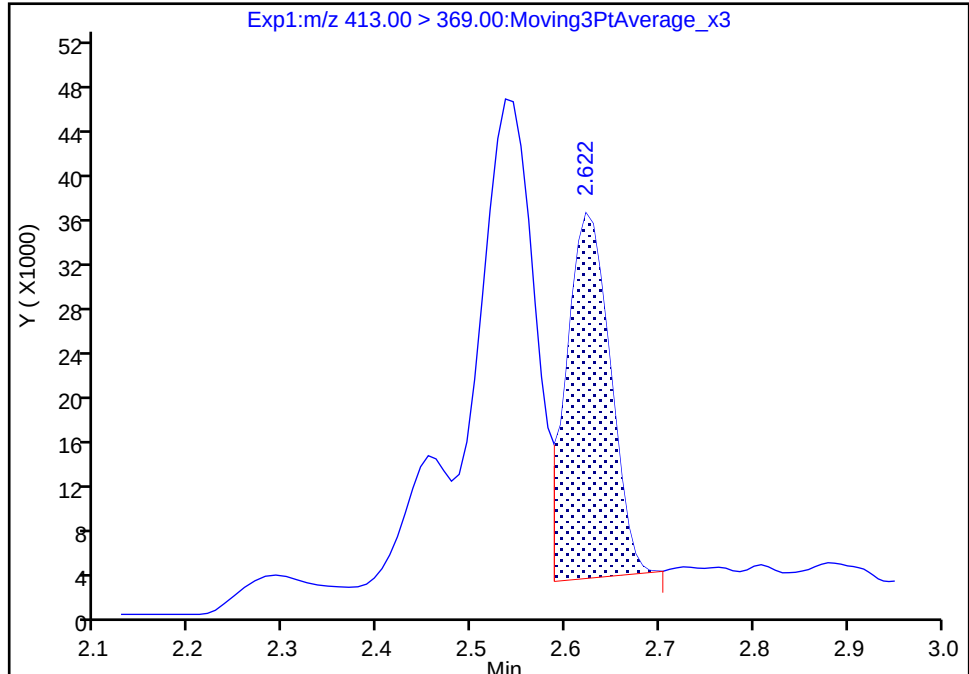
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_012.d				
Injection Date:	10-Aug-2018 09:03:04	Instrument ID:	A8_N		
Lims ID:	320-41704-B-3-A	Lab Sample ID:	320-41704-3		
Client ID:	TP-PFC-032-TPE				
Operator ID:	\\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

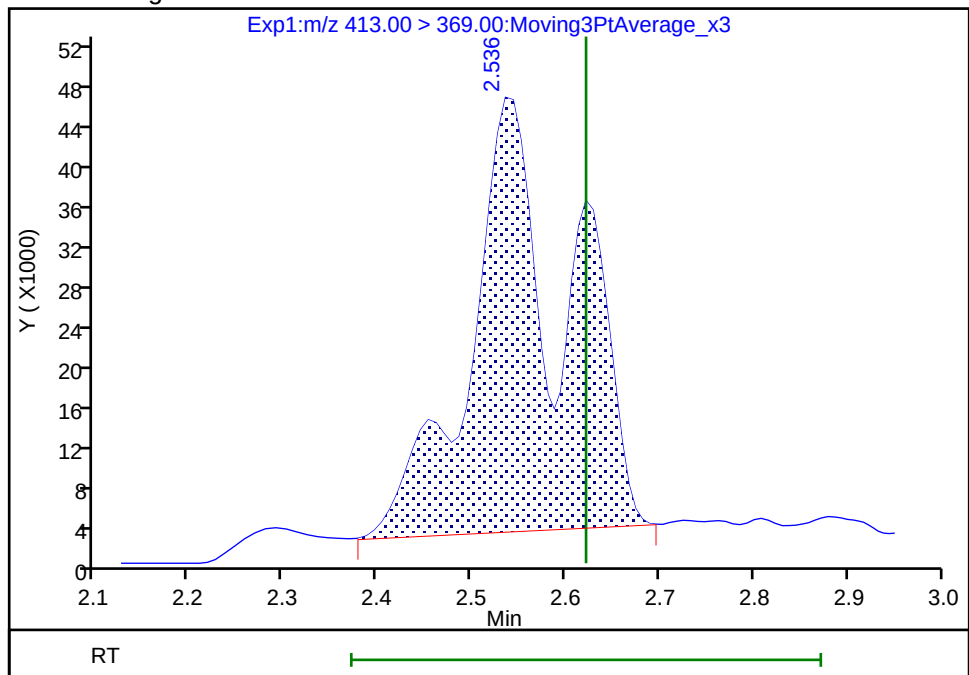
RT: 2.62
Area: 105343
Amount: 0.052881
Amount Units: ng/ml

Processing Integration Results



RT: 2.54
Area: 314881
Amount: 0.158067
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:14:08
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 418 of 725

TestAmerica Sacramento

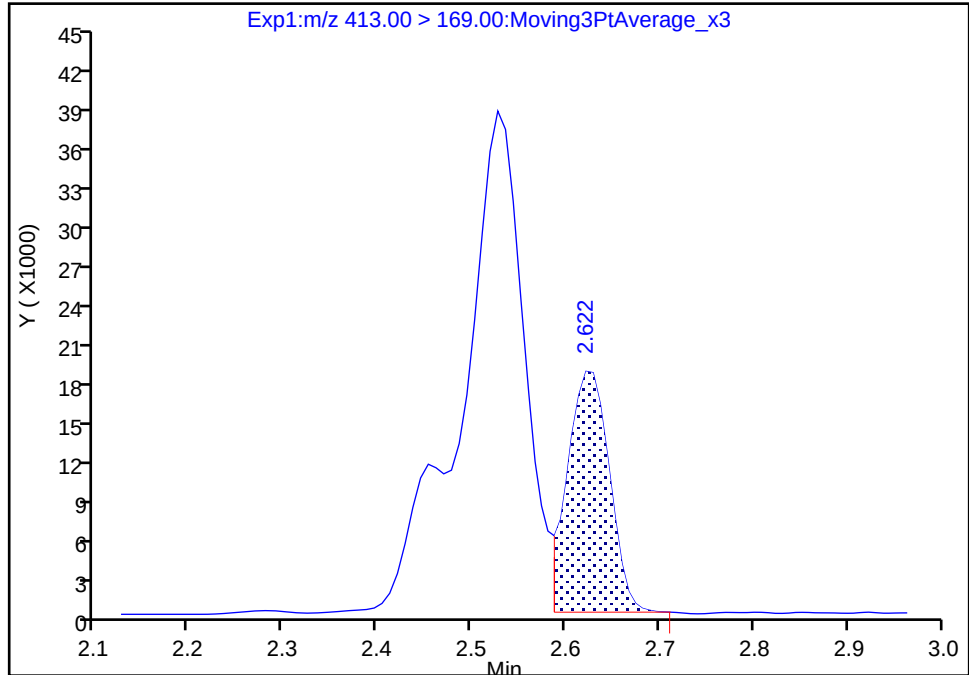
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_012.d
Injection Date: 10-Aug-2018 09:03:04 Instrument ID: A8_N
Lims ID: 320-41704-B-3-A Lab Sample ID: 320-41704-3
Client ID: TP-PFC-032-TPE
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

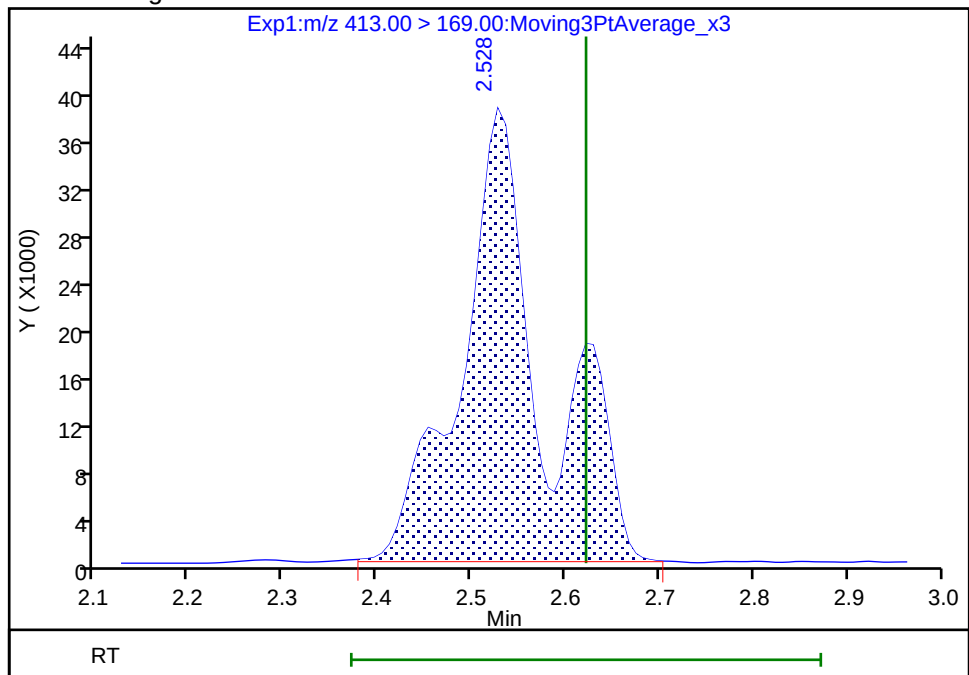
RT: 2.62
Area: 55674
Amount: 0.052881
Amount Units: ng/ml

Processing Integration Results



RT: 2.53
Area: 231263
Amount: 0.158067
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:14:15

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

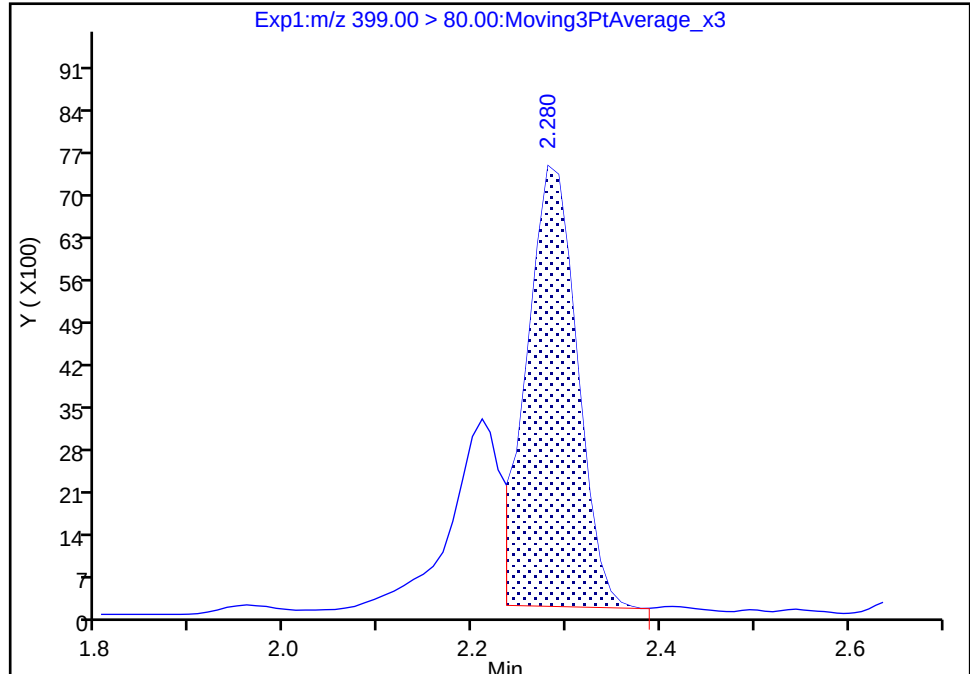
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_012.d				
Injection Date:	10-Aug-2018 09:03:04	Instrument ID:	A8_N		
Lims ID:	320-41704-B-3-A	Lab Sample ID:	320-41704-3		
Client ID:	TP-PFC-032-TPE				
Operator ID:	\\SACINSTLCMS01@tai.com	ALS Bottle#:	6	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

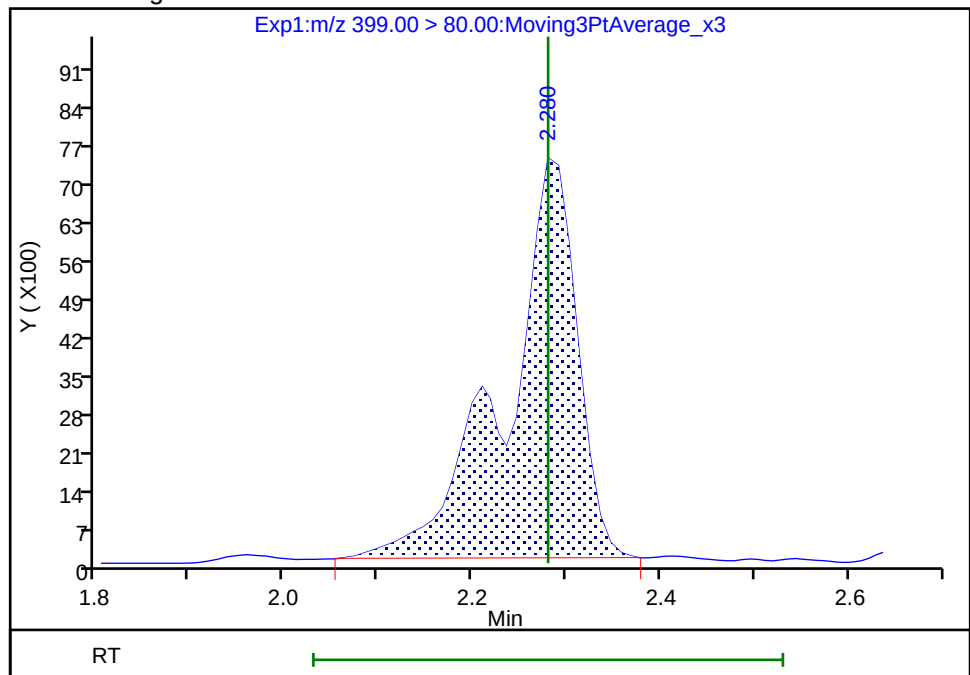
RT: 2.28
Area: 27135
Amount: 0.011370
Amount Units: ng/ml

Processing Integration Results



RT: 2.28
Area: 38922
Amount: 0.016308
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:04:28
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 420 of 725

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPE-D</u>	Lab Sample ID: <u>320-41704-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_013.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 00:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>283.3 (mL)</u>	Date Analyzed: <u>08/10/2018 09:10</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		1.8	1.3	0.52
2706-90-3	Perfluoropentanoic acid (PFPeA)	250		1.8	0.88	0.38
307-24-4	Perfluorohexanoic acid (PFHxA)	140		1.8	0.88	0.41
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.4	J	1.8	1.3	0.54
335-67-1	Perfluorooctanoic acid (PFOA)	5.8	M	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.8	1.3	0.46
335-76-2	Perfluorodecanoic acid (PFDA)	0.88	U	1.8	0.88	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	1.3	0.64
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	1.3	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	2.6	0.67
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	2.6	0.73
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.1		1.8	0.88	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.59	J M	1.8	0.88	0.34
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.88	U	1.8	0.88	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	0.97
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	1.3	0.49
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPE-D</u>	Lab Sample ID: <u>320-41704-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_013.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 00:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>283.3 (mL)</u>	Date Analyzed: <u>08/10/2018 09:10</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	83		50-150
STL00992	13C4 PFBA	90		50-150
STL01893	13C5 PFPeA	81		50-150
STL00993	13C2 PFHxA	81		50-150
STL01892	13C4-PFHpA	82		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	80		50-150
STL00996	13C2 PFDA	84		50-150
STL00997	13C2 PFUnA	85		50-150
STL00998	13C2 PFDoA	88		50-150
STL00994	18O2 PFHxS	80		50-150
STL02116	13C2-PFTeDA	87		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	83		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_013.d
 Lims ID: 320-41704-A-4-A
 Client ID: TP-PFC-032-TPE-D
 Sample Type: Client
 Inject. Date: 10-Aug-2018 09:10:52 ALS Bottle#: 7 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41704-a-4-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 14:12:02 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK035

First Level Reviewer: hannigana

Date: 10-Aug-2018 14:09:05

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	1.409	1.411	-0.002	0.536	6149895	2.26		90.3	9198	
2 Perfluorobutyric acid										
212.90 > 169.00	1.409	1.413	-0.004	1.000	7882107	3.41			706	
D 3 13C5-PFPeA										
267.90 > 223.00	1.668	1.662	0.006	0.634	3808142	2.03		81.2	9135	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.668	1.668	0.0	1.000	12441149	7.18			947	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.700	1.700	0.0	1.000	237306	0.0867			17.0	
298.90 > 99.00	1.692	1.700	-0.008	0.995	120354		1.97(1.25-3.74)		20.2	
D 47 13C3-PFBS										
301.90 > 83.00	1.700	1.702	-0.002	0.646	83742	1.93		83.0	506	
D 7 13C2 PFHxA										
315.00 > 270.00	1.949	1.943	0.006	0.741	4303249	2.02		80.9	9794	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.939	1.949	-0.010	0.995	6720854	3.83			1970	R
313.00 > 119.00	1.949	1.949	0.0	1.000	389602		17.25(5.03-15.10)		997	
D 9 13C4-PFHpA										
367.00 > 322.00	2.280	2.265	0.015	0.867	4289384	2.05		81.9	9463	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.269	2.269	0.0	0.995	70670	0.0388			8.4	
363.00 > 169.00	2.269	2.269	0.0	0.995	24143		2.93(1.13-3.40)		11.8	
D 11 18O2 PFHxS										
403.00 > 84.00	2.292	2.276	0.016	0.872	5049879	1.88		79.5	7609	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.292	2.280	0.012	1.000	38731	0.0167			64.8	M
399.00 > 99.00	2.292	2.280	0.012	1.000	10491		3.69(1.50-4.49)		11.6	

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	2.629	2.619	0.010	1.000	4281253	2.23		89.1	8504	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.544	2.622	-0.078	0.968	316376	0.1634			14.1	M
413.00 > 169.00	2.528	2.622	-0.094	0.961	236574		1.34(0.84-2.52)		267	M
* 62 13C2-PFOA										
415.00 > 370.00	2.629	2.622	0.007		4916577	2.50			8913	
D 18 13C4 PFOS										
503.00 > 80.00	3.001	2.992	0.009	1.141	3432684	1.95		81.4	4382	
D 19 13C5 PFNA										
468.00 > 423.00	3.001	2.992	0.009	1.141	3468976	2.01		80.5	8820	
D 21 13C8 FOSA										
506.00 > 78.00	3.335	3.326	0.009	1.268	4833028	2.07		82.7	7569	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.335	3.334	0.001	1.000	3391	0.001802			29.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.365	3.355	0.010	1.280	3168121	2.09		83.7	5605	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.677	3.676	0.001	1.225	2206	0.002430			10.6	
599.00 > 99.00	3.669	3.676	-0.007	1.223	724		3.05(1.39-4.16)		7.5	
D 30 13C2 PFUnA										
565.00 > 520.00	3.694	3.682	0.012	1.405	2579470	2.12		84.8	3063	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.694	3.685	0.009	1.000	7862	0.006781			7.2	
563.00 > 169.00	3.694	3.685	0.009	1.000	2153		3.65(2.12-6.36)		10.7	
D 36 13C2 PFDaA										
615.00 > 570.00	3.991	3.987	0.004	1.518	2845476	2.21		88.5	4728	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.259	4.257	0.002	1.067	4709	0.003848			2.3	
663.00 > 169.00	4.259	4.257	0.002	1.067	1370		3.44(1.25-3.76)		11.1	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.498	4.493	0.005	1.711	3545594	2.16		86.5	5738	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_013.d

Injection Date: 10-Aug-2018 09:10:52

Instrument ID: A8_N

Lims ID: 320-41704-A-4-A

Lab Sample ID: 320-41704-4

Client ID: TP-PFC-032-TPE-D

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 7

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

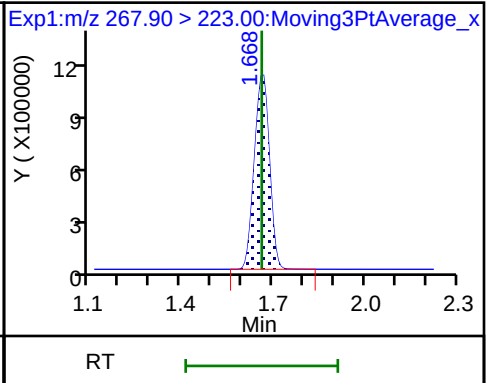
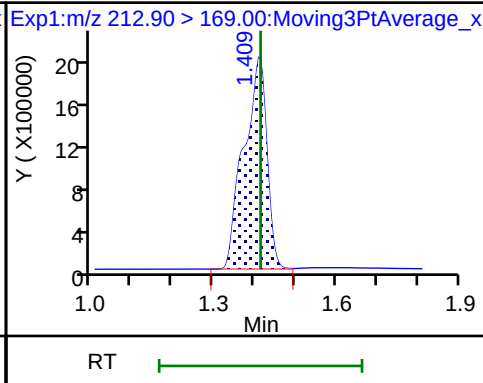
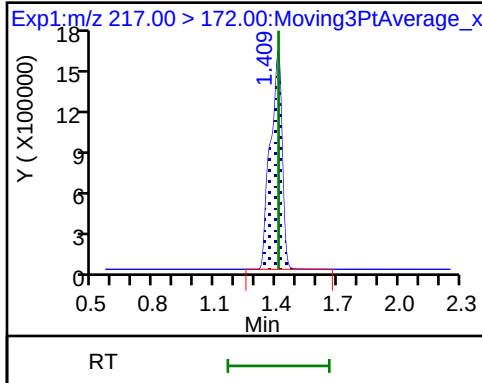
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

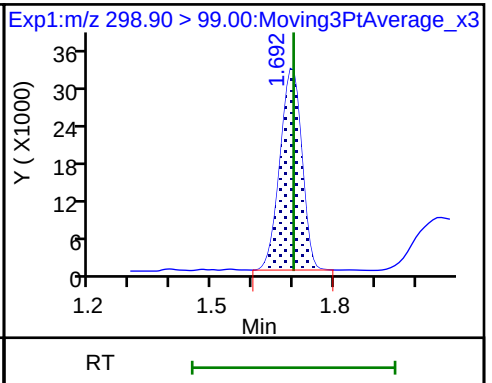
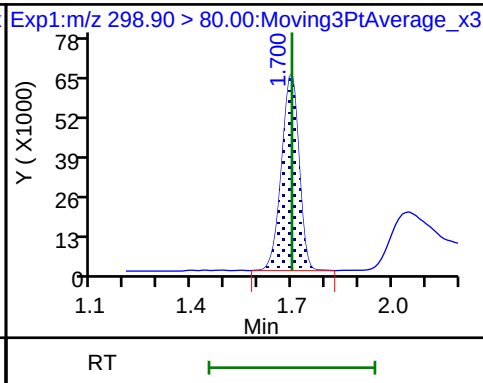
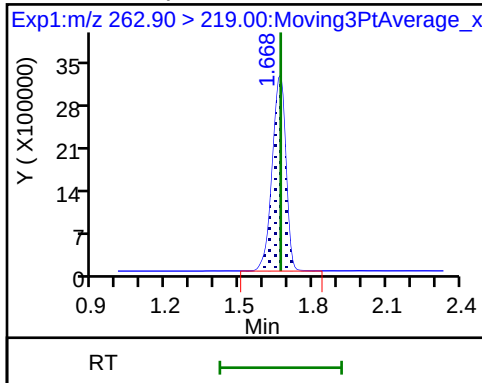
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

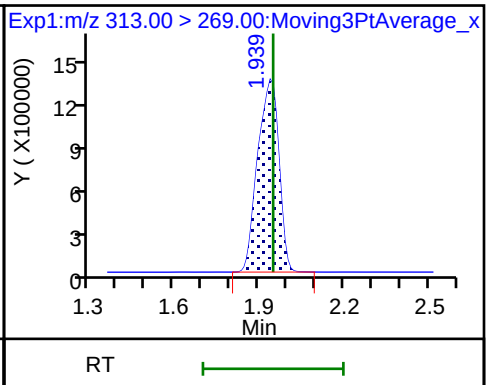
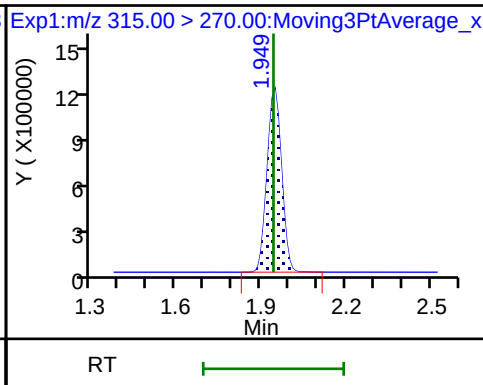
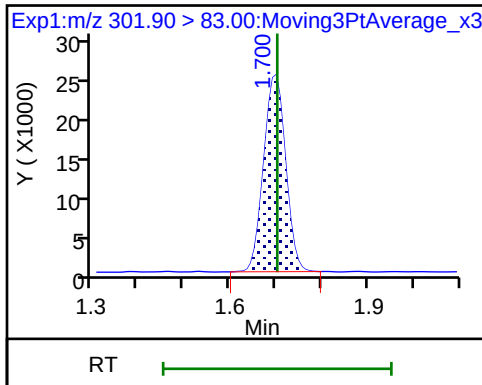
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

D 7 13C2 PFHxA

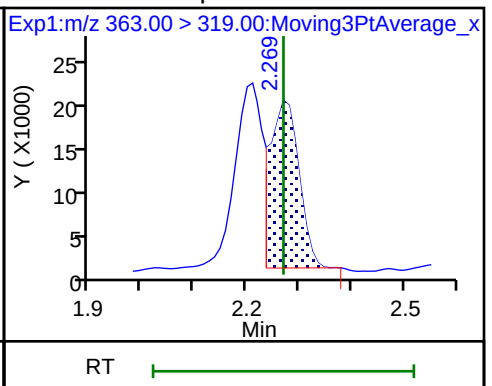
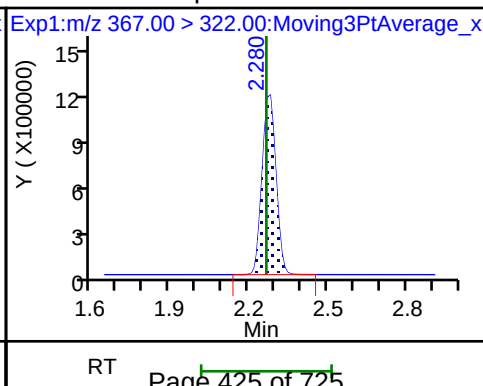
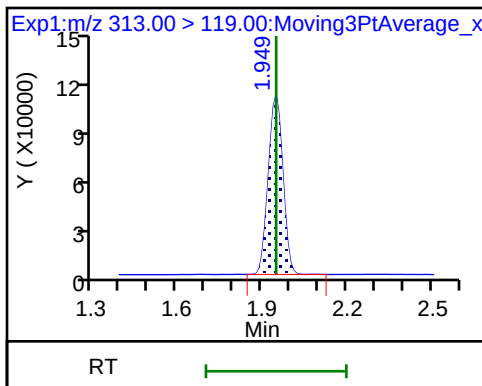
6 Perfluorohexanoic acid

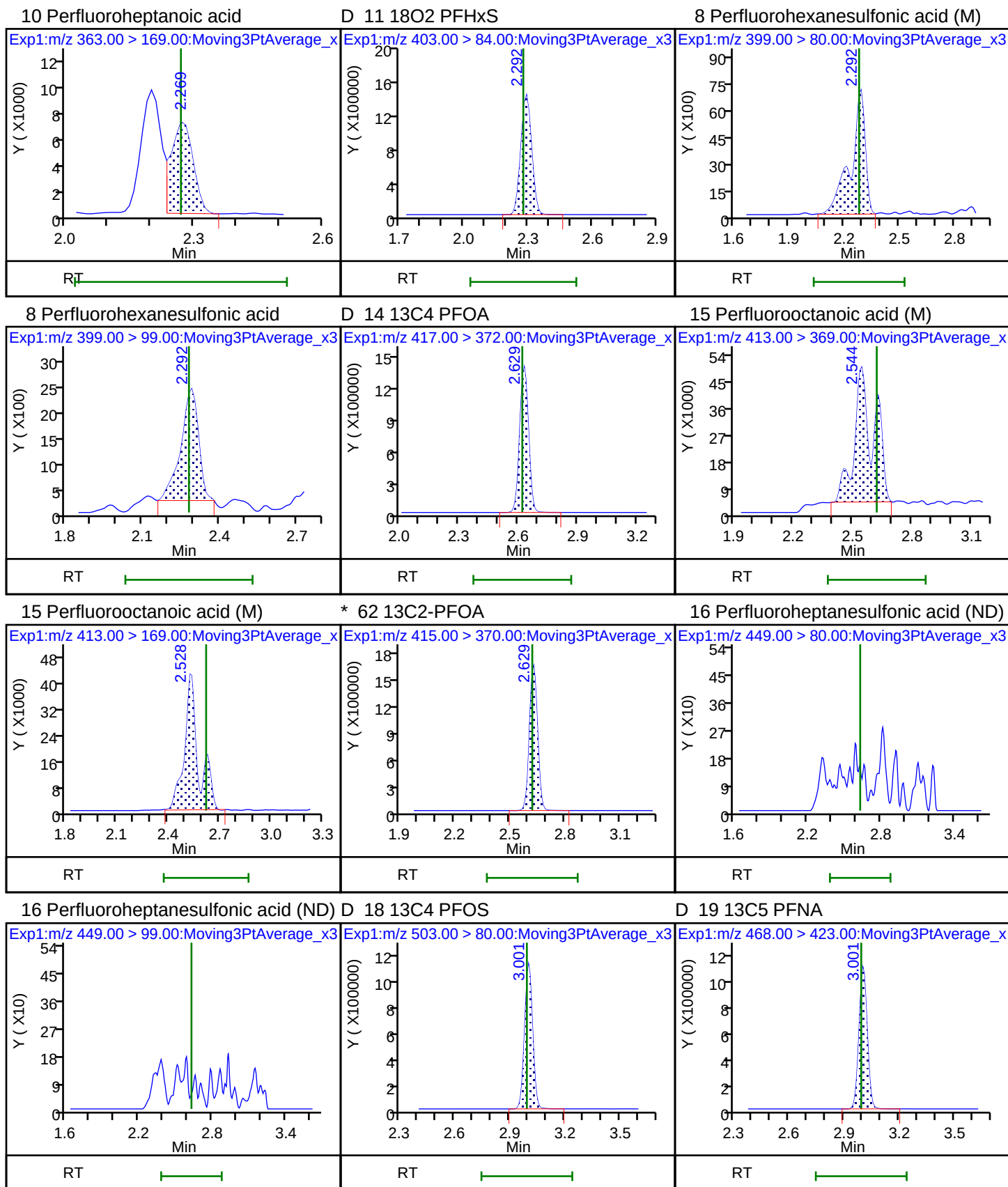


6 Perfluorohexanoic acid

D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

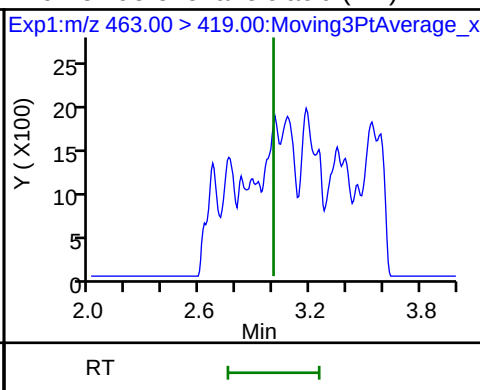
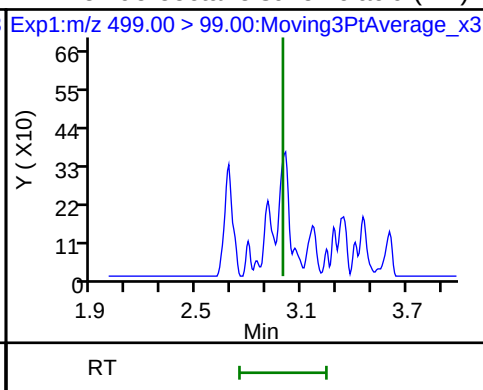
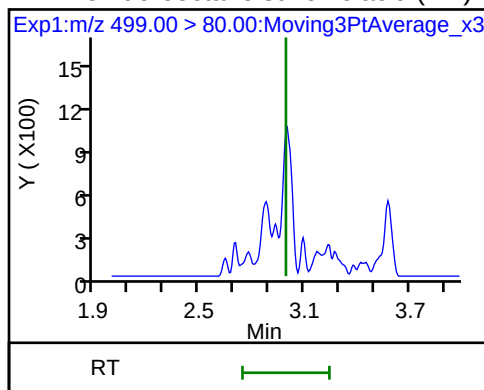




17 Perfluorooctane sulfonic acid (ND)

17 Perfluorooctane sulfonic acid (ND)

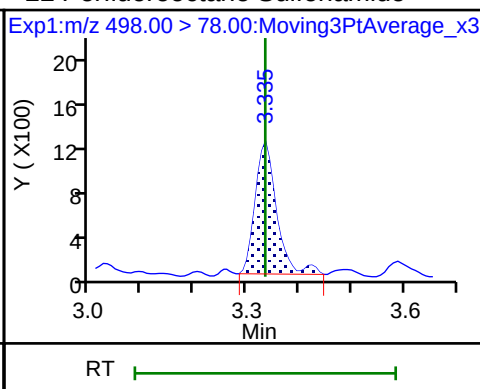
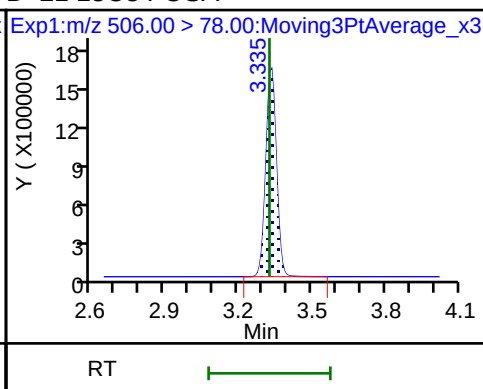
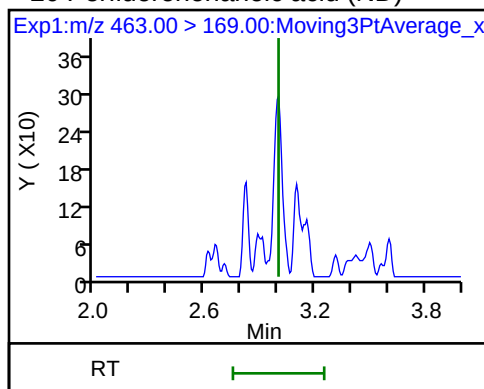
20 Perfluorononanoic acid (ND)



20 Perfluorononanoic acid (ND)

D 21 13C8 FOSA

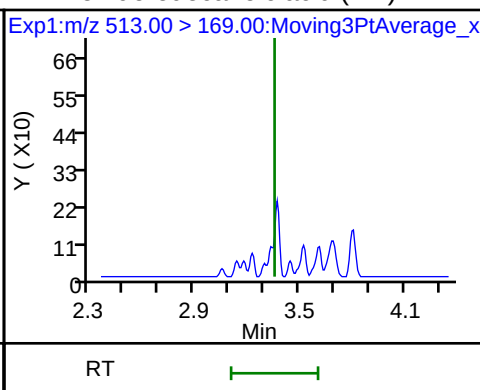
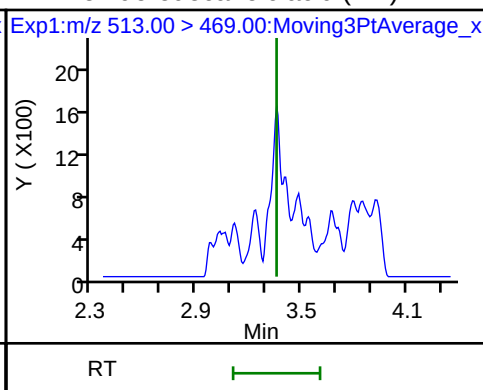
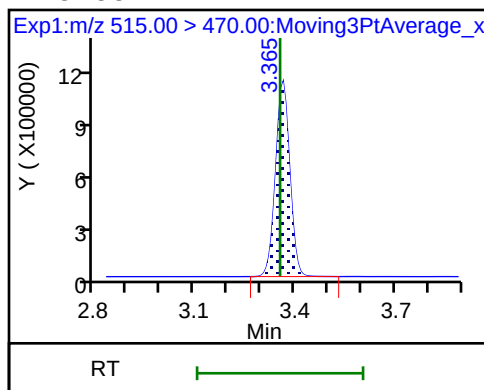
22 Perfluorooctane Sulfonamide



D 23 13C2 PFDA

24 Perfluorodecanoic acid (ND)

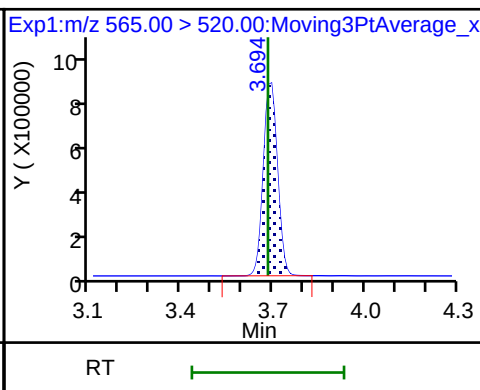
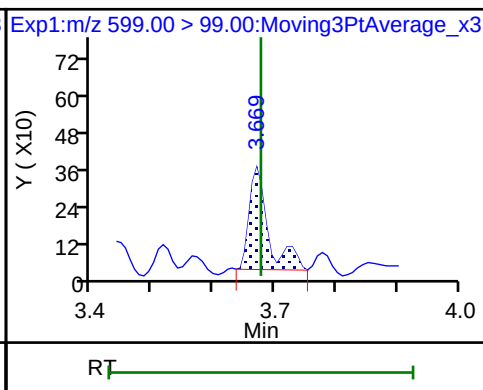
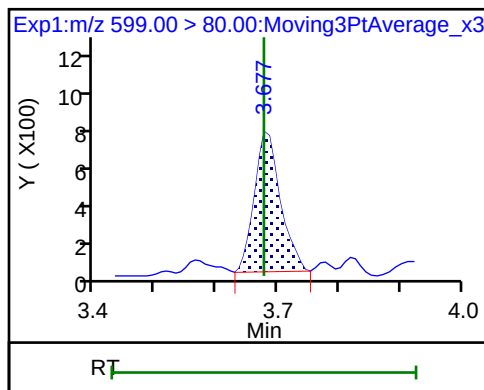
24 Perfluorodecanoic acid (ND)



29 Perfluorodecane Sulfonic acid

29 Perfluorodecane Sulfonic acid

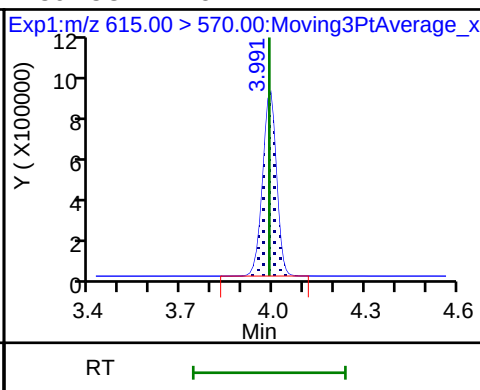
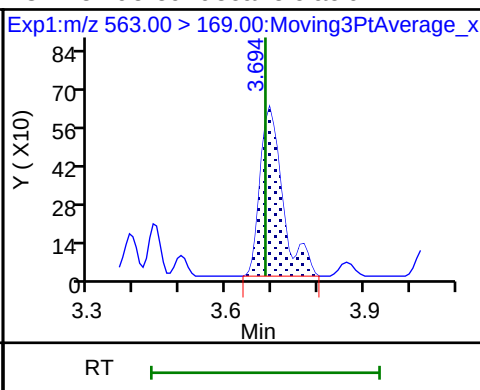
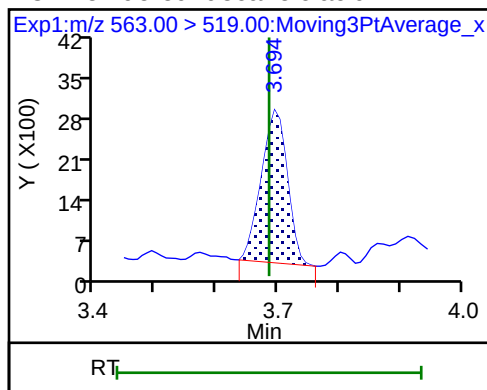
D 30 13C2 PFUnA



31 Perfluoroundecanoic acid

31 Perfluoroundecanoic acid

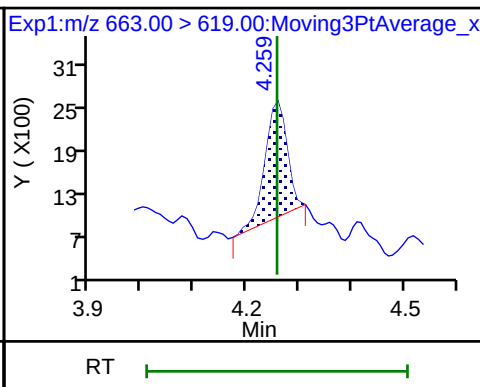
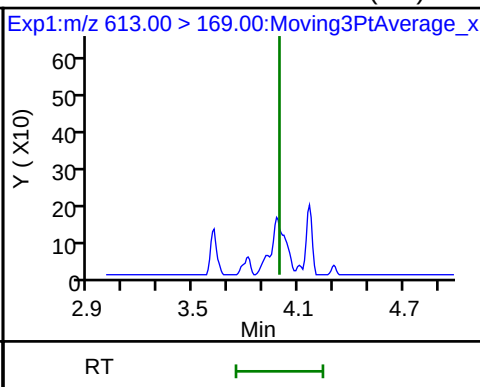
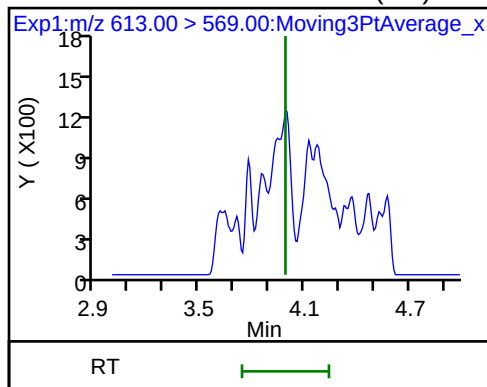
D 36 13C2 PFDaA



37 Perfluorododecanoic acid (ND)

37 Perfluorododecanoic acid (ND)

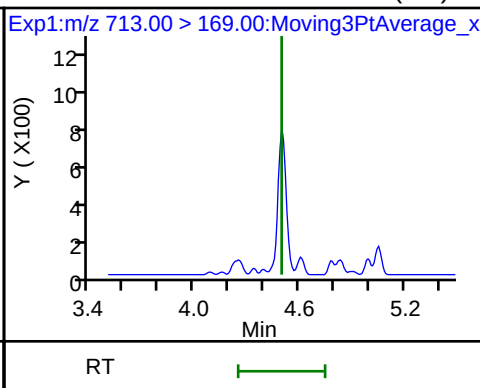
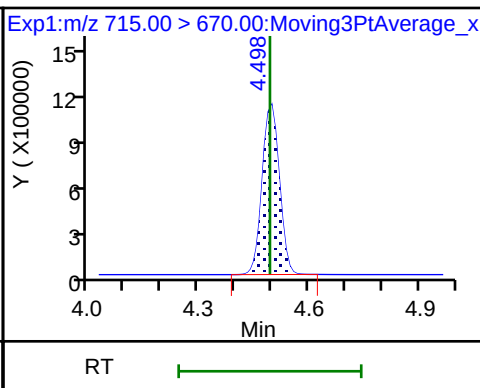
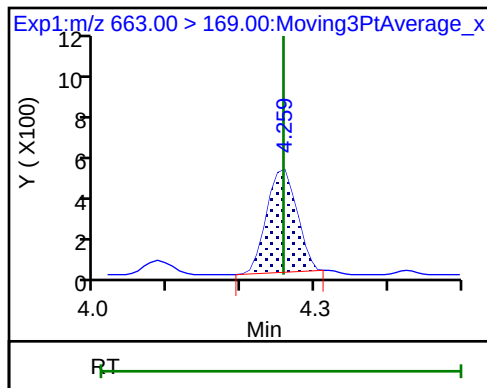
41 Perfluorotridecanoic acid



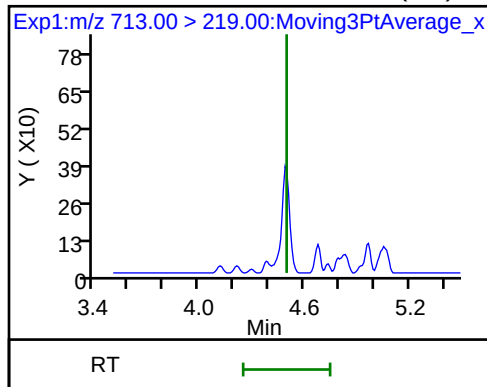
41 Perfluorotridecanoic acid

D 43 13C2-PFTeDA

42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



TestAmerica Sacramento

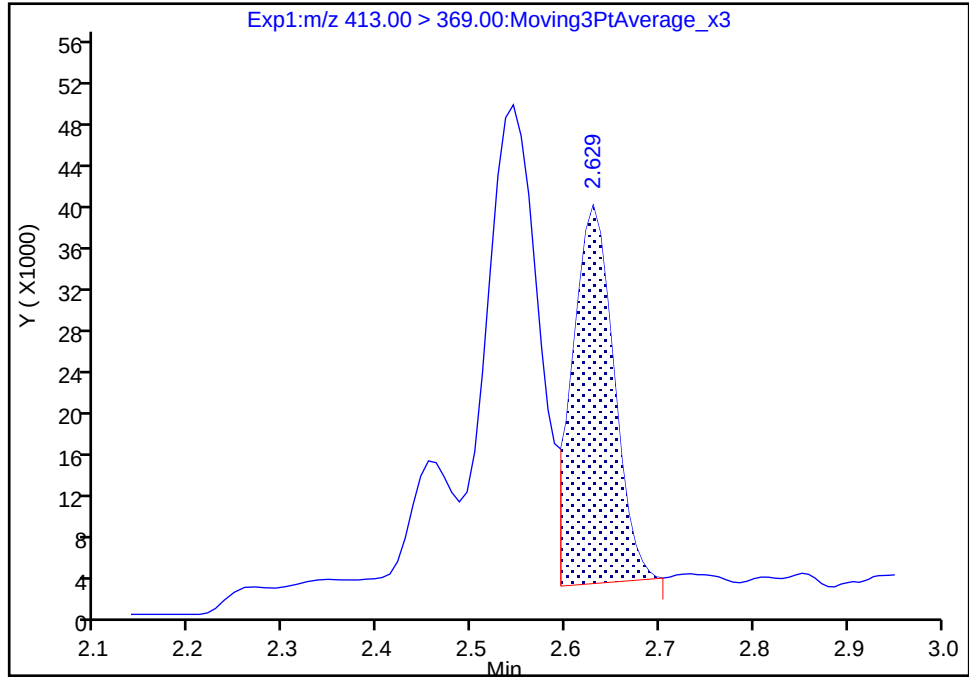
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_013.d
Injection Date: 10-Aug-2018 09:10:52 Instrument ID: A8_N
Lims ID: 320-41704-A-4-A Lab Sample ID: 320-41704-4
Client ID: TP-PFC-032-TPE-D
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

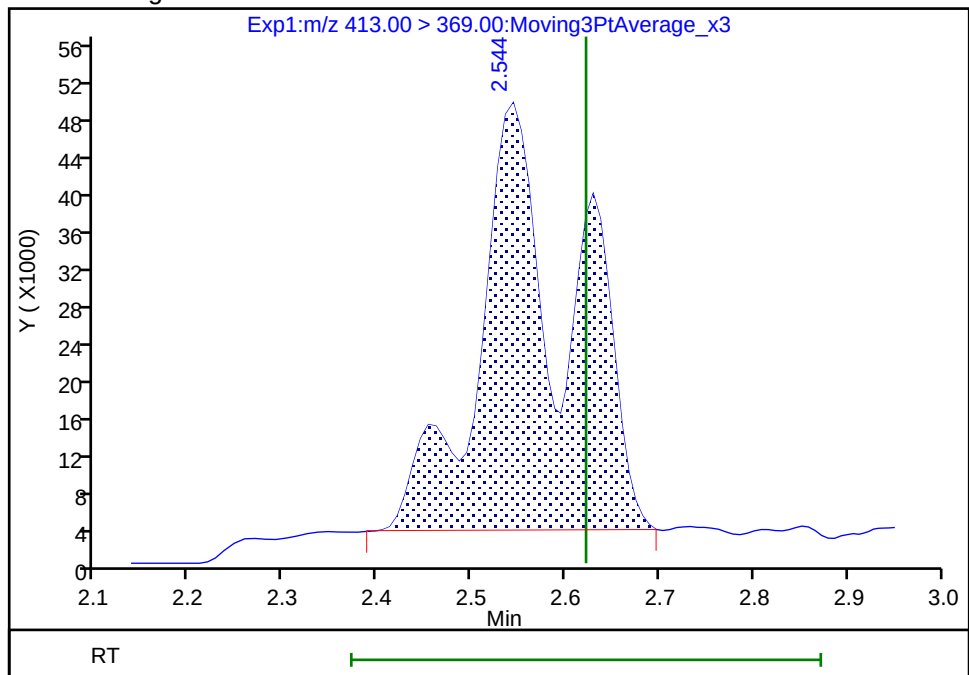
RT: 2.63
Area: 110884
Amount: 0.057266
Amount Units: ng/ml

Processing Integration Results



RT: 2.54
Area: 316376
Amount: 0.163393
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:05:47

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

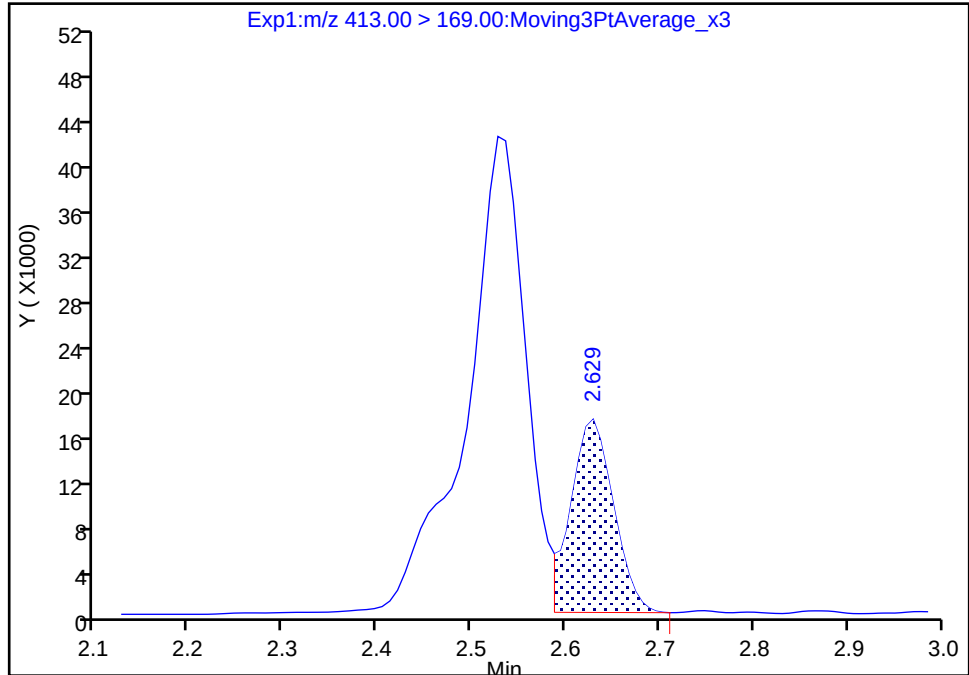
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_013.d
Injection Date: 10-Aug-2018 09:10:52 Instrument ID: A8_N
Lims ID: 320-41704-A-4-A Lab Sample ID: 320-41704-4
Client ID: TP-PFC-032-TPE-D
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

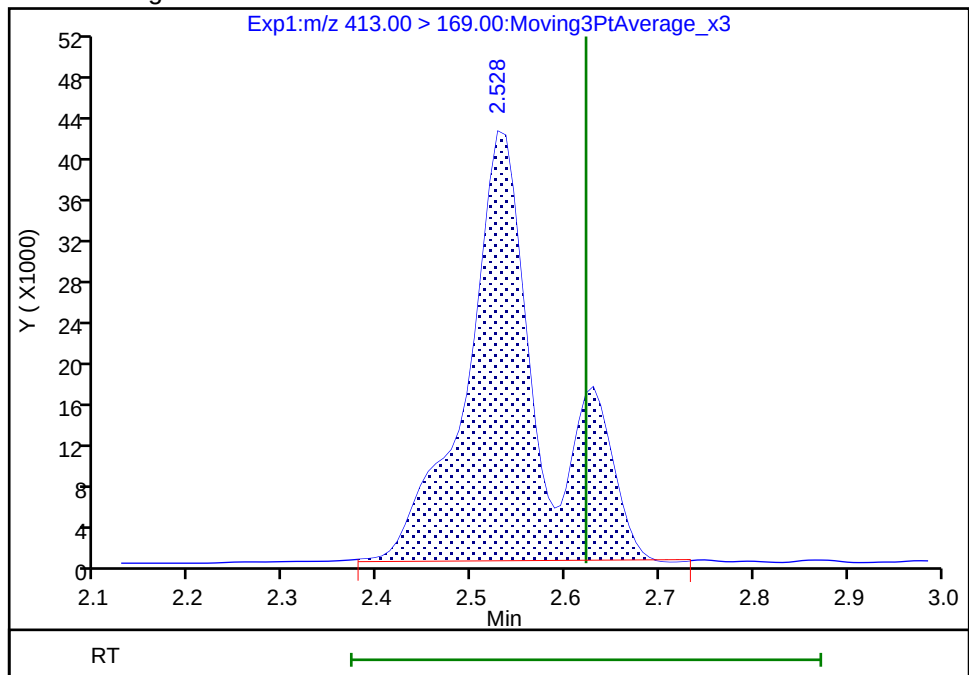
RT: 2.63
Area: 53972
Amount: 0.057266
Amount Units: ng/ml

Processing Integration Results



RT: 2.53
Area: 236574
Amount: 0.163393
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:06:03

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

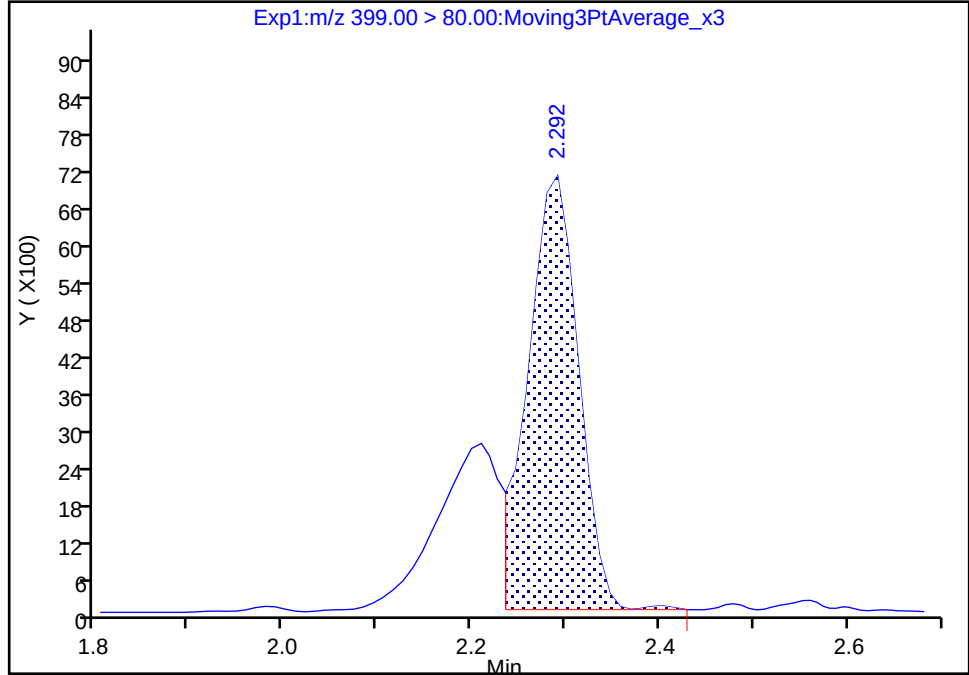
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_013.d				
Injection Date:	10-Aug-2018 09:10:52	Instrument ID:	A8_N		
Lims ID:	320-41704-A-4-A	Lab Sample ID:	320-41704-4		
Client ID:	TP-PFC-032-TPE-D				
Operator ID:	\\SACINSTLCMS01@tai.com	ALS Bottle#:	7	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_QSM5-1 ICAL		
Column:		Detector	EXP1		

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

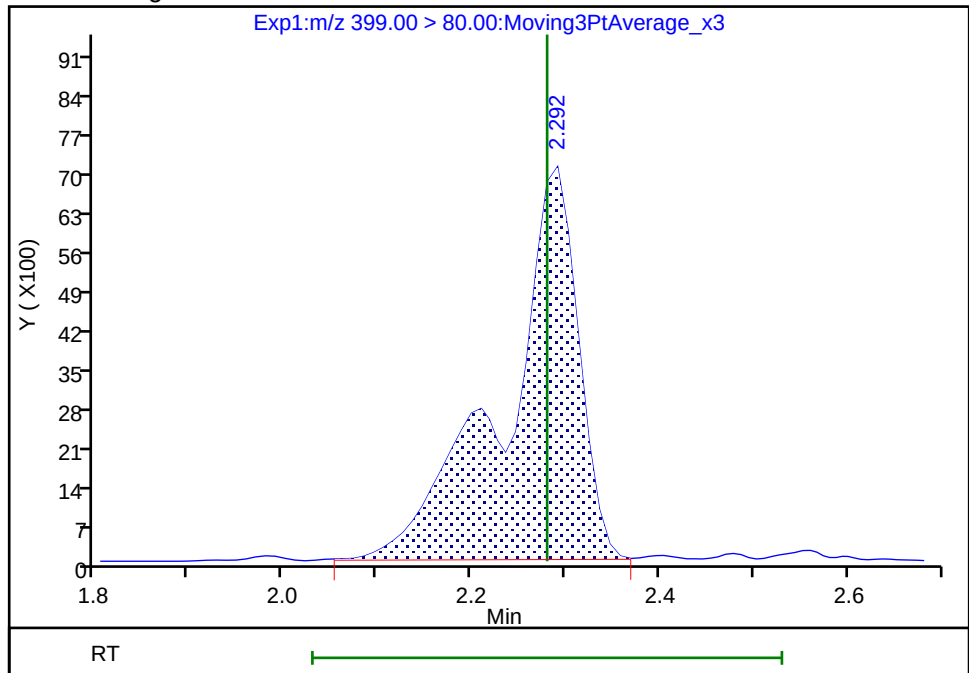
RT: 2.29
Area: 26138
Amount: 0.011292
Amount Units: ng/ml

Processing Integration Results



RT: 2.29
Area: 38731
Amount: 0.016732
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:05:12

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	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		B	M1	M2								
Perfluorobutanoic acid (PFBA)	1.0356 0.9385	0.9092 0.9295	0.9181	0.9138	0.9275	AveID		0.9389				4.7		20.0			
Perfluoropentanoic acid (PFPeA)	1.3867 1.1127	1.0717 1.1007	1.0769	1.1120	1.1037	AveID		1.1378				9.8		20.0			
Perfluorobutanesulfonic acid (PFBS)	76.063 79.702	72.042 71.920	75.499	79.131	77.346	AveID		75.957				4.1		20.0			
4:2 FTS	16.899 16.409	15.948 15.581	16.354	17.979	16.820	AveID		16.570				4.7		20.0			
Perfluorohexanoic acid (PFHxA)	1.1713 1.0157	0.9838 0.9930	0.9663	1.0078	1.0064	AveID		1.0206				6.7		20.0			
Perfluoropentanesulfonic acid	68.597 72.591	70.149 63.027	67.160	70.677	70.259	AveID		68.923				4.5		20.0			
Perfluoroheptanoic acid (PFHpA)	+++++ 1.0462	1.0598 1.0766	1.0410	1.0735	1.0740	AveID		1.0619				1.4		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2251 1.0319	1.1827 1.0319	1.0717	1.0213	1.0237	AveID		1.0841				7.8		20.0			
6:2 FTS	1.7499 1.5710	1.5746 1.6133	1.4237	1.5556	1.5255	AveID		1.5734				6.2		20.0			
Perfluorooctanoic acid (PFOA)	1.2008 1.0886	1.2853 1.0557	1.0978	1.0896	1.0969	AveID		1.1307				7.2		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2610 1.2616	1.2442 1.2011	1.1885	1.2551	1.2619	AveID		1.2391				2.5		20.0			
Perfluorononanoic acid (PFNA)	1.1473 1.0799	1.0748 1.0323	1.0182	0.9962	1.0249	AveID		1.0534				4.9		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.1452 1.0892	1.0806 1.0719	1.0331	1.0486	1.0477	AveID		1.0738				3.5		20.0			
Perfluorononanesulfonic acid	0.7326 0.7691	0.7576 0.7460	0.7565	0.7459	0.7575	AveID		0.7522				1.6		20.0			

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.: 320-41704-1 Analy Batch No.: 238193
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	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		B	M1	M2								
8:2 FTS	1.3250 1.2730	1.4395 1.3051	1.2793	1.2063	1.2657	AveID		1.2991				5.6		20.0			
Perfluorodecanoic acid (PFDA)	1.0978 0.9968	1.0000 0.9777	1.0353	0.9399	0.9748	AveID		1.0032				5.1		20.0			
Perfluorooctane Sulfonamide (FOSA)	0.9400 1.0032	0.9765 0.9376	0.9545	0.9847	1.0189	AveID		0.9736				3.2		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9510 0.9835	1.0084 0.9888	0.9336	0.9540	0.9328	AveID		0.9646				3.0		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6051 0.6390	0.6643 0.6091	0.6429	0.6182	0.6451	AveID		0.6320				3.4		20.0			
Perfluoroundecanoic acid (PFUnA)	++++ 1.0924	1.2343 1.0863	1.0961	1.1589	1.0738	AveID		1.1236				5.5		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.9845 0.8814	0.9491 0.9072	0.8112	0.8526	0.8566	AveID		0.8918				6.7		20.0			
Perfluorododecanoic acid (PFDoA)	1.1896 1.0745	1.1772 1.0999	1.0449	1.1145	1.0884	AveID		1.1127				4.8		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.0415 1.1188	1.0997 1.0389	1.0944	1.0656	1.0680	AveID		1.0753				2.8		20.0			
Perfluorotetradecanoic acid (PFTeA)	++++ 0.2376	0.2550 0.2466	0.2390	0.2330	0.2410	AveID		0.2420				3.2		20.0			
13C4 PFBA	1.3454 1.4071	1.3544 1.4354	1.3670	1.3767	1.4083	Ave		1.3849				2.4		20.0			
13C5 PFPeA	0.9142 0.9681	0.9515 0.9792	0.9416	0.9284	0.9928	Ave		0.9537				2.9		20.0			
13C3-PFBS	0.0217 0.0217	0.0221 0.0231	0.0222	0.0212	0.0224	Ave		0.0221				2.7		20.0			
13C2 PFHxA	1.0908 1.0709	1.0832 1.0771	1.0664	1.0648	1.1220	Ave		1.0822				1.8		20.0			
13C4-PFHpA	1.0528 1.0755	1.0748 1.0417	1.0614	1.0647	1.0848	Ave		1.0651				1.4		20.0			
18O2 PFHxS	1.3540 1.3675	1.4005 1.3474	1.3411	1.3518	1.3975	Ave		1.3657				1.8		20.0			
M2-6:2FTS	0.2197 0.2237	0.2210 0.2189	0.2309	0.2274	0.2275	Ave		0.2242				2.0		20.0			
13C4 PFOA	0.9700 0.9794	0.9570 0.9943	0.9864	0.9624	0.9914	Ave		0.9773				1.5		20.0			
13C4 PFOS	0.8675 0.8973	0.8804 0.9183	0.9045	0.8918	0.9213	Ave		0.8973				2.2		20.0			
13C5 PFNA	0.8612 0.8554	0.8748 0.8585	0.8921	0.8848	0.9123	Ave		0.8770				2.4		20.0			

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.: 320-41704-1 Analy Batch No.: 238193
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	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		B	M1	M2								
M2-8:2FTS	0.2727 0.2715	0.2729 0.2567	0.2676	0.2731	0.2806	Ave		0.2707				2.7		20.0			
13C2 PFDA	0.7423 0.7808	0.7526 0.7805	0.7387	0.7911	0.8001	Ave		0.7695				3.2		20.0			
13C8 FOSA	1.1730 1.1817	1.1961 1.2106	1.1997	1.1702	1.1882	Ave		1.1885				1.2		20.0			
d3-NMeFOSAA	0.3925 0.3861	0.3877 0.3984	0.3885	0.3872	0.4143	Ave		0.3935				2.6		20.0			
d5-NEtFOSAA	0.4192 0.3947	0.4132 0.3750	0.4229	0.4161	0.4128	Ave		0.4077				4.2		20.0			
13C2 PFUnA	0.6182 0.6069	0.6026 0.6096	0.6343	0.6068	0.6538	Ave		0.6189				3.0		20.0			
13C2 PFDoA	0.6320 0.6494	0.6378 0.6472	0.6693	0.6531	0.6902	Ave		0.6541				3.0		20.0			
13C2-PFTeDA	0.8409 0.8358	0.8205 0.8213	0.8511	0.8289	0.8364	Ave		0.8335				1.3		20.0			
13C2-PFHxDA	1.6553 1.6633	1.6811 1.6556	1.6239	1.6406	1.6546	Ave		1.6535				1.1		20.0			

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.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			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)		AveID	57127 10686384	100389 19976933	522272	2011540	5049773	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	51978 8717868	83129 16137329	421991	1650773	4235935	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	59862 12353528	114549 21980500	616670	2375205	5929736	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	14052 2687262	26792 5031154	141135	570176	1362407	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	52384 8802526	86871 16015982	428854	1715767	4365425	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	57284 11938702	118353 20439230	582073	2251038	5715419	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	+++++ 9106263	92858 16791846	459833	1827459	4504362	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	61896 10391537	122877 18945578	544267	2008773	5033358	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	14940 2696182	26890 5013052	129666	536262	1272183	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	47808 8637324	100379 15733520	451059	1678386	4208258	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	42699 8721667	85012 15722427	425894	1703787	4278634	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	40510 7475851	76644 13269892	377996	1409363	3614991	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	37801 7339820	71970 13677354	360873	1387650	3462772	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanesulfonic acid		AveID	25016 5361178	52199 9847776	273347	1021056	2589883	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
8:2 FTS		AveID	14190 2679186	30677 4806399	136487	504558	1315230	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			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
Perfluorodecanoic acid (PFDA)		AveID	33414 6298810	61353 11426488	318256	1188927	3015215	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctane Sulfonamide (FOSA)		AveID	45210 9594151	95215 16995473	476525	1842464	4680280	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	15304 3073336	31870 5898014	150940	590682	1493989	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	20747 4472904	45962 8074266	233277	849835	2214864	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	++++ 5365541	60636 9915678	289310	1124406	2714159	++++ 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16923 2815576	31965 5094367	142770	567205	1366918	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	30826 5646629	61213 10658790	291016	1163733	2903966	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	26989 5879570	57183 10067689	304796	1112653	2849697	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	++++ 1606848	17056 3032661	84652	308839	779223	++++ 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5516377 5693569	5520570 5373122	5688815	5503224	5444583	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	3748386 3917323	3878229 3665379	3918495	3711287	3838069	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	82796 81531	83639 80382	85930	78945	80654	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4472467 4333101	4415087 4032113	4437948	4256324	4337626	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4316698 4351928	4381099 3899256	4417214	4255889	4193874	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5251983 5234562	5400125 4771422	5279483	5111728	5111206	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	855574 859900	855666 778460	912690	863649	835688	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3977347 3963063	3900845 3722009	4104790	3847208	3832692	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3400422 3471061	3430647 3286355	3598367	3408113	3404908	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3530907 3461355	3565521 3213782	3712571	3536917	3527035	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1070959 1052330	1065531 920670	1066887	1045687	1039099	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C2 PFDA	13PF OA	Ave	3043654 3159574	3067735 2921735	3074087	3162481	3093053	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			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
13C8 FOSA	13PF OA	Ave	4809407 4781606	4875140 4531636	4992636	4677735	4593505	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1609182 1562466	1580220 1491160	1616798	1547904	1601576	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1718969 1597197	1684036 1403844	1760050	1663128	1595779	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2534521 2455806	2456263 2281933	2639555	2425508	2527555	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2591339 2627551	2599869 2422707	2785129	2610480	2668181	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3447891 3382019	3344339 3074334	3541707	3313318	3233399	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6786819 6730439	6852227 6197635	6757749	6558204	6396595	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

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
Perfluorobutanoic acid (PFBA)	10.3 -1.0	-3.2	-2.2	-2.7	-1.2	0.0	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	21.9 -3.3	-5.8	-5.3	-2.3	-3.0	-2.2	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	0.1 -5.3	-5.2	-0.6	4.2	1.8	4.9	30 30	30	30	30	30	30
4:2 FTS	2.0 -6.0	-3.8	-1.3	8.5	1.5	-1.0	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	14.8 -2.7	-3.6	-5.3	-1.3	-1.4	-0.5	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-0.5 -8.6	1.8	-2.6	2.5	1.9	5.3	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	++++ 1.4	-0.2	-2.0	1.1	1.1	-1.5	30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	13.0 -4.8	9.1	-1.1	-5.8	-5.6	-4.8	30 30	30	30	30	30	30
6:2 FTS	11.2 2.5	0.1	-9.5	-1.1	-3.0	-0.1	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	6.2 -6.6	13.7	-2.9	-3.6	-3.0	-3.7	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	1.8 -3.1	0.4	-4.1	1.3	1.8	1.8	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	8.9 -2.0	2.0	-3.3	-5.4	-2.7	2.5	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	6.7 -0.2	0.6	-3.8	-2.3	-2.4	1.4	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-2.6 -0.8	0.7	0.6	-0.8	0.7	2.2	30 30	30	30	30	30	30
8:2 FTS	2.0 0.5	10.8	-1.5	-7.1	-2.6	-2.0	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

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
Perfluorodecanoic acid (PFDA)	9.4 -2.5	-0.3	3.2	-6.3	-2.8	-0.6	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-3.5 -3.7	0.3	-2.0	1.1	4.6	3.0	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-1.4 2.5	4.5	-3.2	-1.1	-3.3	2.0	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-4.3 -3.6	5.1	1.7	-2.2	2.1	1.1	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	++++ -3.3	9.8	-2.5	3.1	-4.4	-2.8	30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	10.4 1.7	6.4	-9.0	-4.4	-3.9	-1.2	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	6.9 -1.2	5.8	-6.1	0.2	-2.2	-3.4	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	-3.1 -3.4	2.3	1.8	-0.9	-0.7	4.1	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	++++ 1.9	5.4	-1.2	-3.7	-0.4	-1.8	30	30	30	30	30	30

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_002.d
 Lims ID: IC L1 Full
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 06-Aug-2018 11:10:09 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@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:16:53 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: westendorfc

Date: 06-Aug-2018 14:22:54

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	1.401	1.395	0.006	0.543	5516377	2.43		97.1	8663	
2 Perfluorobutyric acid										
212.90 > 169.00	1.401	1.397	0.004	1.000	57127	0.0276		110	6.0	
D 3 13C5-PFPeA										
267.90 > 223.00	1.646	1.639	0.007	0.638	3748386	2.40		95.9	8167	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.646	1.643	0.003	1.000	51978	0.0305		122	3.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.678	1.675	0.003	0.651	82796	2.29		98.4	394	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.678	1.676	0.002	1.000	59862	0.0221		100	27.4	
298.90 > 99.00	1.686	1.676	0.010	1.005	26611		2.25(1.25-3.74)	100	16.7	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.875	1.875	0.0	1.117	14052	0.0238		102	121	
D 60 M2-4:2FTS										
329.00 > 81.00	1.883	1.875	0.008	0.730	605486	NC			831	
D 7 13C2 PFHxA										
315.00 > 270.00	1.912	1.908	0.004	0.741	4472467	2.52		101	8390	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.912	1.908	0.004	1.000	52384	0.0287		115	14.5	
313.00 > 119.00	1.923	1.908	0.015	1.005	4815		10.88(5.03-15.10)	115	12.0	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.933	1.930	0.003	1.152	57284	0.0233		99.5	135	
349.00 > 99.00	1.933	1.930	0.003	1.152	21167		2.71(1.36-4.07)	99.5	28.8	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.006	2.003	0.003	1.000	9494	NC			3.9	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.006	2.003	0.003	0.778	326098	NC			976	
D 9 13C4-PFHpA										
367.00 > 322.00	2.233	2.227	0.006	0.866	4316698	2.47		98.8	9522	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.233	2.228	0.005	1.000	70955	0.0387		155	13.9	
363.00 > 169.00	2.233	2.228	0.005	1.000	28093		2.53(1.13-3.40)	155	60.1	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.243	2.239	0.004	1.000	61896	0.0257		113	144	
399.00 > 99.00	2.243	2.239	0.004	1.000	21470		2.88(1.50-4.49)	113	24.0	
D 11 18O2 PFHxS										
403.00 > 84.00	2.243	2.239	0.004	0.870	5251983	2.34		99.1	5490	
65 ADONA										
377.00 > 251.00	2.277	2.271	0.006	0.773	119095	NC			369	
377.00 > 85.00	2.277	2.271	0.006	0.773	70717		1.68(0.84-2.53)		160	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.557	2.548	0.009	1.000	14940	0.0264		111	29.3	
D 12 M2-6:2FTS										
429.00 > 81.00	2.557	2.549	0.008	0.992	855574	2.33		98.0	2284	
D 73 13C8 PFOA										
421.00 > 376.00	2.579	2.571	0.008	1.000	7829980	NC			11714	
D 14 13C4 PFOA										
417.00 > 372.00	2.579	2.573	0.006	1.000	3977347	2.48		99.3	6149	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.579	2.574	0.005	1.000	47808	0.0266		106	5.0	
413.00 > 169.00	2.579	2.574	0.005	1.000	27163		1.76(0.84-2.52)	106	59.5	
* 62 13C2-PFOA										
415.00 > 370.00	2.579	2.575	0.004		4100164	2.50			7067	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.586	2.583	0.003	0.878	42699	0.0242		102	133	
449.00 > 99.00	2.586	2.583	0.003	0.878	10587		4.03(1.94-5.82)	102	22.5	
D 72 13C8 PFOS										
507.00 > 99.00	2.944	2.938	0.006	1.141	1668266	NC			5837	
D 18 13C4 PFOS										
503.00 > 80.00	2.944	2.939	0.005	1.141	3400422	2.31		96.7	4592	
D 19 13C5 PFNA										
468.00 > 423.00	2.944	2.939	0.005	1.141	3530907	2.45		98.2	7876	
20 Perfluorononanoic acid										
463.00 > 419.00	2.944	2.939	0.005	1.000	40510	0.0272		109	12.3	
463.00 > 169.00	2.944	2.939	0.005	1.000	8595		4.71(1.90-5.69)	109	72.2	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.950	2.940	0.010	1.002	37801	0.0247		107	105	
499.00 > 99.00	2.950	2.940	0.010	1.002	10855		3.48(2.31-6.93)	107	29.5	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.154	3.150	0.004	1.071	61193	NC			259	
D 26 M2-8:2FTS										
529.00 > 81.00	3.284	3.284	0.0	1.273	1070959	2.41		101	2863	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.284	3.285	0.0	1.115	25016	0.0234		97.4	162	
549.00 > 99.00	3.291	3.285	0.007	1.118	10319		2.42(1.33-3.97)	97.4	44.8	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.298	3.286	0.012	1.004	14190	0.0244		102	42.6	
D 23 13C2 PFDA										
515.00 > 470.00	3.298	3.294	0.004	1.279	3043654	2.41		96.5	5778	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.298	3.296	0.002	1.000	33414	0.0274		109	26.5	
513.00 > 169.00	3.298	3.296	0.002	1.000	4888		6.84(2.36-7.09)	109	34.8	
D 21 13C8 FOSA										
506.00 > 78.00	3.320	3.317	0.003	1.287	4809407	2.47		98.7	5689	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.320	3.319	0.001	1.000	45210	0.0241		96.5	291	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.453	3.448	0.005	1.339	1609182	2.49		99.7	4803	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.460	3.453	0.007	1.002	15304	0.0246		98.6	9.3	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.613	3.608	0.005	1.227	20747	0.0231		95.7	187	
599.00 > 99.00	3.620	3.608	0.012	1.230	9035		2.30(1.39-4.16)	95.7	58.0	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.620	3.616	0.004	1.404	1718969	2.57		103	1292	
D 30 13C2 PFUnA										
565.00 > 520.00	3.620	3.620	0.0	1.404	2534521	2.50		99.9	7331	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.627	3.622	0.005	1.002	39159	0.0344		138	28.2	R
563.00 > 169.00	3.620	3.622	-0.002	1.000	5282		7.41(2.12-6.36)	138	39.3	R
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.627	3.623	0.004	1.002	16923	0.0276		110	56.6	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.783	3.781	0.002	1.285	85084	NC			354	
35 MeFOSA										
512.00 > 169.00	3.824	3.826	-0.002		15364	NC			107	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.919	3.913	0.006	1.000	30826	0.0267		107	19.8	
613.00 > 169.00	3.919	3.913	0.006	1.000	5801		5.31(2.13-6.40)	107	54.6	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.919	3.913	0.006	1.194	9310	NC			66.5	
D 36 13C2 PFDaA										
615.00 > 570.00	3.919	3.913	0.006	1.520	2591339	2.42		96.6	4078	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.148	4.148	0.0	1.409	8457	NC			56.6	
699.00 > 99.00	4.148	4.148	0.0	1.409	12505		0.68(0.00-0.00)		138	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.177	4.173	0.004	1.066	26989	0.0242		96.9	12.7	
663.00 > 169.00	4.177	4.173	0.004	1.066	9362		2.88(1.25-3.76)	96.9	74.8	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.405	4.399	0.006	1.708	3447891	2.52		101	9514	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.405	4.400	0.005	1.000	8064	0.0242		96.6	88.6	
713.00 > 219.00	4.413	4.400	0.013	1.002	5513		1.46(0.71-2.13)	96.6	97.0	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.803	4.799	0.004	1.862	6786819	2.50		100	7400	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.814	4.801	0.013	1.002	117463	NC			50.8	
813.00 > 169.00	4.803	4.801	0.002	1.000	21885		5.37(2.86-8.58)		197	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.147	5.136	0.011	1.072	61329	NC			14.1	
913.00 > 169.00	5.140	5.136	0.004	1.070	7812		7.85(3.83-11.48)		103	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Reagents:

LCPFC_LL1_00007

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_002.d

Injection Date: 06-Aug-2018 11:10:09

Instrument ID: A8_N

Lims ID: IC L1 Full

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 10

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

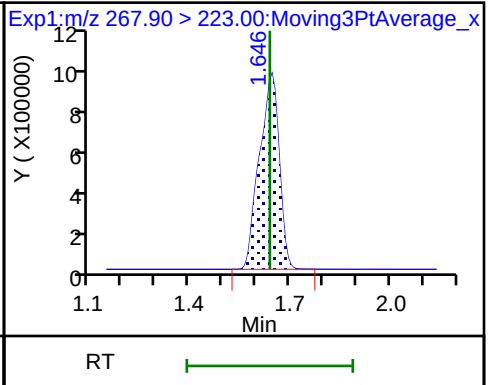
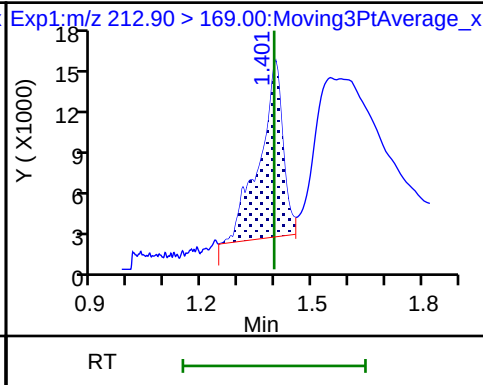
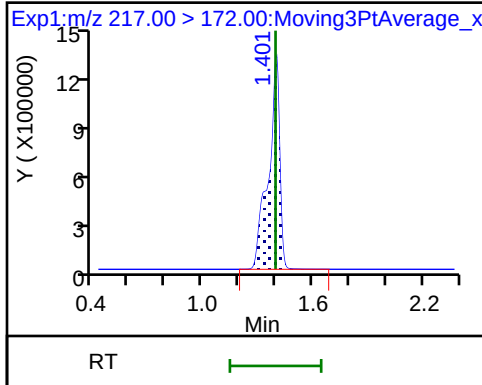
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

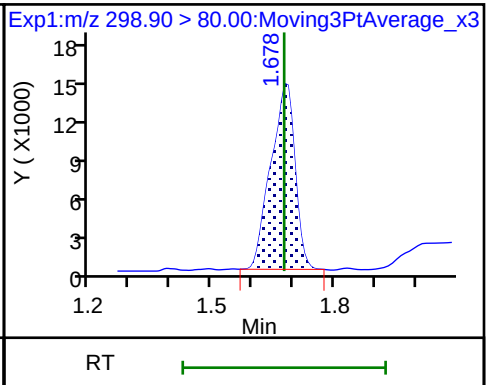
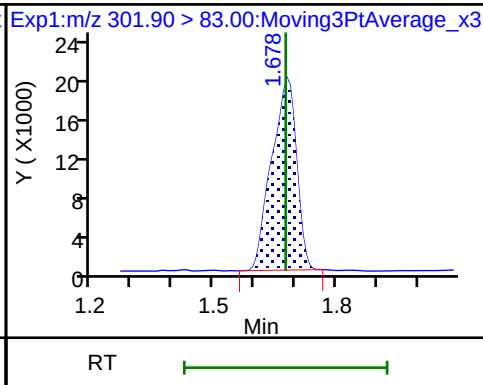
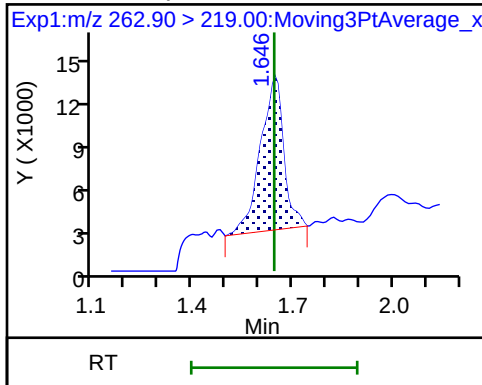
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

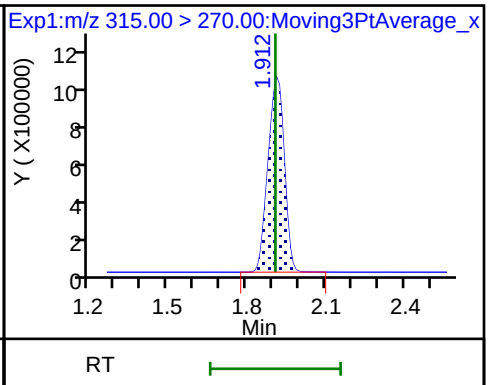
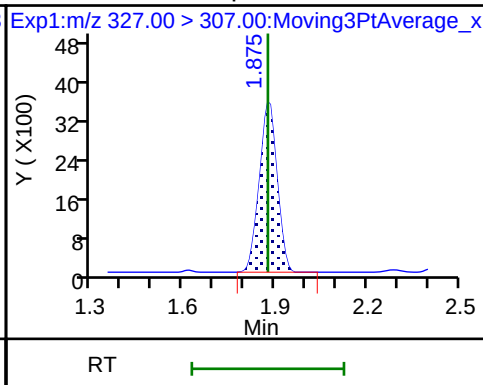
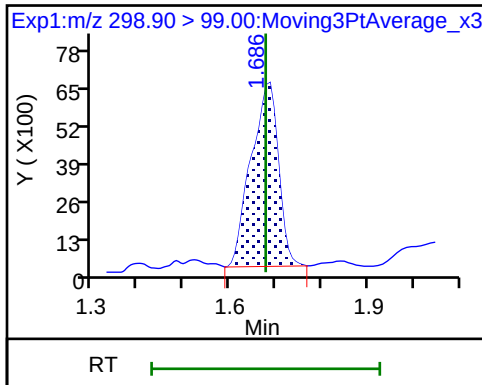
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

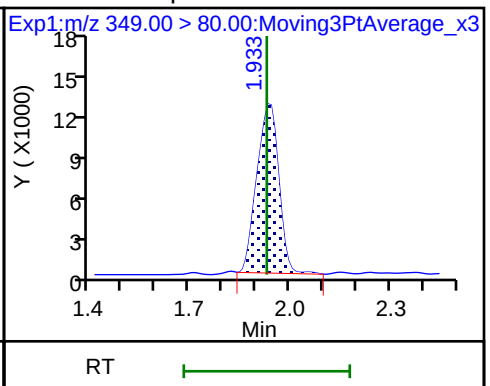
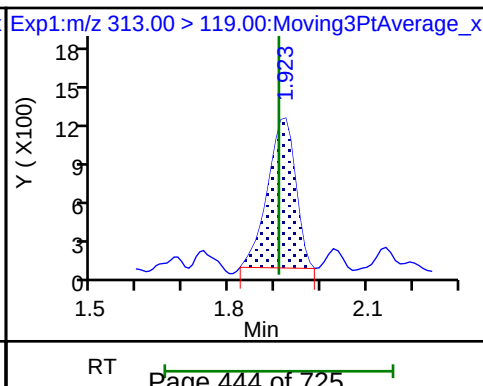
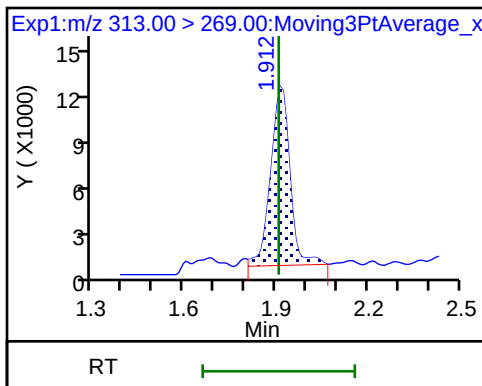
D 7 13C2 PFHxA



6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

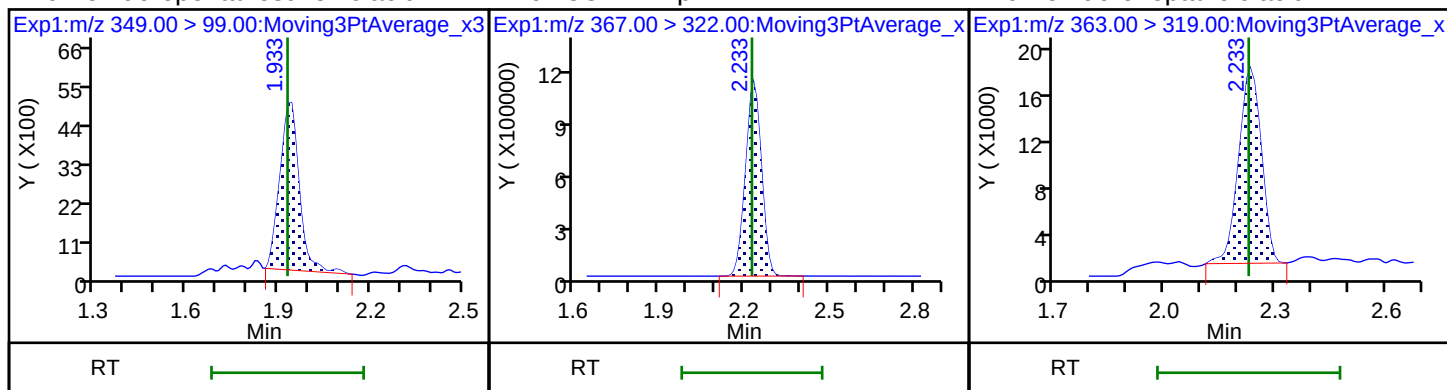
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

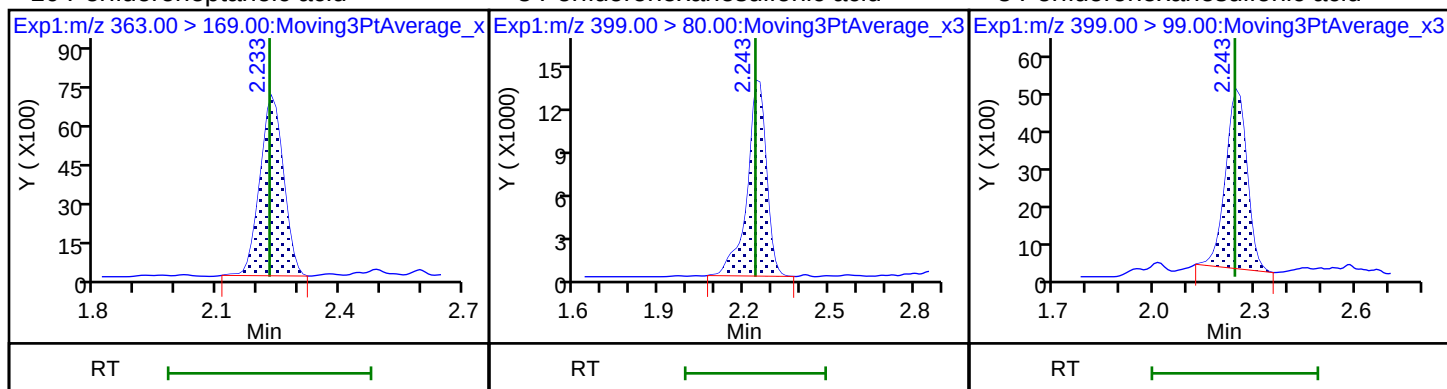
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

8 Perfluorohexanesulfonic acid

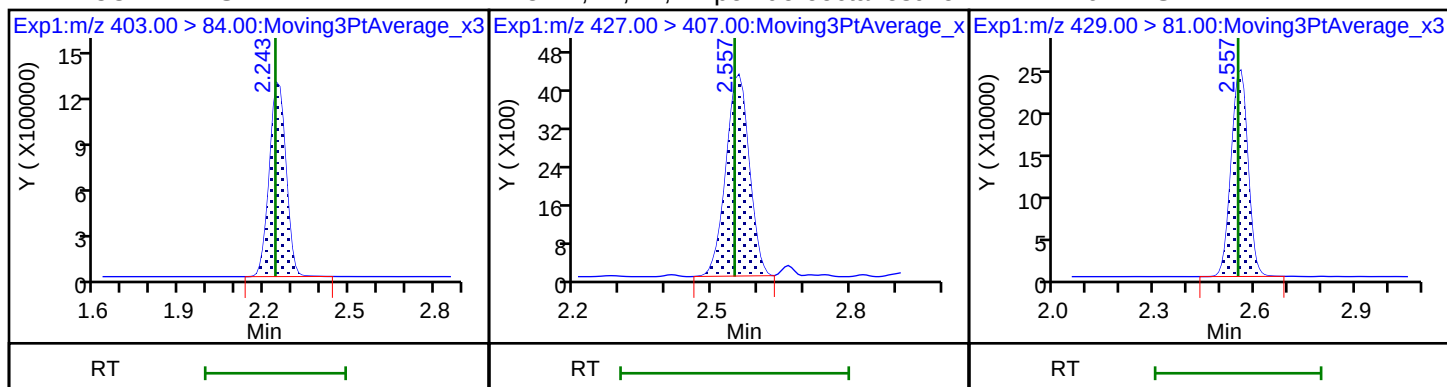
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

13 1H,1H,2H,2H-perfluorooctanesulfonD

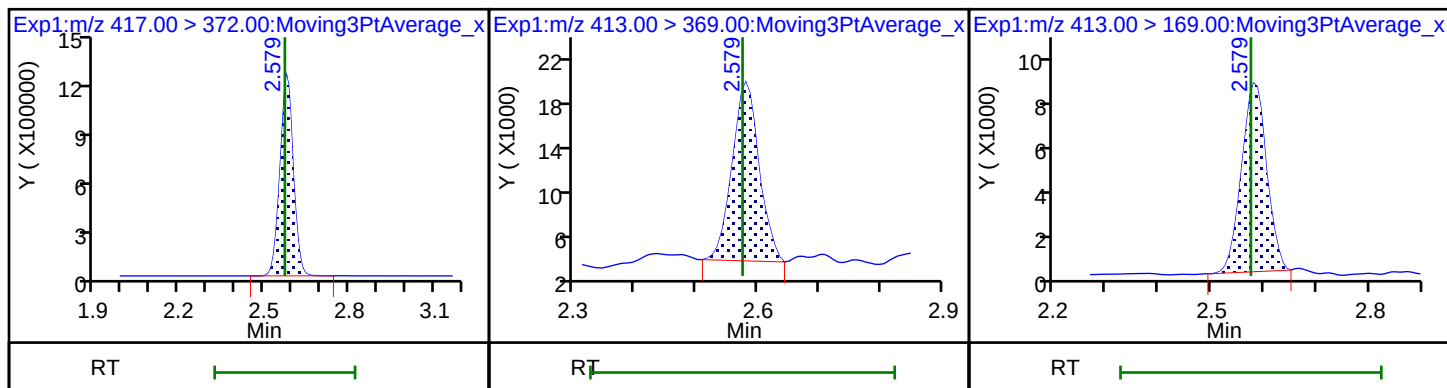
12 M2-6:2FTS



D 14 13C4 PFOA

15 Perfluorooctanoic acid

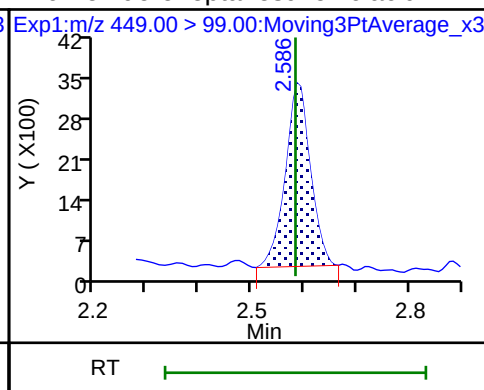
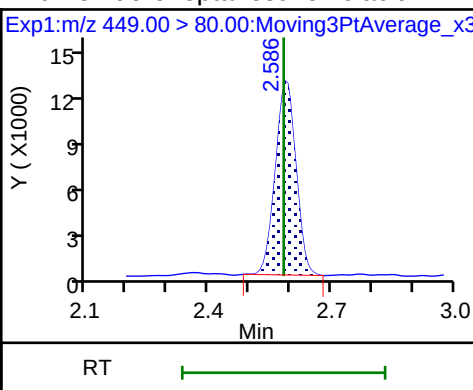
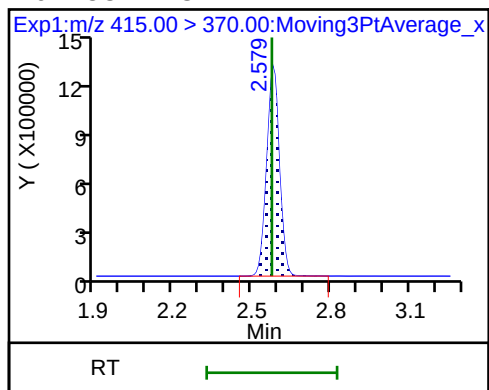
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

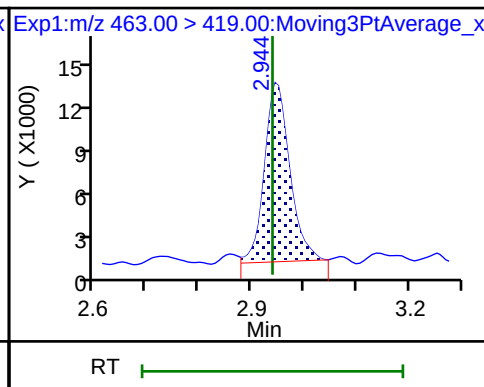
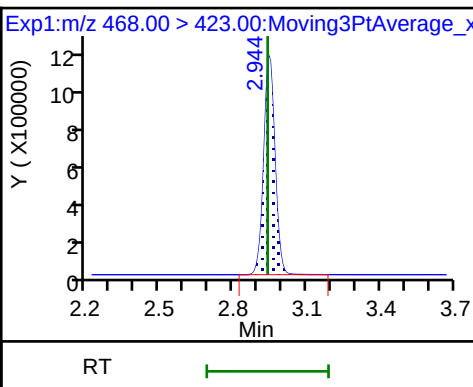
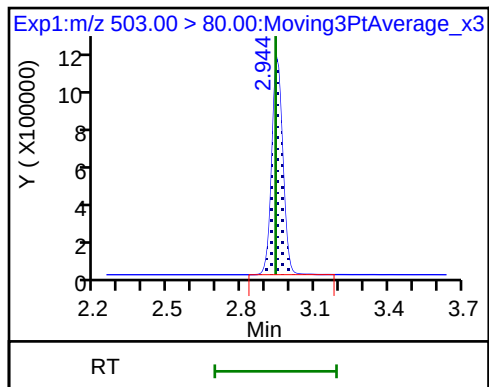
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

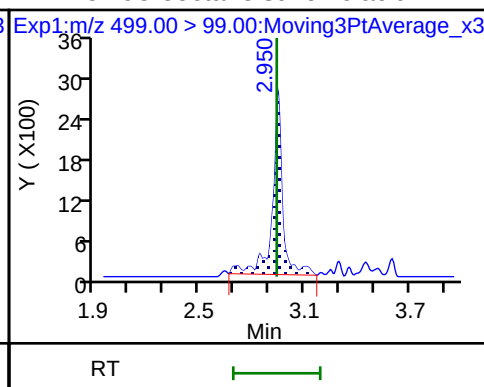
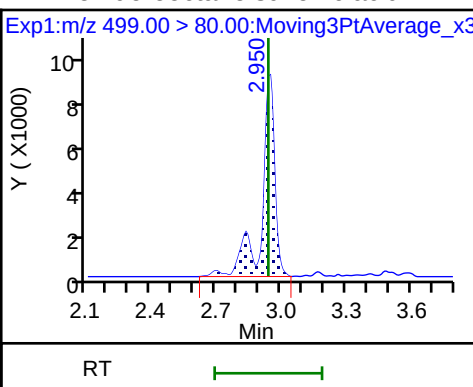
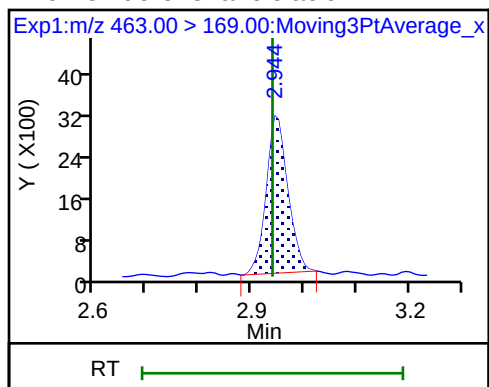
20 Perfluorononanoic acid



20 Perfluorononanoic acid

17 Perfluorooctane sulfonic acid

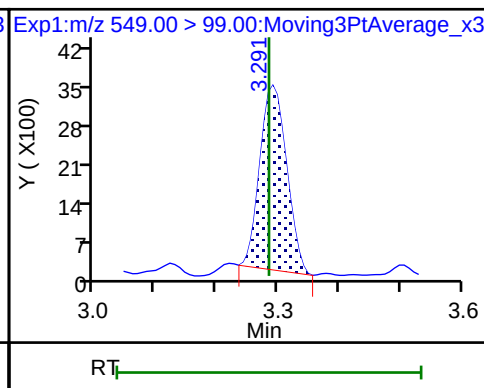
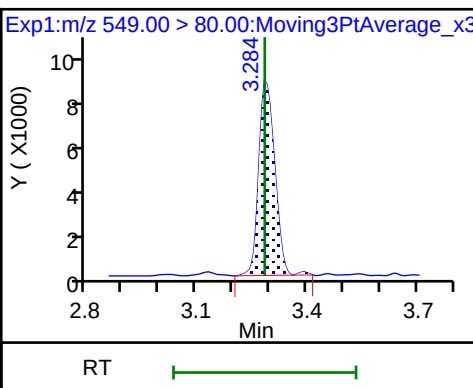
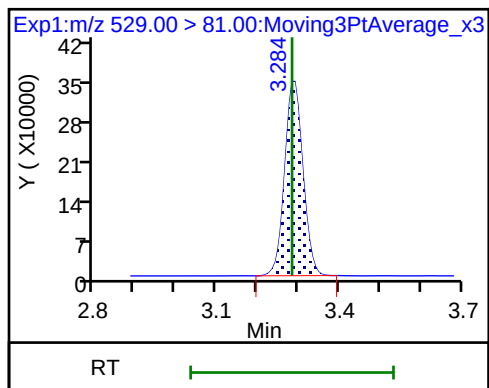
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid

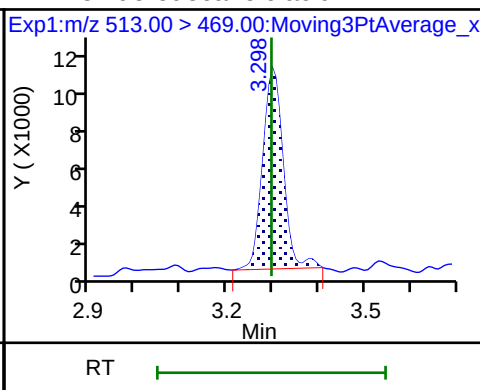
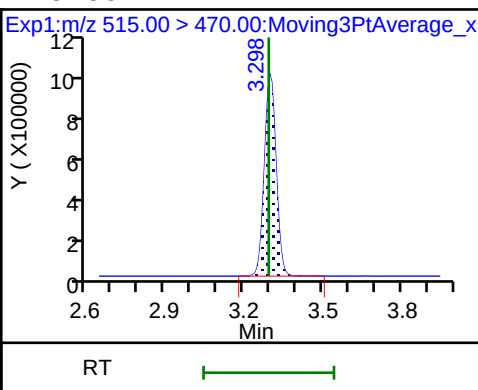
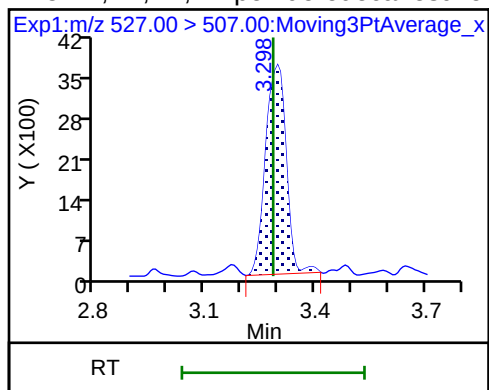
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfonate

D 23 13C2 PFDA

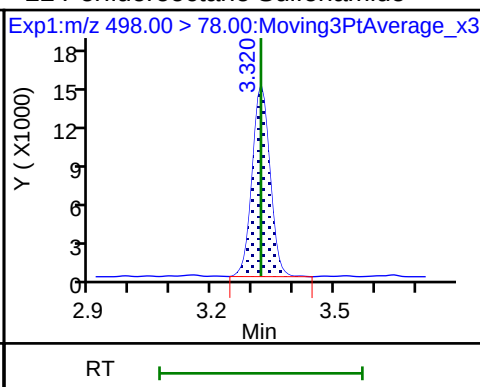
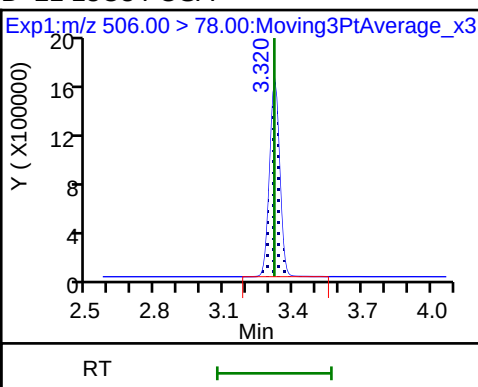
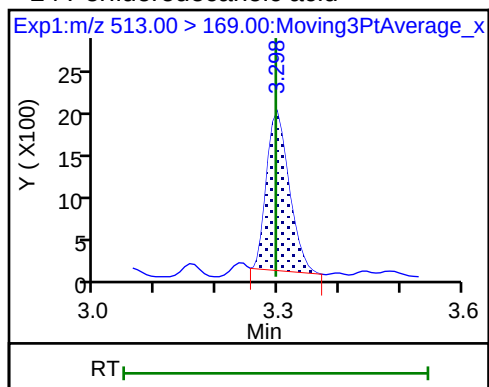
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 21 13C8 FOSA

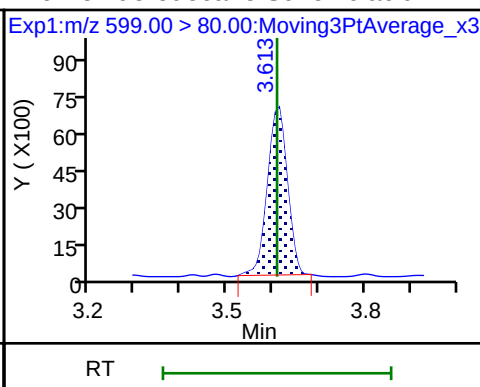
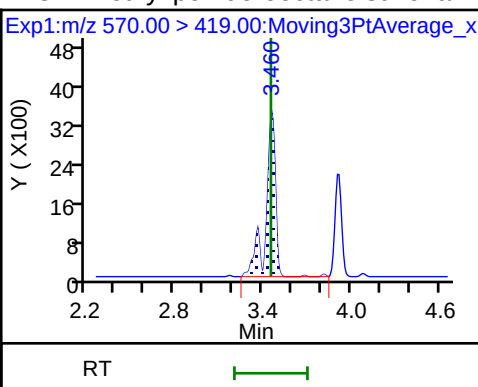
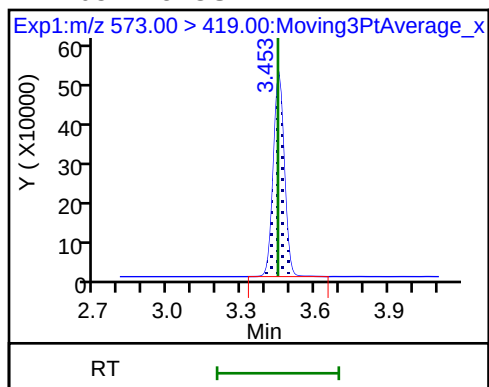
22 Perfluorooctane Sulfonamide



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

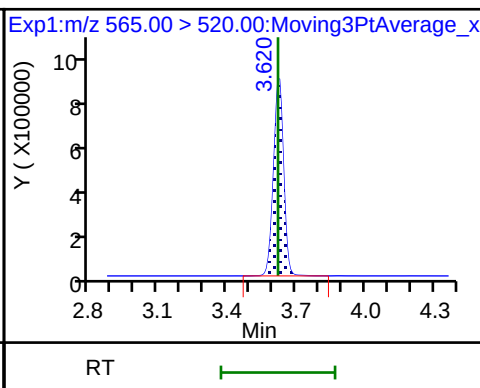
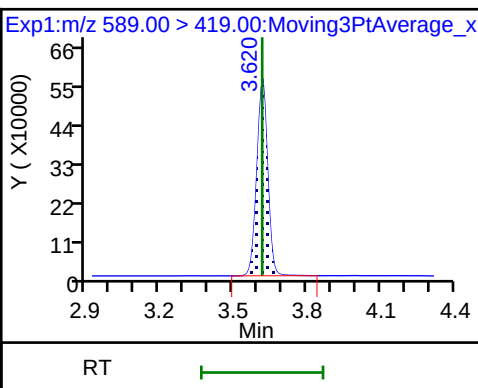
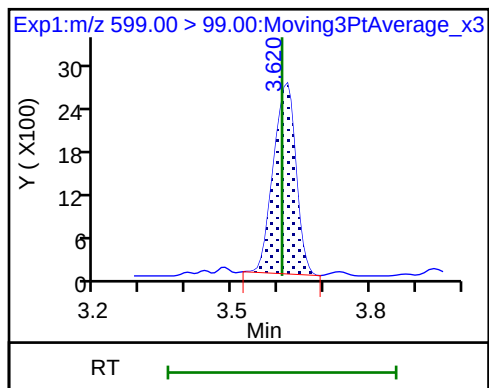
29 Perfluorodecane Sulfonic acid

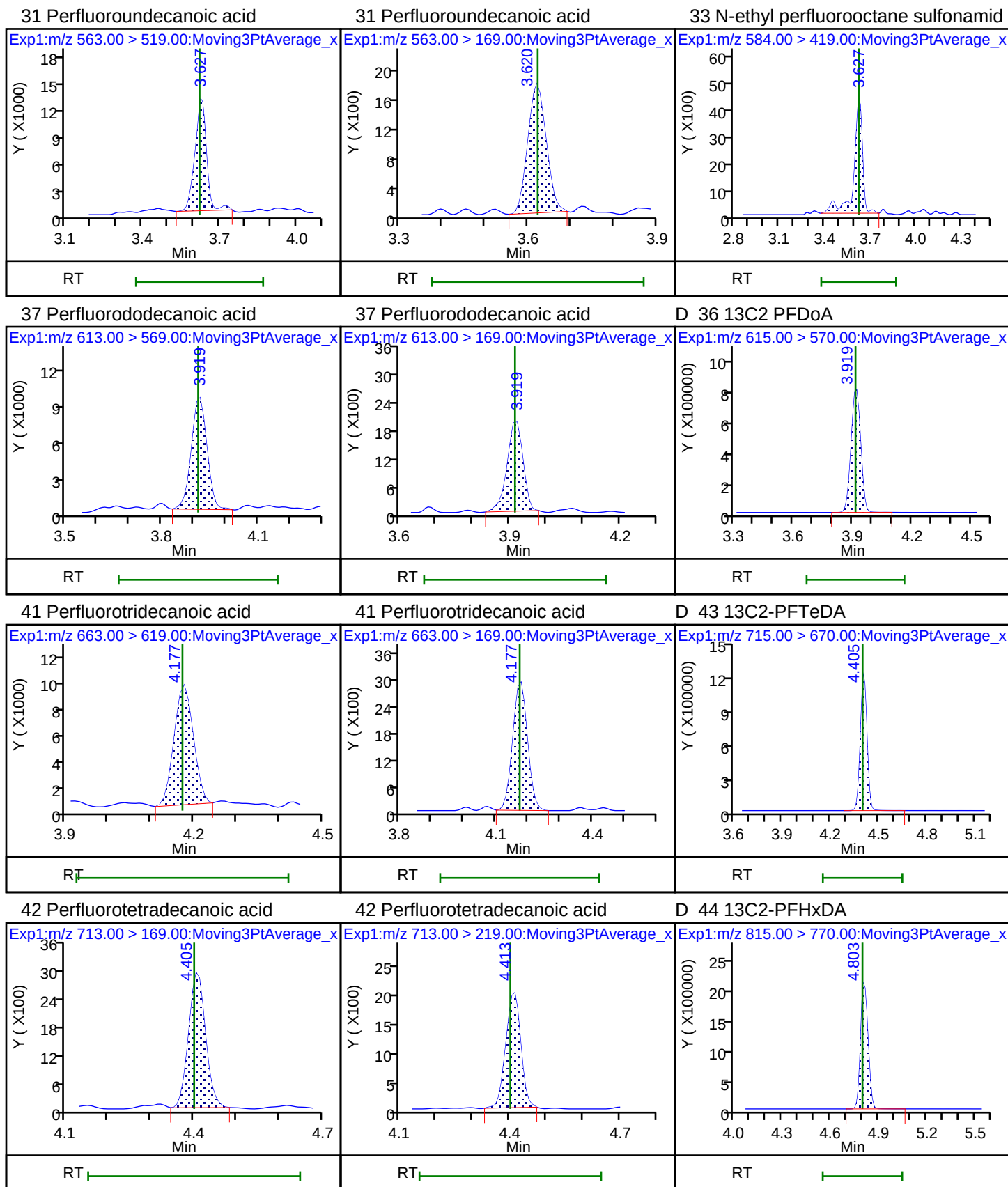


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_003.d
 Lims ID: IC L2 Full
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 06-Aug-2018 11:17:57 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@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:16:59 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: westendorfc

Date: 06-Aug-2018 14:29:16

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	1.394	1.395	-0.001	0.541	5520570	2.44		97.8	9922	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.394	1.397	-0.003	1.000	100389	0.0484		96.8	10.2	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.644	1.639	0.005	0.638	3878229	2.49		99.8	8401	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.644	1.643	0.001	1.000	83129	0.0471		94.2	5.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.651	83639	2.33		100	351	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.676	0.0	1.000	114549	0.0419		94.8	51.2	
298.90 > 99.00	1.676	1.676	0.0	1.000	46700		2.45(1.25-3.74)	94.8	30.6	
D 60 M2-4:2FTS										
329.00 > 81.00	1.880	1.875	0.005	0.730	589543	NC			1139	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.880	1.875	0.005	1.122	26792	0.0449		96.2	390	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.908	-0.001	1.000	86871	0.0482		96.4	22.2	
313.00 > 119.00	1.898	1.908	-0.010	0.995	8895		9.77(5.03-15.10)	96.4	23.2	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.908	-0.001	0.741	4415087	2.50		100	10413	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.930	-0.002	1.151	118353	0.0477		102	348	
349.00 > 99.00	1.939	1.930	0.009	1.157	42210		2.80(1.36-4.07)	102	57.1	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.003	-0.002	0.777	334230	NC			816	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.001	2.003	-0.002	1.000	15610	NC			6.2	
D 9 13C4-PFHpA										
367.00 > 322.00	2.227	2.227	0.0	0.865	4381099	2.52		101	6167	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.228	-0.001	1.000	92858	0.0499		99.8	18.9	
363.00 > 169.00	2.227	2.228	-0.001	1.000	37320		2.49(1.13-3.40)	99.8	83.7	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.239	-0.003	0.869	5400125	2.43		103	4645	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.239	-0.003	1.000	122877	0.0496		109	251	
399.00 > 99.00	2.236	2.239	-0.003	1.000	41779		2.94(1.50-4.49)	109	38.1	
65 ADONA										
377.00 > 251.00	2.269	2.271	-0.002	0.772	237055	NC			440	
377.00 > 85.00	2.269	2.271	-0.002	0.772	142844		1.66(0.84-2.53)		244	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.544	2.548	-0.004	0.997	26890	0.0474		100	38.6	
D 12 M2-6:2FTS										
429.00 > 81.00	2.553	2.549	0.004	0.991	855666	2.34		98.6	2444	
D 73 13C8 PFOA										
421.00 > 376.00	2.568	2.571	-0.003	0.997	7724966	NC			14507	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.573	0.001	1.000	3900845	2.45		97.9	7238	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.574	0.0	1.000	100379	0.0569		114	9.5	
413.00 > 169.00	2.574	2.574	0.0	1.000	49130		2.04(0.84-2.52)	114	101	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.575	-0.001		4076020	2.50			7362	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.002	0.878	85012	0.0478		100	401	
449.00 > 99.00	2.581	2.583	-0.002	0.878	21336		3.98(1.94-5.82)	100	49.1	
D 72 13C8 PFOS										
507.00 > 99.00	2.933	2.938	-0.005	1.139	1726052	NC			3374	
20 Perfluorononanoic acid										
463.00 > 419.00	2.939	2.939	0.0	1.000	76644	0.0510		102	24.0	
463.00 > 169.00	2.933	2.939	-0.006	0.998	17838		4.30(1.90-5.69)	102	95.9	
D 19 13C5 PFNA										
468.00 > 423.00	2.939	2.939	0.0	1.141	3565521	2.49		99.7	4849	
D 18 13C4 PFOS										
503.00 > 80.00	2.939	2.939	0.0	1.141	3430647	2.34		98.1	4945	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.940	-0.001	1.000	71970	0.0467		101	155	
499.00 > 99.00	2.939	2.940	-0.001	1.000	19079		3.77(2.31-6.93)	101	32.7	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.147	3.150	-0.003	1.071	113277	NC			601	
D 26 M2-8:2FTS										
529.00 > 81.00	3.285	3.284	0.001	1.276	1065531	2.41		101	3535	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.285	3.285	0.001	1.118	52199	0.0483		101	318	
549.00 > 99.00	3.285	3.285	0.001	1.118	19699		2.65(1.33-3.97)	101	87.3	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.285	3.286	-0.001	1.000	30677	0.0531		111	130	
D 23 13C2 PFDA										
515.00 > 470.00	3.292	3.294	-0.002	1.279	3067735	2.45		97.8	7563	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.296	0.003	1.002	61353	0.0498		99.7	43.1	
513.00 > 169.00	3.299	3.296	0.003	1.002	12066		5.08(2.36-7.09)	99.7	64.7	
D 21 13C8 FOSA										
506.00 > 78.00	3.313	3.317	-0.004	1.287	4875140	2.52		101	5256	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.319	0.002	1.002	95215	0.0501		100	663	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.339	1580220	2.46		98.5	3859	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.453	0.001	1.002	31870	0.0523		105	38.4	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.606	3.608	-0.002	1.227	45962	0.0507		105	238	
599.00 > 99.00	3.606	3.608	-0.002	1.227	14657		3.14(1.39-4.16)	105	83.7	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.615	3.616	-0.001	1.404	1684036	2.53		101	1215	
D 30 13C2 PFUnA										
565.00 > 520.00	3.622	3.620	0.002	1.407	2456263	2.43		97.4	5363	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.622	3.622	0.0	1.000	60636	0.0549		110	38.2	
563.00 > 169.00	3.629	3.622	0.007	1.002	11793		5.14(2.12-6.36)	110	69.7	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.622	3.623	-0.001	1.002	31965	0.0532		106	133	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.785	3.781	0.004	1.288	186244	NC			799	
35 MeFOSA										
512.00 > 169.00	3.826	3.826	0.0		27155	NC			156	
D 36 13C2 PFDaA										
615.00 > 570.00	3.913	3.913	0.0	1.520	2599869	2.44		97.5	4097	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.913	3.913	0.0	1.191	18880	NC			179	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	61213	0.0529		106	37.0	
613.00 > 169.00	3.913	3.913	0.0	1.000	13716		4.46(2.13-6.40)	106	77.9	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.153	4.148	0.005	1.413	18872	NC			117	
699.00 > 99.00	4.153	4.148	0.005	1.413	25750		0.73(0.00-0.00)		251	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.173	4.173	0.0	1.066	57183	0.0511		102	26.7	
663.00 > 169.00	4.173	4.173	0.0	1.066	17627		3.24(1.25-3.76)	102	142	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.403	4.399	0.004	1.710	3344339	2.46		98.4	7399	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.403	4.400	0.003	1.000	17056	0.0527		105	165	
713.00 > 219.00	4.403	4.400	0.003	1.000	14716		1.16(0.71-2.13)	105	310	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.801	4.799	0.002	1.865	6852227	2.54		102	6967	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.801	4.801	0.0	1.000	174341	NC			76.1	
813.00 > 169.00	4.801	4.801	0.0	1.000	29566		5.90(2.86-8.58)		282	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.136	5.136	0.0	1.070	124240	NC			40.2	
913.00 > 169.00	5.136	5.136	0.0	1.070	15061		8.25(3.83-11.48)		225	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_003.d

Injection Date: 06-Aug-2018 11:17:57

Instrument ID: A8_N

Lims ID: IC L2 Full

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 11

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

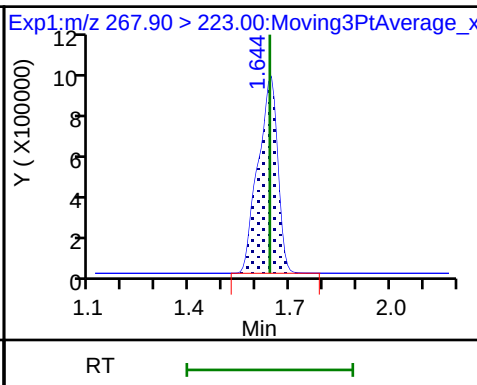
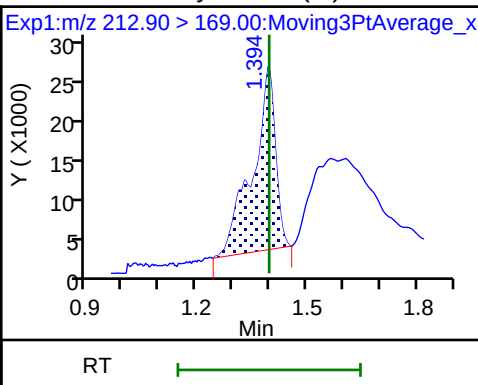
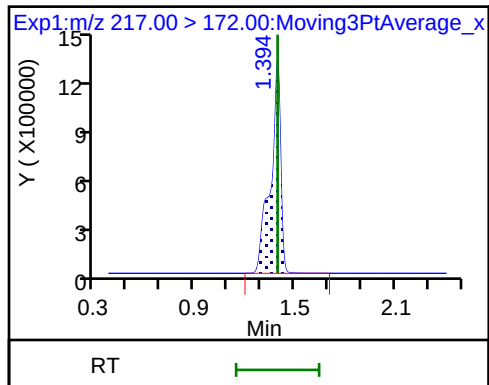
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

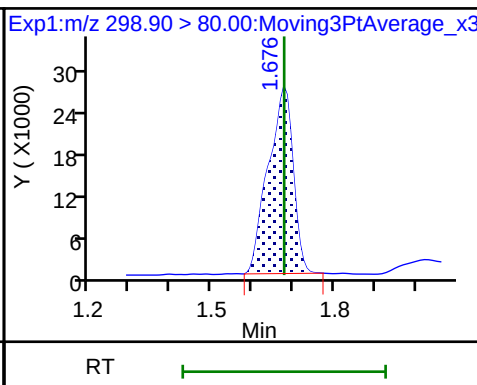
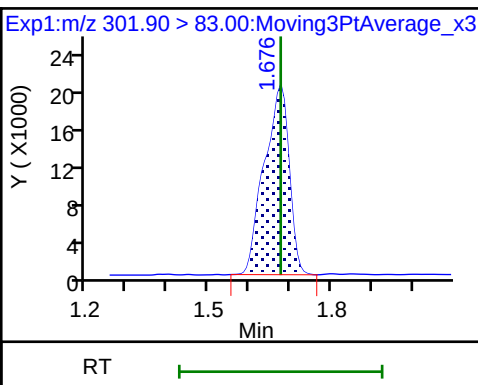
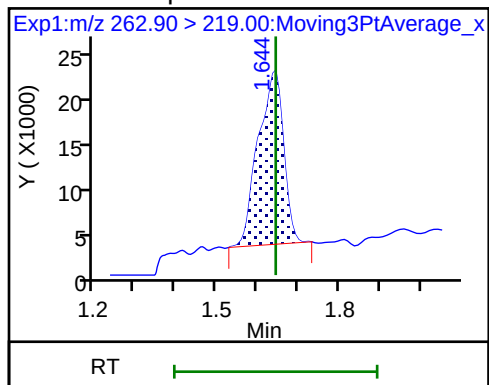
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

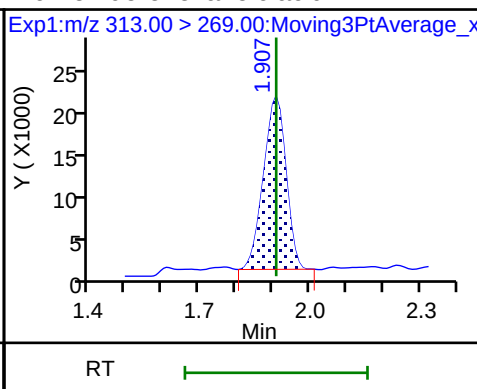
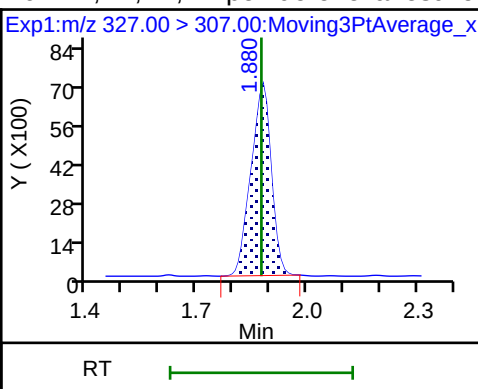
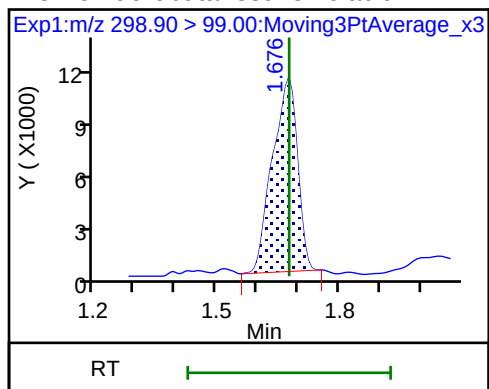
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfoni

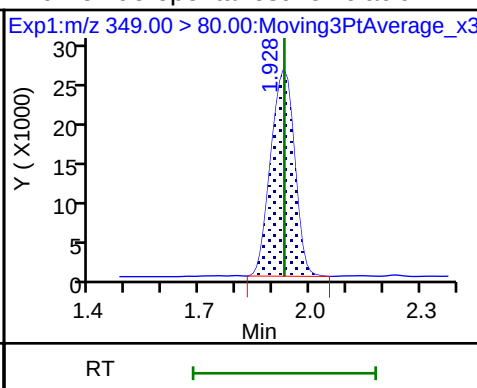
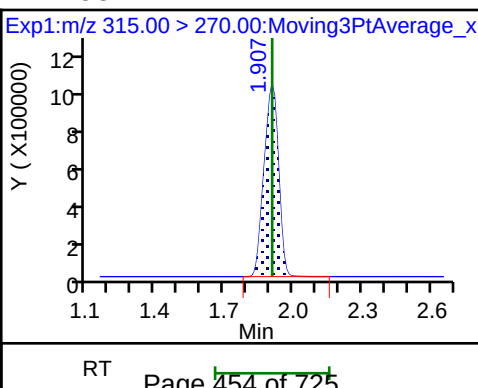
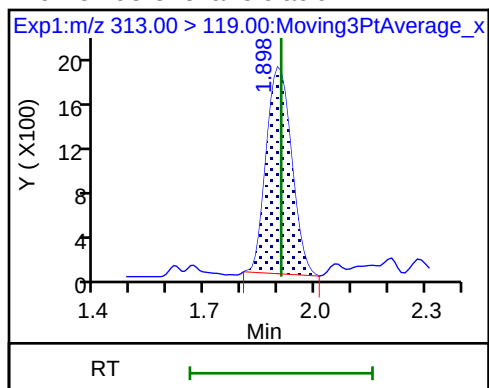
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

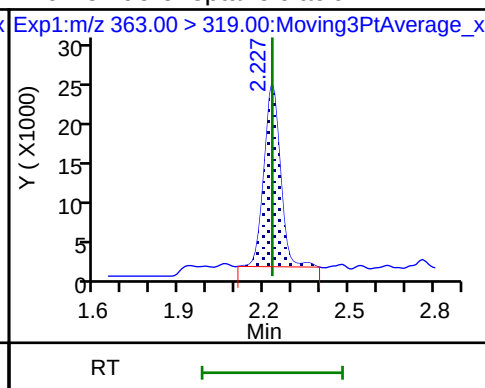
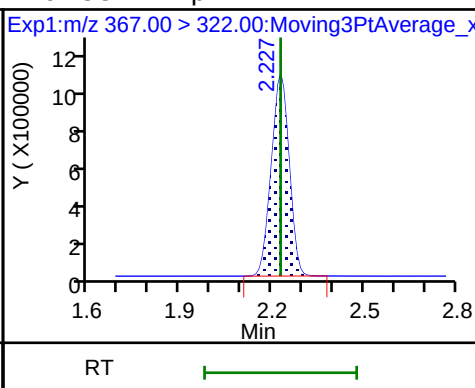
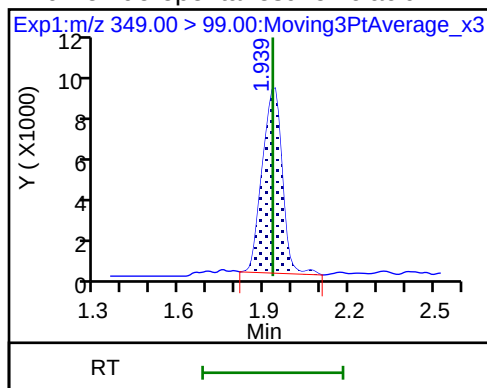
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

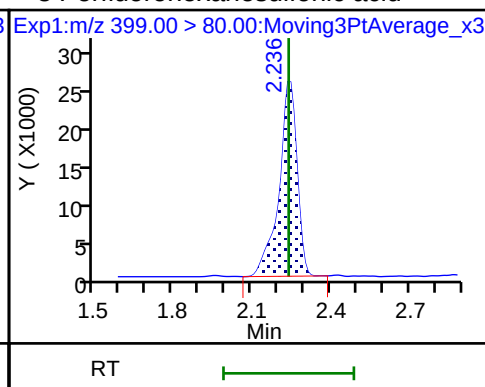
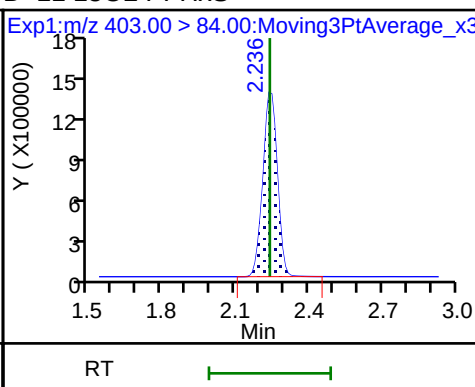
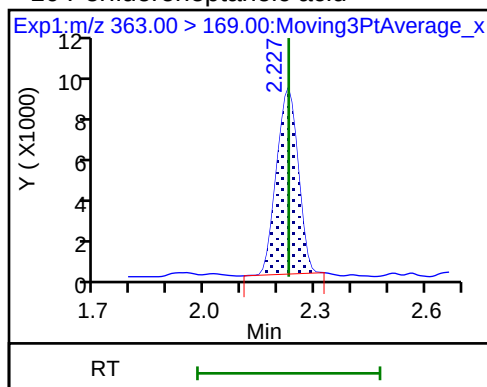
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

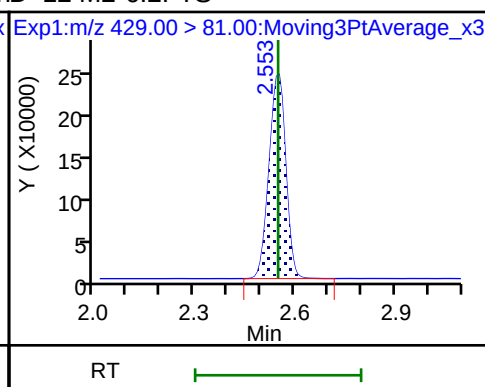
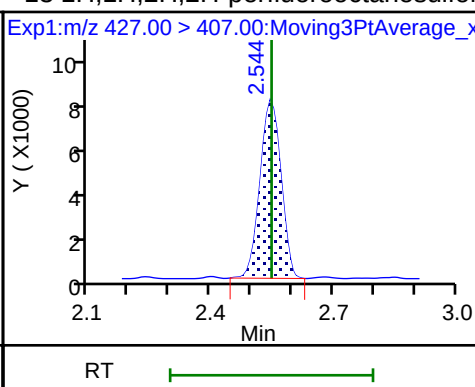
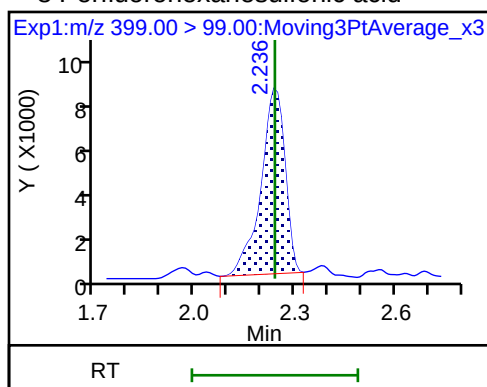
D 11 18O2 PFHxS

8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

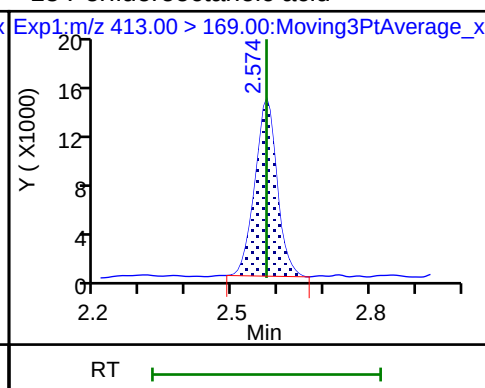
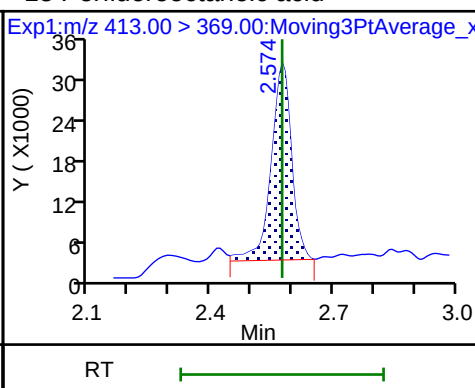
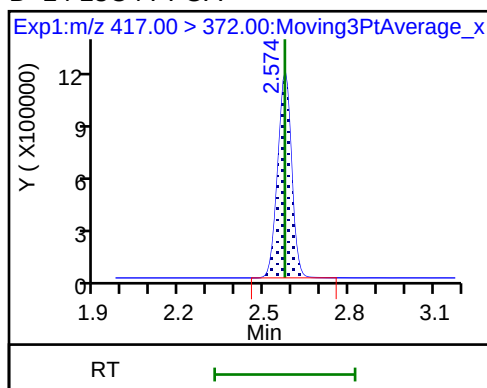
13 1H,1H,2H,2H-perfluorooctanesulfonD 12 M2-6:2FTS



D 14 13C4 PFOA

15 Perfluorooctanoic acid

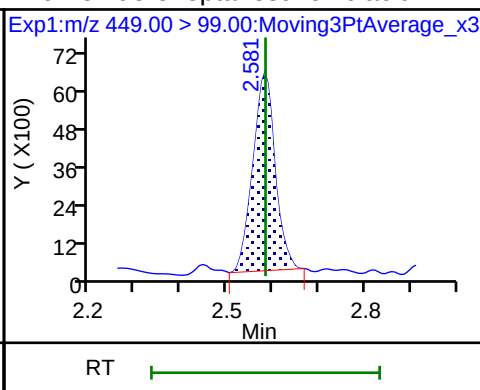
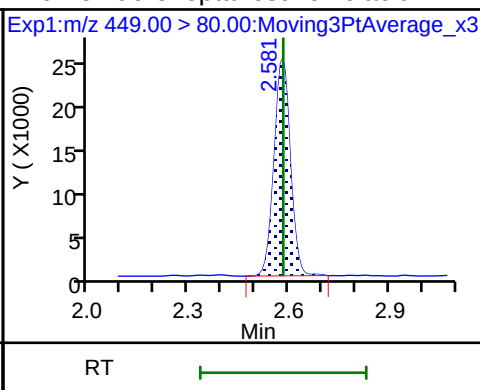
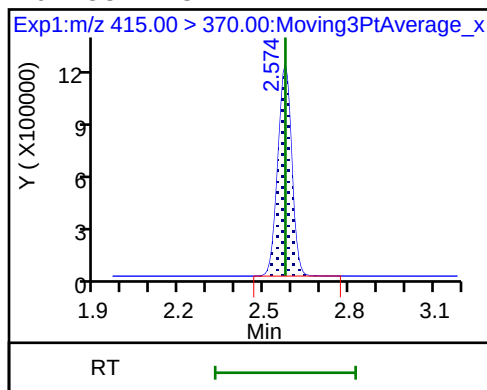
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

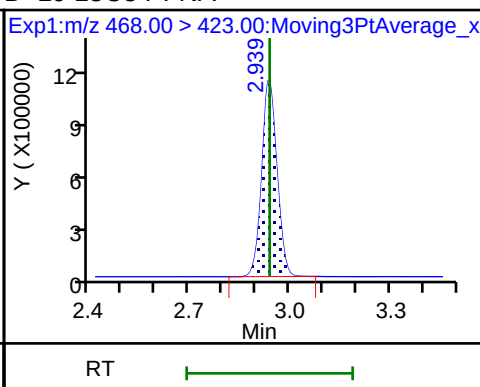
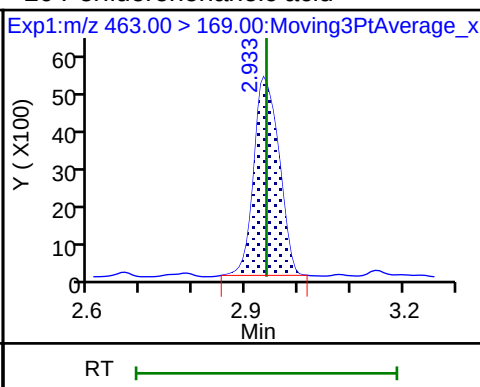
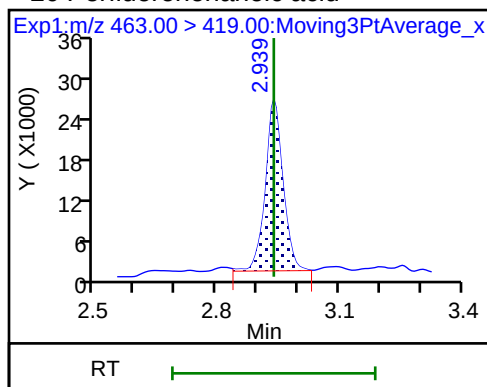
16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid

20 Perfluorononanoic acid

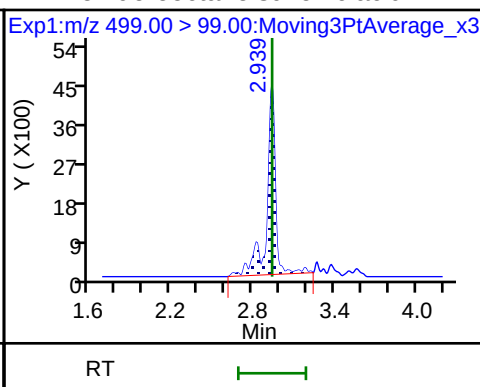
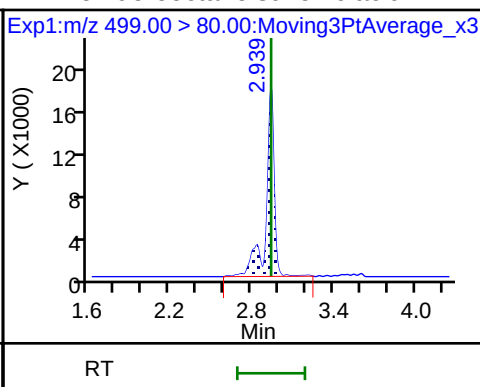
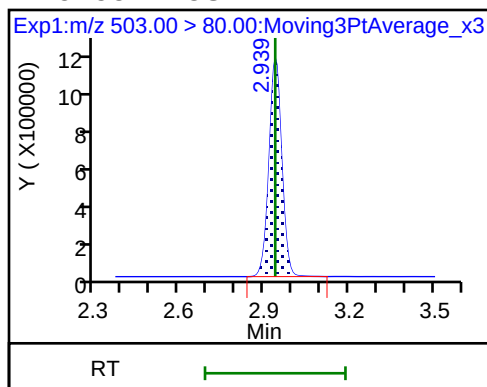
D 19 13C5 PFNA



D 18 13C4 PFOS

17 Perfluorooctane sulfonic acid

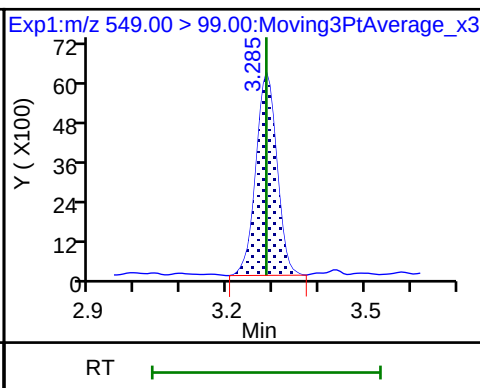
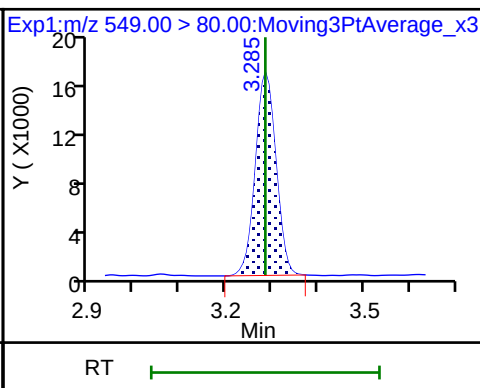
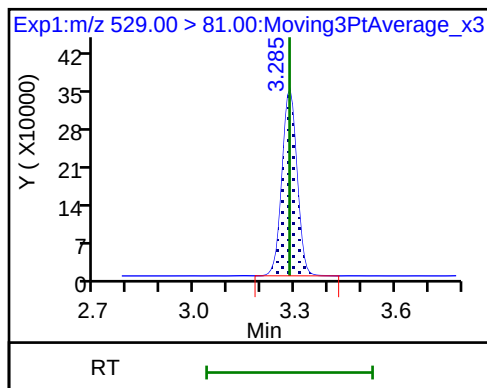
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid

68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfonate

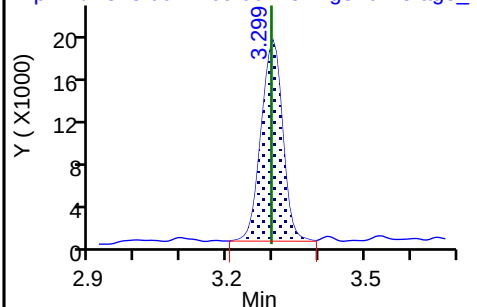
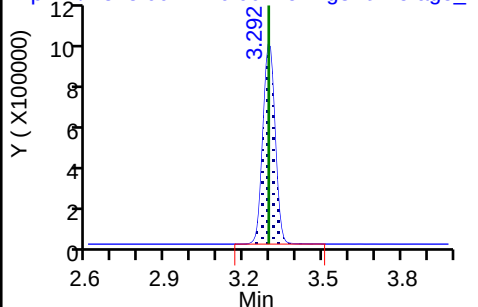
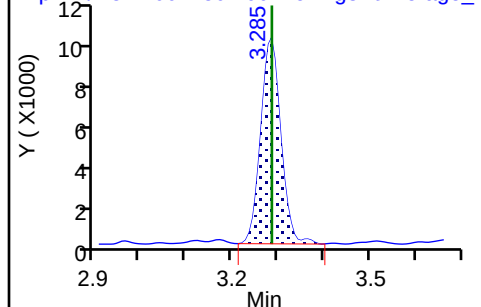
D 23 13C2 PFDA

24 Perfluorodecanoic acid

Exp1:m/z 527.00 > 507.00:Moving3PtAverage_x

Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x

Exp1:m/z 513.00 > 469.00:Moving3PtAverage_x



24 Perfluorodecanoic acid

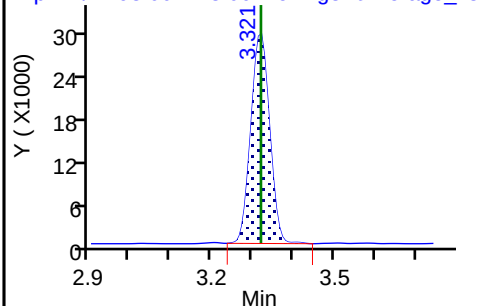
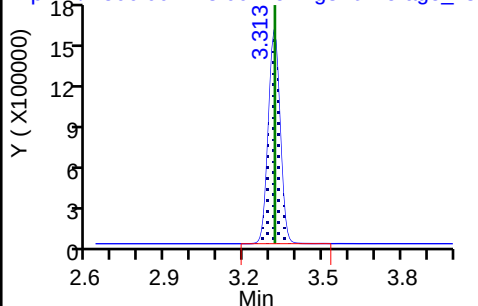
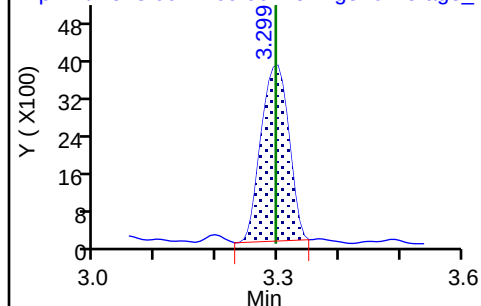
D 21 13C8 FOSA

22 Perfluorooctane Sulfonamide

Exp1:m/z 513.00 > 169.00:Moving3PtAverage_x

Exp1:m/z 506.00 > 78.00:Moving3PtAverage_x3

Exp1:m/z 498.00 > 78.00:Moving3PtAverage_x3



D 27 d3-NMeFOSAA

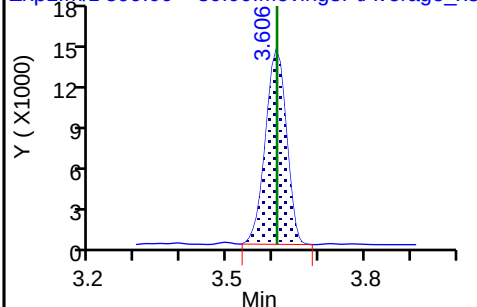
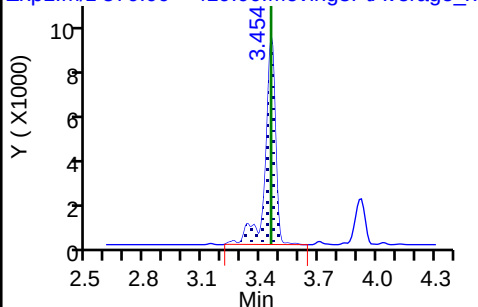
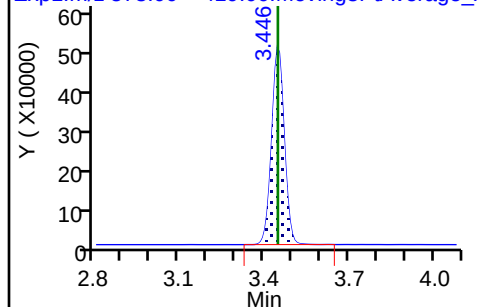
28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

Exp1:m/z 573.00 > 419.00:Moving3PtAverage_x

Exp1:m/z 570.00 > 419.00:Moving3PtAverage_x

Exp1:m/z 599.00 > 80.00:Moving3PtAverage_x3



29 Perfluorodecane Sulfonic acid

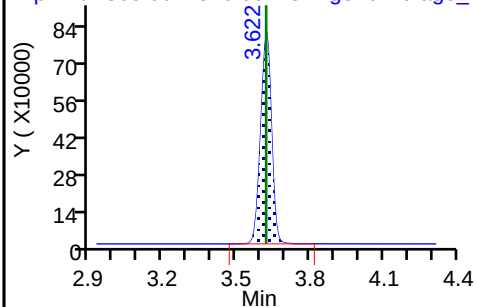
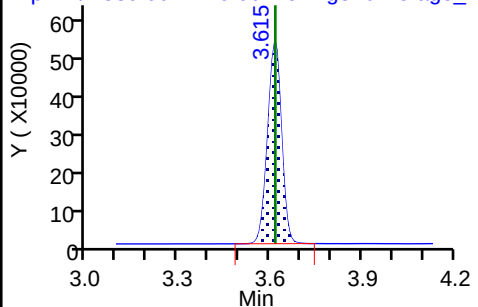
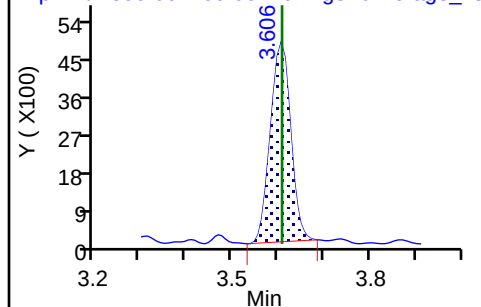
D 32 d5-NEtFOSAA

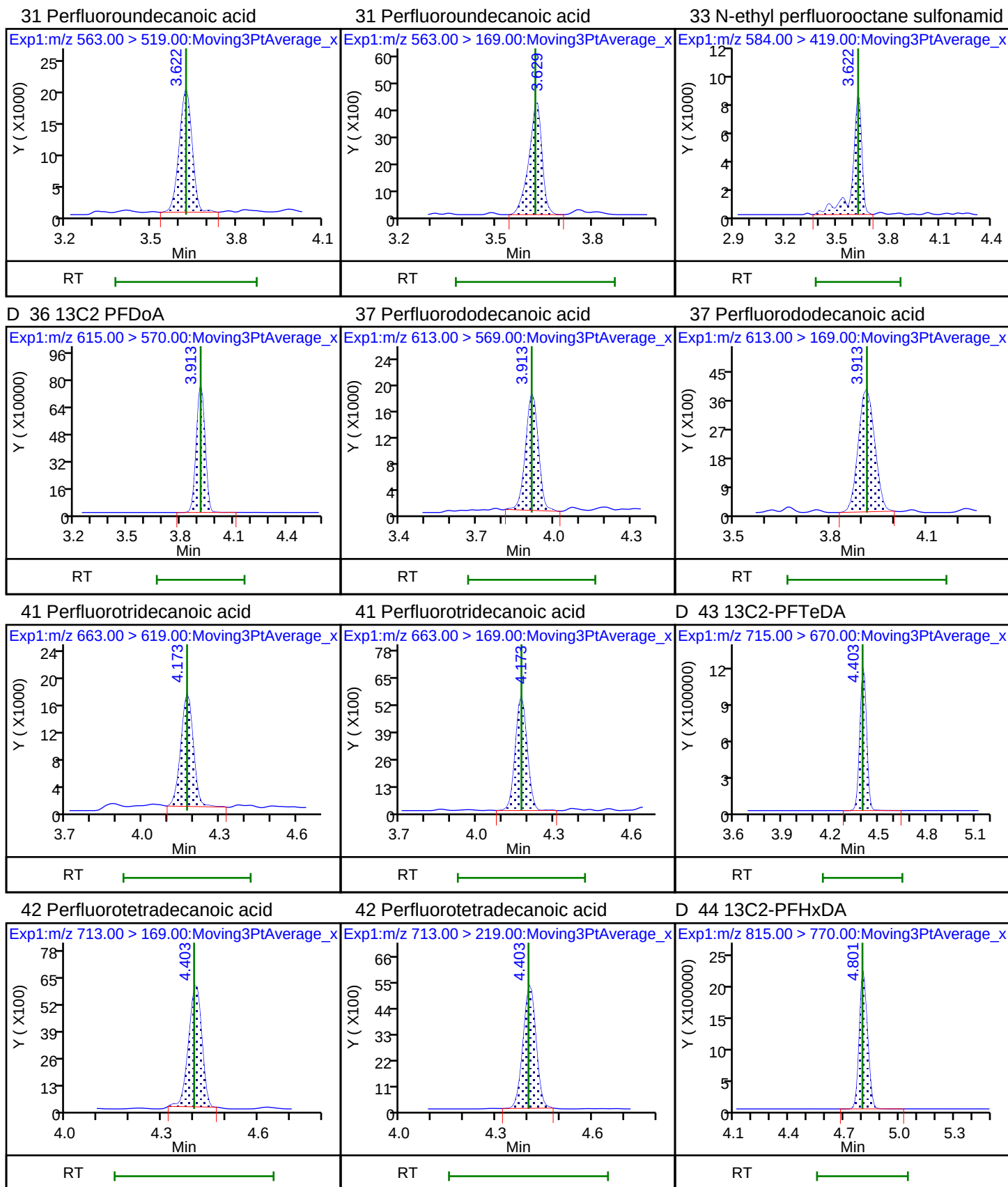
D 30 13C2 PFUnA

Exp1:m/z 599.00 > 99.00:Moving3PtAverage_x3

Exp1:m/z 589.00 > 419.00:Moving3PtAverage_x

Exp1:m/z 565.00 > 520.00:Moving3PtAverage_x





TestAmerica Sacramento

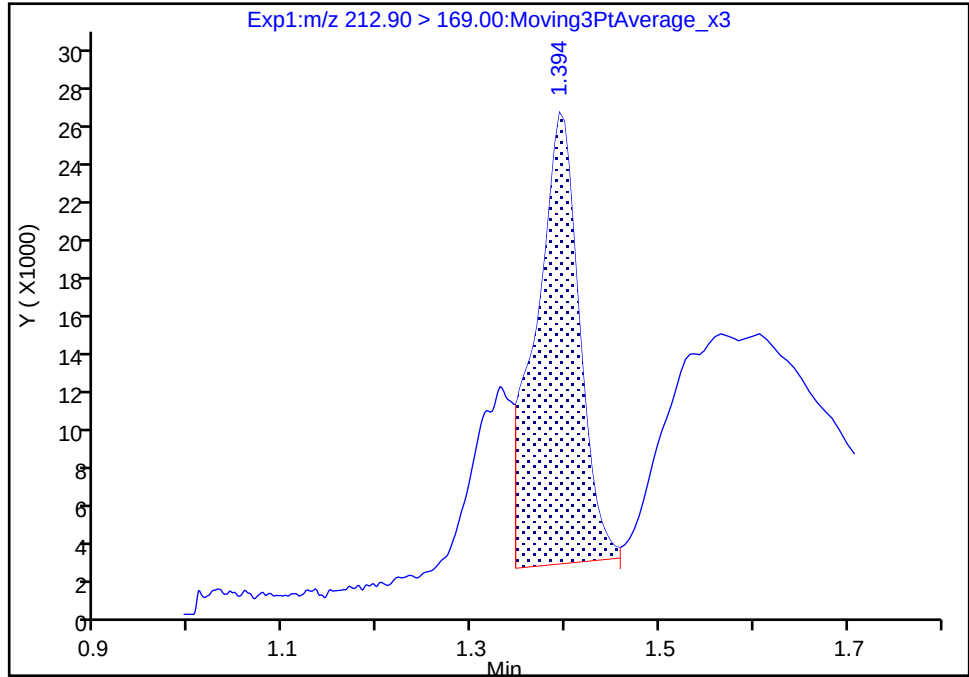
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_003.d
Injection Date: 06-Aug-2018 11:17:57 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

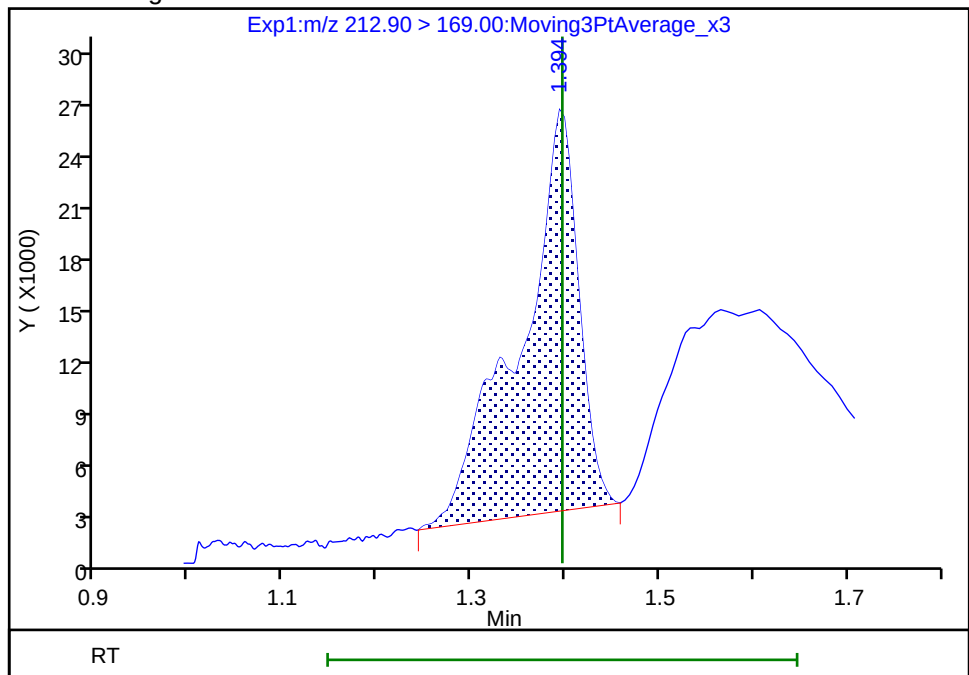
RT: 1.39
Area: 75241
Amount: 0.037594
Amount Units: ng/ml

Processing Integration Results



RT: 1.39
Area: 100389
Amount: 0.048421
Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 06-Aug-2018 15:52:40

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_004.d
 Lims ID: IC L3 Full
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 06-Aug-2018 11:25:44 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@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:17:05 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: westendorfc

Date: 06-Aug-2018 14:28:13

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	1.396	1.395	0.001	0.541	5688815	2.47		98.7	8052	
2 Perfluorobutyric acid										
212.90 > 169.00	1.401	1.397	0.004	1.004	522272	0.2445		97.8	52.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.639	0.001	0.635	3918495	2.47		98.7	11150	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.647	1.643	0.004	1.005	421991	0.2366		94.7	28.3	
D 47 13C3-PFBS										
301.90 > 83.00	1.679	1.675	0.004	0.651	85930	2.34		101	402	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.679	1.676	0.003	1.000	616670	0.2197		99.4	231	
298.90 > 99.00	1.679	1.676	0.003	1.000	251343		2.45(1.25-3.74)	99.4	142	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.885	1.875	0.010	1.122	141135	0.2305		98.7	1346	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.875	0.001	0.727	601195	NC			964	
D 7 13C2 PFHxA										
315.00 > 270.00	1.913	1.908	0.005	0.741	4437948	2.46		98.5	14259	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.913	1.908	0.005	1.000	428854	0.2367		94.7	119	
313.00 > 119.00	1.913	1.908	0.005	1.000	41462		10.34(5.03-15.10)	94.7	91.4	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.934	1.930	0.004	1.152	582073	0.2285		97.4	1268	
349.00 > 99.00	1.934	1.930	0.004	1.152	218098		2.67(1.36-4.07)	97.4	288	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.007	2.003	0.004	1.000	81354	NC			37.6	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.007	2.003	0.004	0.778	346469	NC			940	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.227	-0.002	0.862	4417214	2.49		99.7	7046	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.234	2.228	0.006	1.004	459833	0.2451		98.0	94.8	
363.00 > 169.00	2.225	2.228	-0.003	1.000	172415		2.67(1.13-3.40)	98.0	347	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.245	2.239	0.006	1.000	544267	0.2249		98.9	1144	
399.00 > 99.00	2.245	2.239	0.006	1.000	172368		3.16(1.50-4.49)	98.9	186	
D 11 18O2 PFHxS										
403.00 > 84.00	2.245	2.239	0.006	0.870	5279483	2.32		98.2	5983	
65 ADONA										
377.00 > 251.00	2.278	2.271	0.007	0.774	1256630	NC			3231	
377.00 > 85.00	2.278	2.271	0.007	0.774	754513		1.67(0.84-2.53)		1041	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.553	2.548	0.005	1.000	129666	0.2145		90.5	183	
D 12 M2-6:2FTS										
429.00 > 81.00	2.553	2.549	0.004	0.989	912690	2.45		103	2504	
D 73 13C8 PFOA										
421.00 > 376.00	2.575	2.571	0.004	0.997	7698803	NC			11913	
D 14 13C4 PFOA										
417.00 > 372.00	2.575	2.573	0.002	0.997	4104790	2.52		101	6871	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.575	2.574	0.001	1.000	451059	0.2430		97.1	42.9	
413.00 > 169.00	2.581	2.574	0.007	1.003	229069		1.97(0.84-2.52)	97.1	434	
* 62 13C2-PFOA										
415.00 > 370.00	2.581	2.575	0.006		4161520	2.50			6277	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.588	2.583	0.005	0.879	425894	0.2283		95.9	1142	
449.00 > 99.00	2.588	2.583	0.005	0.879	119281		3.57(1.94-5.82)	95.9	308	
D 72 13C8 PFOS										
507.00 > 99.00	2.945	2.938	0.007	1.141	1729501	NC			4106	
D 18 13C4 PFOS										
503.00 > 80.00	2.945	2.939	0.006	1.141	3598367	2.41		101	4581	
D 19 13C5 PFNA										
468.00 > 423.00	2.945	2.939	0.006	1.141	3712571	2.54		102	9104	
20 Perfluorononanoic acid										
463.00 > 419.00	2.945	2.939	0.006	1.000	377996	0.2416		96.7	111	
463.00 > 169.00	2.945	2.939	0.006	1.000	90259		4.19(1.90-5.69)	96.7	548	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.945	2.940	0.005	1.000	360873	0.2232		96.2	732	
499.00 > 99.00	2.945	2.940	0.005	1.000	85319		4.23(2.31-6.93)	96.2	158	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.155	3.150	0.005	1.072	586624	NC			2466	
D 26 M2-8:2FTS										
529.00 > 81.00	3.292	3.284	0.008	1.275	1066887	2.37		98.9	2644	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.292	3.285	0.008	1.118	273347	0.2414		101	1085	
549.00 > 99.00	3.292	3.285	0.008	1.118	98712		2.77(1.33-3.97)	101	413	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.292	3.286	0.006	1.000	136487	0.2358		98.5	563	
D 23 13C2 PFDA										
515.00 > 470.00	3.299	3.294	0.005	1.278	3074087	2.40		96.0	5313	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.296	0.003	1.000	318256	0.2580		103	203	
513.00 > 169.00	3.299	3.296	0.003	1.000	54367		5.85(2.36-7.09)	103	170	
D 21 13C8 FOSA										
506.00 > 78.00	3.321	3.317	0.004	1.286	4992636	2.52		101	5246	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.319	0.002	1.000	476525	0.2451		98.0	1873	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.454	3.448	0.006	1.338	1616798	2.47		98.7	4005	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.461	3.453	0.008	1.002	150940	0.2420		96.8	179	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.615	3.608	0.007	1.228	233277	0.2452		102	968	
599.00 > 99.00	3.606	3.608	-0.002	1.225	79055		2.95(1.39-4.16)	102	375	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.622	3.616	0.006	1.403	1760050	2.59		104	1377	
D 30 13C2 PFUnA										
565.00 > 520.00	3.622	3.620	0.002	1.403	2639555	2.56		102	7745	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.622	3.622	0.0	1.000	289310	0.2439		97.5	194	
563.00 > 169.00	3.629	3.622	0.007	1.002	49327		5.87(2.12-6.36)	97.5	296	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.629	3.623	0.006	1.002	142770	0.2274		91.0	559	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.786	3.781	0.005	1.286	948354	NC			2037	
35 MeFOSA										
512.00 > 169.00	3.827	3.826	0.001		147856	NC			551	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	291016	0.2348		93.9	163	
613.00 > 169.00	3.913	3.913	0.0	1.000	60342		4.82(2.13-6.40)	93.9	418	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.913	3.913	0.0	1.189	99141	NC			902	
D 36 13C2 PFDaA										
615.00 > 570.00	3.913	3.913	0.0	1.516	2785129	2.56		102	5994	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.154	4.148	0.006	1.411	111497	NC			728	
699.00 > 99.00	4.154	4.148	0.006	1.411	133931		0.83(0.00-0.00)		1049	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.173	4.173	0.0	1.066	304796	0.2544		102	138	
663.00 > 169.00	4.173	4.173	0.0	1.066	95463		3.19(1.25-3.76)	102	719	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.403	4.399	0.004	1.706	3541707	2.55		102	7360	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.403	4.400	0.003	1.000	84652	0.2469		98.8	893	
713.00 > 219.00	4.403	4.400	0.003	1.000	58906		1.44(0.71-2.13)	98.8	634	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.801	4.799	0.002	1.860	6757749	2.46		98.2	5754	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.808	4.801	0.007	1.001	661220	NC			299	
813.00 > 169.00	4.801	4.801	0.0	1.000	112805		5.86(2.86-8.58)		1161	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.142	5.136	0.006	1.071	644655	NC			182	
913.00 > 169.00	5.135	5.136	-0.001	1.070	77077		8.36(3.83-11.48)		768	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_004.d

Injection Date: 06-Aug-2018 11:25:44

Instrument ID: A8_N

Lims ID: IC L3 Full

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 12

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

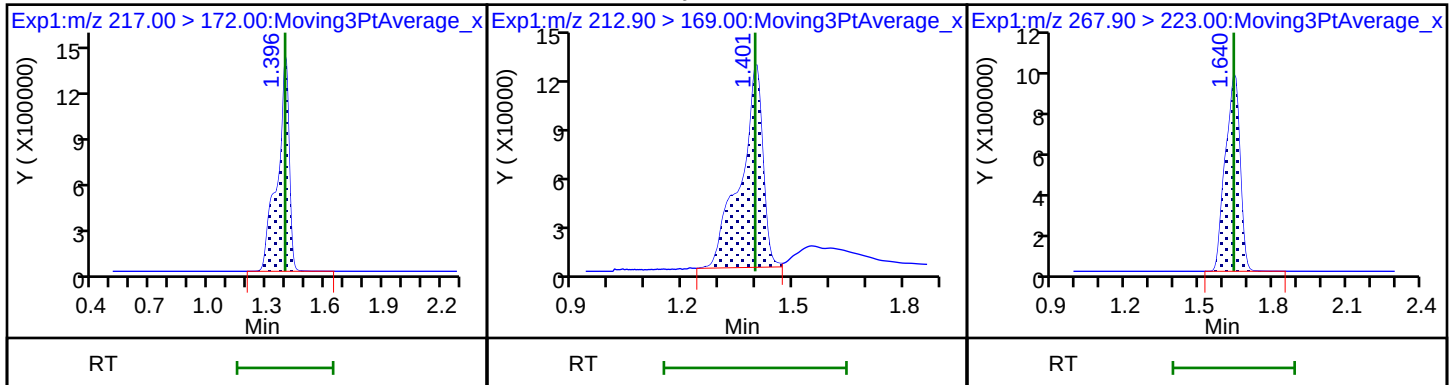
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

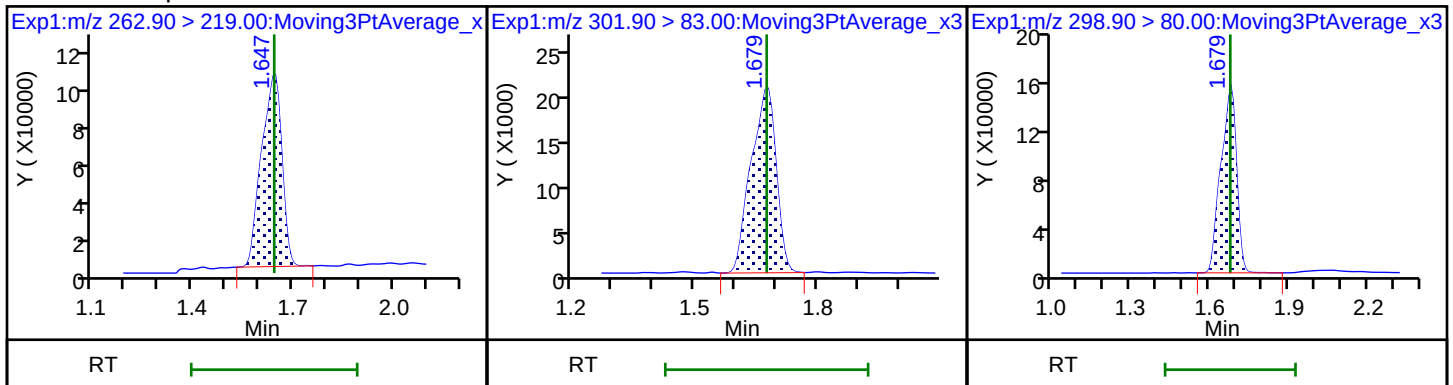
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

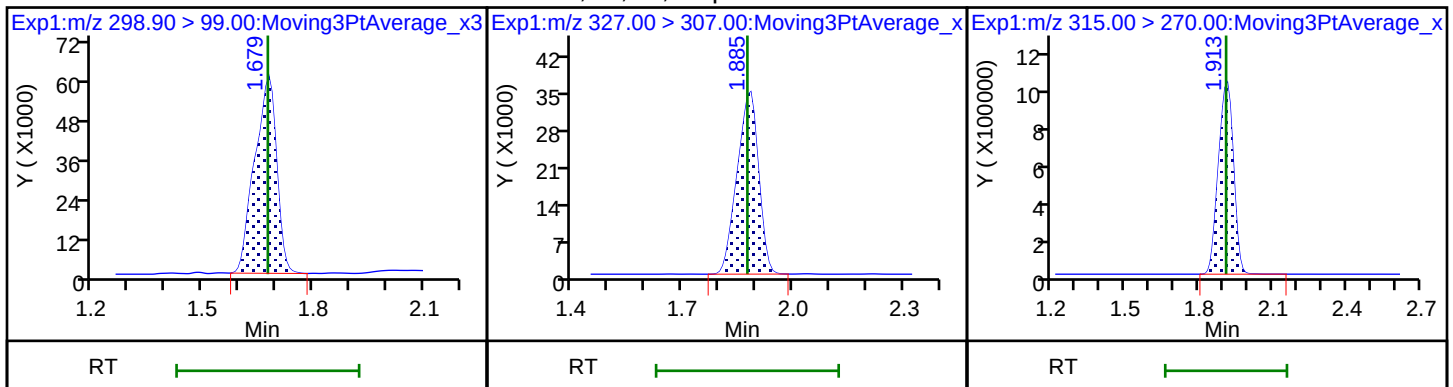
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

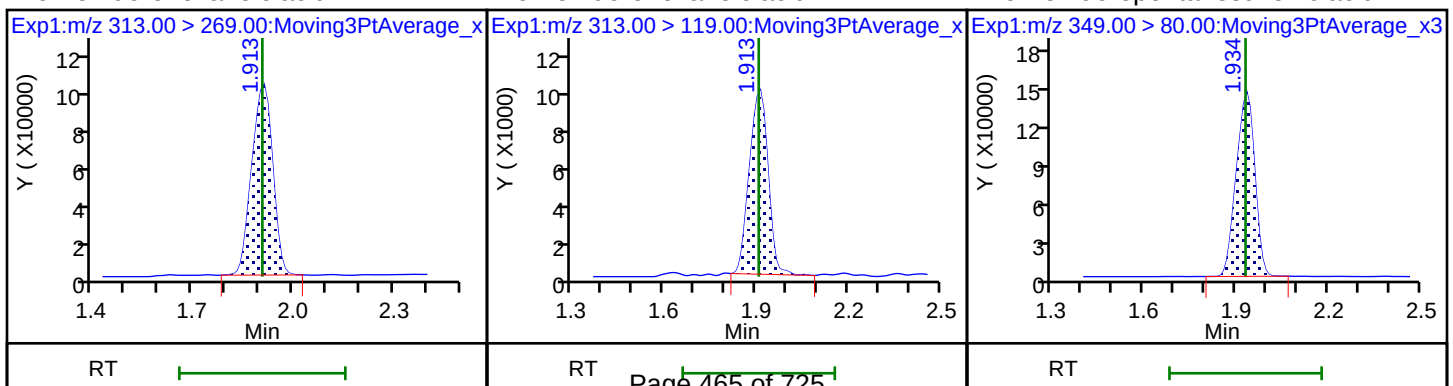
D 7 13C2 PFHxA



6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

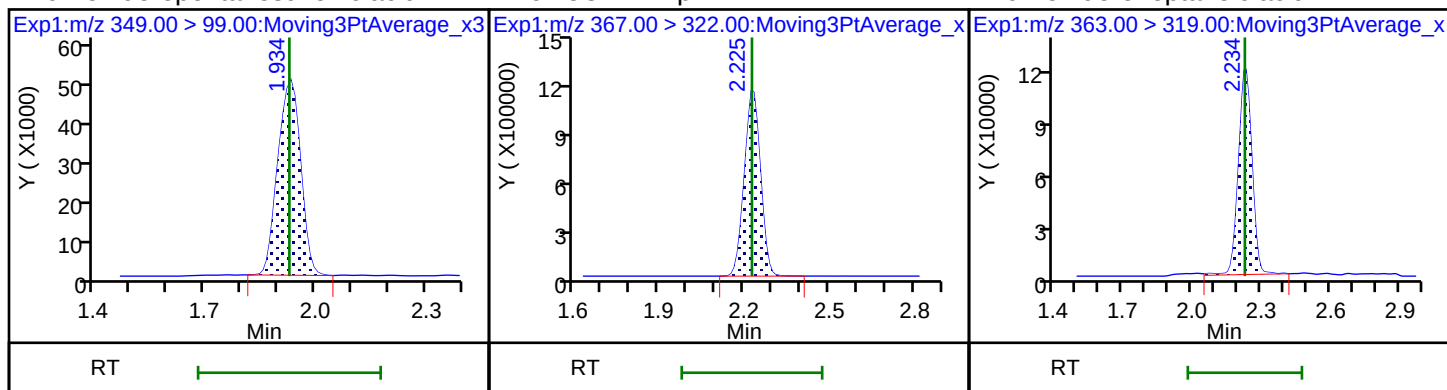
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

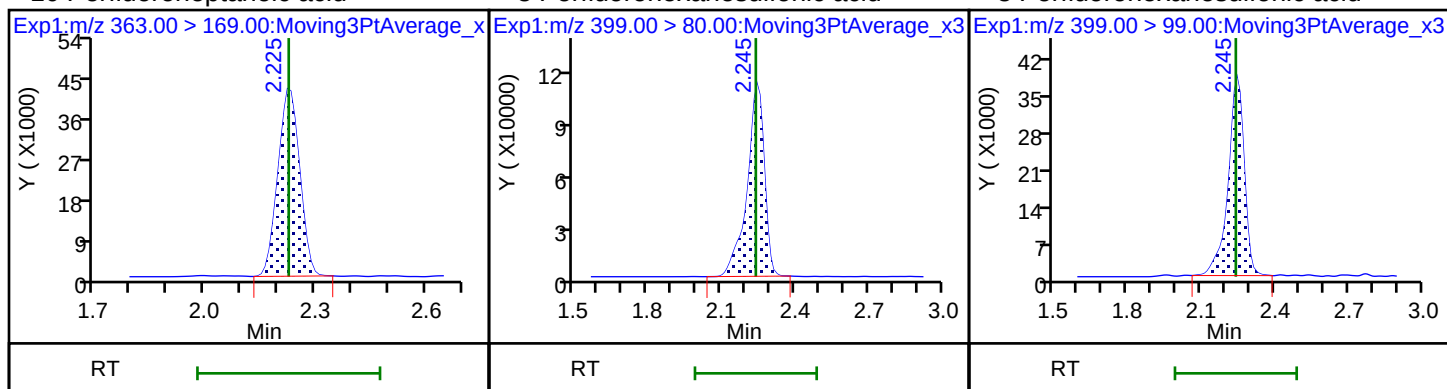
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

8 Perfluorohexanesulfonic acid

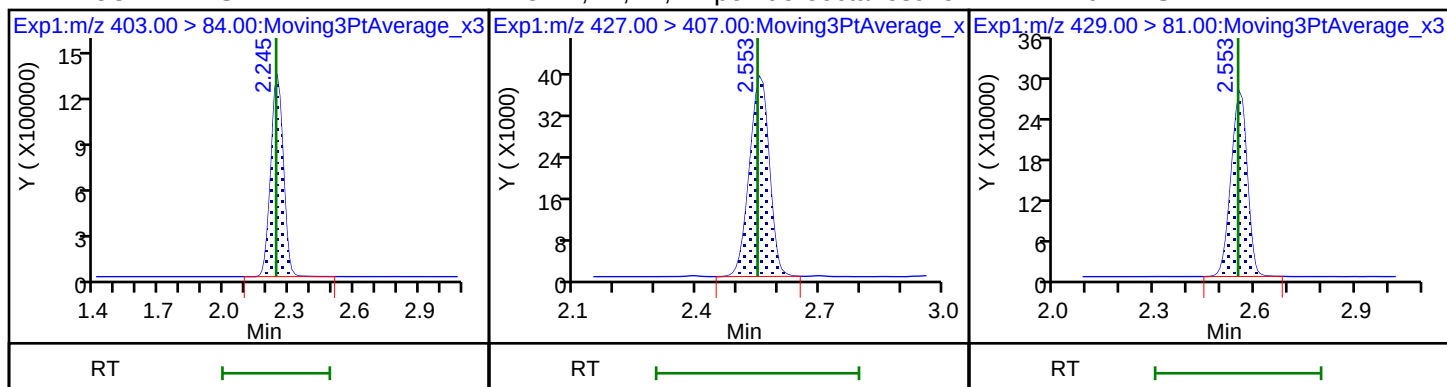
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

13 1H,1H,2H,2H-perfluorooctanesulfonD

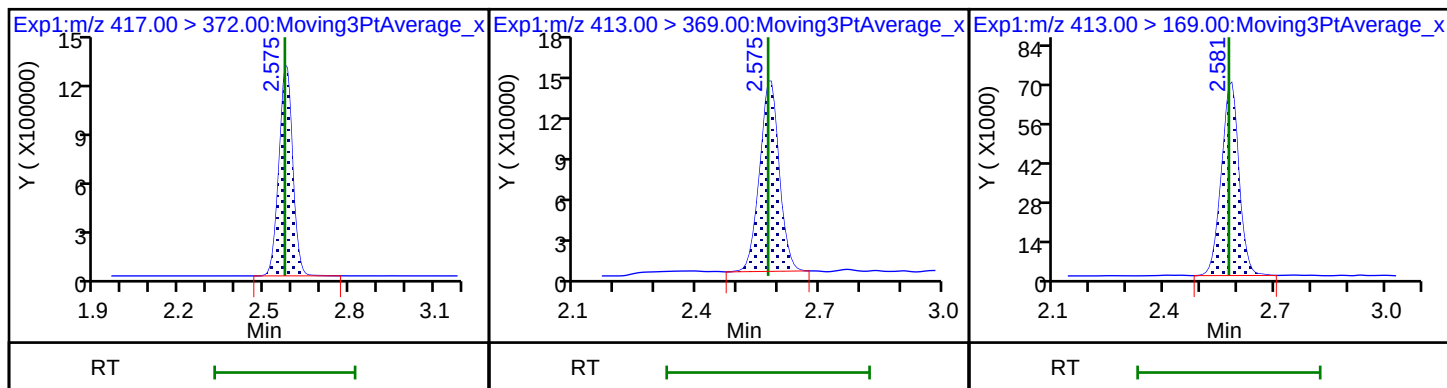
12 M2-6:2FTS



D 14 13C4 PFOA

15 Perfluorooctanoic acid

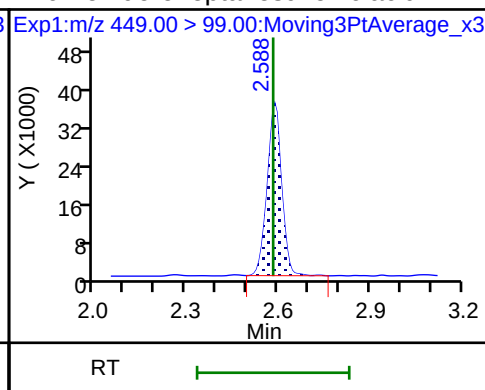
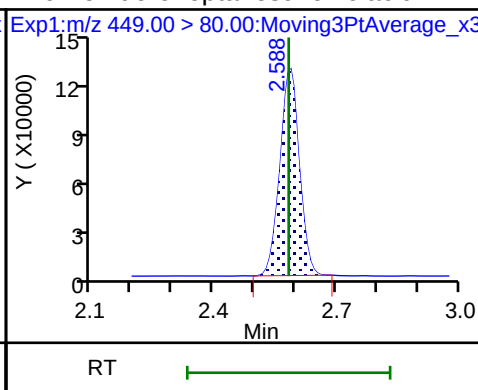
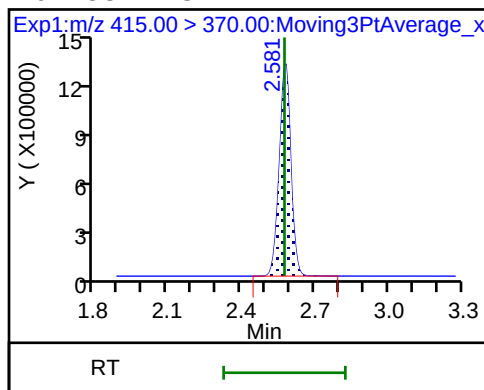
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

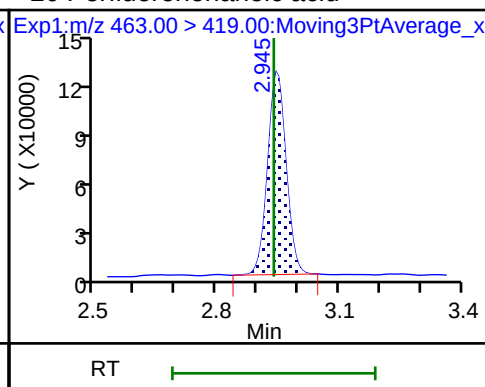
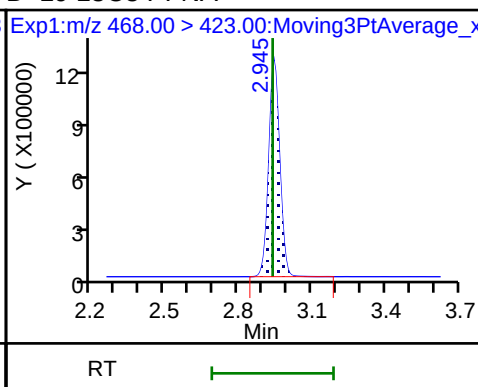
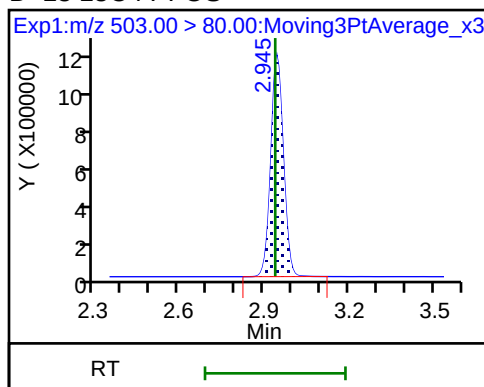
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

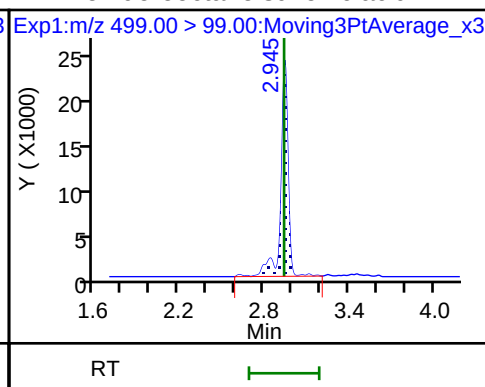
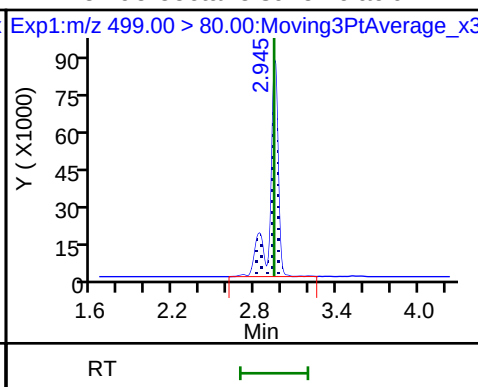
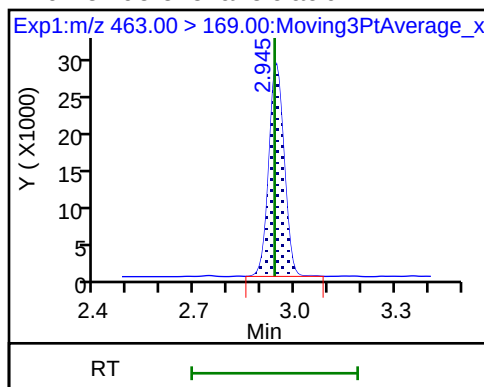
20 Perfluorononanoic acid



20 Perfluorononanoic acid

17 Perfluorooctane sulfonic acid

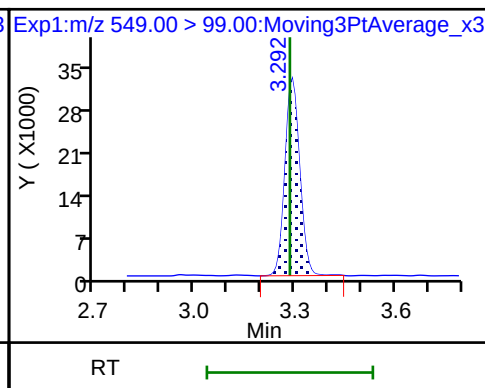
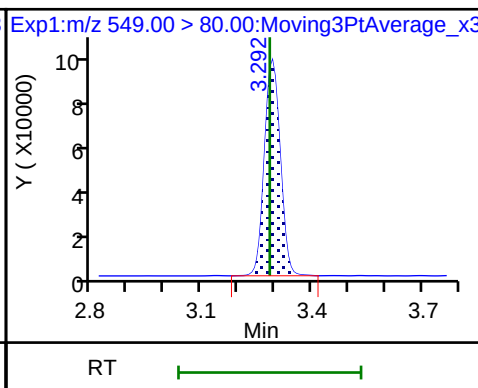
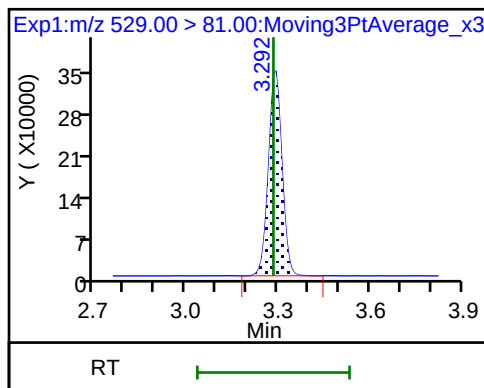
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid

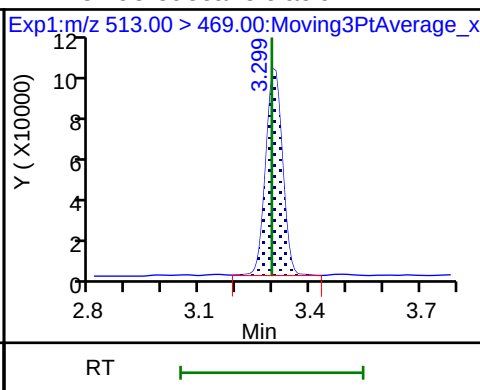
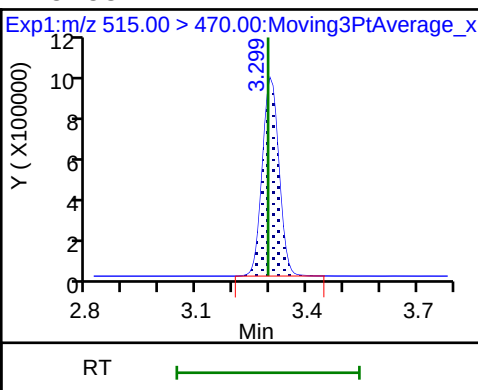
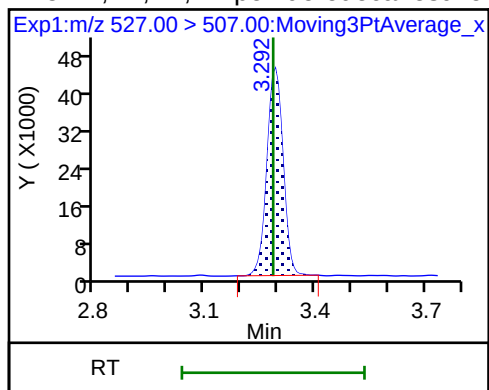
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfonate

D 23 13C2 PFDA

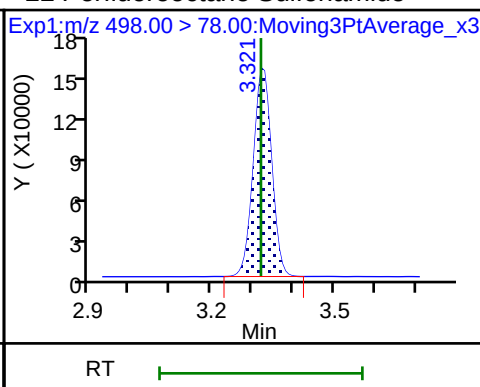
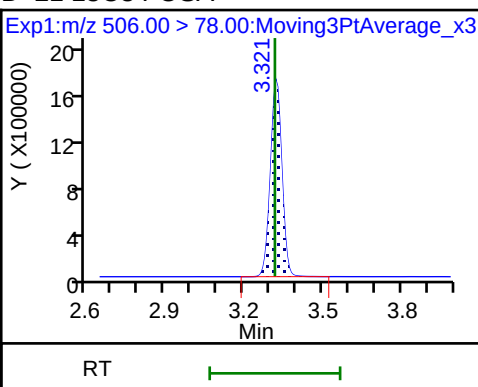
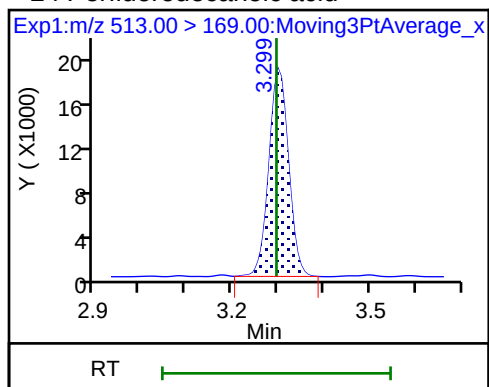
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 21 13C8 FOSA

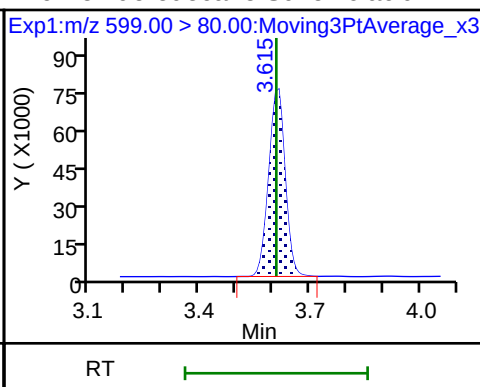
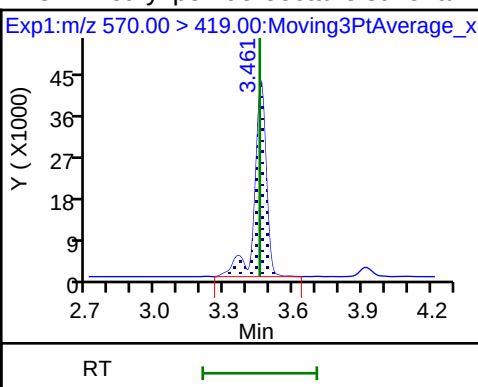
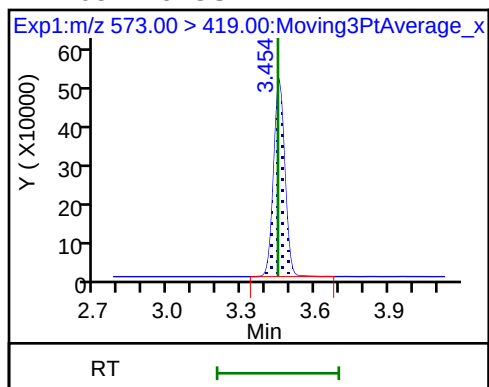
22 Perfluorooctane Sulfonamide



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

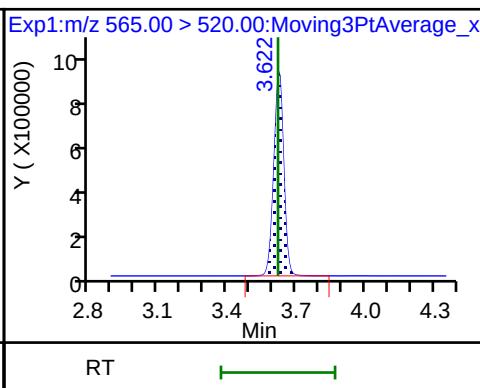
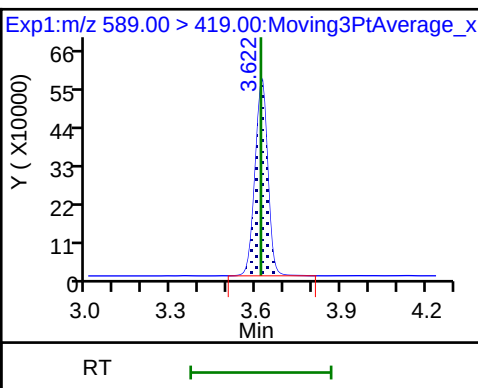
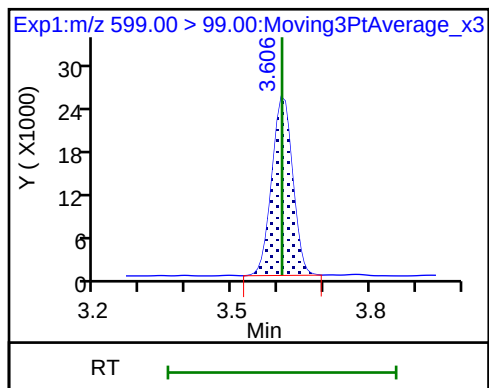
29 Perfluorodecane Sulfonic acid

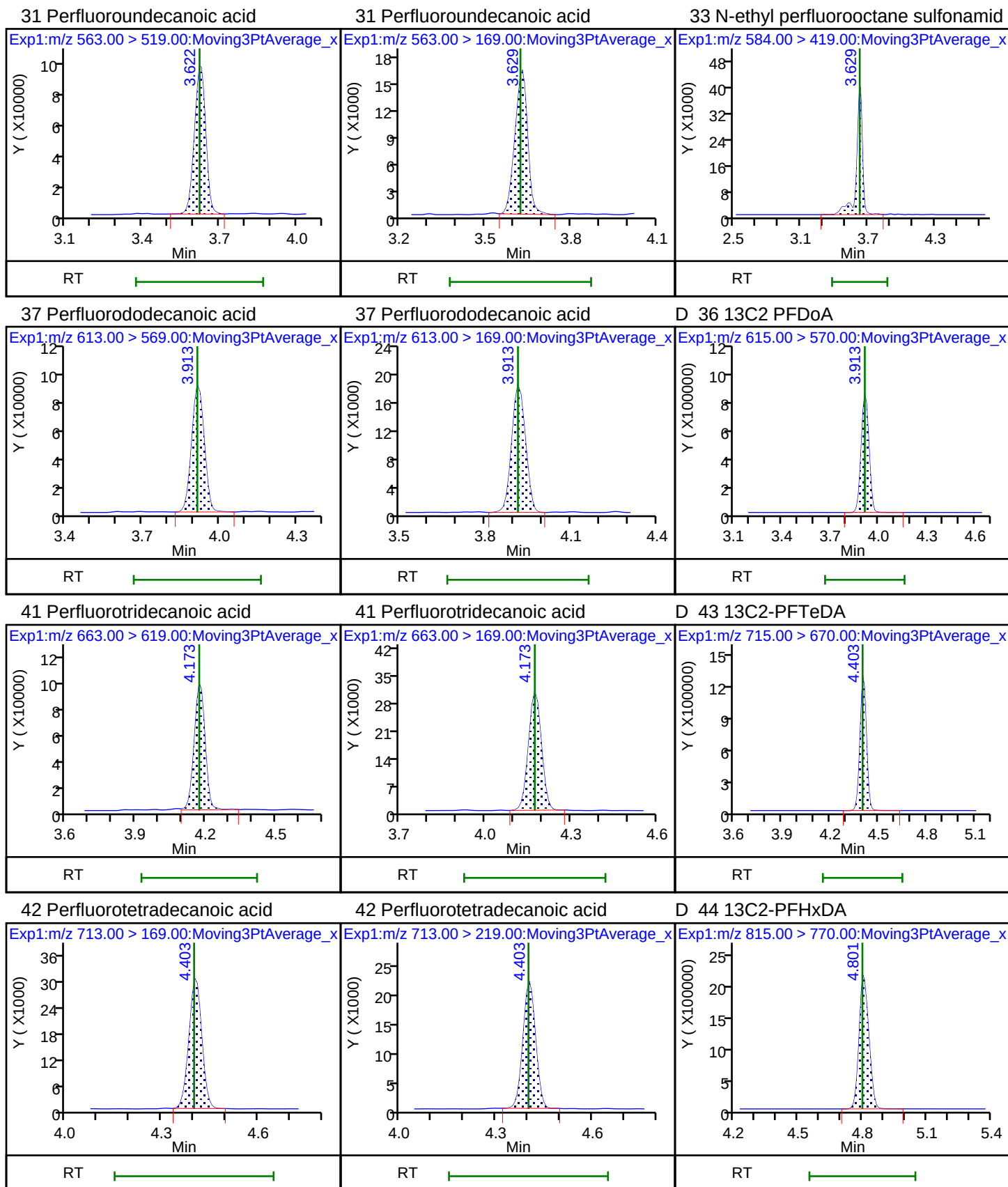


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_005.d
 Lims ID: IC L4 Full
 Client ID:
 Sample Type: ICIS Calib Level: 4
 Inject. Date: 06-Aug-2018 11:33:34 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@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:17:10 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: westendorfc

Date: 06-Aug-2018 14:00:54

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	1.397	1.395	0.002	0.543	5503224	2.49		99.4	10421	
2 Perfluorobutyric acid										
212.90 > 169.00	1.397	1.397	0.0	1.000	2011540	0.9733		97.3	198	
D 3 13C5-PFPeA										
267.90 > 223.00	1.640	1.639	0.001	0.637	3711287	2.43		97.4	9635	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.640	1.643	-0.003	1.000	1650773	0.9773		97.7	114	
D 47 13C3-PFBS										
301.90 > 83.00	1.672	1.675	-0.003	0.649	78945	2.24		96.3	323	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.680	1.676	0.004	1.005	2375205	0.9209		104	901	
298.90 > 99.00	1.680	1.676	0.004	1.005	1015406		2.34(1.25-3.74)	104	513	
D 60 M2-4:2FTS										
329.00 > 81.00	1.876	1.875	0.001	0.729	592717	NC			872	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.876	1.875	0.001	1.122	570176	1.01		109	3930	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.903	1.908	-0.005	1.000	1715767	0.9874		98.7	433	
313.00 > 119.00	1.903	1.908	-0.005	1.000	156736		10.95(5.03-15.10)	98.7	462	
D 7 13C2 PFHxA										
315.00 > 270.00	1.903	1.908	-0.005	0.739	4256324	2.46		98.4	8880	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.934	1.930	0.004	1.157	2251038	0.9619		103	2681	
349.00 > 99.00	1.934	1.930	0.004	1.157	845080		2.66(1.36-4.07)	103	824	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.008	2.003	0.005	0.780	332511	NC			1022	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.008	2.003	0.005	1.000	308918	NC			152	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.227	-0.002	0.864	4255889	2.50		100.0	6181	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.228	-0.003	1.000	1827459	1.01		101	379	
363.00 > 169.00	2.225	2.228	-0.003	1.000	719613		2.54(1.13-3.40)	101	1239	
D 11 18O2 PFHxS										
403.00 > 84.00	2.245	2.239	0.006	0.872	5111728	2.34		99.0	4756	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.245	2.239	0.006	1.000	2008773	0.8573		94.2	1987	
399.00 > 99.00	2.245	2.239	0.006	1.000	689420		2.91(1.50-4.49)	94.2	645	
65 ADONA										
377.00 > 251.00	2.267	2.271	-0.004	0.771	4950939	NC			7395	
377.00 > 85.00	2.267	2.271	-0.004	0.771	2850758		1.74(0.84-2.53)		3276	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.550	2.548	0.002	1.000	536262	0.9373		98.9	1106	
D 12 M2-6:2FTS										
429.00 > 81.00	2.550	2.549	0.001	0.991	863649	2.41		101	2238	
D 73 13C8 PFOA										
421.00 > 376.00	2.574	2.571	0.003	1.000	7724133	NC			11158	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.573	0.001	1.000	3847208	2.46		98.5	6637	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.574	0.0	1.000	1678386	0.9646		96.4	158	
413.00 > 169.00	2.574	2.574	0.0	1.000	874632		1.92(0.84-2.52)	96.4	1551	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.575	-0.001		3997336	2.50			9177	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.003	0.878	1703787	0.9643		101	2000	
449.00 > 99.00	2.581	2.583	-0.003	0.878	442374		3.85(1.94-5.82)	101	761	
D 72 13C8 PFOS										
507.00 > 99.00	2.939	2.938	0.001	1.142	1640677	NC			3589	
20 Perfluorononanoic acid										
463.00 > 419.00	2.939	2.939	0.0	1.000	1409363	0.9457		94.6	412	
463.00 > 169.00	2.939	2.939	0.0	1.000	338359		4.17(1.90-5.69)	94.6	1435	
D 19 13C5 PFNA										
468.00 > 423.00	2.939	2.939	0.0	1.142	3536917	2.52		101	6788	
D 18 13C4 PFOS										
503.00 > 80.00	2.939	2.939	0.0	1.142	3408113	2.38		99.4	4275	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.940	-0.001	1.000	1387650	0.9063		97.7	2200	
499.00 > 99.00	2.939	2.940	-0.001	1.000	324621		4.27(2.31-6.93)	97.7	823	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.155	3.150	0.005	1.074	2339008	NC			3500	
D 26 M2-8:2FTS										
529.00 > 81.00	3.285	3.284	0.001	1.276	1045687	2.42		101	3279	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.285	3.285	0.001	1.118	1021056	0.9520		99.2	2447	
549.00 > 99.00	3.285	3.285	0.001	1.118	375050		2.72(1.33-3.97)	99.2	1043	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.285	3.286	-0.001	1.000	504558	0.8895		92.9	1402	
D 23 13C2 PFDA										
515.00 > 470.00	3.292	3.294	-0.002	1.279	3162481	2.57		103	5418	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.299	3.296	0.003	1.002	1188927	0.9369		93.7	777	
513.00 > 169.00	3.299	3.296	0.003	1.002	213587		5.57(2.36-7.09)	93.7	390	
D 21 13C8 FOSA										
506.00 > 78.00	3.321	3.317	0.004	1.290	4677735	2.46		98.5	7100	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.319	0.002	1.000	1842464	1.01		101	3243	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.339	1547904	2.46		98.4	3369	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.453	0.001	1.002	590682	0.9890		98.9	742	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.606	3.608	-0.002	1.227	849835	0.9430		97.8	3617	
599.00 > 99.00	3.606	3.608	-0.002	1.227	299784		2.83(1.39-4.16)	97.8	2220	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.615	3.616	-0.001	1.405	1663128	2.55		102	1489	
D 30 13C2 PFUnA										
565.00 > 520.00	3.622	3.620	0.002	1.407	2425508	2.45		98.0	5922	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.622	3.622	0.0	1.000	1124406	1.03		103	798	
563.00 > 169.00	3.622	3.622	0.0	1.000	177923		6.32(2.12-6.36)	103	940	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.622	3.623	-0.001	1.002	567205	0.9561		95.6	1327	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.785	3.781	0.004	1.288	3752452	NC			5976	
35 MeFOSA										
512.00 > 169.00	3.826	3.826	0.0		540488	NC			861	
D 36 13C2 PFDaA										
615.00 > 570.00	3.913	3.913	0.0	1.520	2610480	2.50		99.8	3794	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.913	3.913	0.0	1.191	366950	NC			2916	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	1163733	1.00		100	624	
613.00 > 169.00	3.913	3.913	0.0	1.000	259339		4.49(2.13-6.40)	100	1676	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.153	4.148	0.005	1.413	393708	NC			1564	
699.00 > 99.00	4.153	4.148	0.005	1.413	556205		0.71(0.00-0.00)		3372	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.172	4.173	-0.001	1.066	1112653	0.99		99.1	487	
663.00 > 169.00	4.172	4.173	-0.001	1.066	335552		3.32(1.25-3.76)	99.1	2095	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.402	4.399	0.003	1.711	3313318	2.49		99.4	6184	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.402	4.400	0.002	1.000	308839	0.9628		96.3	3431	
713.00 > 219.00	4.402	4.400	0.002	1.000	221323		1.40(0.71-2.13)	96.3	1043	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.800	4.799	0.001	1.865	6558204	2.48		99.2	7387	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.800	4.801	-0.001	1.000	2363491	NC			902	
813.00 > 169.00	4.800	4.801	-0.001	1.000	402071		5.88(2.86-8.58)		2430	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.135	5.136	-0.001	1.070	2459730	NC			668	
913.00 > 169.00	5.135	5.136	-0.001	1.070	301046		8.17(3.83-11.48)		2004	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_005.d

Injection Date: 06-Aug-2018 11:33:34

Instrument ID: A8_N

Lims ID: IC L4 Full

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 13

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

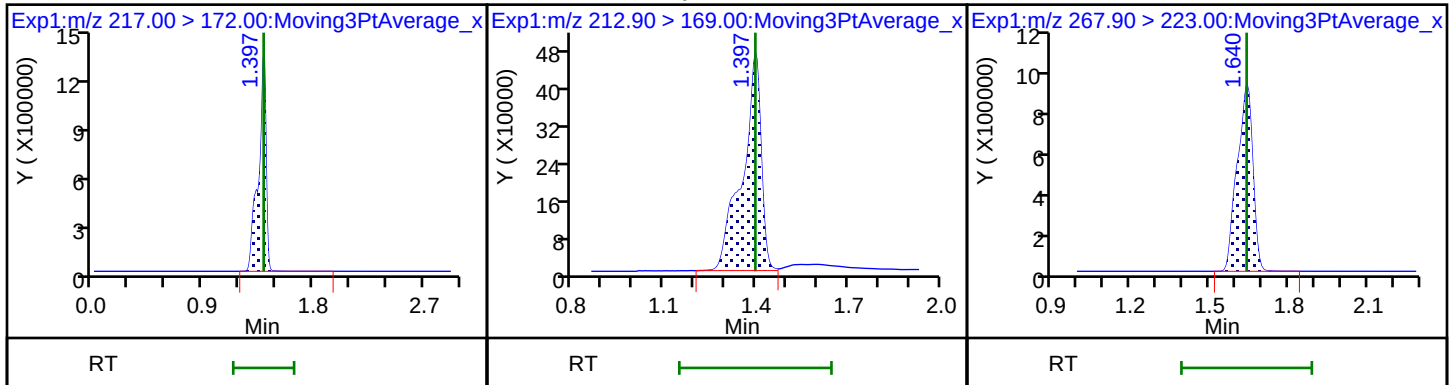
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

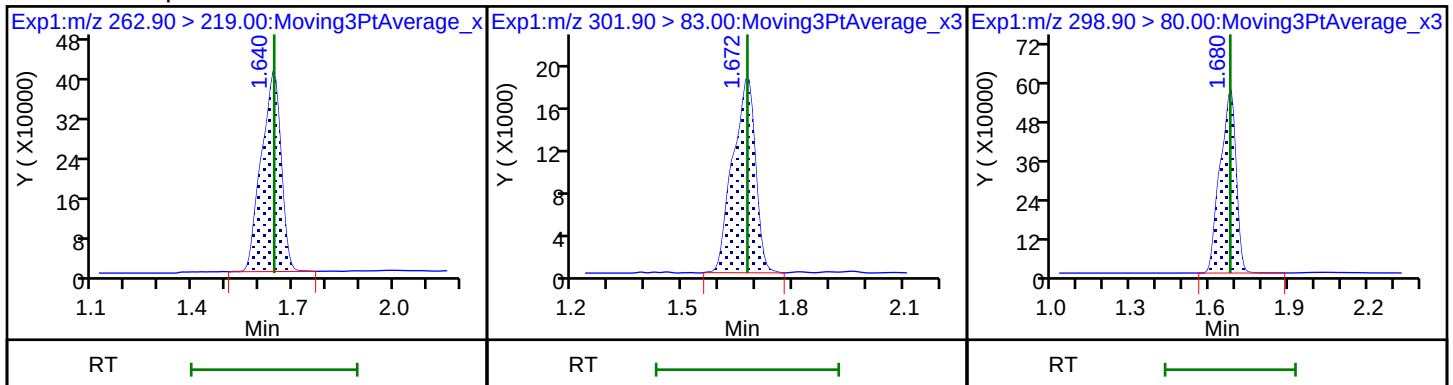
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

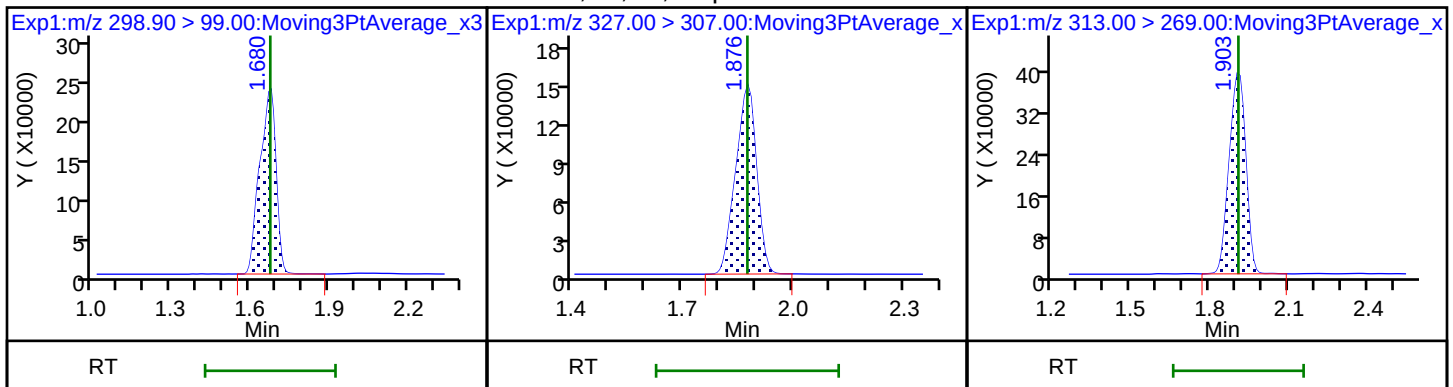
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfoni

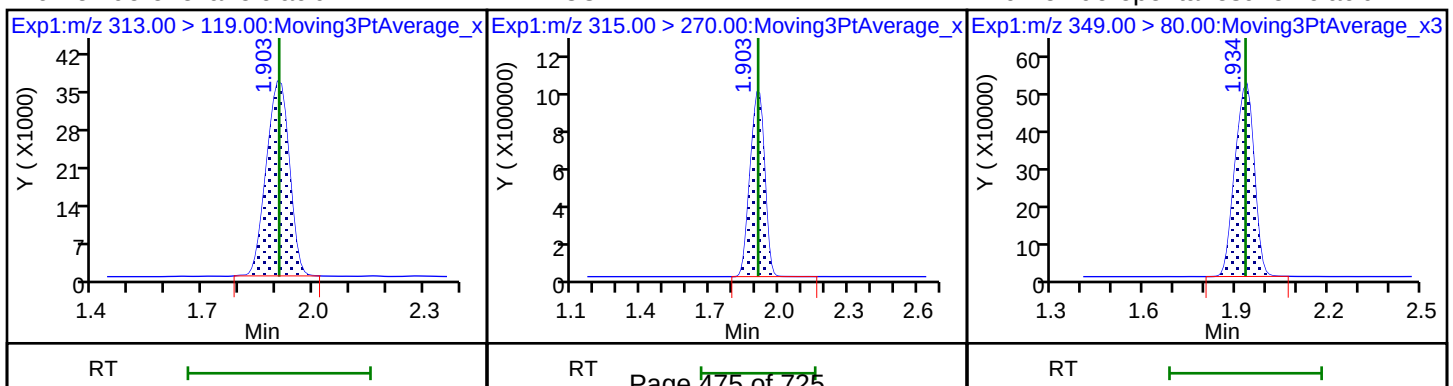
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

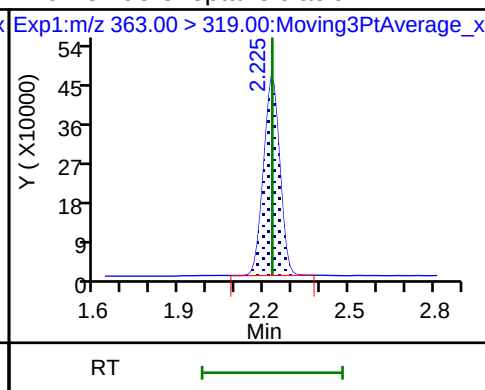
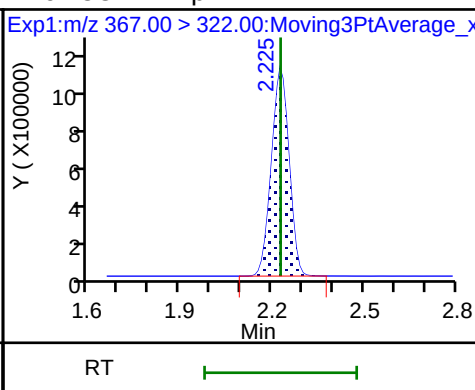
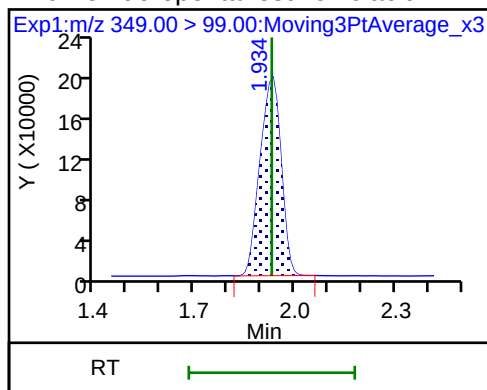
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

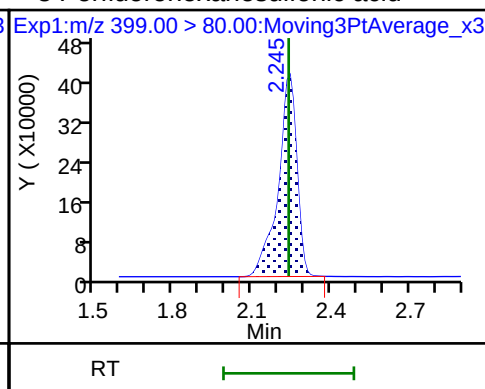
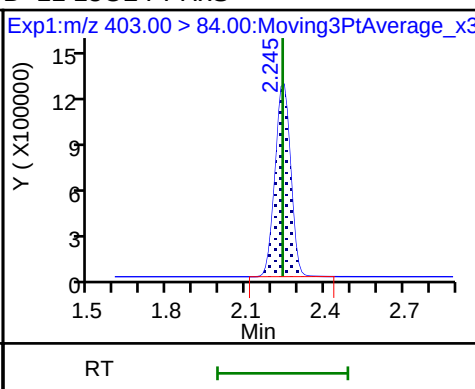
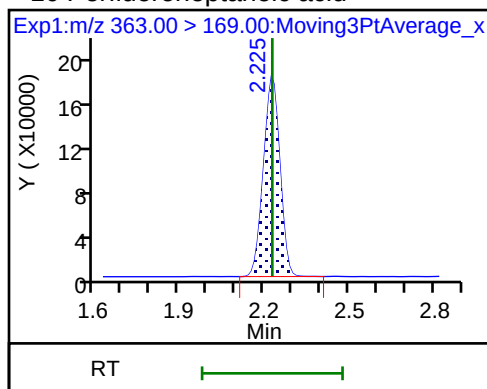
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

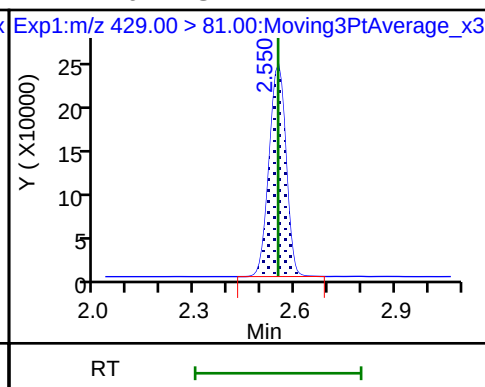
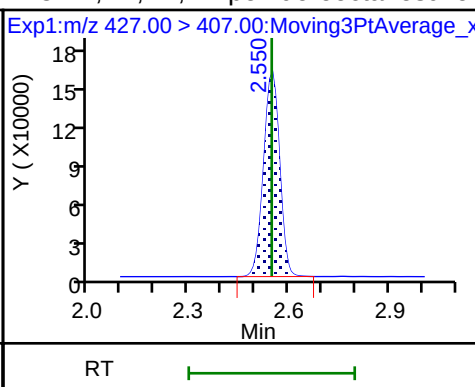
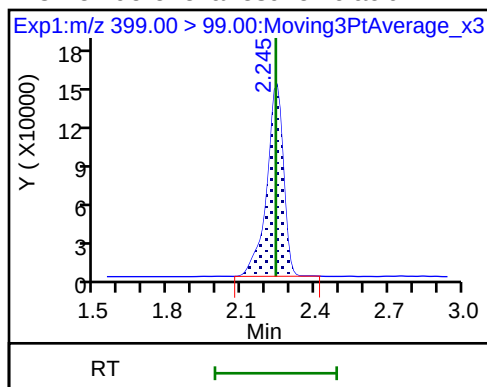
D 11 18O2 PFHxS

8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

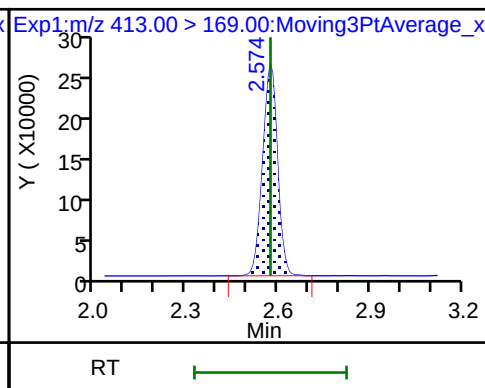
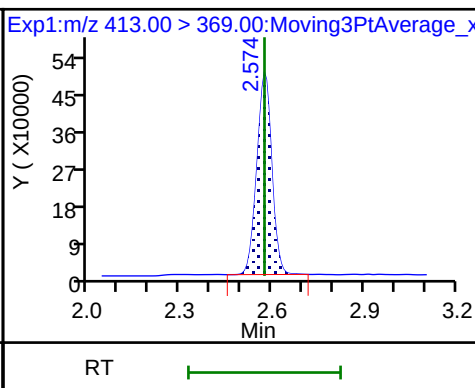
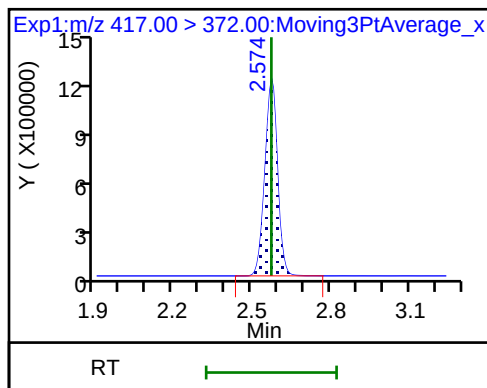
13 1H,1H,2H,2H-perfluorooctanesulfonD 12 M2-6:2FTS



D 14 13C4 PFOA

15 Perfluorooctanoic acid

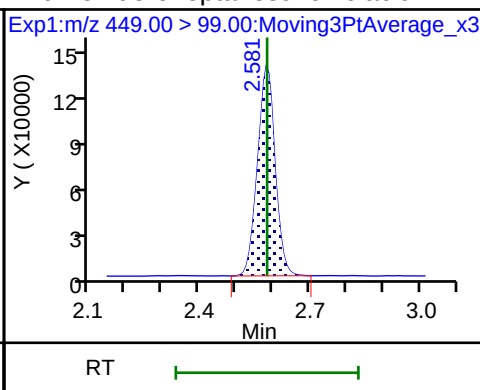
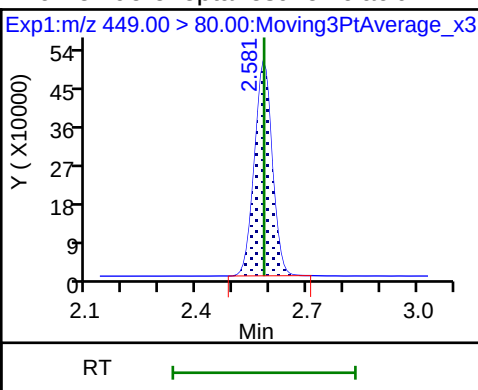
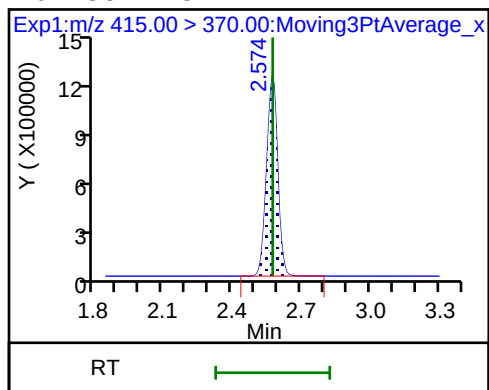
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

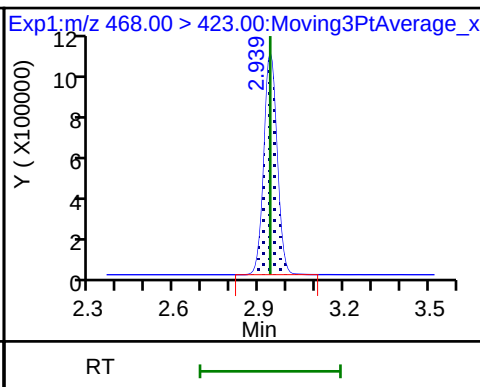
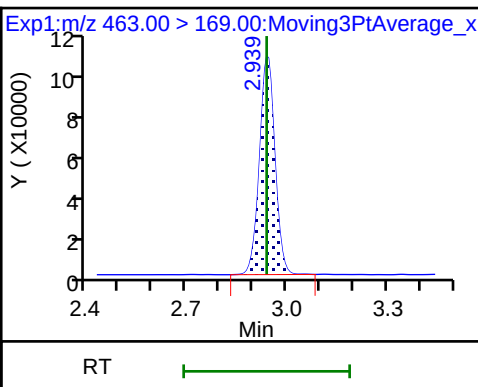
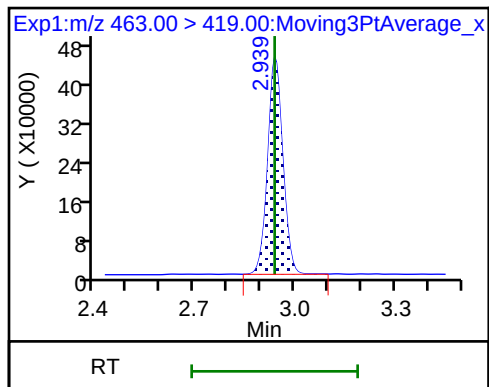
16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid

20 Perfluorononanoic acid

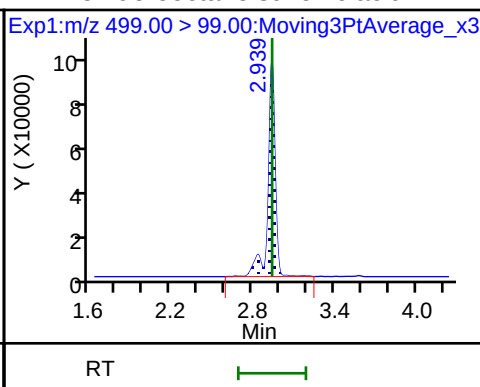
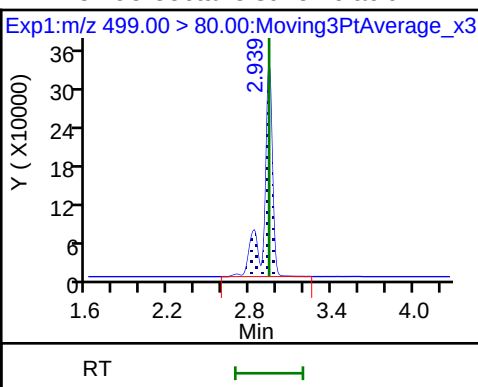
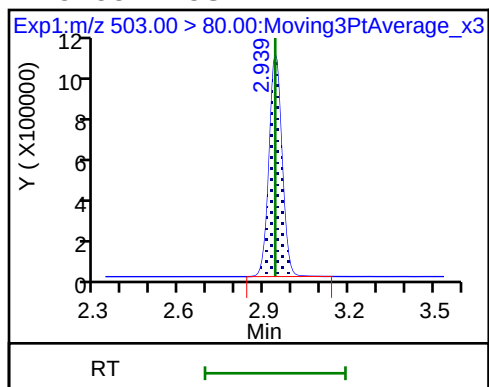
D 19 13C5 PFNA



D 18 13C4 PFOS

17 Perfluorooctane sulfonic acid

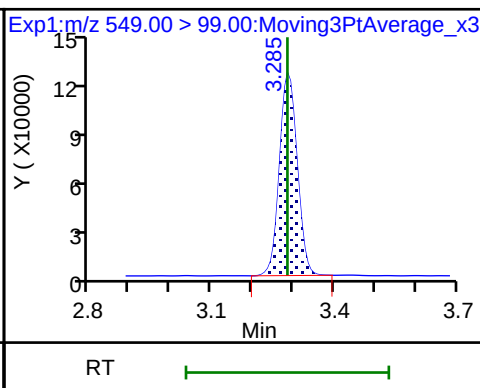
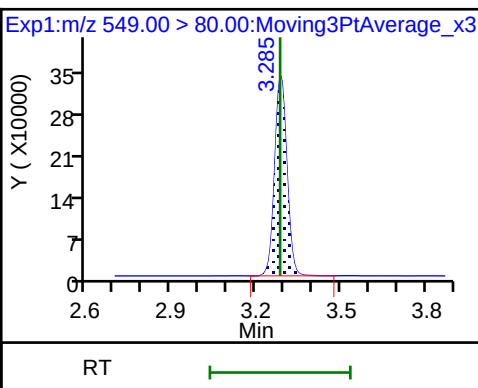
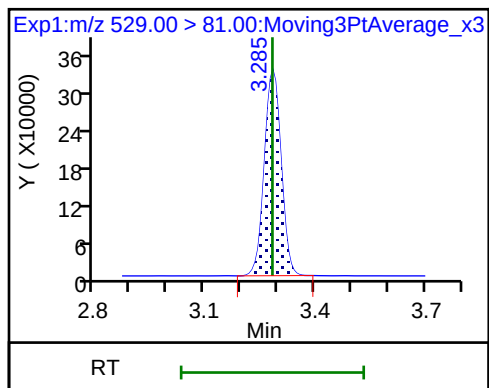
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid

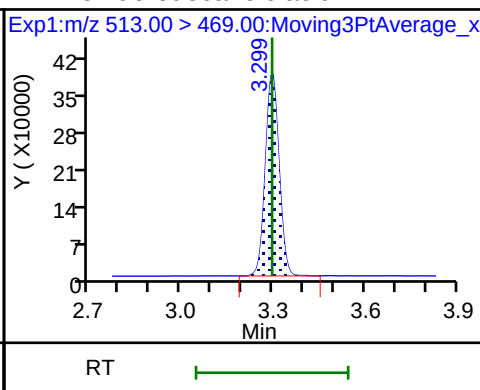
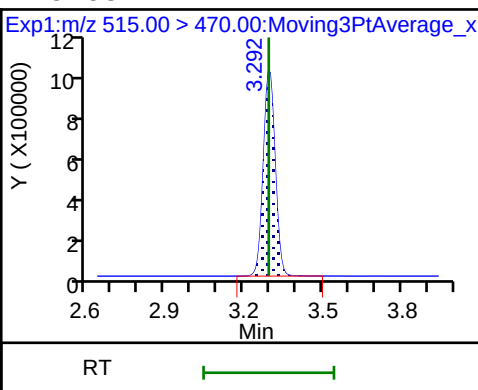
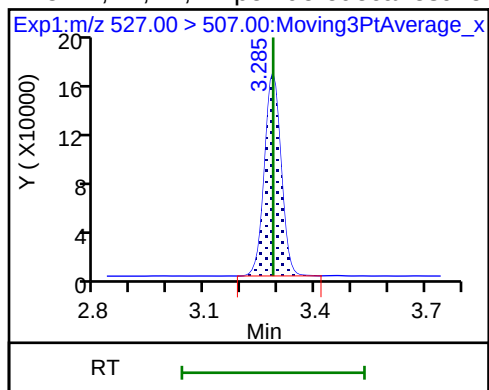
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfonate

D 23 13C2 PFDA

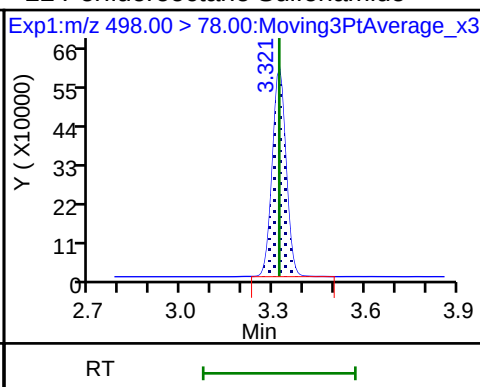
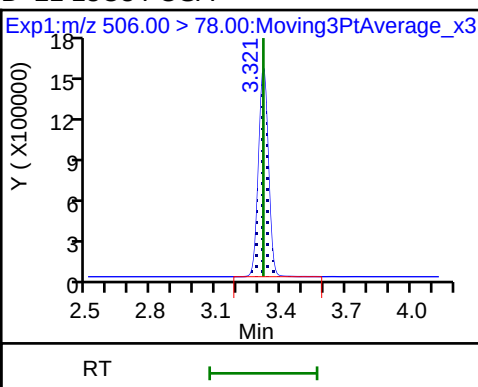
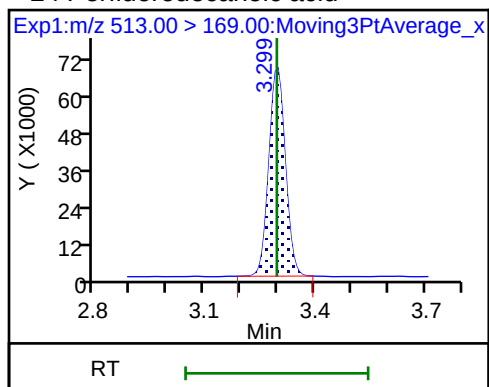
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 21 13C8 FOSA

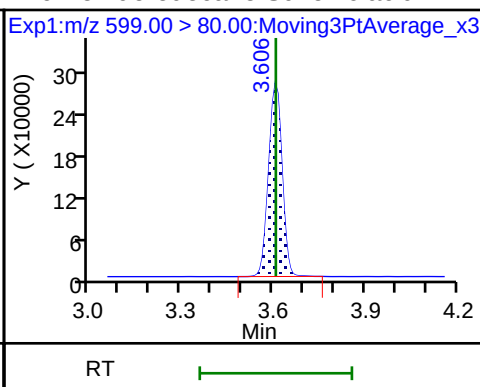
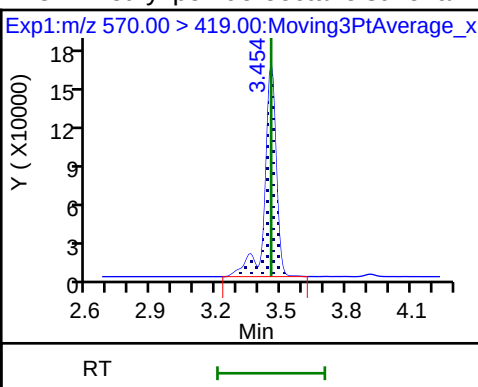
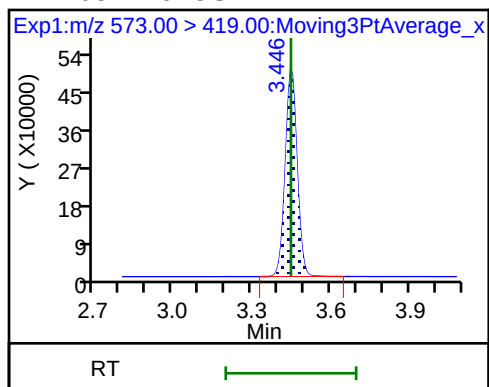
22 Perfluorooctane Sulfonamide



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

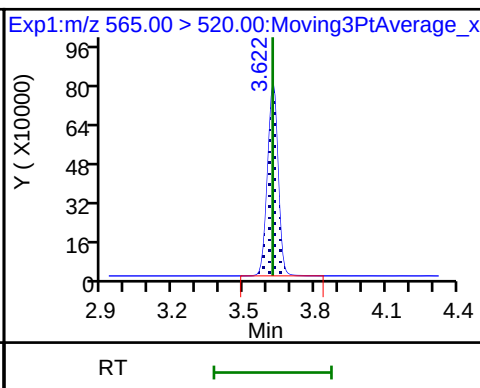
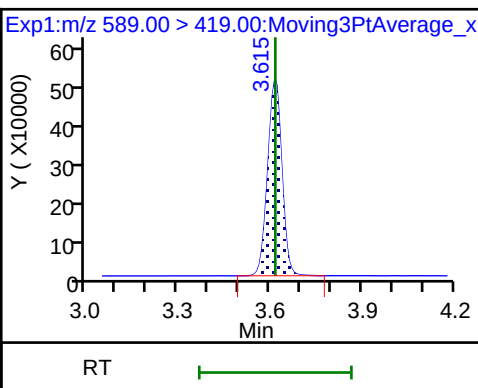
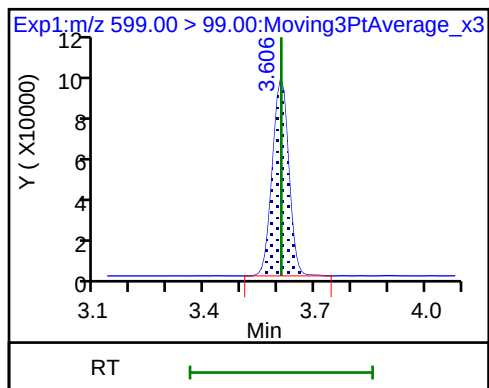
29 Perfluorodecane Sulfonic acid

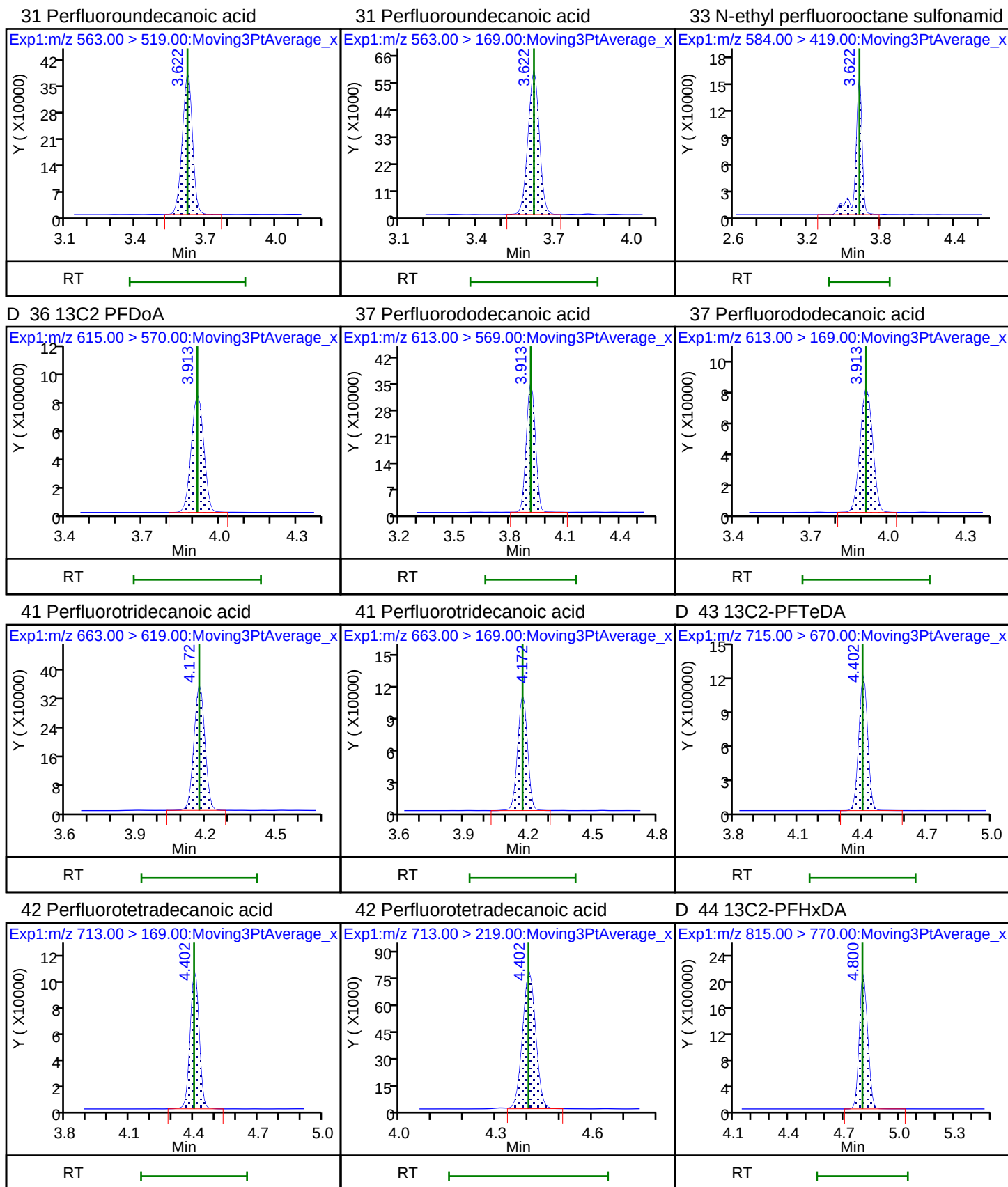


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_006.d
 Lims ID: IC L5 Full
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 06-Aug-2018 11:41:23 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@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:17:16 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: westendorfc

Date: 06-Aug-2018 14:07:34

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	1.392	1.395	-0.003	0.541	5444583	2.54		102	8249	
2 Perfluorobutyric acid										
212.90 > 169.00	1.392	1.397	-0.005	1.000	5049773	2.47		98.8	508	
D 3 13C5-PFPeA										
267.90 > 223.00	1.633	1.639	-0.006	0.634	3838069	2.60		104	8427	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.640	1.643	-0.003	1.005	4235935	2.43		97.0	293	
D 47 13C3-PFBS										
301.90 > 83.00	1.672	1.675	-0.003	0.649	80654	2.36		102	261	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.672	1.676	-0.004	1.000	5929736	2.25		102	2174	
298.90 > 99.00	1.672	1.676	-0.004	1.000	2454638		2.42(1.25-3.74)	102	1269	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.868	1.875	-0.007	1.117	1362407	2.37		102	7811	
D 60 M2-4:2FTS										
329.00 > 81.00	1.868	1.875	-0.007	0.726	585341	NC			782	
D 7 13C2 PFHxA										
315.00 > 270.00	1.903	1.908	-0.005	0.739	4337626	2.59		104	12580	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.903	1.908	-0.005	1.000	4365425	2.47		98.6	1122	
313.00 > 119.00	1.903	1.908	-0.005	1.000	395592		11.04(5.03-15.10)	98.6	758	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.924	1.930	-0.006	1.151	5715419	2.39		102	6693	
349.00 > 99.00	1.924	1.930	-0.006	1.151	2110213		2.71(1.36-4.07)	102	2084	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.997	2.003	-0.006	1.000	779751	NC			346	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.997	2.003	-0.006	0.776	352025	NC			762	
D 9 13C4-PFHpA										
367.00 > 322.00	2.225	2.227	-0.002	0.865	4193874	2.55		102	5912	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.225	2.228	-0.003	1.000	4504362	2.53		101	823	
363.00 > 169.00	2.225	2.228	-0.003	1.000	1708808		2.64(1.13-3.40)	101	2518	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.234	2.239	-0.005	1.000	5033358	2.15		94.4	2983	
399.00 > 99.00	2.234	2.239	-0.005	1.000	1700813		2.96(1.50-4.49)	94.4	1217	
D 11 18O2 PFHxS										
403.00 > 84.00	2.234	2.239	-0.005	0.868	5111206	2.42		102	4580	
65 ADONA										
377.00 > 251.00	2.267	2.271	-0.004	0.771	11980639	NC			8272	
377.00 > 85.00	2.267	2.271	-0.004	0.771	7225332		1.66(0.84-2.53)		5651	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.542	2.548	-0.006	1.000	1272183	2.30		97.0	1798	
D 12 M2-6:2FTS										
429.00 > 81.00	2.542	2.549	-0.007	0.988	835688	2.41		102	2359	
D 73 13C8 PFOA										
421.00 > 376.00	2.567	2.571	-0.004	0.997	7486707	NC			12368	
D 14 13C4 PFOA										
417.00 > 372.00	2.574	2.573	0.001	1.000	3832692	2.54		101	8027	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.574	0.0	1.000	4208258	2.43		97.0	382	
413.00 > 169.00	2.574	2.574	0.0	1.000	2127673		1.98(0.84-2.52)	97.0	2867	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.575	-0.001		3866051	2.50			7379	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.002	0.878	4278634	2.42		102	4054	
449.00 > 99.00	2.581	2.583	-0.002	0.878	1138164		3.76(1.94-5.82)	102	1763	
D 72 13C8 PFOS										
507.00 > 99.00	2.939	2.938	0.001	1.142	1644552	NC			3344	
D 18 13C4 PFOS										
503.00 > 80.00	2.939	2.939	0.0	1.142	3404908	2.45		103	4842	
D 19 13C5 PFNA										
468.00 > 423.00	2.939	2.939	0.0	1.142	3527035	2.60		104	6184	
20 Perfluorononanoic acid										
463.00 > 419.00	2.939	2.939	0.0	1.000	3614991	2.43		97.3	1002	
463.00 > 169.00	2.939	2.939	0.0	1.000	865774		4.18(1.90-5.69)	97.3	3370	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.940	-0.001	1.000	3462772	2.26		97.6	2634	
499.00 > 99.00	2.939	2.940	-0.001	1.000	797490		4.34(2.31-6.93)	97.6	1200	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.147	3.150	-0.003	1.071	5895997	NC			4521	
D 26 M2-8:2FTS										
529.00 > 81.00	3.285	3.284	0.001	1.276	1039099	2.48		104	4478	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.285	3.285	0.001	1.118	2589883	2.42		101	3256	
549.00 > 99.00	3.285	3.285	0.001	1.118	921596		2.81(1.33-3.97)	101	2355	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.285	3.286	-0.001	1.000	1315230	2.33		97.4	3552	
D 23 13C2 PFDA										
515.00 > 470.00	3.292	3.294	-0.002	1.279	3093053	2.60		104	7014	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.292	3.296	-0.004	1.000	3015215	2.43		97.2	1428	
513.00 > 169.00	3.299	3.296	0.003	1.002	521331		5.78(2.36-7.09)	97.2	351	
D 21 13C8 FOSA										
506.00 > 78.00	3.321	3.317	0.004	1.290	4593505	2.50		100.0	4893	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.319	0.002	1.000	4680280	2.62		105	6720	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.339	1601576	2.63		105	3113	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.454	3.453	0.001	1.002	1493989	2.42		96.7	1186	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.606	3.608	-0.002	1.227	2214864	2.46		102	4654	
599.00 > 99.00	3.606	3.608	-0.002	1.227	732667		3.02(1.39-4.16)	102	3079	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.615	3.616	-0.001	1.405	1595779	2.53		101	1266	
D 30 13C2 PFUnA										
565.00 > 520.00	3.622	3.620	0.002	1.407	2527555	2.64		106	4544	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.622	3.622	0.0	1.000	2714159	2.39		95.6	1491	
563.00 > 169.00	3.622	3.622	0.0	1.000	457550		5.93(2.12-6.36)	95.6	2345	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.622	3.623	-0.001	1.002	1366918	2.40		96.1	2485	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.777	3.781	-0.004	1.285	9579999	NC			13064	
35 MeFOSA										
512.00 > 169.00	3.827	3.826	0.001		1352810	NC			1222	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.913	3.913	0.0	1.000	2903966	2.45		97.8	1268	
613.00 > 169.00	3.913	3.913	0.0	1.000	683851		4.25(2.13-6.40)	97.8	2694	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.913	3.913	0.0	1.191	940315	NC			5393	
D 36 13C2 PFDaA										
615.00 > 570.00	3.913	3.913	0.0	1.520	2668181	2.64		106	5732	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.144	4.148	-0.004	1.410	961771	NC			3921	
699.00 > 99.00	4.144	4.148	-0.004	1.410	1365105		0.70(0.00-0.00)		3564	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.173	4.173	0.0	1.066	2849697	2.48		99.3	1172	
663.00 > 169.00	4.173	4.173	0.0	1.066	828238		3.44(1.25-3.76)	99.3	3194	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.395	4.399	-0.004	1.708	3233399	2.51		100	5729	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.395	4.400	-0.005	1.000	779223	2.49		99.6	2925	
713.00 > 219.00	4.395	4.400	-0.005	1.000	544891		1.43(0.71-2.13)	99.6	5524	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.794	4.799	-0.005	1.863	6396595	2.50		100	7999	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.794	4.801	-0.007	1.000	5763175	NC			2066	
813.00 > 169.00	4.794	4.801	-0.007	1.000	944162		6.10(2.86-8.58)		4213	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.131	5.136	-0.005	1.070	6077489	NC			1462	
913.00 > 169.00	5.131	5.136	-0.005	1.070	729623		8.33(3.83-11.48)		3111	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_006.d

Injection Date: 06-Aug-2018 11:41:23

Instrument ID: A8_N

Lims ID: IC L5 Full

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 14

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

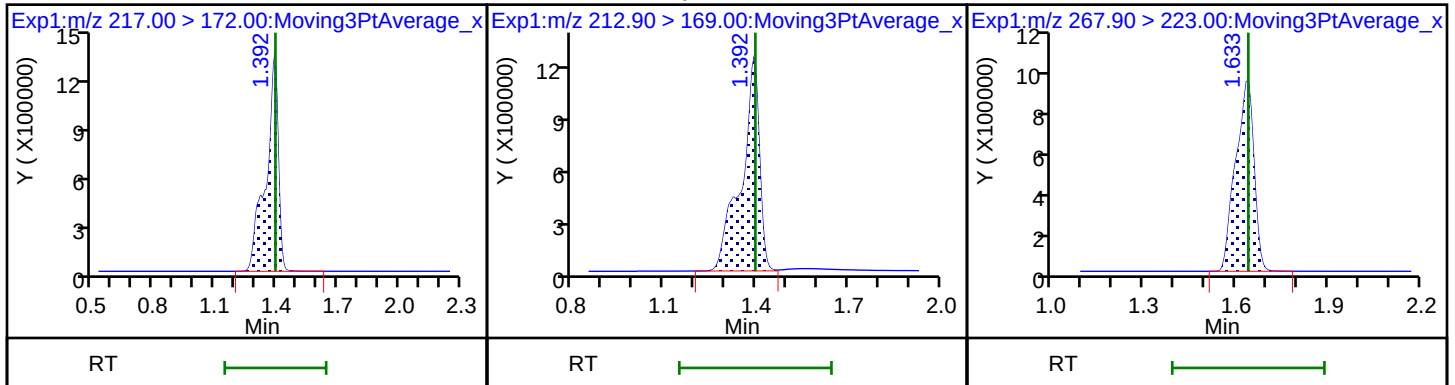
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

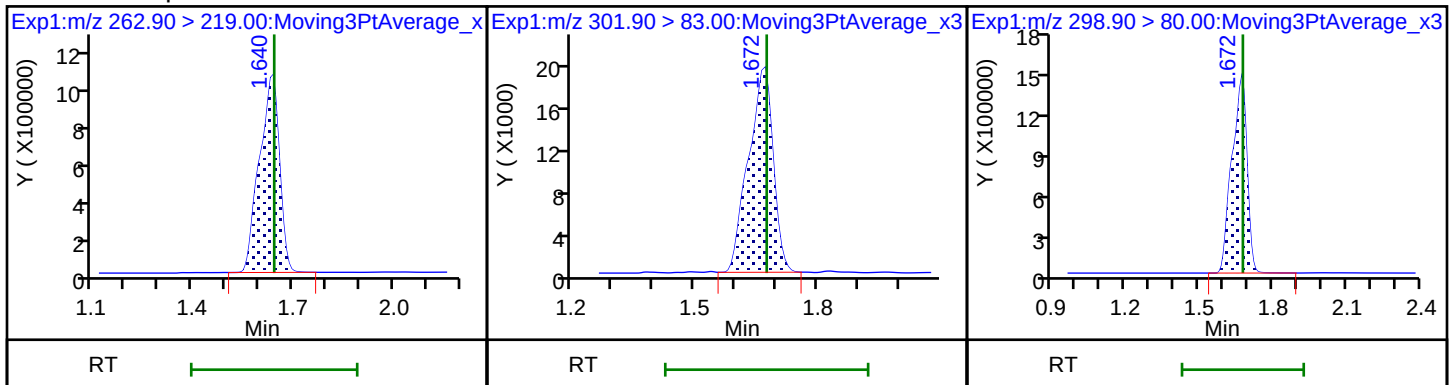
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

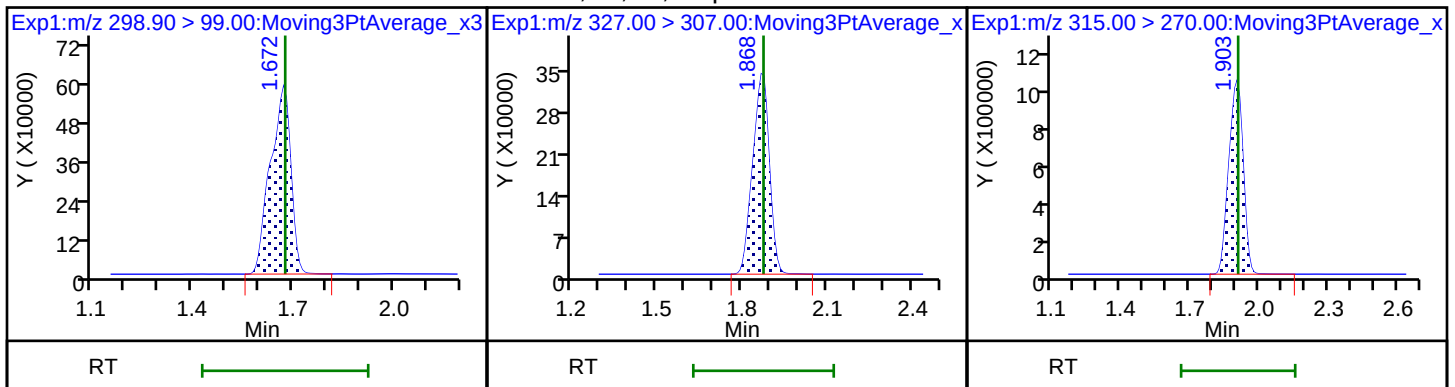
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

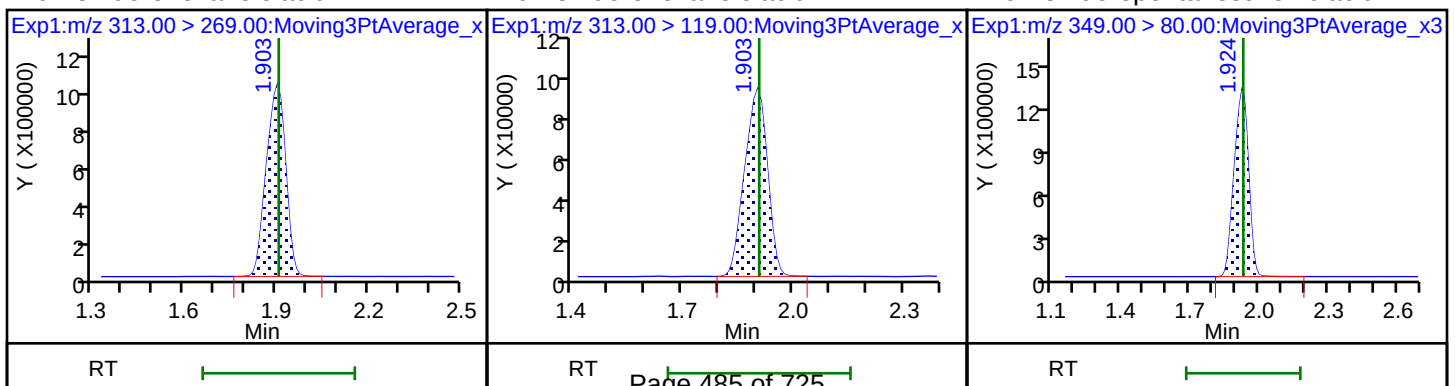
D 7 13C2 PFHxA



6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

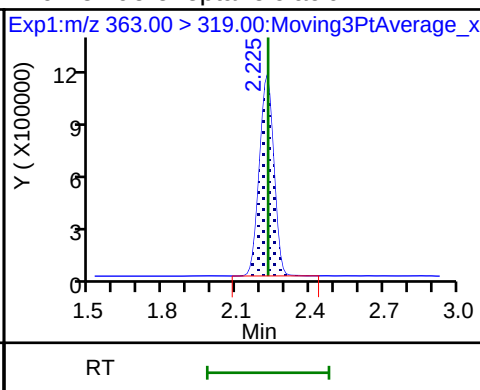
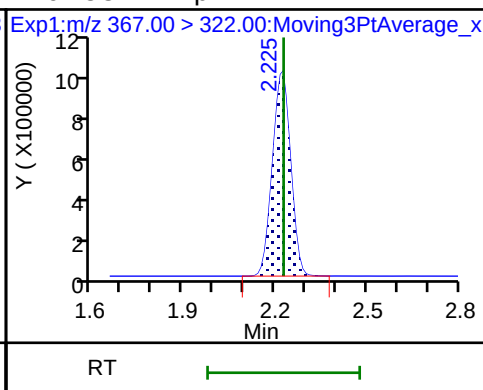
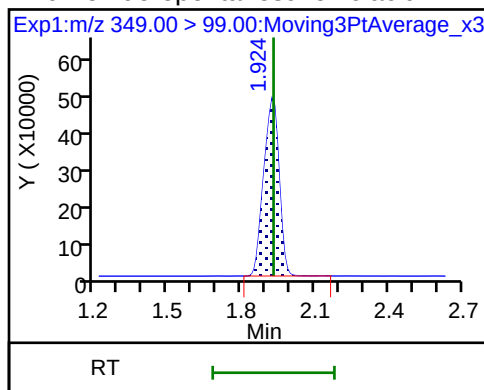
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

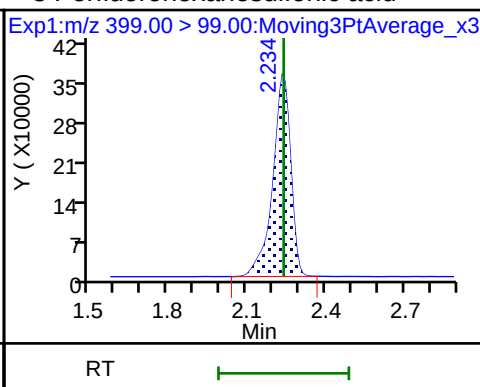
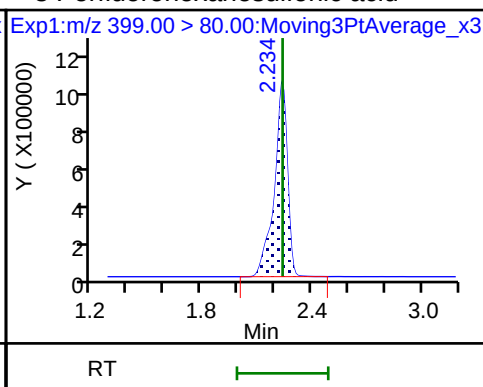
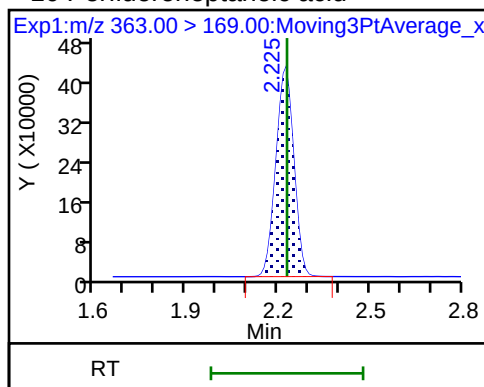
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

8 Perfluorohexanesulfonic acid

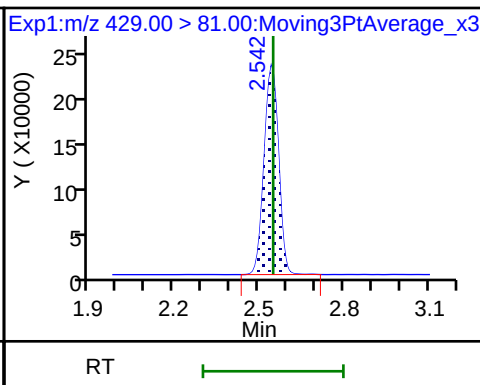
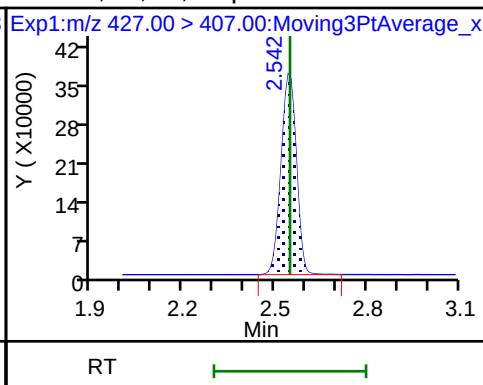
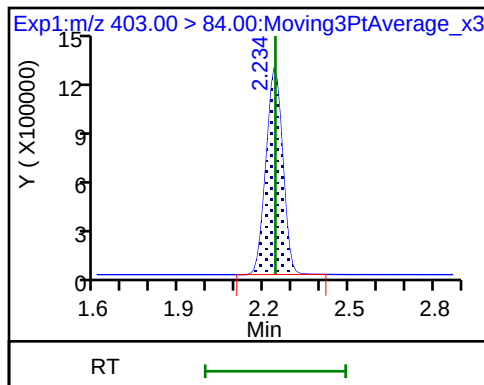
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

13 1H,1H,2H,2H-perfluorooctanesulfonD

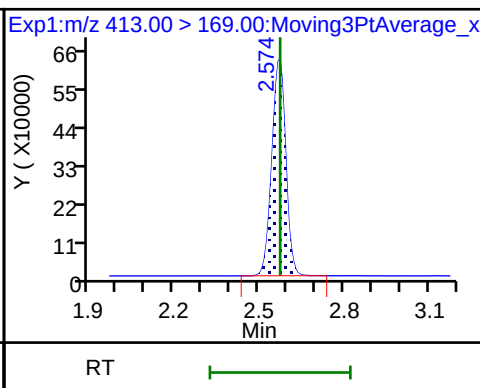
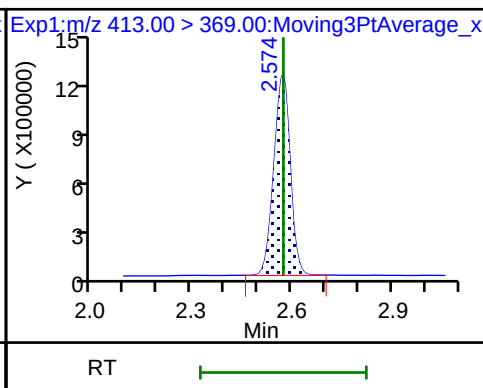
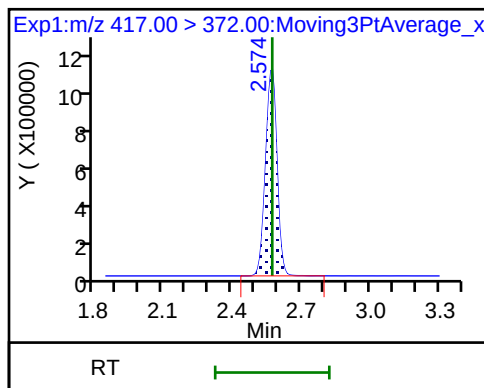
12 M2-6:2FTS



D 14 13C4 PFOA

15 Perfluorooctanoic acid

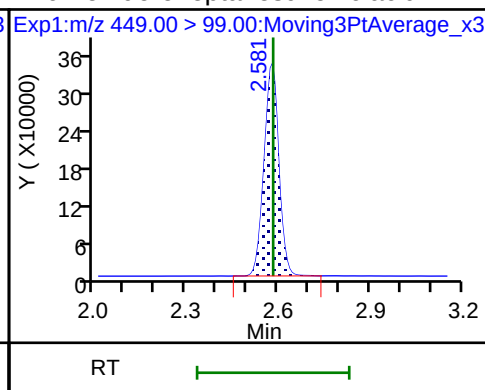
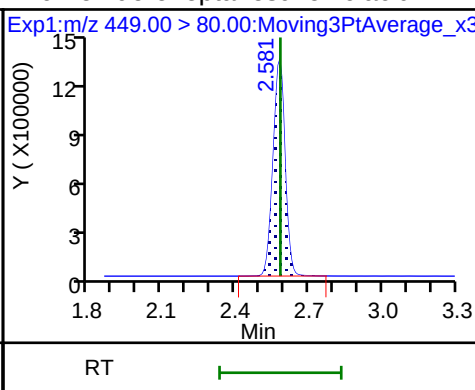
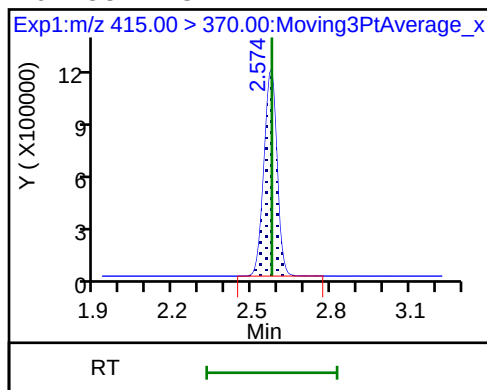
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

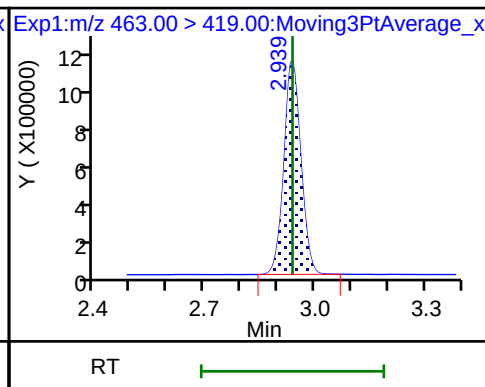
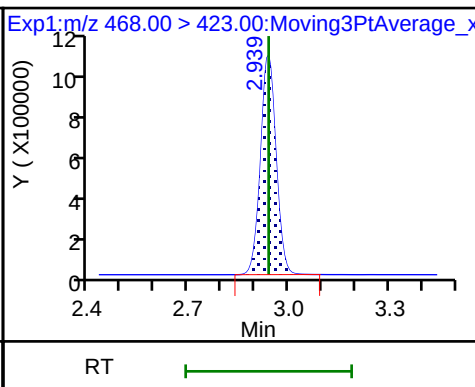
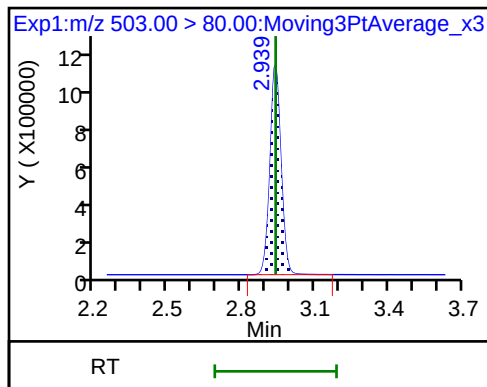
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

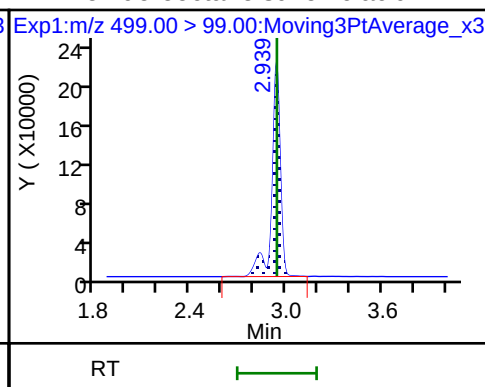
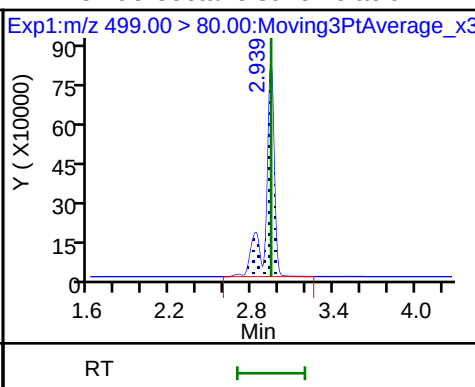
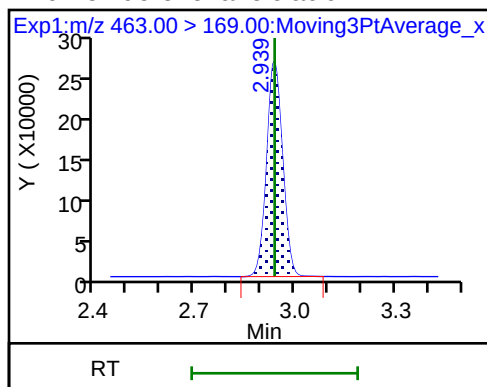
20 Perfluorononanoic acid



20 Perfluorononanoic acid

17 Perfluorooctane sulfonic acid

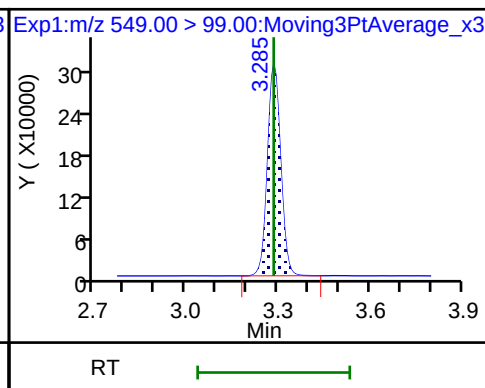
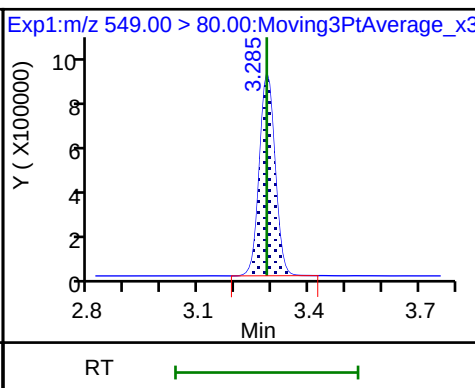
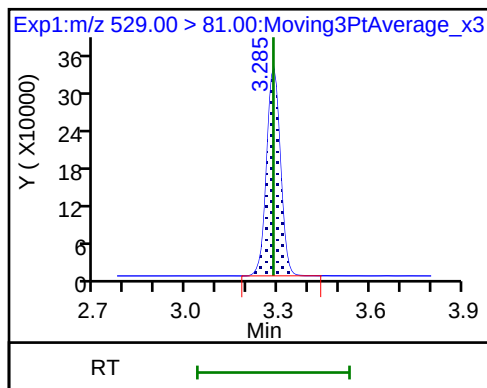
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid

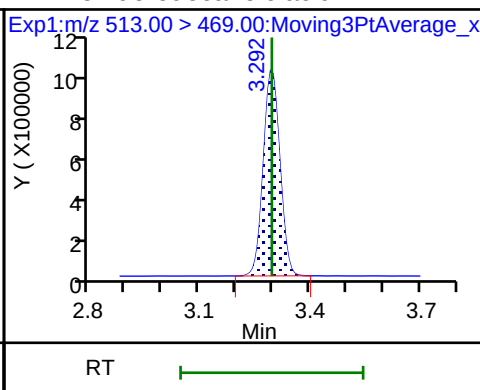
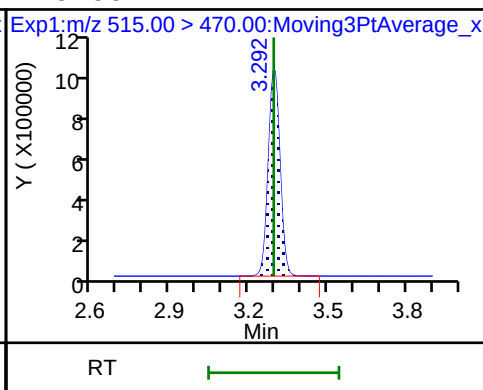
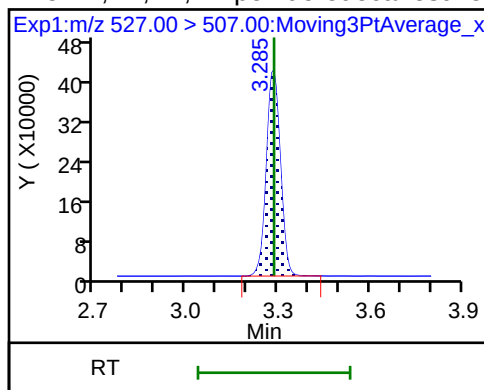
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfonate

D 23 13C2 PFDA

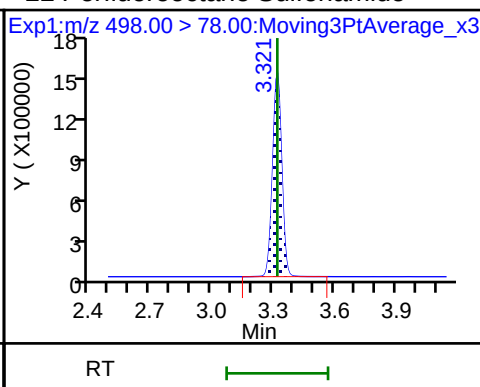
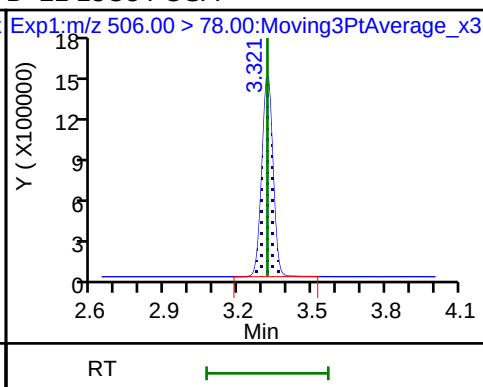
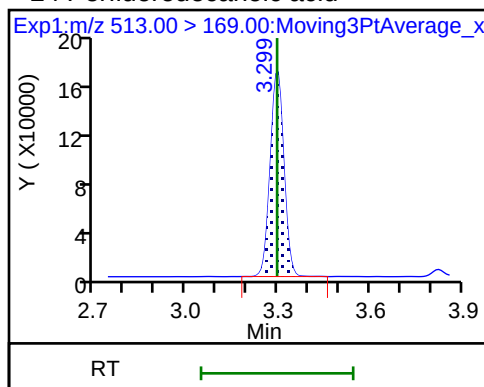
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 21 13C8 FOSA

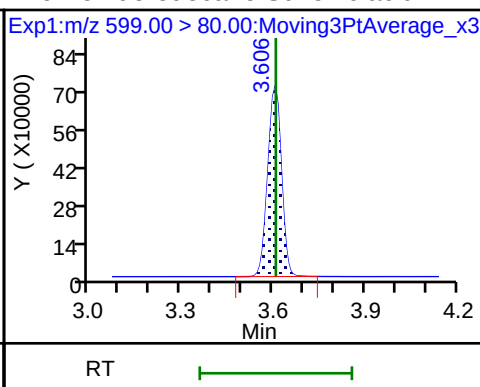
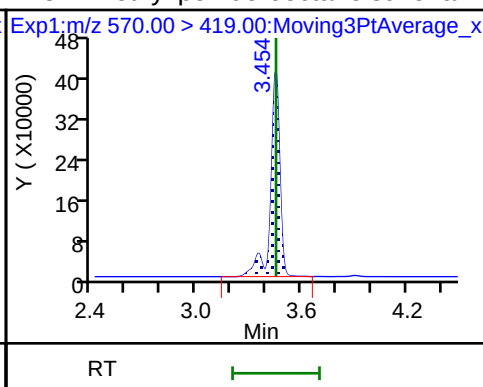
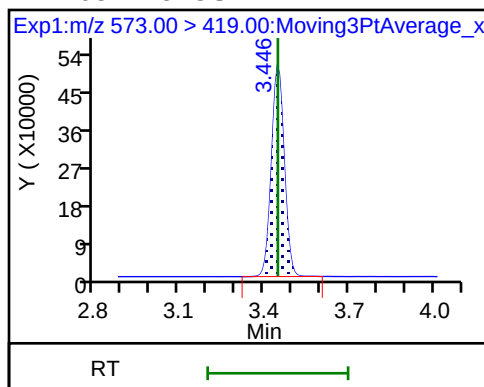
22 Perfluorooctane Sulfonamide



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

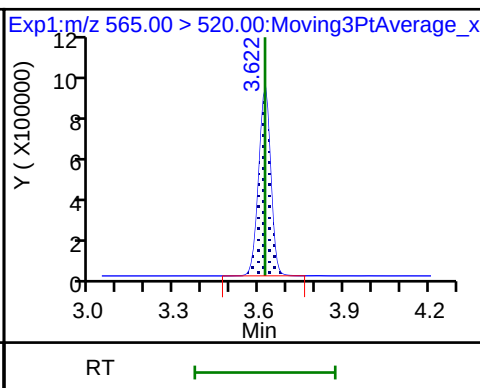
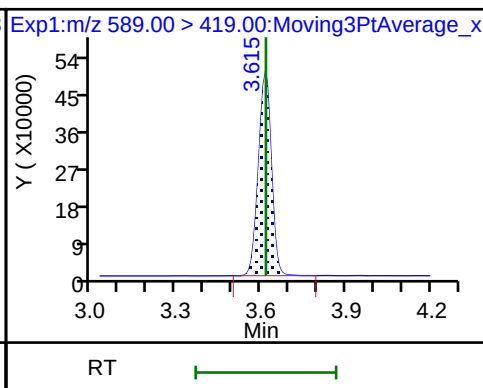
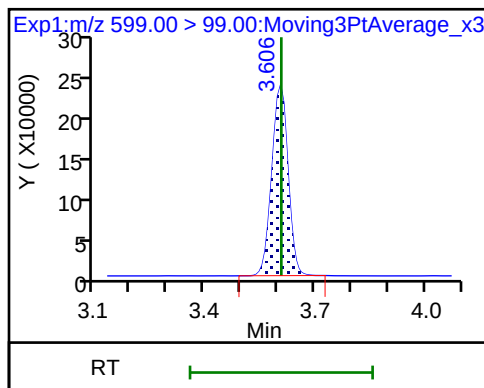
29 Perfluorodecane Sulfonic acid

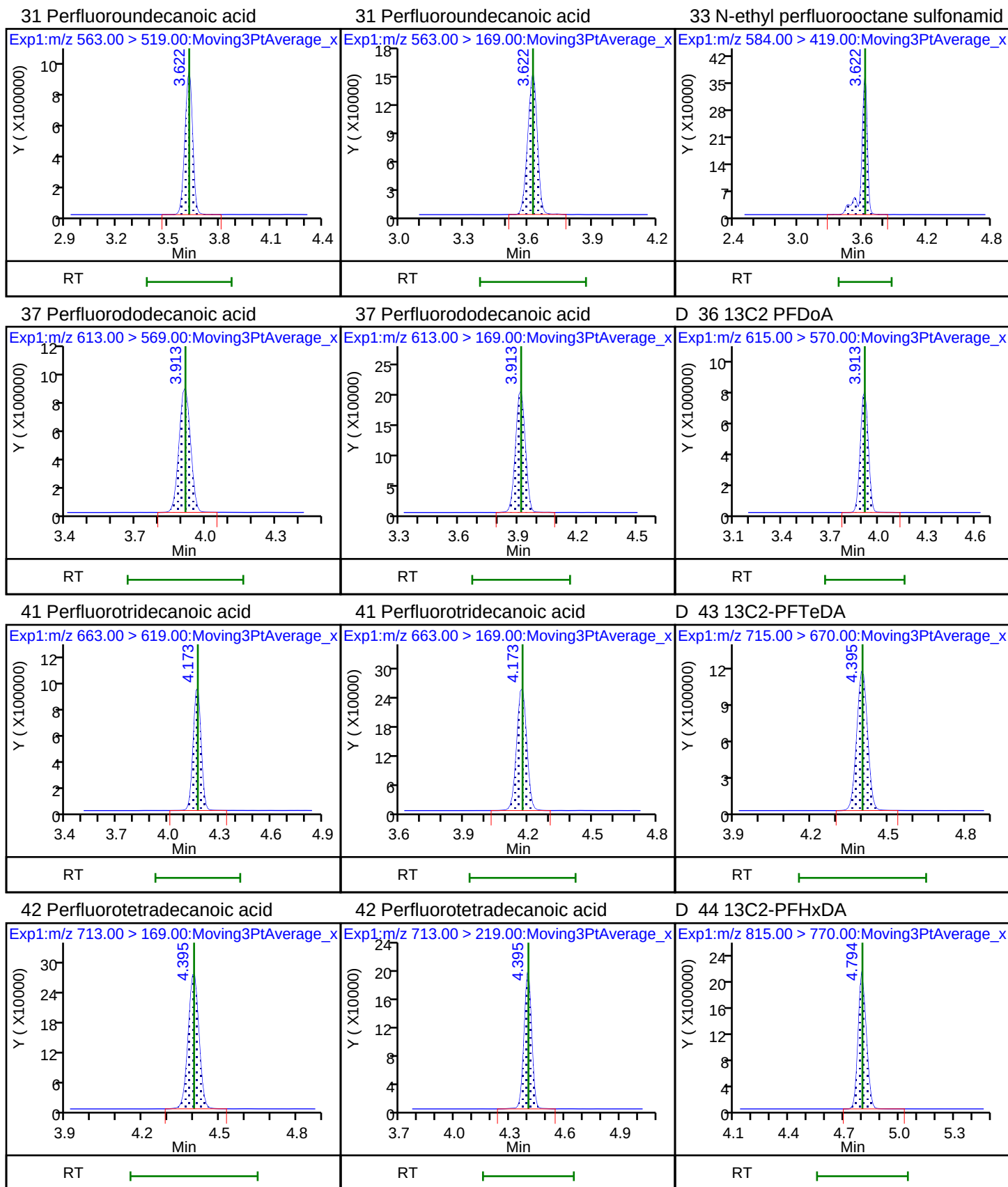


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_007.d
 Lims ID: IC L6 Full
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 06-Aug-2018 11:49:11 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@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:17:22 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: westendorfc

Date: 06-Aug-2018 14:40:35

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	1.394	1.395	-0.001	0.541	5693569	2.54		102	7704	
2 Perfluorobutyric acid										
212.90 > 169.00	1.394	1.397	-0.003	1.000	10686384	5.00		100.0	1220	
D 3 13C5-PFPeA										
267.90 > 223.00	1.636	1.639	-0.003	0.636	3917323	2.54		102	8427	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.643	1.643	0.0	1.005	8717868	4.89		97.8	602	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.651	81531	2.28		98.2	279	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.676	1.676	0.0	1.000	12353528	4.64		105	4081	
298.90 > 99.00	1.676	1.676	0.0	1.000	5231288		2.36(1.25-3.74)	105	2506	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.875	-0.003	0.727	609022	NC			998	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.875	-0.003	1.117	2687262	4.62		99.0	10818	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.908	-0.001	1.000	8802526	4.98		99.5	1994	
313.00 > 119.00	1.907	1.908	-0.001	1.000	793855		11.09(5.03-15.10)	99.5	1839	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.908	-0.001	0.741	4333101	2.47		99.0	9810	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.930	-0.002	1.151	11938702	4.94		105	10425	
349.00 > 99.00	1.928	1.930	-0.002	1.151	4318494		2.76(1.36-4.07)	105	3576	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.003	-0.002	0.777	336215	NC			800	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.001	2.003	-0.002	1.000	1620535	NC			795	
D 9 13C4-PFHpA										
367.00 > 322.00	2.227	2.227	0.0	0.865	4351928	2.52		101	6506	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.228	-0.001	1.000	9106263	4.93		98.5	1787	
363.00 > 169.00	2.227	2.228	-0.001	1.000	3813206		2.39(1.13-3.40)	98.5	5503	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.239	-0.003	0.869	5234562	2.37		100	5690	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.239	-0.003	1.000	10391537	4.33		95.2	4424	
399.00 > 99.00	2.236	2.239	-0.003	1.000	3502068		2.97(1.50-4.49)	95.2	2351	
65 ADONA										
377.00 > 251.00	2.269	2.271	-0.002	0.774	22851214	NC			14304	
377.00 > 85.00	2.269	2.271	-0.002	0.774	14239580		1.60(0.84-2.53)		11126	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.544	2.548	-0.004	1.000	2696182	4.73		99.9	2996	
D 12 M2-6:2FTS										
429.00 > 81.00	2.544	2.549	-0.005	0.988	859900	2.37		99.8	3069	
D 73 13C8 PFOA										
421.00 > 376.00	2.568	2.571	-0.003	0.997	7461246	NC			9011	
D 14 13C4 PFOA										
417.00 > 372.00	2.568	2.573	-0.005	0.997	3963063	2.51		100	5629	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.568	2.574	-0.006	1.000	8637324	4.82		96.3	834	
413.00 > 169.00	2.574	2.574	0.0	1.003	4333301		1.99(0.84-2.52)	96.3	3910	
* 62 13C2-PFOA										
415.00 > 370.00	2.574	2.575	-0.001		4046341	2.50			5779	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.002	0.880	8721667	4.85		102	5365	
449.00 > 99.00	2.581	2.583	-0.002	0.880	2296888		3.80(1.94-5.82)	102	2733	
D 72 13C8 PFOS										
507.00 > 99.00	2.933	2.938	-0.005	1.139	1714648	NC			3239	
20 Perfluorononanoic acid										
463.00 > 419.00	2.933	2.939	-0.006	1.000	7475851	5.13		103	1834	
463.00 > 169.00	2.933	2.939	-0.006	1.000	1732734		4.31(1.90-5.69)	103	4946	
D 19 13C5 PFNA										
468.00 > 423.00	2.933	2.939	-0.006	1.139	3461355	2.44		97.5	7405	
D 18 13C4 PFOS										
503.00 > 80.00	2.933	2.939	-0.006	1.139	3471061	2.39		100	4088	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.933	2.940	-0.007	1.000	7339820	4.71		101	4397	
499.00 > 99.00	2.933	2.940	-0.007	1.000	1648492		4.45(2.31-6.93)	101	2215	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.147	3.150	-0.003	1.073	11940295	NC			9089	
D 26 M2-8:2FTS										
529.00 > 81.00	3.278	3.284	-0.006	1.273	1052330	2.40		100	2990	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.278	3.285	-0.006	1.118	5361178	4.91		102	6489	
549.00 > 99.00	3.278	3.285	-0.006	1.118	1913317		2.80(1.33-3.97)	102	4125	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.278	3.286	-0.008	1.000	2679186	4.69		98.0	7666	
D 23 13C2 PFDA										
515.00 > 470.00	3.291	3.294	-0.003	1.279	3159574	2.54		101	5723	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.291	3.296	-0.005	1.000	6298810	4.97		99.4	3082	
513.00 > 169.00	3.291	3.296	-0.005	1.000	1066541		5.91(2.36-7.09)	99.4	375	
D 21 13C8 FOSA										
506.00 > 78.00	3.313	3.317	-0.004	1.287	4781606	2.49		99.4	7259	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.313	3.319	-0.006	1.000	9594151	5.15		103	5632	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.338	1562466	2.45		98.1	3298	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.446	3.453	-0.007	1.000	3073336	5.10		102	1851	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.605	3.608	-0.003	1.229	4472904	4.87		101	6207	
599.00 > 99.00	3.605	3.608	-0.003	1.229	1485053		3.01(1.39-4.16)	101	3079	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.614	3.616	-0.002	1.404	1597197	2.42		96.8	1213	
D 30 13C2 PFUnA										
565.00 > 520.00	3.620	3.620	0.0	1.406	2455806	2.45		98.1	4433	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.620	3.622	-0.002	1.000	5365541	4.86		97.2	2645	
563.00 > 169.00	3.620	3.622	-0.002	1.000	966969		5.55(2.12-6.36)	97.2	3828	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.620	3.623	-0.003	1.002	2815576	4.94		98.8	3781	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.776	3.781	-0.005	1.287	18718037	NC			15847	
35 MeFOSA										
512.00 > 169.00	3.825	3.826	-0.001		2815632	NC			1284	
D 36 13C2 PFDaA										
615.00 > 570.00	3.912	3.913	-0.001	1.519	2627551	2.48		99.3	5544	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.912	3.913	-0.001	1.193	1978025	NC			5592	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.912	3.913	-0.001	1.000	5646629	4.83		96.6	2368	
613.00 > 169.00	3.912	3.913	-0.001	1.000	1341283		4.21(2.13-6.40)	96.6	4604	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.143	4.148	-0.005	1.413	1963594	NC			4220	
699.00 > 99.00	4.143	4.148	-0.005	1.413	2852468		0.69(0.00-0.00)		6658	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.172	4.173	-0.001	1.066	5879570	5.20		104	1968	
663.00 > 169.00	4.172	4.173	-0.001	1.066	1735255		3.39(1.25-3.76)	104	3374	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.394	4.399	-0.005	1.707	3382019	2.51		100	6979	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.402	4.400	0.002	1.002	1606848	4.91		98.2	5145	
713.00 > 219.00	4.394	4.400	-0.006	1.000	1111841		1.45(0.71-2.13)	98.2	2346	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.800	4.799	0.001	1.864	6730439	2.51		101	7597	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.800	4.801	-0.001	1.000	11833130	NC			3519	
813.00 > 169.00	4.800	4.801	-0.001	1.000	2057982		5.75(2.86-8.58)		6089	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.135	5.136	-0.001	1.070	12433827	NC			2663	
913.00 > 169.00	5.128	5.136	-0.008	1.068	1501219		8.28(3.83-11.48)		4432	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00007

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_007.d

Injection Date: 06-Aug-2018 11:49:11

Instrument ID: A8_N

Lims ID: IC L6 Full

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#:

15

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

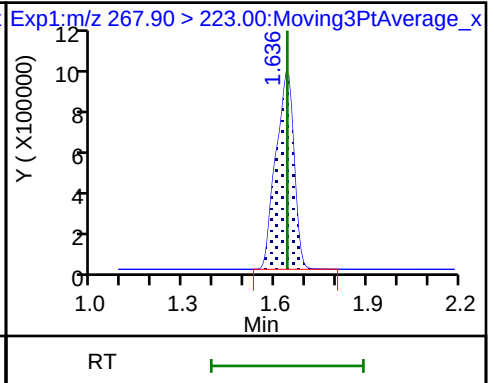
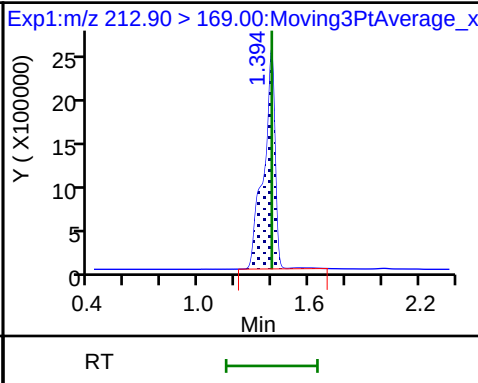
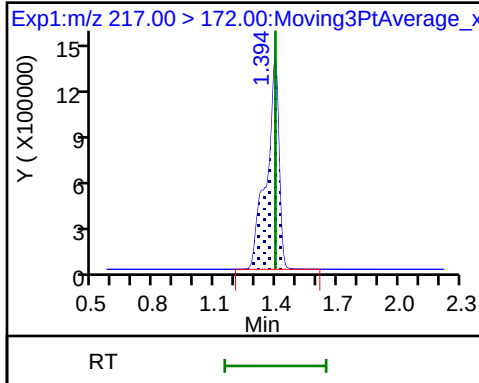
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

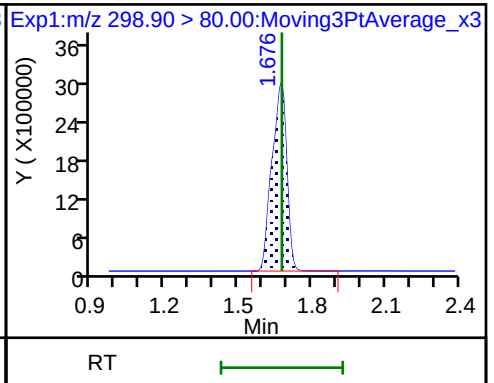
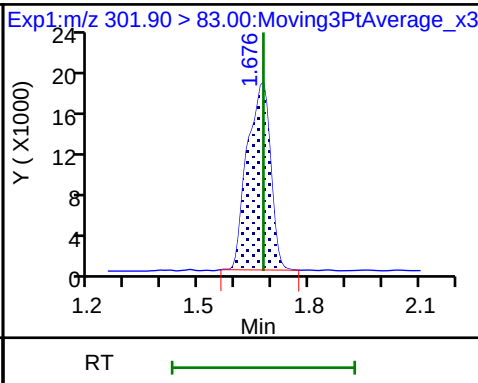
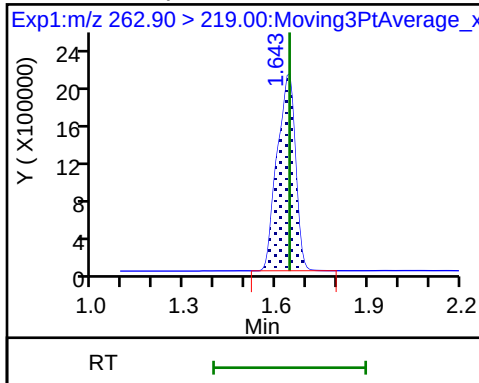
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

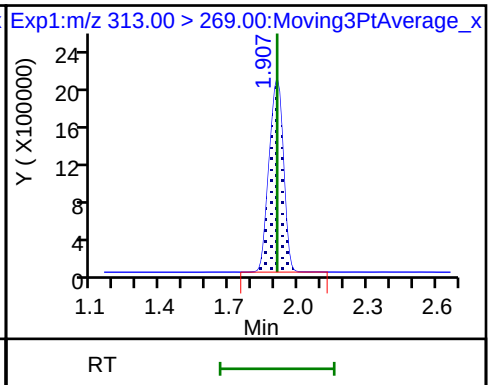
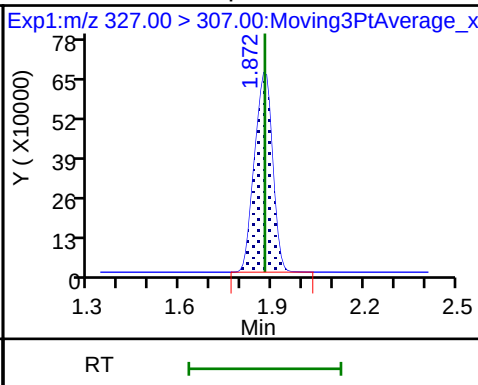
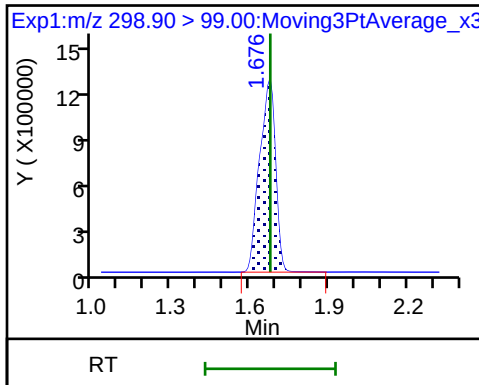
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfoni

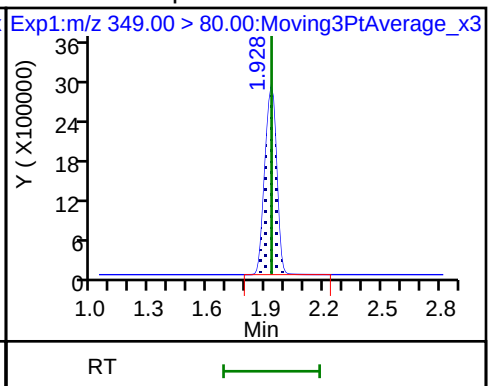
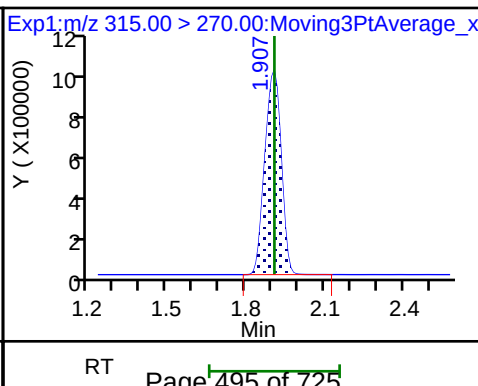
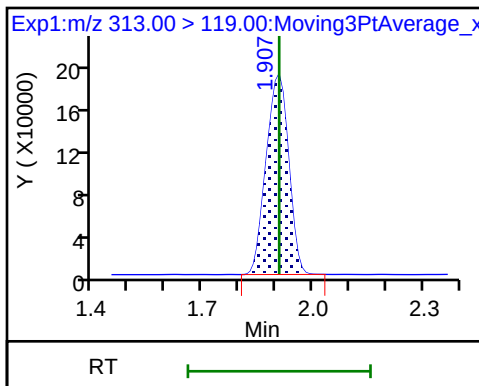
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

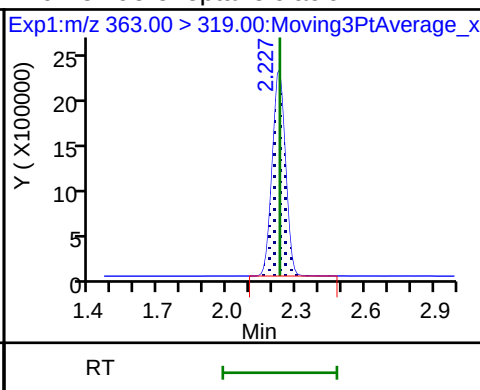
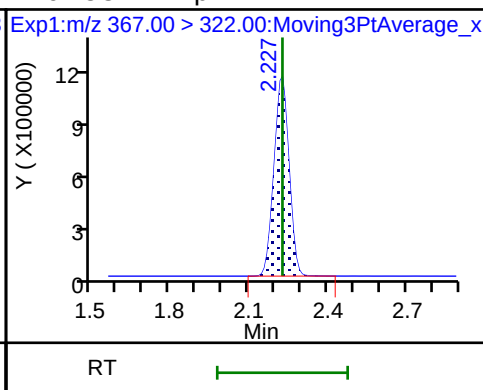
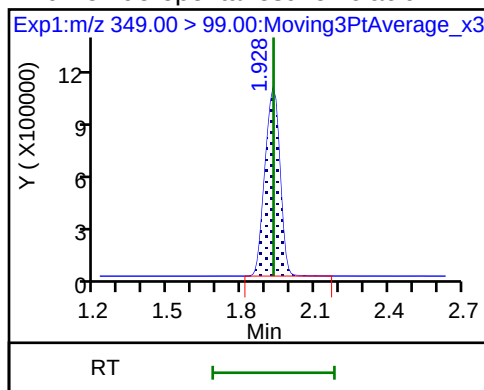
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

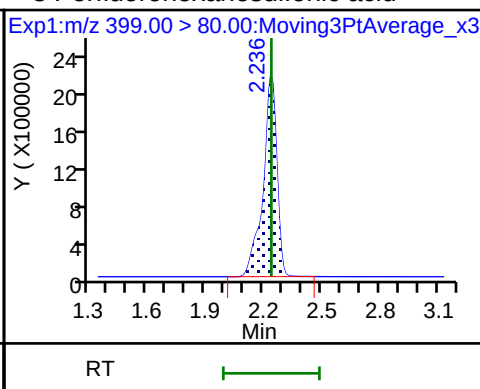
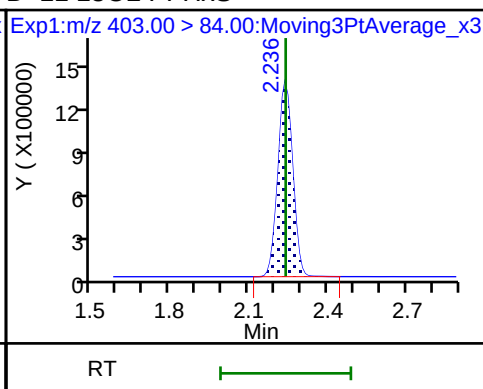
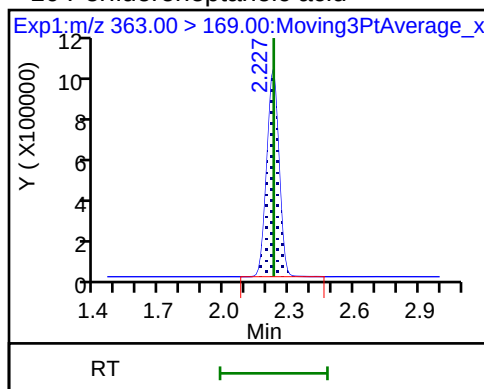
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

D 11 18O2 PFHxS

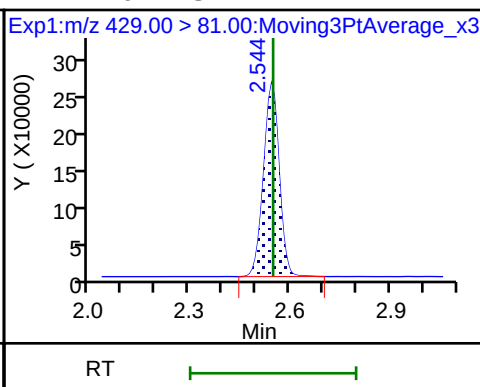
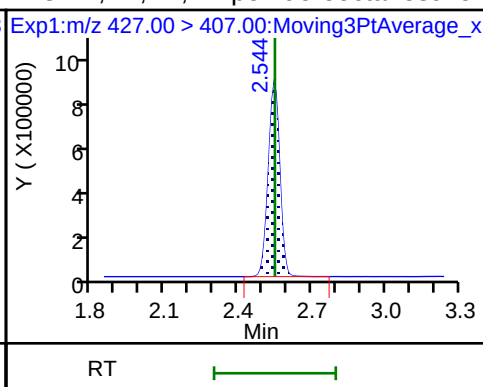
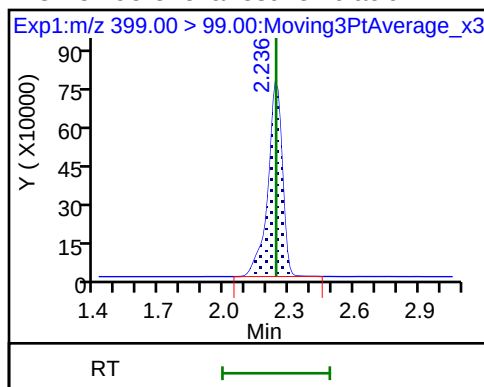
8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

13 1H,1H,2H,2H-perfluorooctanesulfonD

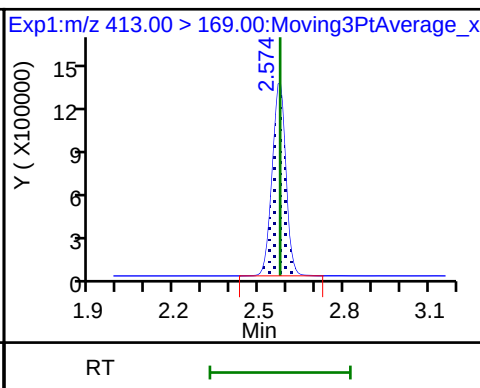
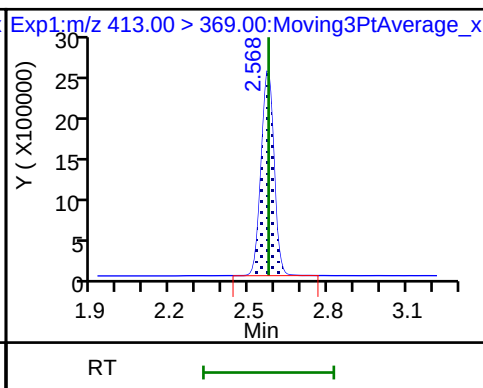
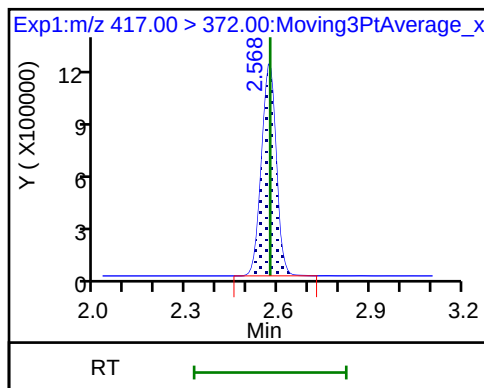
12 M2-6:2FTS



D 14 13C4 PFOA

15 Perfluorooctanoic acid

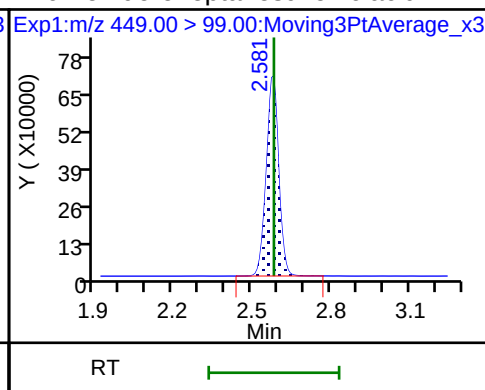
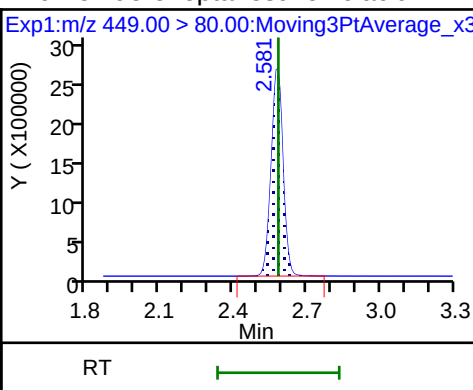
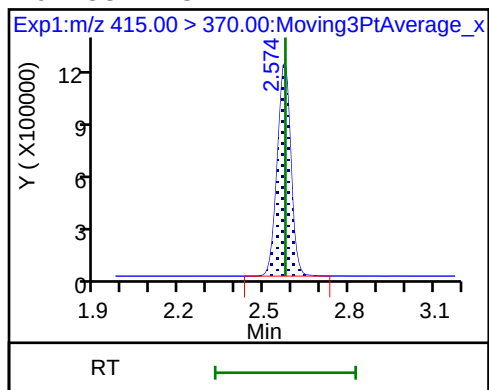
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

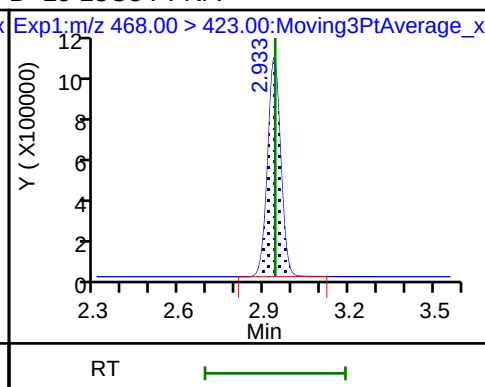
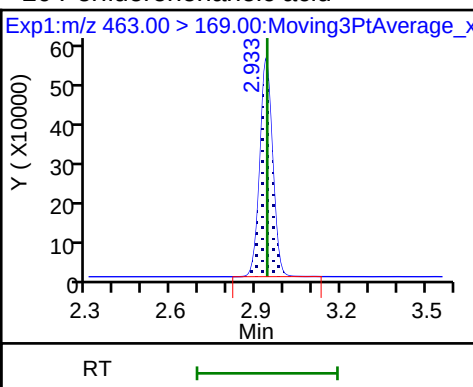
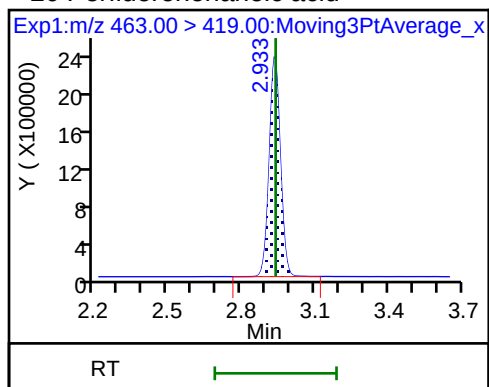
16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid

20 Perfluorononanoic acid

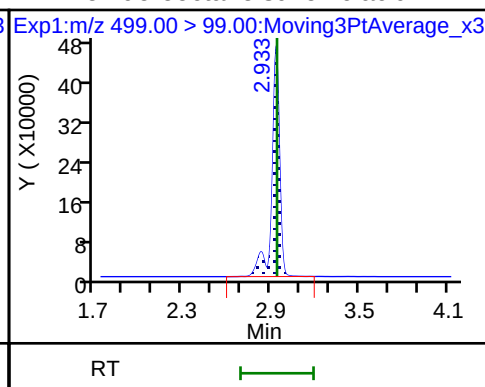
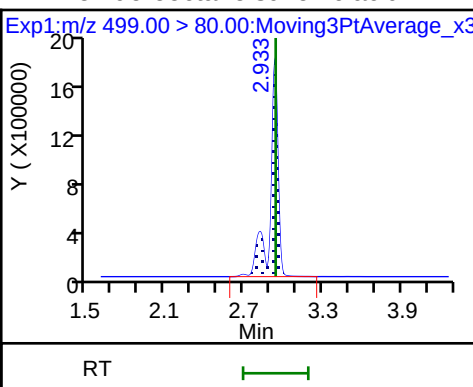
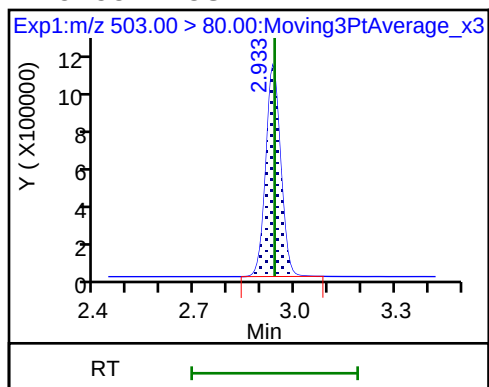
D 19 13C5 PFNA



D 18 13C4 PFOS

17 Perfluorooctane sulfonic acid

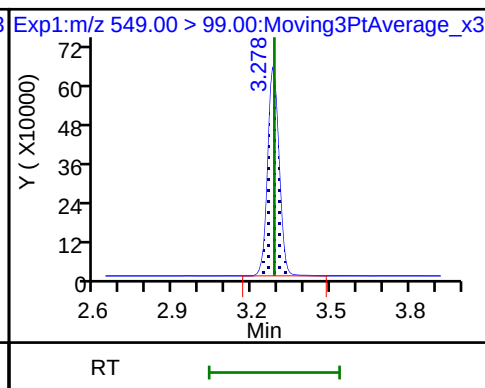
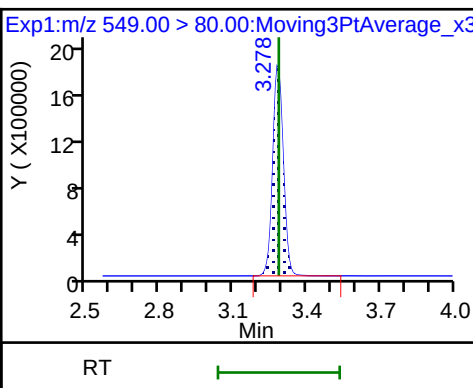
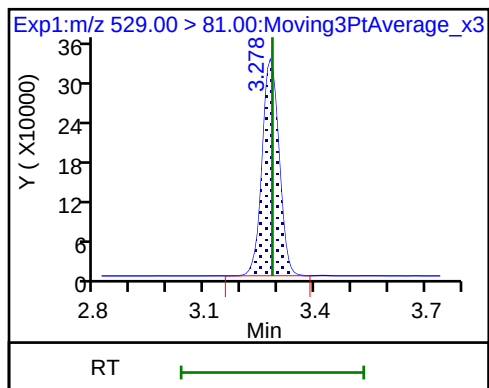
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid

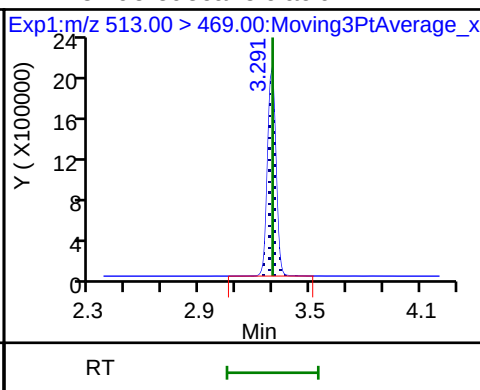
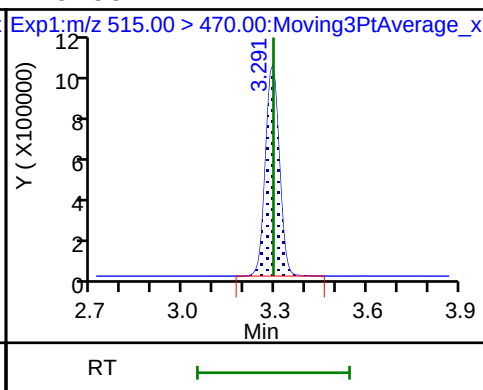
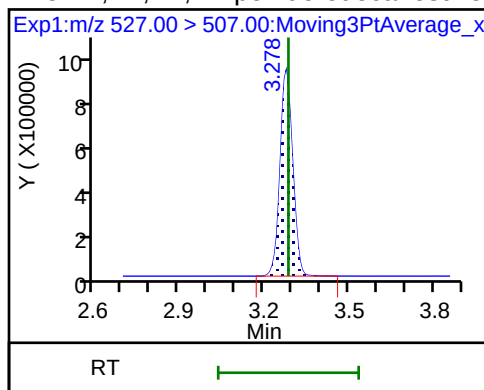
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfonate

D 23 13C2 PFDA

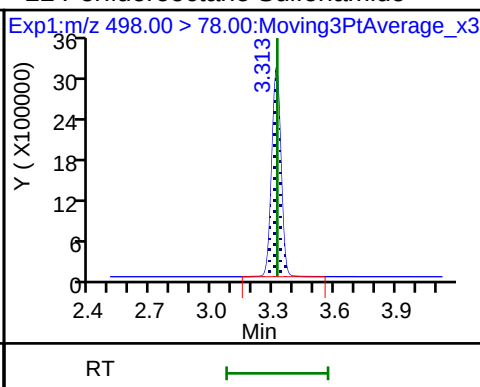
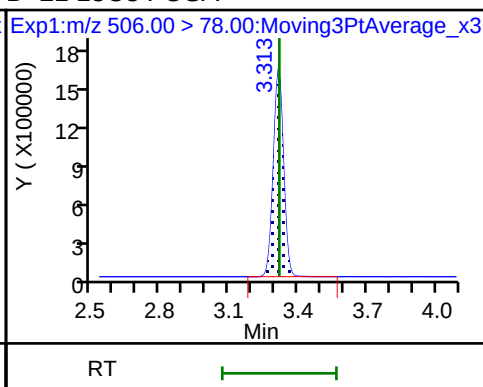
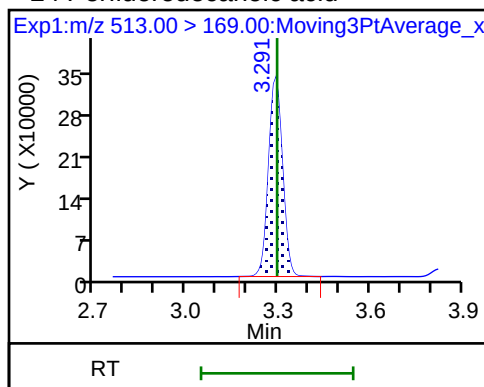
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 21 13C8 FOSA

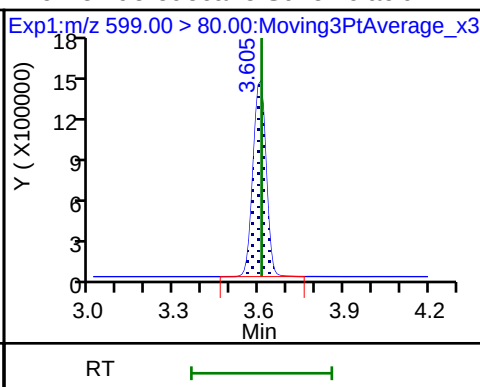
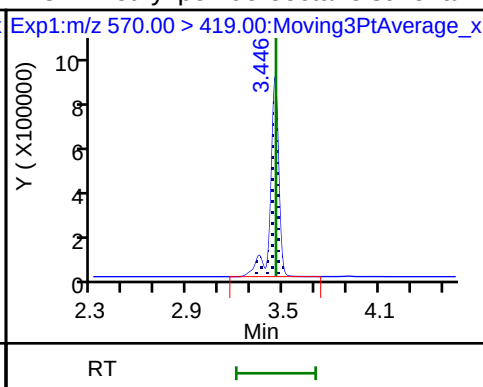
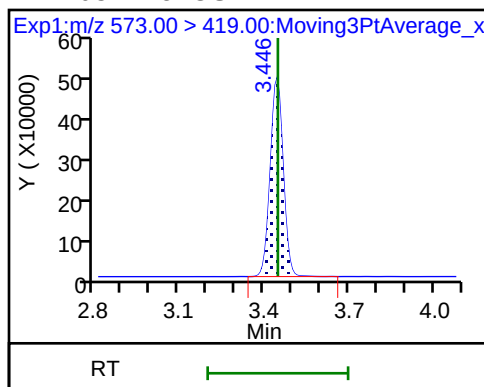
22 Perfluorooctane Sulfonamide



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

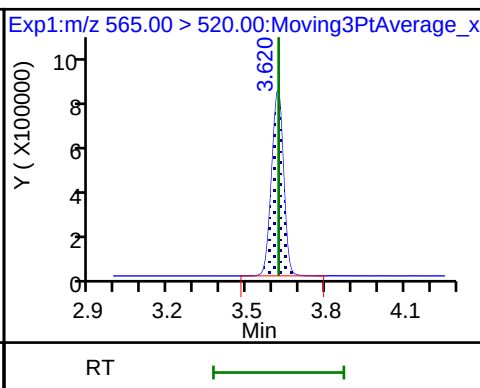
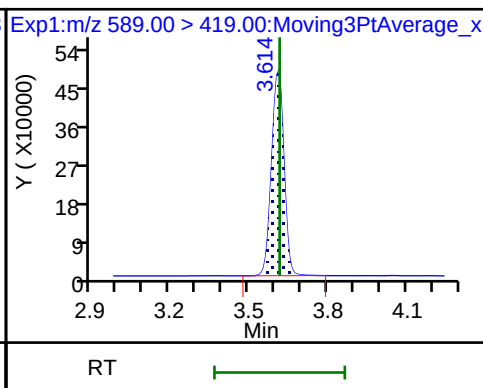
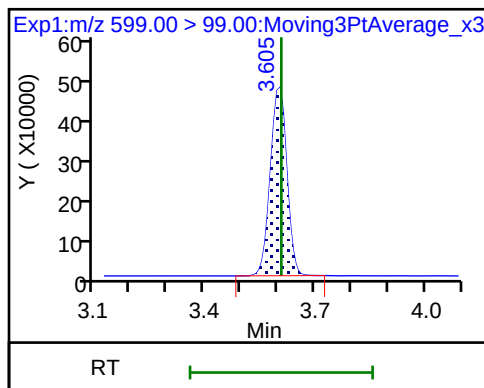
29 Perfluorodecane Sulfonic acid

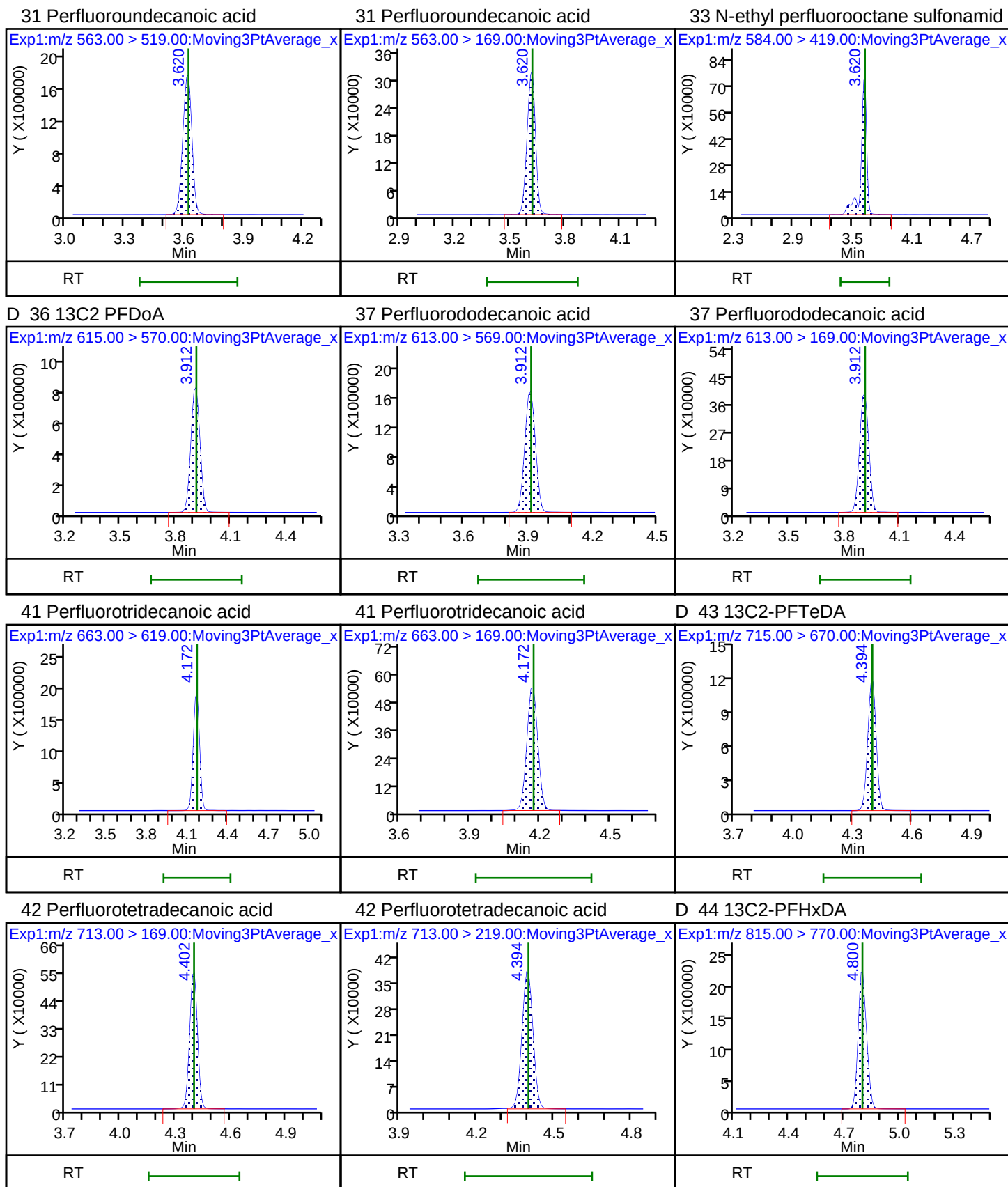


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Lims ID: IC L7 Full
 Client ID:
 Sample Type: IC Calib Level: 7
 Inject. Date: 06-Aug-2018 11:56:59 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@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:17:27 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: westendorfc

Date: 06-Aug-2018 14:40:56

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	1.393	1.395	-0.002	0.543	5373122	2.59		104	8955	
2 Perfluorobutyric acid										
212.90 > 169.00	1.398	1.397	0.001	1.004	19976933	9.90		99.0	2232	
D 3 13C5-PFPeA										
267.90 > 223.00	1.636	1.639	-0.003	0.637	3665379	2.57		103	10131	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.643	1.643	0.0	1.005	16137329	9.67		96.7	1088	
D 47 13C3-PFBS										
301.90 > 83.00	1.675	1.675	0.0	0.653	80382	2.43		105	383	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.675	1.676	-0.001	1.000	21980500	8.37		94.7	5584	
298.90 > 99.00	1.675	1.676	-0.001	1.000	9699800		2.27(1.25-3.74)	94.7	4353	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.872	1.875	-0.003	1.117	5031154	8.78		94.0	19015	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.875	-0.003	0.729	526817	NC			662	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.908	-0.001	0.743	4032113	2.49		99.5	6971	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.908	-0.001	1.000	16015982	9.73		97.3	3097	
313.00 > 119.00	1.907	1.908	-0.001	1.000	1512000		10.59(5.03-15.10)	97.3	4252	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.928	1.930	-0.002	1.151	20439230	8.58		91.4	14928	
349.00 > 99.00	1.928	1.930	-0.002	1.151	8089990		2.53(1.36-4.07)	91.4	6469	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.001	2.003	-0.002	1.000	3129271	NC			1411	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.003	-0.002	0.779	325849	NC			928	
D 9 13C4-PFHpA										
367.00 > 322.00	2.227	2.227	0.0	0.867	3899256	2.44		97.8	10839	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.228	-0.001	1.000	16791846	10.1		101	2753	
363.00 > 169.00	2.227	2.228	-0.001	1.000	6618023		2.54(1.13-3.40)	101	6159	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.239	-0.003	1.000	18945578	8.66		95.2	5842	
399.00 > 99.00	2.236	2.239	-0.003	1.000	6725945		2.82(1.50-4.49)	95.2	3280	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.239	-0.003	0.871	4771422	2.33		98.7	7147	
65 ADONA										
377.00 > 251.00	2.269	2.271	-0.002	0.774	37729670	NC			19741	
377.00 > 85.00	2.269	2.271	-0.002	0.774	24564041		1.54(0.84-2.53)		8345	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.544	2.548	-0.004	1.000	5013052	9.72		103	5460	
D 12 M2-6:2FTS										
429.00 > 81.00	2.544	2.549	-0.005	0.991	778460	2.32		97.7	2269	
D 73 13C8 PFOA										
421.00 > 376.00	2.567	2.571	-0.004	1.000	6892356	NC			15661	
D 14 13C4 PFOA										
417.00 > 372.00	2.567	2.573	-0.006	1.000	3722009	2.54		102	8195	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.574	2.574	0.0	1.003	15733520	9.35		93.4	1426	
413.00 > 169.00	2.567	2.574	-0.007	1.000	8441832		1.86(0.84-2.52)	93.4	6654	
* 62 13C2-PFOA										
415.00 > 370.00	2.567	2.575	-0.008		3743332	2.50			5893	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.581	2.583	-0.002	0.880	15722427	9.23		96.9	5659	
449.00 > 99.00	2.581	2.583	-0.002	0.880	4425328		3.55(1.94-5.82)	96.9	3345	
D 72 13C8 PFOS										
507.00 > 99.00	2.933	2.938	-0.005	1.142	1541520	NC			4287	
D 18 13C4 PFOS										
503.00 > 80.00	2.933	2.939	-0.006	1.142	3286355	2.45		102	3679	
D 19 13C5 PFNA										
468.00 > 423.00	2.933	2.939	-0.006	1.142	3213782	2.45		97.9	5714	
20 Perfluorononanoic acid										
463.00 > 419.00	2.933	2.939	-0.006	1.000	13269892	9.80		98.0	3367	
463.00 > 169.00	2.939	2.939	0.0	1.002	3365018		3.94(1.90-5.69)	98.0	6693	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.939	2.940	-0.001	1.002	13677354	9.26		99.8	4268	
499.00 > 99.00	2.939	2.940	-0.001	1.002	3143905		4.35(2.31-6.93)	99.8	4772	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.146	3.150	-0.004	1.073	21558959	NC			9734	
D 26 M2-8:2FTS										
529.00 > 81.00	3.278	3.284	-0.006	1.277	920670	2.27		94.8	3125	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.284	3.285	0.0	1.120	9847776	9.52		99.2	6966	
549.00 > 99.00	3.278	3.285	-0.006	1.118	3544459		2.78(1.33-3.97)	99.2	4072	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.278	3.286	-0.008	1.000	4806399	9.62		100	8267	
D 23 13C2 PFDA										
515.00 > 470.00	3.291	3.294	-0.003	1.282	2921735	2.54		101	4151	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.291	3.296	-0.005	1.000	11426488	9.75		97.5	5078	
513.00 > 169.00	3.291	3.296	-0.005	1.000	1895278		6.03(2.36-7.09)	97.5	380	
D 21 13C8 FOSA										
506.00 > 78.00	3.313	3.317	-0.004	1.290	4531636	2.55		102	5690	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.320	3.319	0.001	1.002	16995473	9.63		96.3	5922	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.446	3.448	-0.002	1.342	1491160	2.53		101	3267	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.446	3.453	-0.007	1.000	5898014	10.3		103	2718	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.605	3.608	-0.003	1.229	8074266	9.29		96.4	7721	
599.00 > 99.00	3.605	3.608	-0.003	1.229	2686974		3.00(1.39-4.16)	96.4	3936	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.613	3.616	-0.003	1.407	1403844	2.30		92.0	1026	
D 30 13C2 PFUnA										
565.00 > 520.00	3.613	3.620	-0.007	1.407	2281933	2.46		98.5	3233	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.620	3.622	-0.002	1.002	9915678	9.67		96.7	4400	
563.00 > 169.00	3.613	3.622	-0.009	1.000	1720527		5.76(2.12-6.36)	96.7	3803	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.620	3.623	-0.003	1.002	5094367	10.2		102	3513	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.776	3.781	-0.005	1.287	30579411	NC			12956	
35 MeFOSA										
512.00 > 169.00	3.825	3.826	-0.001		5720935	NC			1392	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.911	3.913	-0.002	1.000	10658790	9.88		98.8	3649	
613.00 > 169.00	3.911	3.913	-0.002	1.000	2518515		4.23(2.13-6.40)	98.8	5134	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.911	3.913	-0.002	1.193	3456093	NC			4921	
D 36 13C2 PFDaA										
615.00 > 570.00	3.911	3.913	-0.002	1.523	2422707	2.47		98.9	3347	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.142	4.148	-0.006	1.412	3692356	NC			8127	
699.00 > 99.00	4.142	4.148	-0.006	1.412	5250911		0.70(0.00-0.00)		7654	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.171	4.173	-0.002	1.066	10067689	9.66		96.6	2777	
663.00 > 169.00	4.171	4.173	-0.002	1.066	3084095		3.26(1.25-3.76)	96.6	5037	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.394	4.399	-0.005	1.711	3074334	2.46		98.5	5617	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.394	4.400	-0.006	1.000	3032661	10.2		102	6149	
713.00 > 219.00	4.394	4.400	-0.006	1.000	2077180		1.46(0.71-2.13)	102	5141	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.792	4.799	-0.007	1.866	6197635	2.50		100	8201	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.792	4.801	-0.009	1.000	20527532	NC			4806	
813.00 > 169.00	4.792	4.801	-0.009	1.000	3783975		5.42(2.86-8.58)		8314	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.127	5.136	-0.009	1.070	21448602	NC			3703	
913.00 > 169.00	5.127	5.136	-0.009	1.070	2812581		7.63(3.83-11.48)		4640	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Injection Date: 06-Aug-2018 11:56:59

Instrument ID: A8_N

Lims ID: IC L7 Full

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 16

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

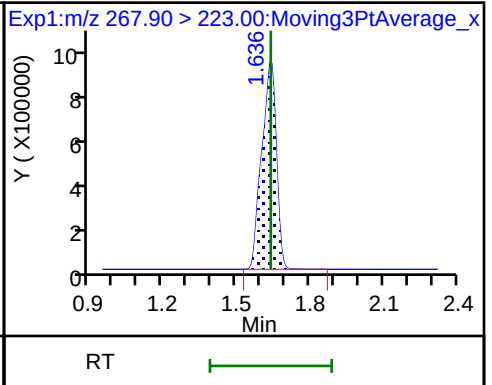
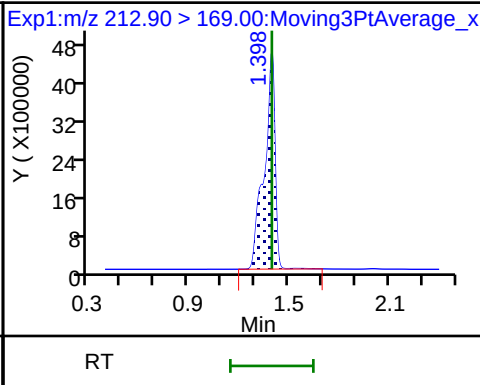
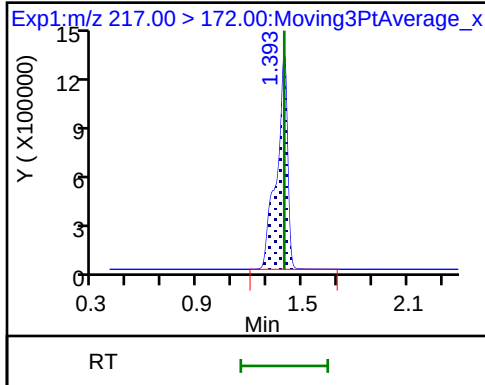
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

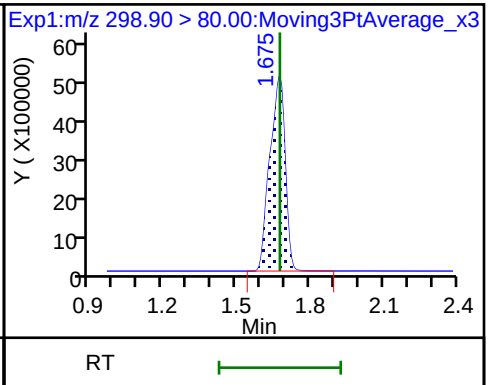
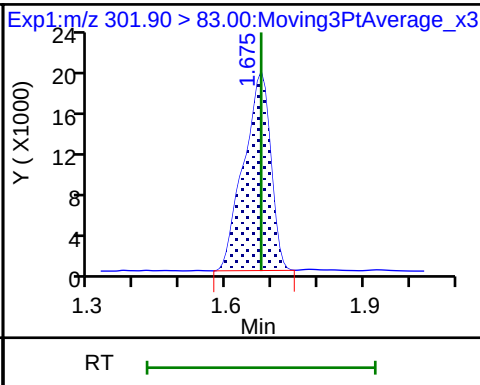
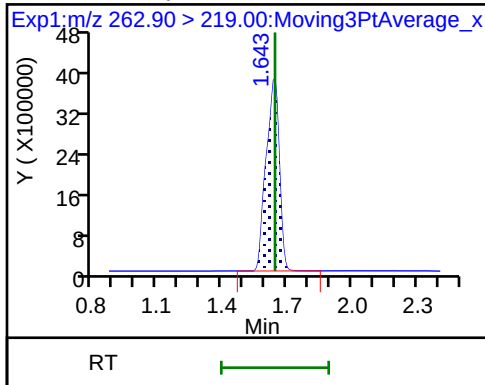
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

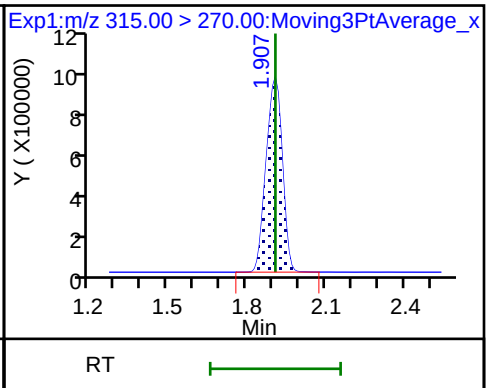
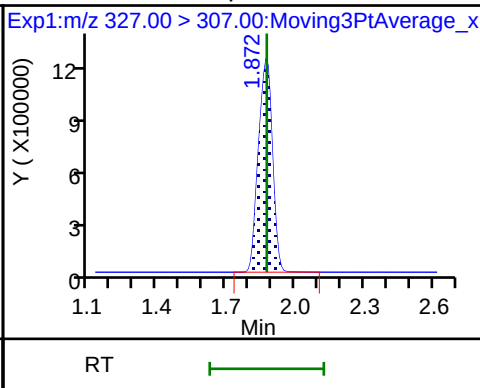
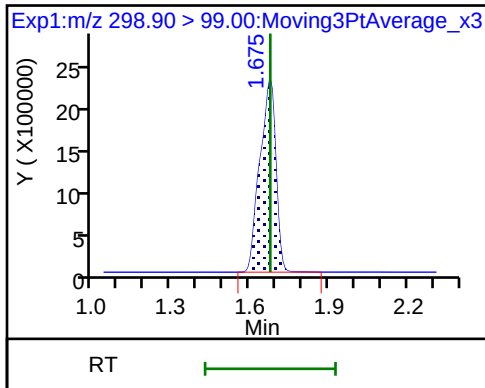
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

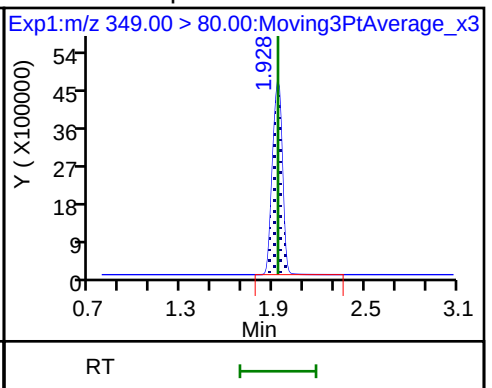
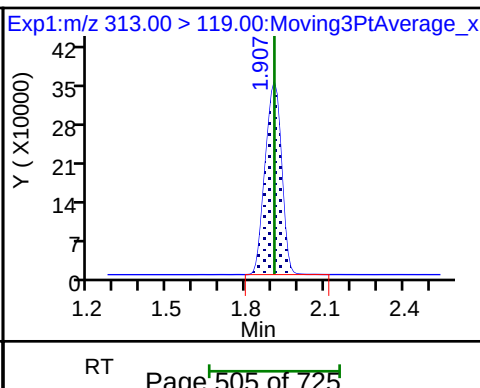
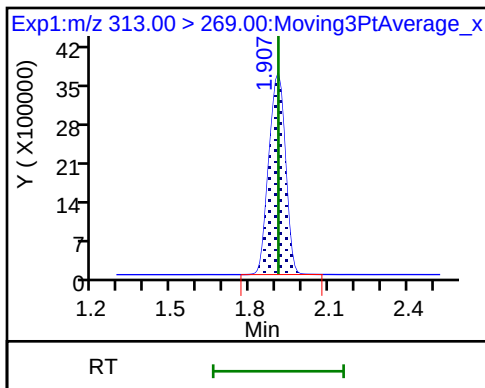
D 7 13C2 PFHxA



6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

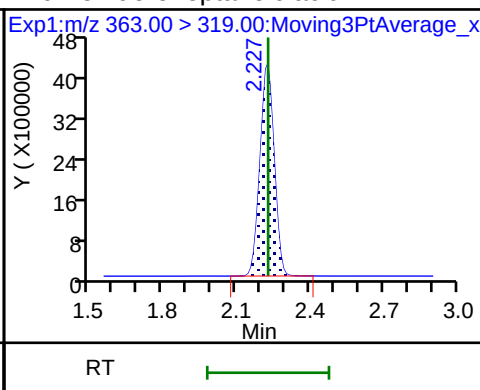
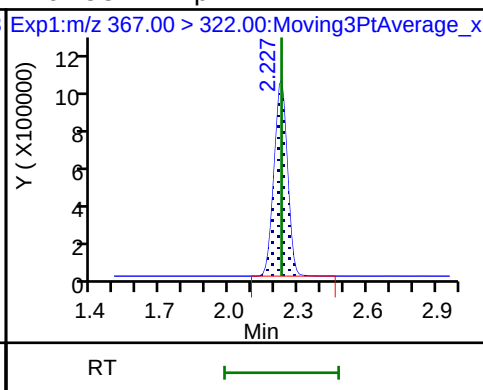
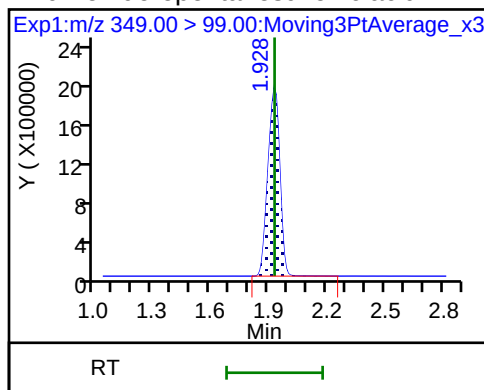
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

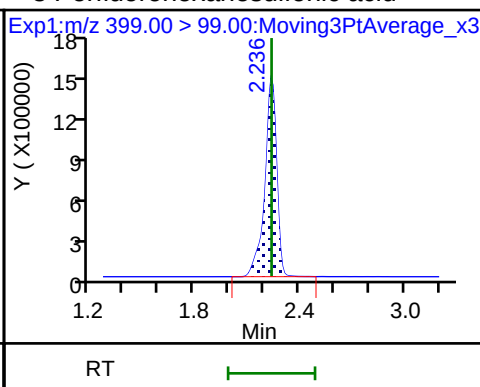
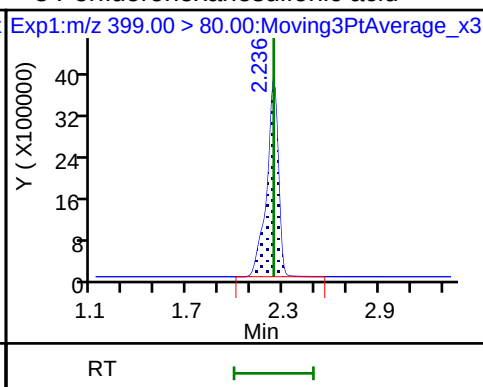
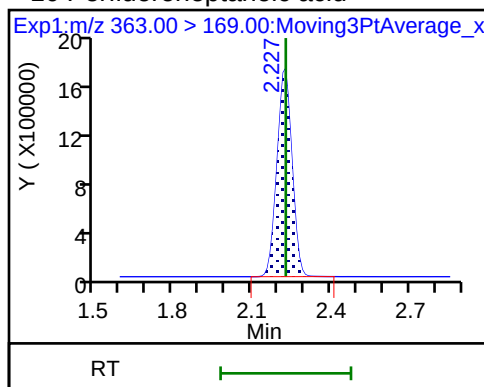
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

8 Perfluorohexanesulfonic acid

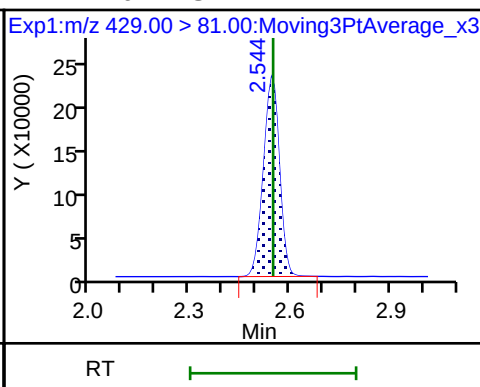
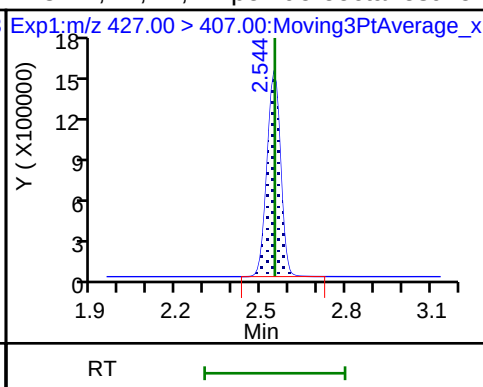
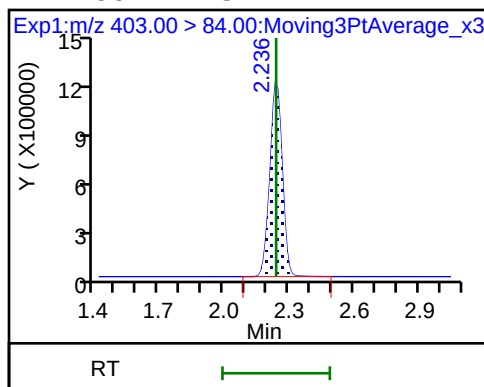
8 Perfluorohexanesulfonic acid



D 11 18O2 PFHxS

13 1H,1H,2H,2H-perfluorooctanesulfonD

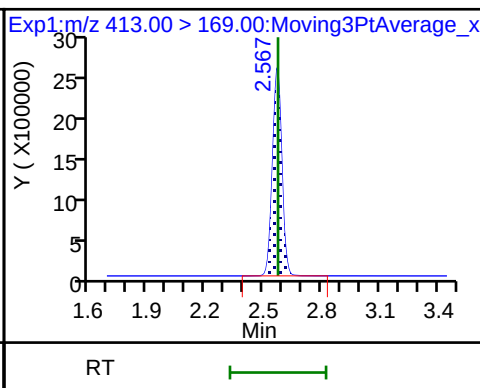
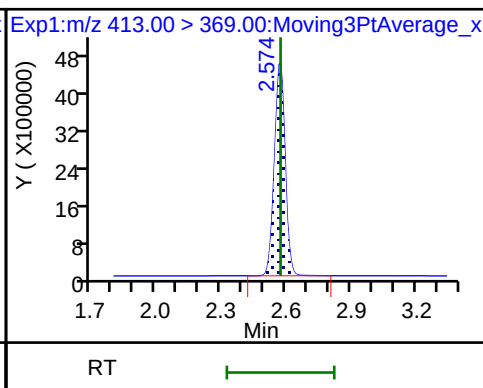
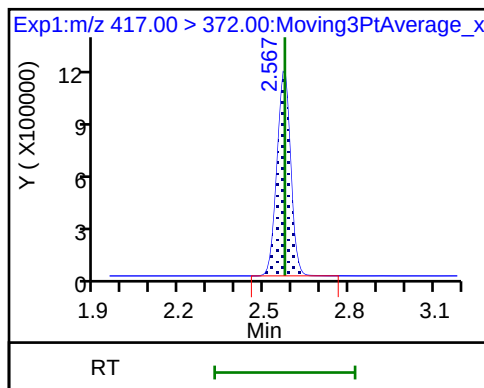
12 M2-6:2FTS



D 14 13C4 PFOA

15 Perfluorooctanoic acid

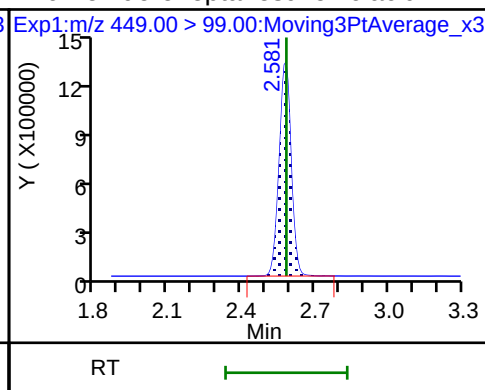
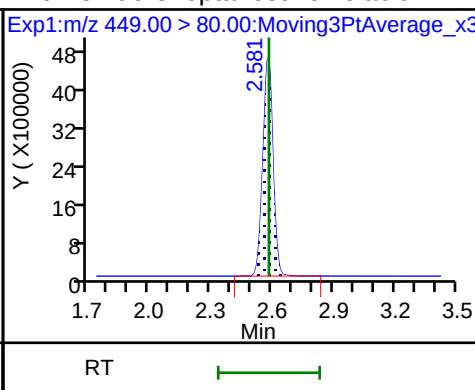
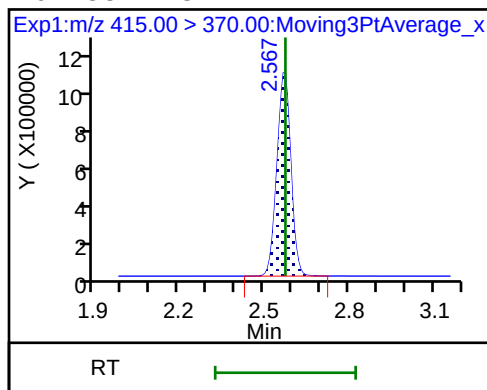
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

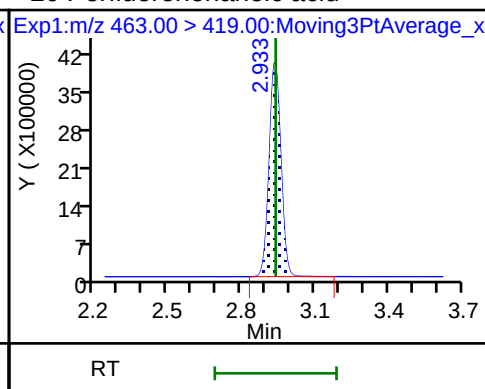
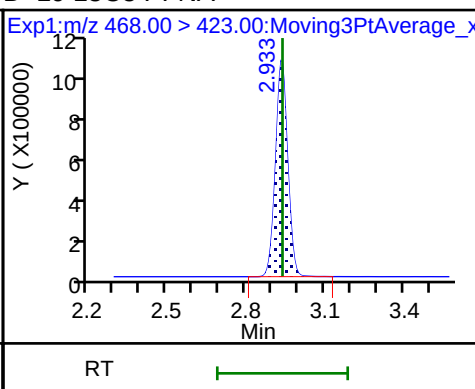
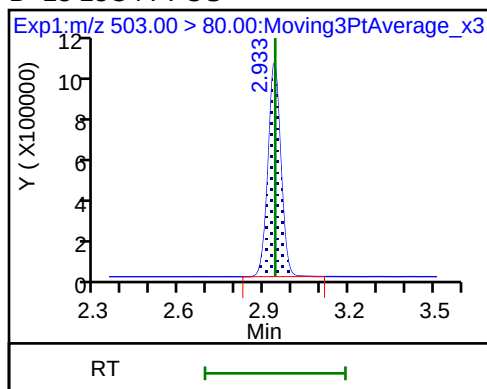
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

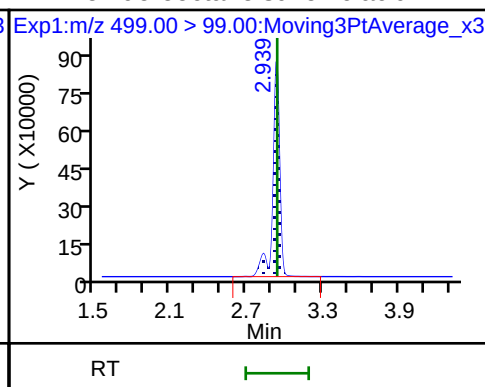
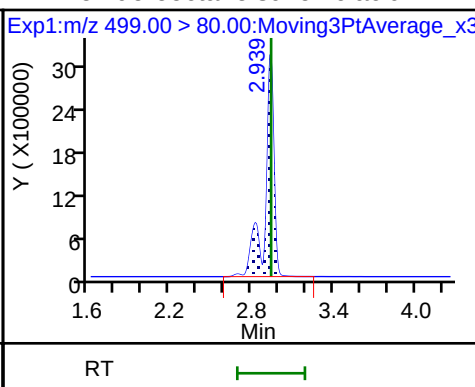
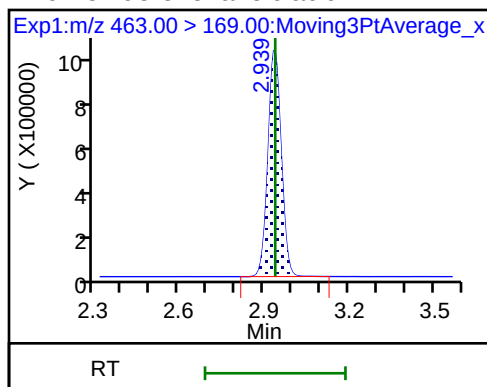
20 Perfluorononanoic acid



20 Perfluorononanoic acid

17 Perfluorooctane sulfonic acid

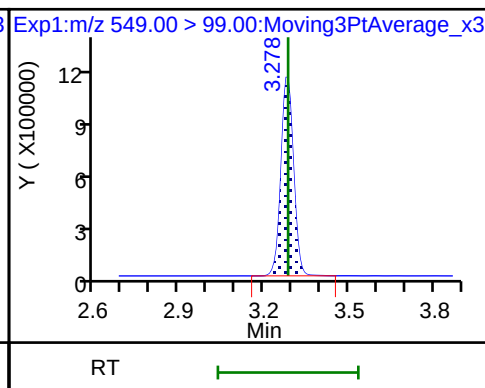
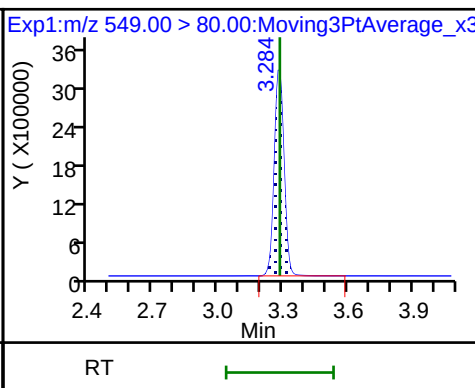
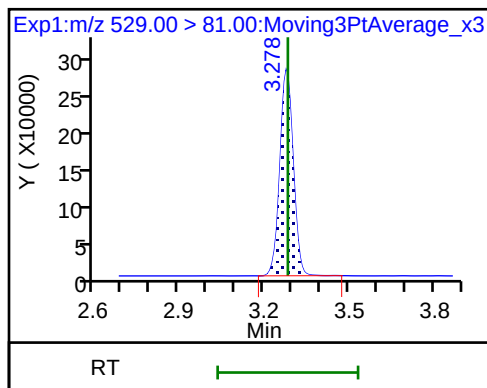
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid

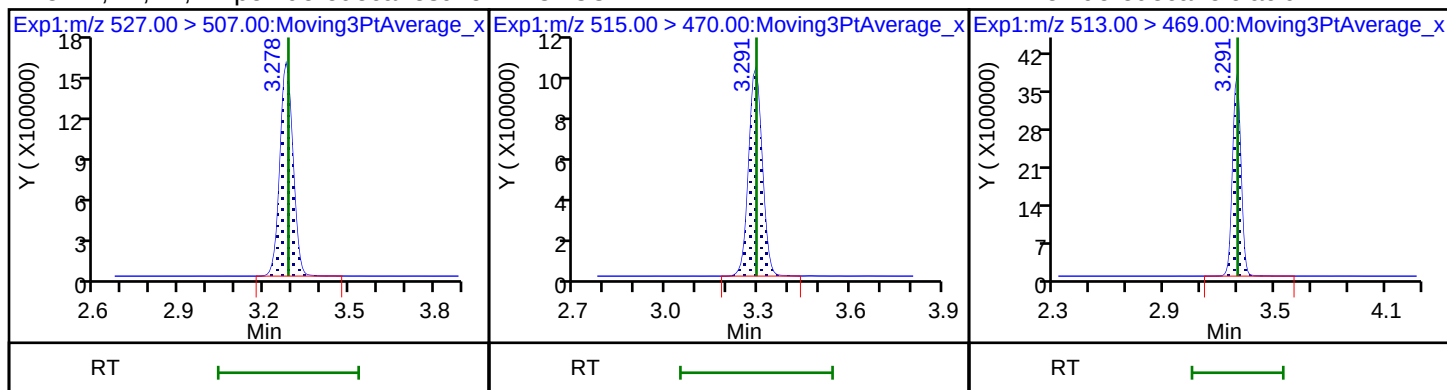
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfonate

D 23 13C2 PFDA

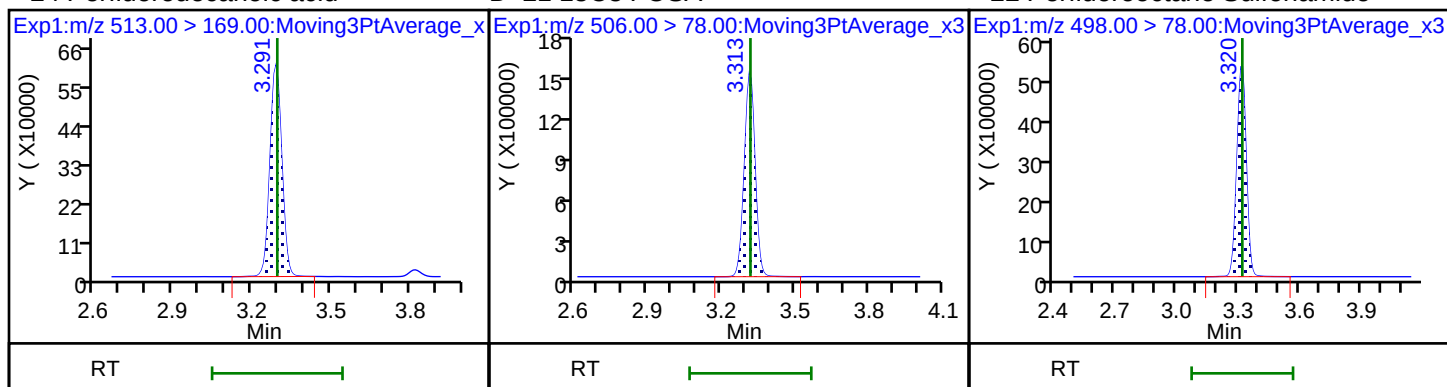
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 21 13C8 FOSA

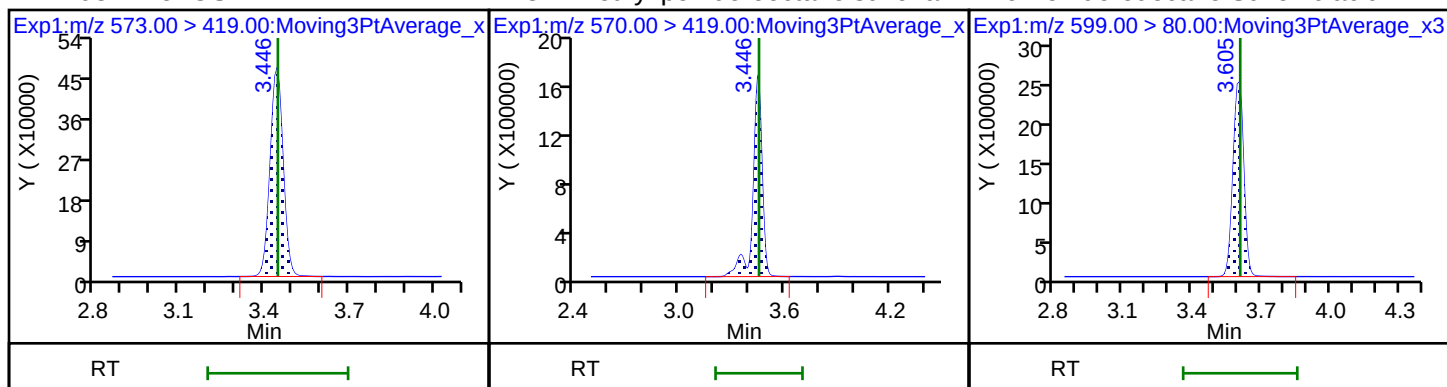
22 Perfluorooctane Sulfonamide



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

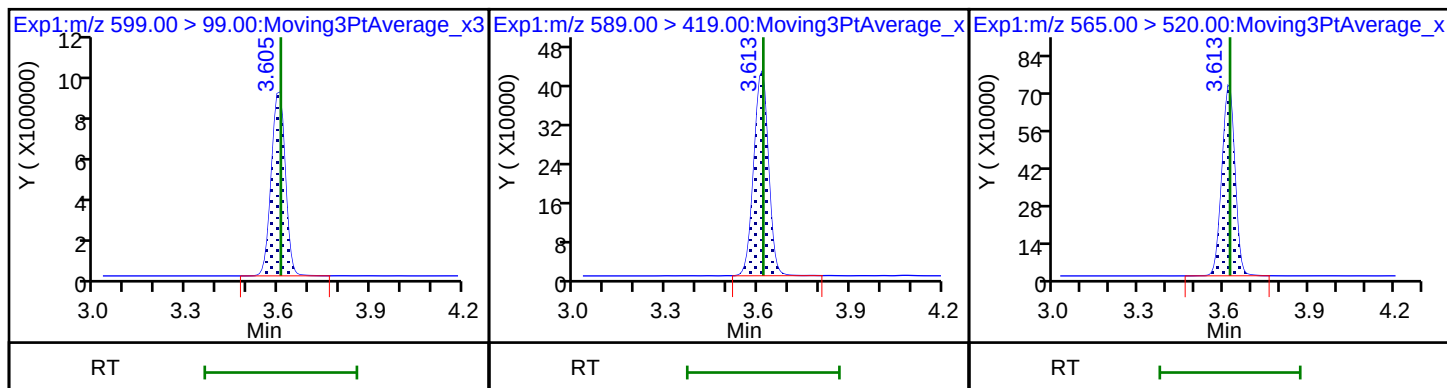
29 Perfluorodecane Sulfonic acid

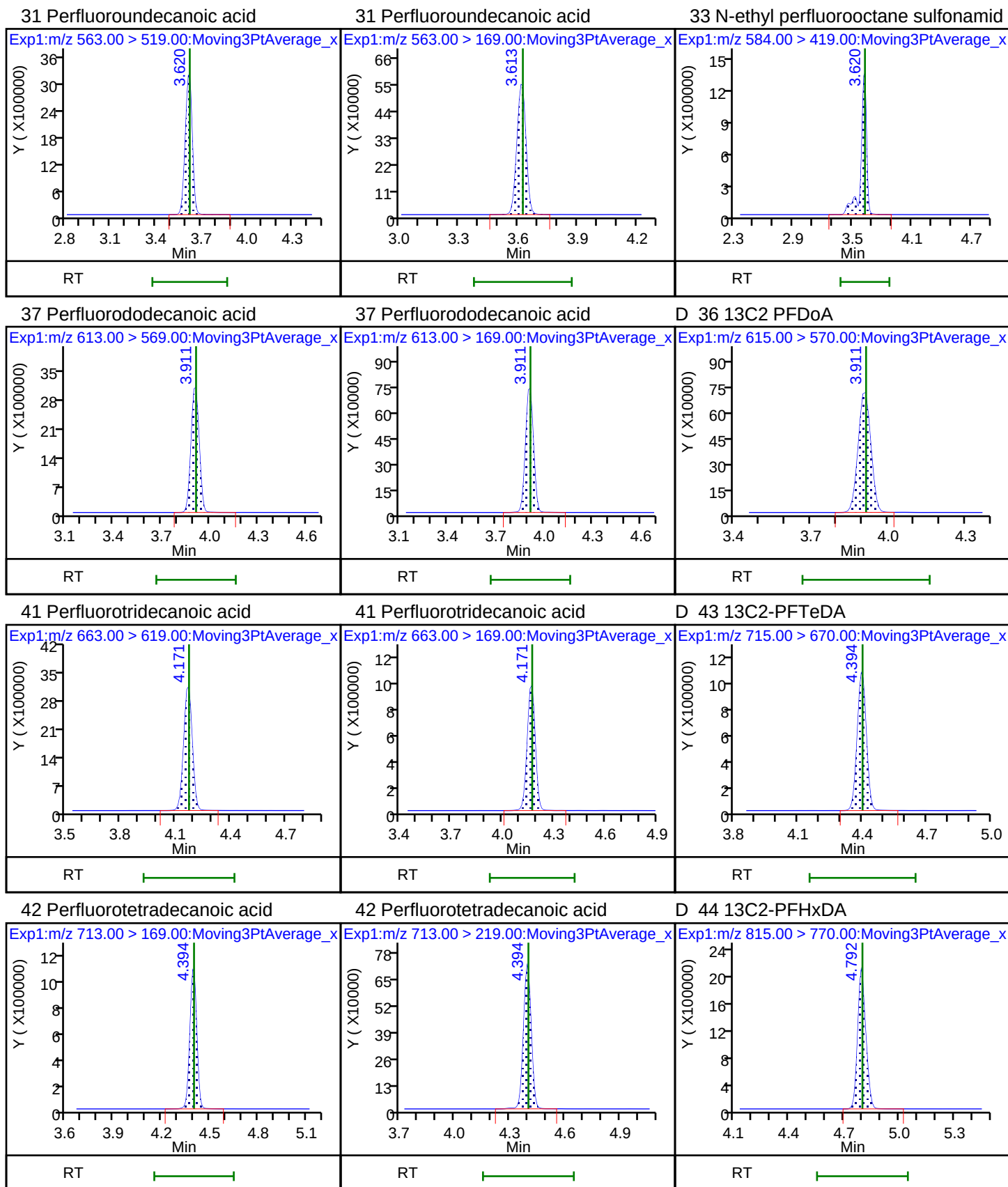


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





Calibration

/ Perfluorobutyric acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

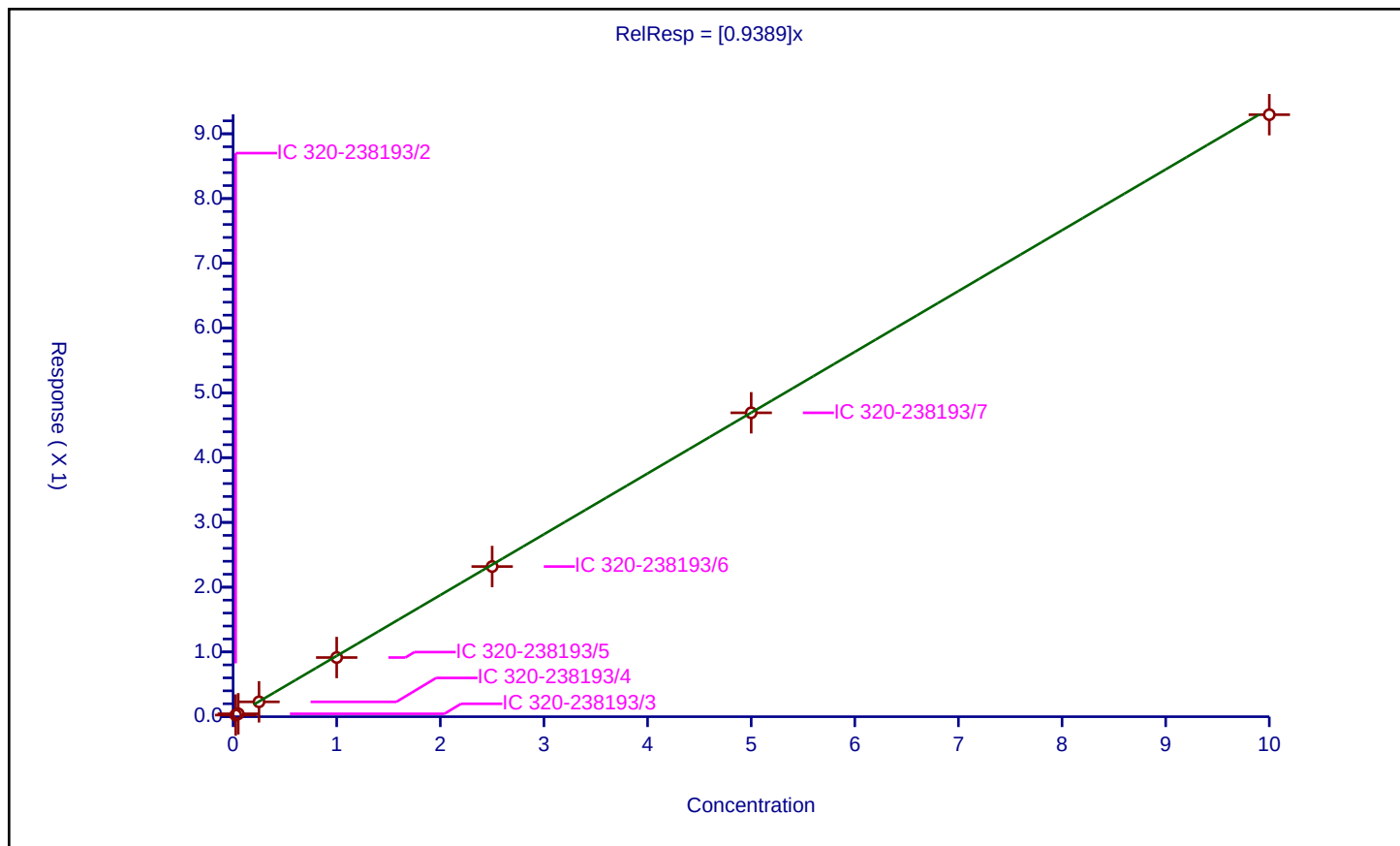
Curve Coefficients

Intercept: 0
 Slope: 0.9389

Error Coefficients

Standard Error: 9510000
 Relative Standard Error: 4.7
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.02589	2.5	5516377.0	1.035589	Y
2	IC 320-238193/3	0.05	0.045461	2.5	5520570.0	0.909227	Y
3	IC 320-238193/4	0.25	0.229517	2.5	5688815.0	0.918068	Y
4	IC 320-238193/5	1.0	0.913801	2.5	5503224.0	0.913801	Y
5	IC 320-238193/6	2.5	2.318714	2.5	5444583.0	0.927486	Y
6	IC 320-238193/7	5.0	4.692305	2.5	5693569.0	0.938461	Y
7	IC 320-238193/8	10.0	9.294844	2.5	5373122.0	0.929484	Y



Calibration

/ Perfluoropentanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

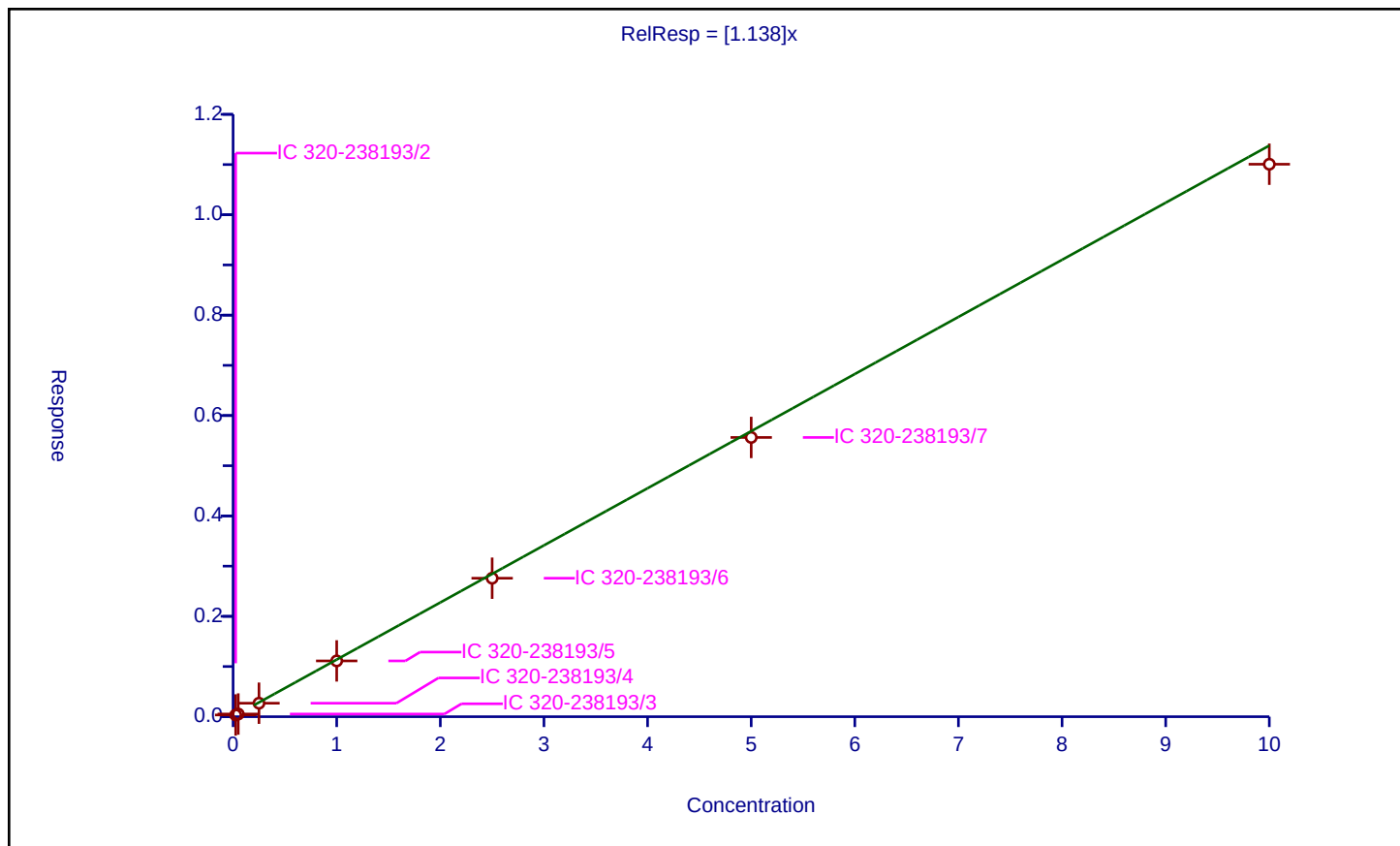
Curve Coefficients

Intercept: 0
 Slope: 1.138

Error Coefficients

Standard Error: 7720000
 Relative Standard Error: 9.8
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.034667	2.5	3748386.0	1.386677	Y
2	IC 320-238193/3	0.05	0.053587	2.5	3878229.0	1.071739	Y
3	IC 320-238193/4	0.25	0.26923	2.5	3918495.0	1.076921	Y
4	IC 320-238193/5	1.0	1.111995	2.5	3711287.0	1.111995	Y
5	IC 320-238193/6	2.5	2.759158	2.5	3838069.0	1.103663	Y
6	IC 320-238193/7	5.0	5.563664	2.5	3917323.0	1.112733	Y
7	IC 320-238193/8	10.0	11.00659	2.5	3665379.0	1.100659	Y



Calibration

/ Perfluorobutanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

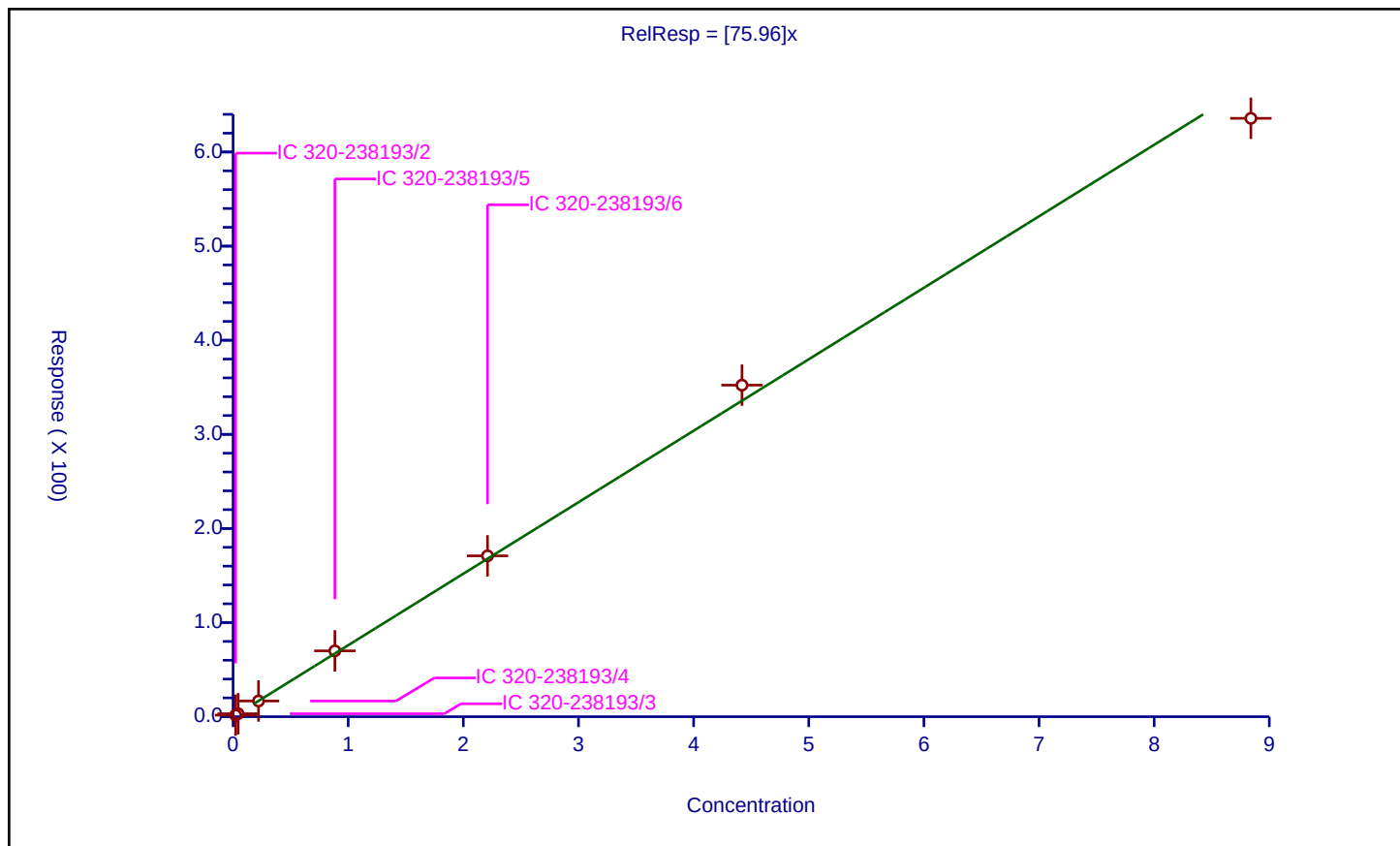
Curve Coefficients

Intercept: 0
 Slope: 75.96

Error Coefficients

Standard Error: 10600000
 Relative Standard Error: 4.1
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0221	1.680989	2.325	82796.0	76.062842	Y
2	IC 320-238193/3	0.0442	3.184237	2.325	83639.0	72.041568	Y
3	IC 320-238193/4	0.221	16.685183	2.325	85930.0	75.498564	Y
4	IC 320-238193/5	0.884	69.951886	2.325	78945.0	79.131093	Y
5	IC 320-238193/6	2.21	170.935554	2.325	80654.0	77.346405	Y
6	IC 320-238193/7	4.42	352.282599	2.325	81531.0	79.701946	Y
7	IC 320-238193/8	8.84	635.772468	2.325	80382.0	71.919962	Y



Calibration

/ 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

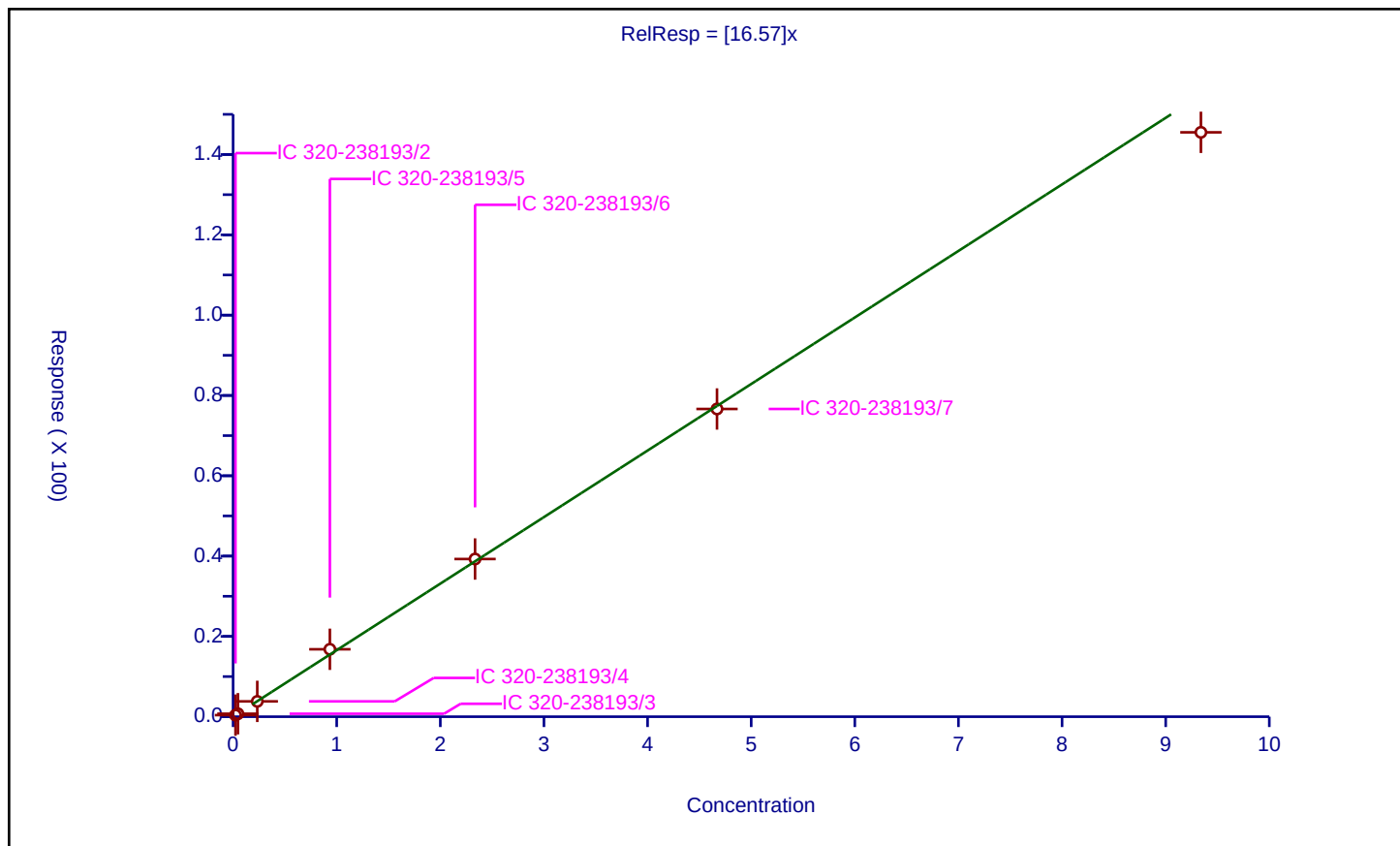
Curve Coefficients

Intercept: 0
 Slope: 16.57

Error Coefficients

Standard Error: 2410000
 Relative Standard Error: 4.7
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02335	0.394595	2.325	82796.0	16.89915	Y
2	IC 320-238193/3	0.0467	0.744765	2.325	83639.0	15.947859	Y
3	IC 320-238193/4	0.2335	3.818677	2.325	85930.0	16.354075	Y
4	IC 320-238193/5	0.934	16.792187	2.325	78945.0	17.978787	Y
5	IC 320-238193/6	2.335	39.273889	2.325	80654.0	16.819653	Y
6	IC 320-238193/7	4.67	76.632007	2.325	81531.0	16.409423	Y
7	IC 320-238193/8	9.34	145.523041	2.325	80382.0	15.580625	Y



Calibration

/ Perfluorohexanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

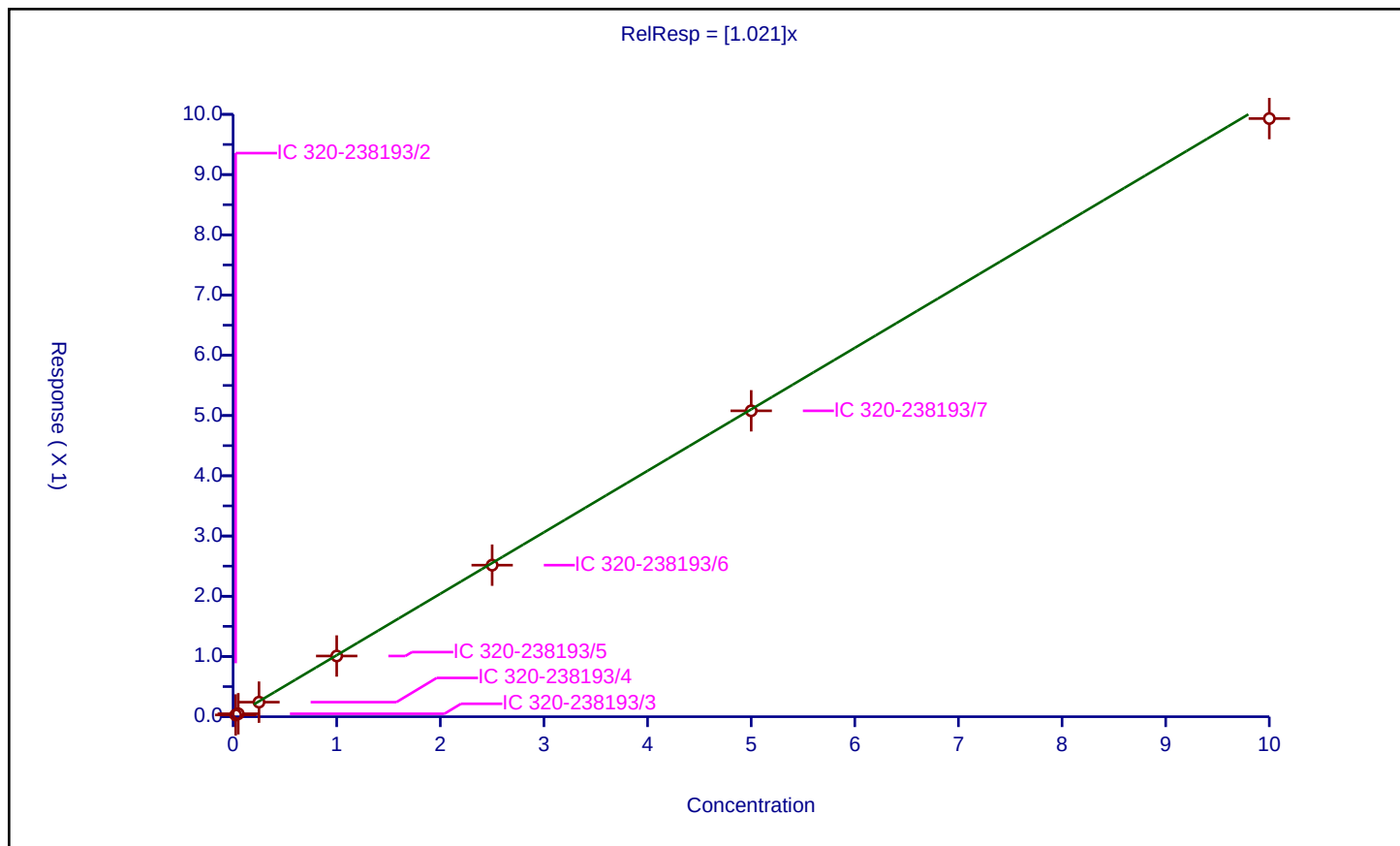
Curve Coefficients

Intercept: 0
 Slope: 1.021

Error Coefficients

Standard Error: 7700000
 Relative Standard Error: 6.7
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.029281	2.5	4472467.0	1.171255	Y
2	IC 320-238193/3	0.05	0.04919	2.5	4415087.0	0.983797	Y
3	IC 320-238193/4	0.25	0.241583	2.5	4437948.0	0.966334	Y
4	IC 320-238193/5	1.0	1.007775	2.5	4256324.0	1.007775	Y
5	IC 320-238193/6	2.5	2.516022	2.5	4337626.0	1.006409	Y
6	IC 320-238193/7	5.0	5.078653	2.5	4333101.0	1.015731	Y
7	IC 320-238193/8	10.0	9.930266	2.5	4032113.0	0.993027	Y



Calibration

/ Perfluoropentanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

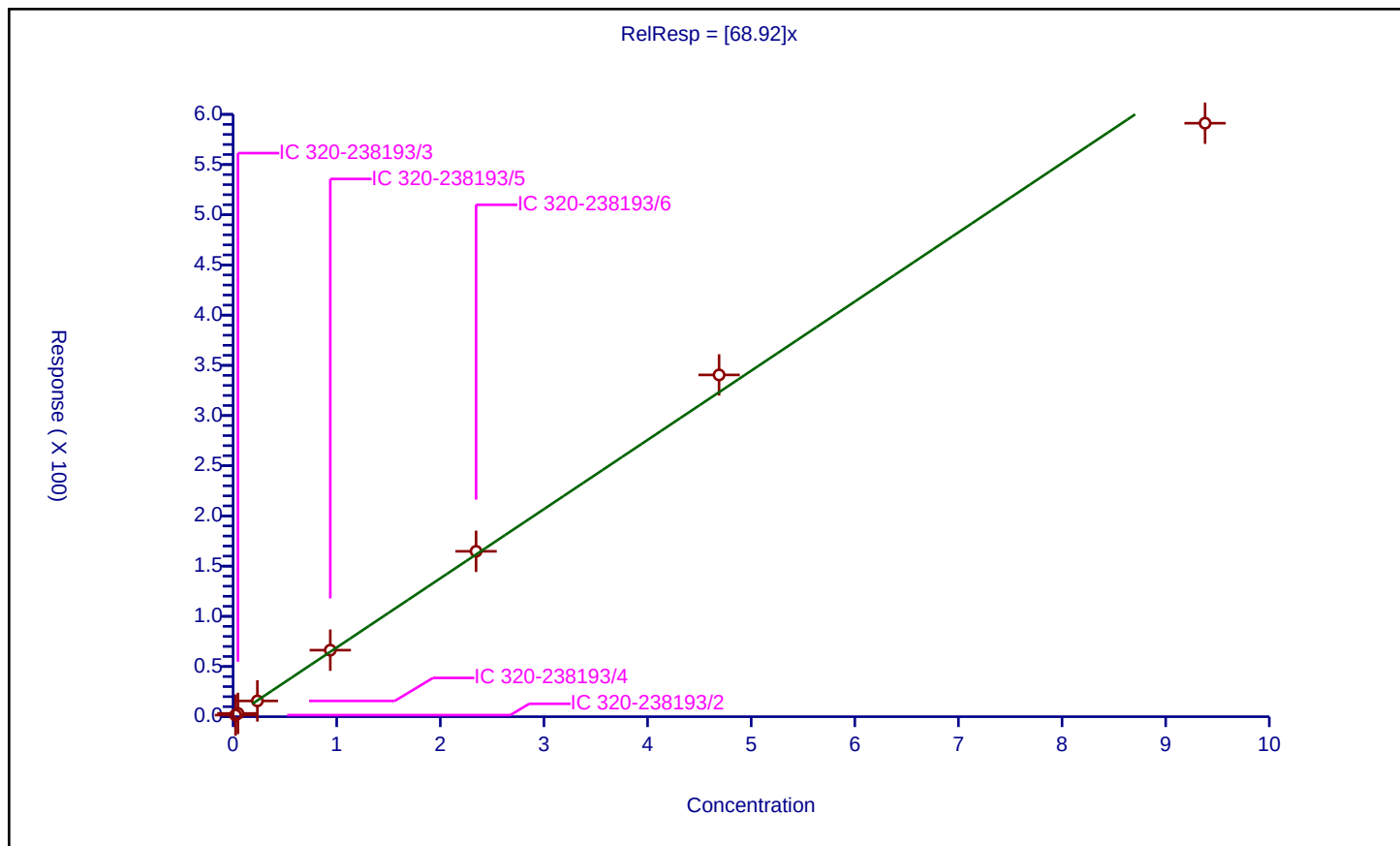
Curve Coefficients

Intercept: 0
 Slope: 68.92

Error Coefficients

Standard Error: 9990000
 Relative Standard Error: 4.5
 Correlation Coefficient: 0.994
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02345	1.608596	2.325	82796.0	68.596837	Y
2	IC 320-238193/3	0.0469	3.289981	2.325	83639.0	70.14885	Y
3	IC 320-238193/4	0.2345	15.749095	2.325	85930.0	67.160319	Y
4	IC 320-238193/5	0.938	66.295058	2.325	78945.0	70.677034	Y
5	IC 320-238193/6	2.345	164.757472	2.325	80654.0	70.25905	Y
6	IC 320-238193/7	4.69	340.453106	2.325	81531.0	72.591281	Y
7	IC 320-238193/8	9.38	591.192179	2.325	80382.0	63.026885	Y



Calibration

/ Perfluoroheptanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

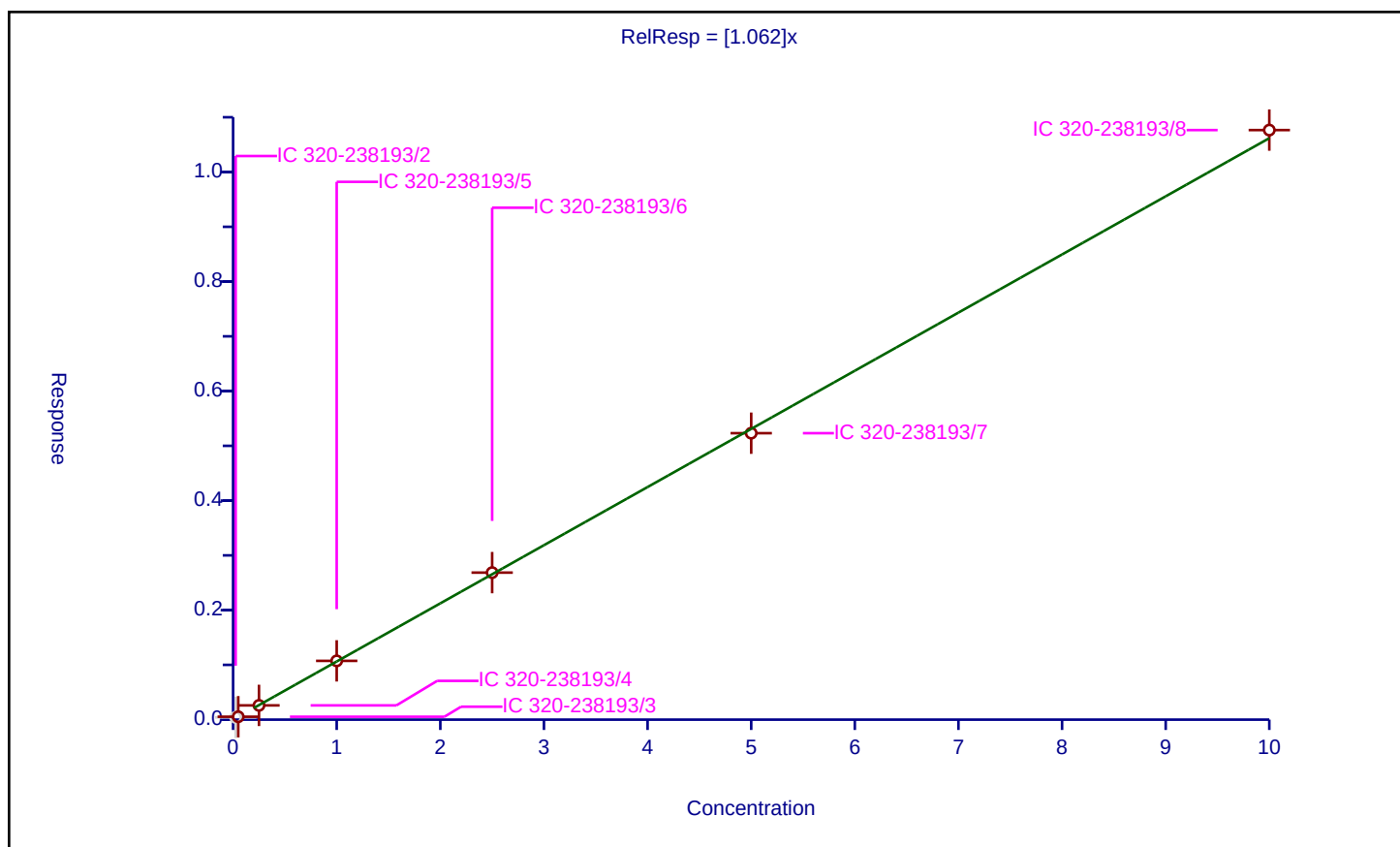
Curve Coefficients

Intercept: 0
 Slope: 1.062

Error Coefficients

Standard Error: 8820000
 Relative Standard Error: 1.4
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.041093	2.5	4316698.0	1.643733	N
2	IC 320-238193/3	0.05	0.052988	2.5	4381099.0	1.059757	Y
3	IC 320-238193/4	0.25	0.260251	2.5	4417214.0	1.041002	Y
4	IC 320-238193/5	1.0	1.073488	2.5	4255889.0	1.073488	Y
5	IC 320-238193/6	2.5	2.685084	2.5	4193874.0	1.074034	Y
6	IC 320-238193/7	5.0	5.231166	2.5	4351928.0	1.046233	Y
7	IC 320-238193/8	10.0	10.766058	2.5	3899256.0	1.076606	Y



Calibration

/ Perfluorohexanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

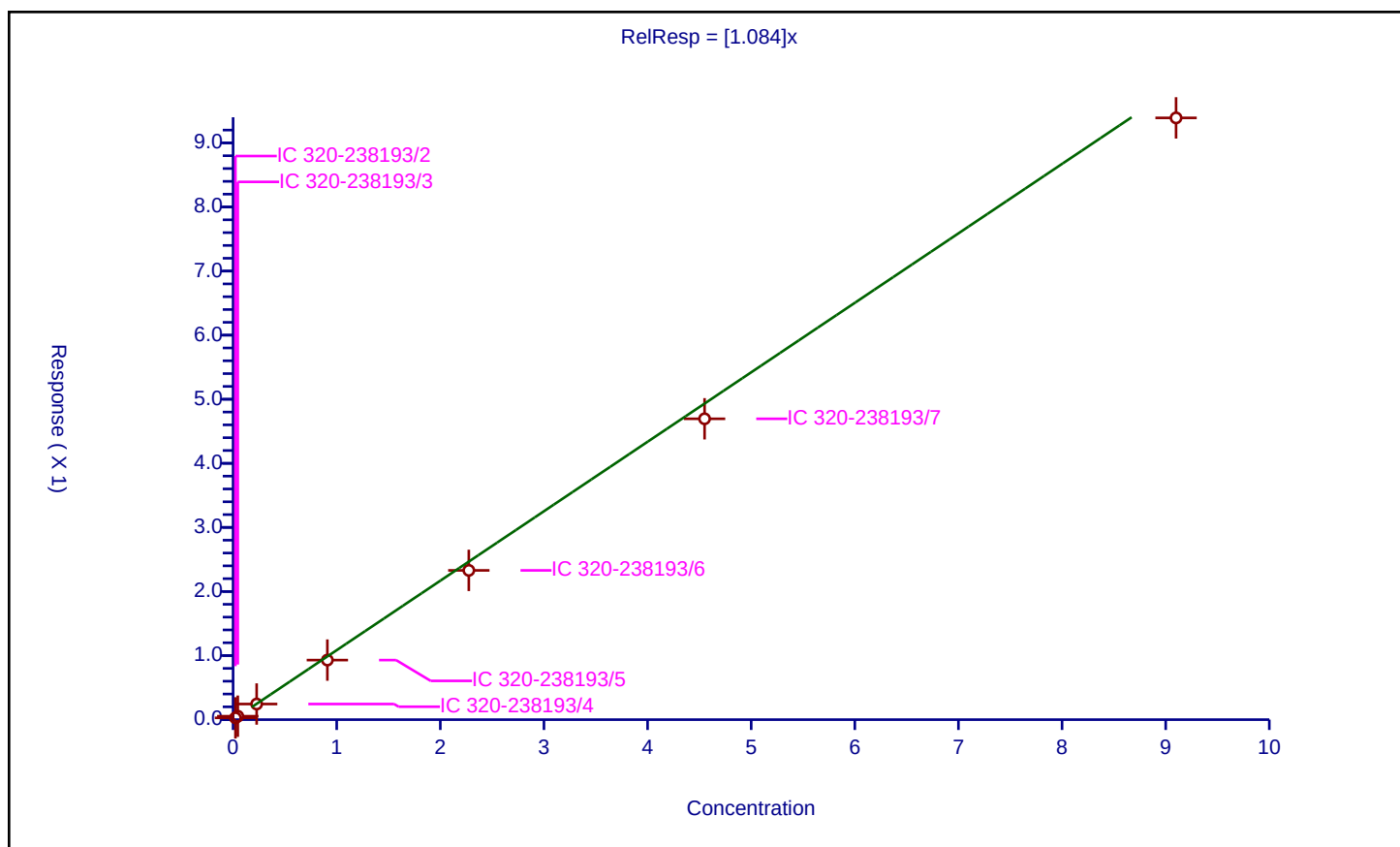
Curve Coefficients

Intercept: 0
 Slope: 1.084

Error Coefficients

Standard Error: 9100000
 Relative Standard Error: 7.8
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02275	0.027872	2.365	5251983.0	1.225149	Y
2	IC 320-238193/3	0.0455	0.053814	2.365	5400125.0	1.182733	Y
3	IC 320-238193/4	0.2275	0.24381	2.365	5279483.0	1.071693	Y
4	IC 320-238193/5	0.91	0.929382	2.365	5111728.0	1.021299	Y
5	IC 320-238193/6	2.275	2.328979	2.365	5111206.0	1.023727	Y
6	IC 320-238193/7	4.55	4.694946	2.365	5234562.0	1.031856	Y
7	IC 320-238193/8	9.1	9.390553	2.365	4771422.0	1.031929	Y



Calibration

/ 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

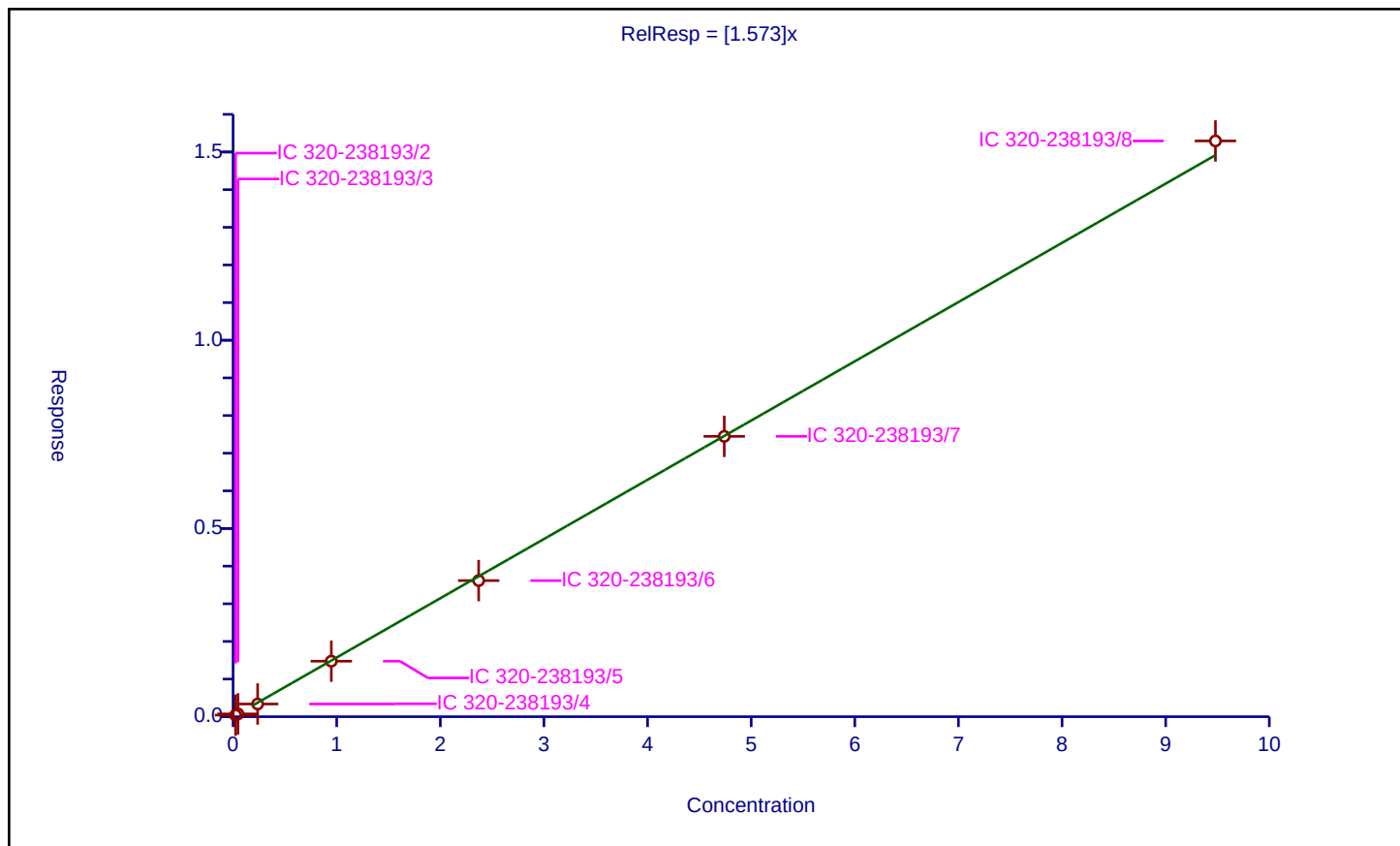
Curve Coefficients

Intercept: 0
 Slope: 1.573

Error Coefficients

Standard Error: 2390000
 Relative Standard Error: 6.2
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0237	0.041472	2.375	855574.0	1.74988	Y
2	IC 320-238193/3	0.0474	0.074636	2.375	855666.0	1.574606	Y
3	IC 320-238193/4	0.237	0.337417	2.375	912690.0	1.423699	Y
4	IC 320-238193/5	0.948	1.474699	2.375	863649.0	1.55559	Y
5	IC 320-238193/6	2.37	3.615506	2.375	835688.0	1.52553	Y
6	IC 320-238193/7	4.74	7.446717	2.375	859900.0	1.571037	Y
7	IC 320-238193/8	9.48	15.294297	2.375	778460.0	1.613322	Y



Calibration

/ Perfluorooctanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base: AREA
RF Rounding: 0

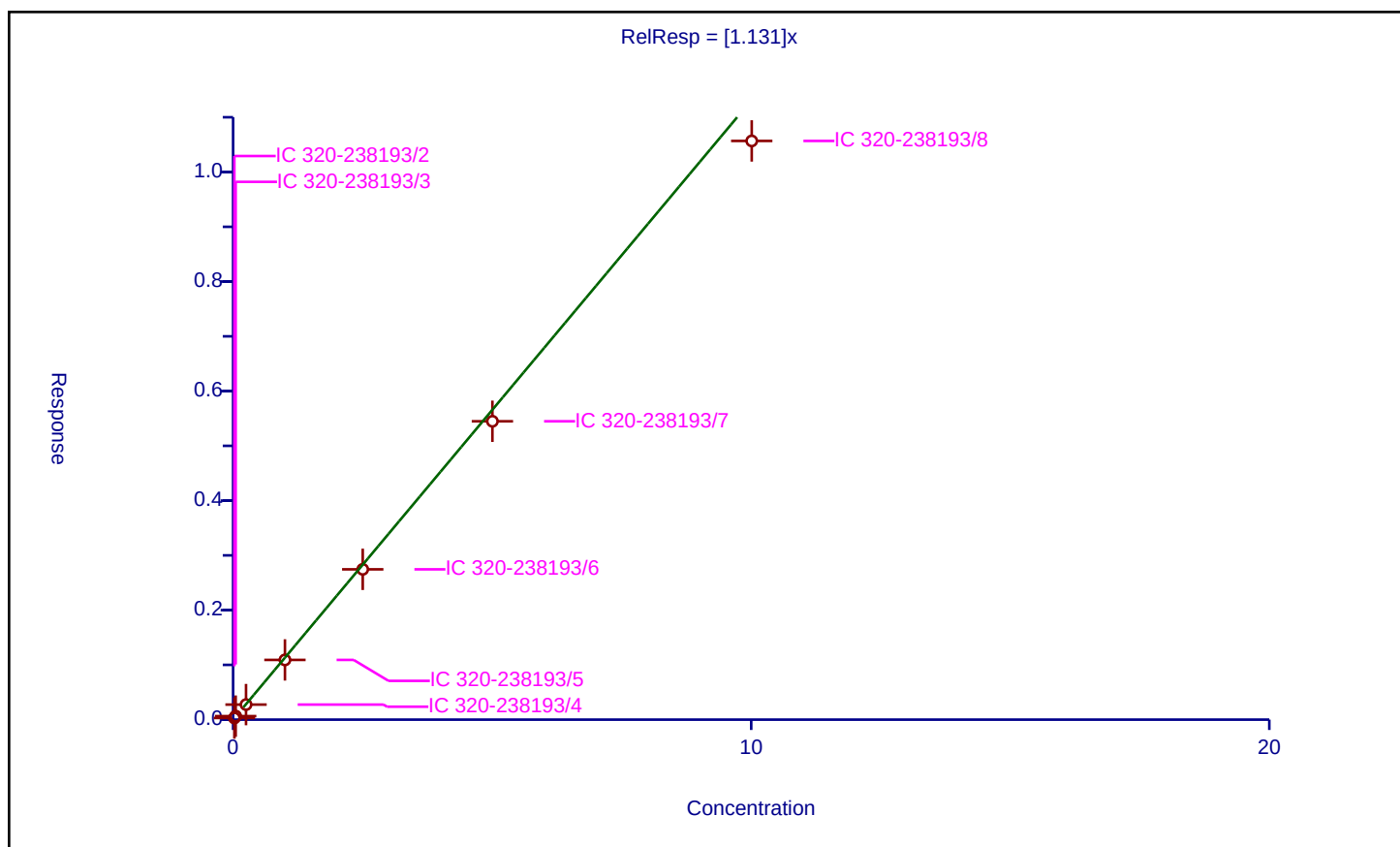
Curve Coefficients

Intercept: 0
Slope: 1.131

Error Coefficients

Standard Error: 7560000
Relative Standard Error: 7.2
Correlation Coefficient: 0.998
Coefficient of Determination (Adjusted): 0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025025	0.03005	2.5	3977347.0	1.200806	Y
2	IC 320-238193/3	0.05005	0.064332	2.5	3900845.0	1.285346	Y
3	IC 320-238193/4	0.25025	0.274715	2.5	4104790.0	1.097762	Y
4	IC 320-238193/5	1.001	1.090652	2.5	3847208.0	1.089562	Y
5	IC 320-238193/6	2.5025	2.744975	2.5	3832692.0	1.096893	Y
6	IC 320-238193/7	5.005	5.448642	2.5	3963063.0	1.08864	Y
7	IC 320-238193/8	10.01	10.567895	2.5	3722009.0	1.055734	Y



Calibration

/ Perfluoroheptanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

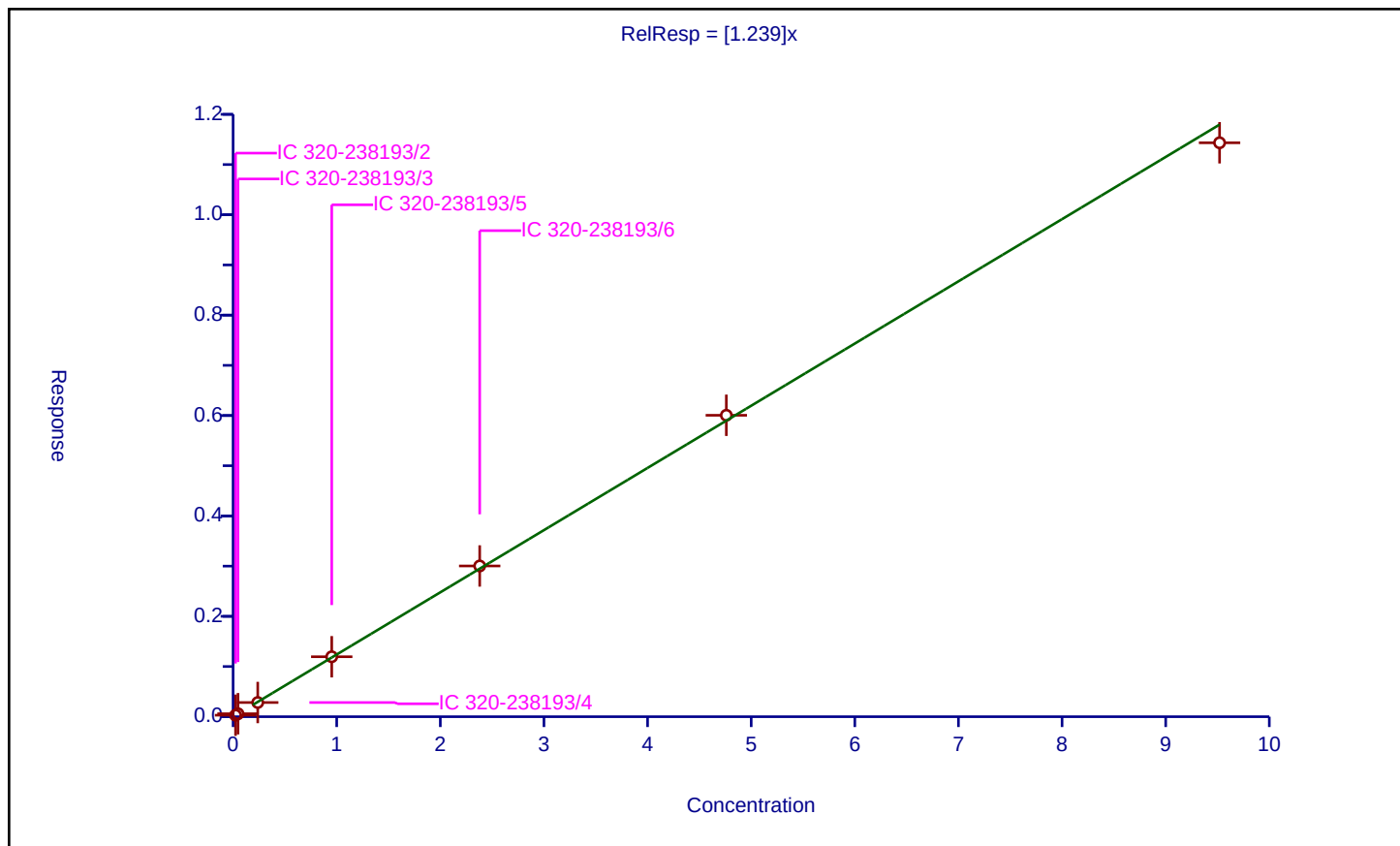
Curve Coefficients

Intercept: 0
 Slope: 1.239

Error Coefficients

Standard Error: 7580000
 Relative Standard Error: 2.5
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0238	0.030011	2.39	3400422.0	1.260973	Y
2	IC 320-238193/3	0.0476	0.059225	2.39	3430647.0	1.244214	Y
3	IC 320-238193/4	0.238	0.282875	2.39	3598367.0	1.188549	Y
4	IC 320-238193/5	0.952	1.194811	2.39	3408113.0	1.255054	Y
5	IC 320-238193/6	2.38	3.003293	2.39	3404908.0	1.261888	Y
6	IC 320-238193/7	4.76	6.005306	2.39	3471061.0	1.261619	Y
7	IC 320-238193/8	9.52	11.434127	2.39	3286355.0	1.201064	Y



Calibration

/ Perfluorononanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base: AREA
RF Rounding: 0

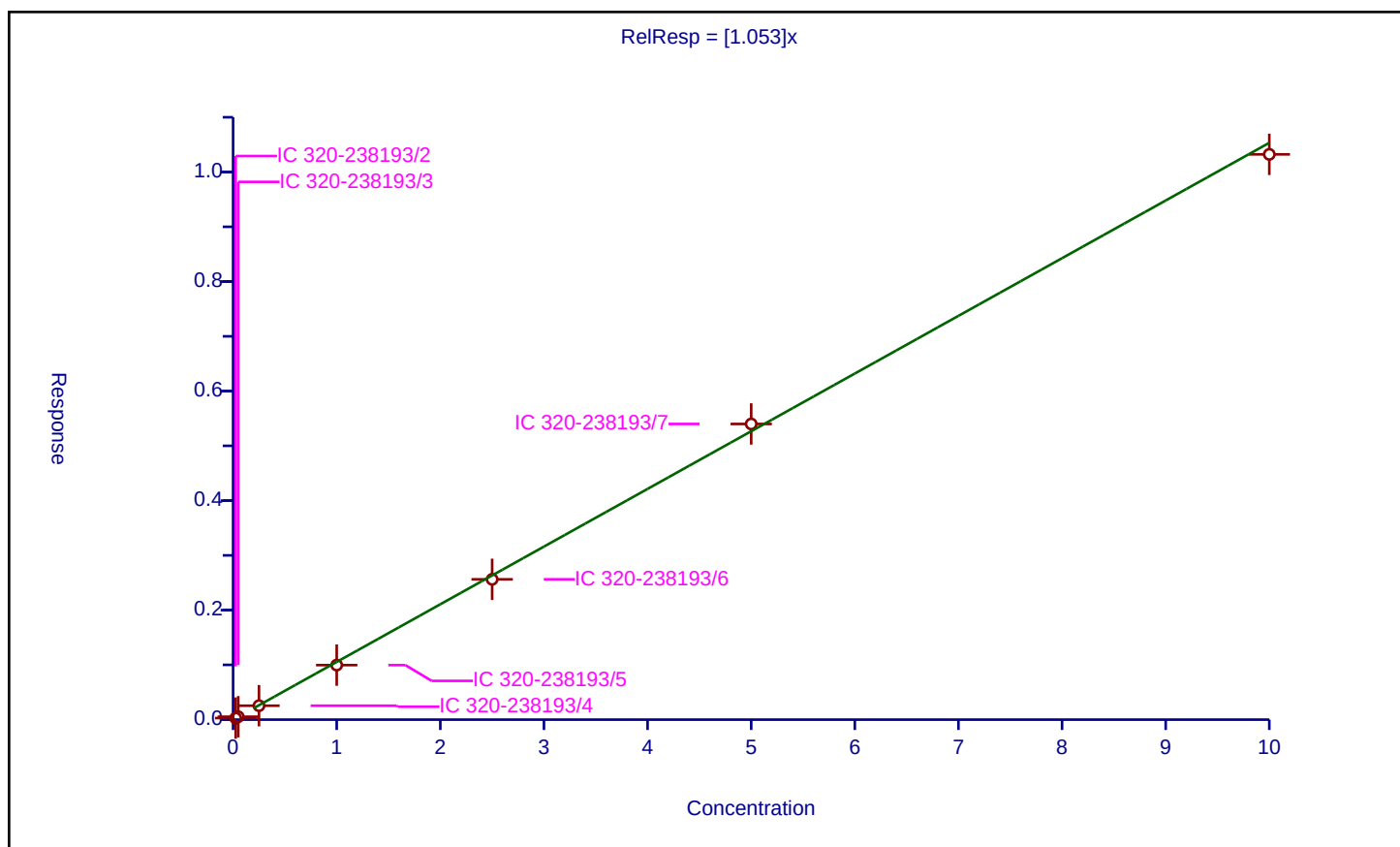
Curve Coefficients

Intercept: 0
Slope: 1.053

Error Coefficients

Standard Error: 6420000
Relative Standard Error: 4.9
Correlation Coefficient: 0.996
Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.028682	2.5	3530907.0	1.147297	Y
2	IC 320-238193/3	0.05	0.05374	2.5	3565521.0	1.074794	Y
3	IC 320-238193/4	0.25	0.254538	2.5	3712571.0	1.018152	Y
4	IC 320-238193/5	1.0	0.99618	2.5	3536917.0	0.99618	Y
5	IC 320-238193/6	2.5	2.562344	2.5	3527035.0	1.024938	Y
6	IC 320-238193/7	5.0	5.399512	2.5	3461355.0	1.079902	Y
7	IC 320-238193/8	10.0	10.322645	2.5	3213782.0	1.032264	Y



Calibration

/ Perfluorooctane sulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

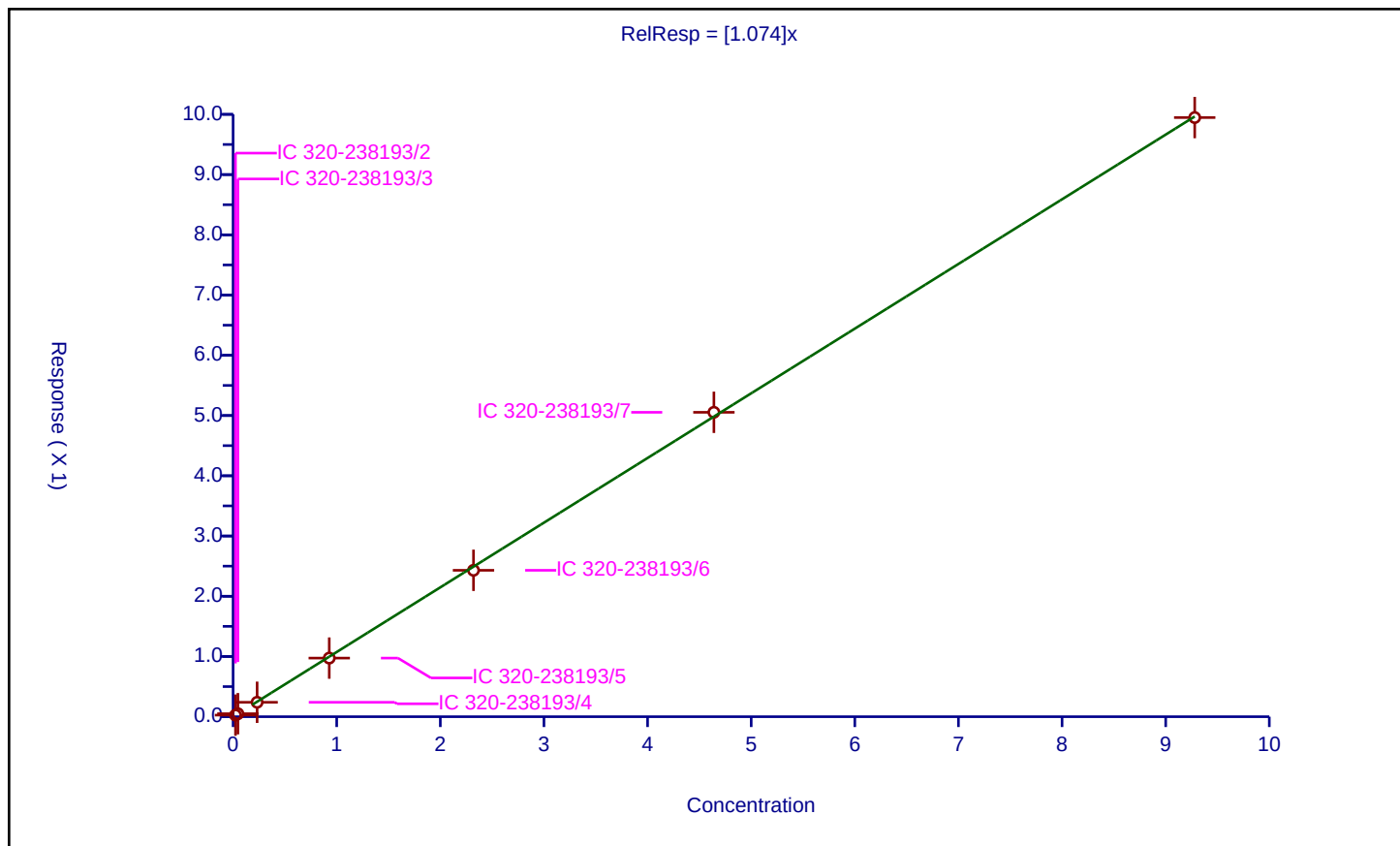
Curve Coefficients

Intercept: 0
 Slope: 1.074

Error Coefficients

Standard Error: 6520000
 Relative Standard Error: 3.5
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0232	0.026569	2.39	3400422.0	1.145197	Y
2	IC 320-238193/3	0.0464	0.050139	2.39	3430647.0	1.080576	Y
3	IC 320-238193/4	0.232	0.239688	2.39	3598367.0	1.033139	Y
4	IC 320-238193/5	0.928	0.973114	2.39	3408113.0	1.048615	Y
5	IC 320-238193/6	2.32	2.430616	2.39	3404908.0	1.047679	Y
6	IC 320-238193/7	4.64	5.053835	2.39	3471061.0	1.089189	Y
7	IC 320-238193/8	9.28	9.946849	2.39	3286355.0	1.071859	Y



Calibration

/ 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

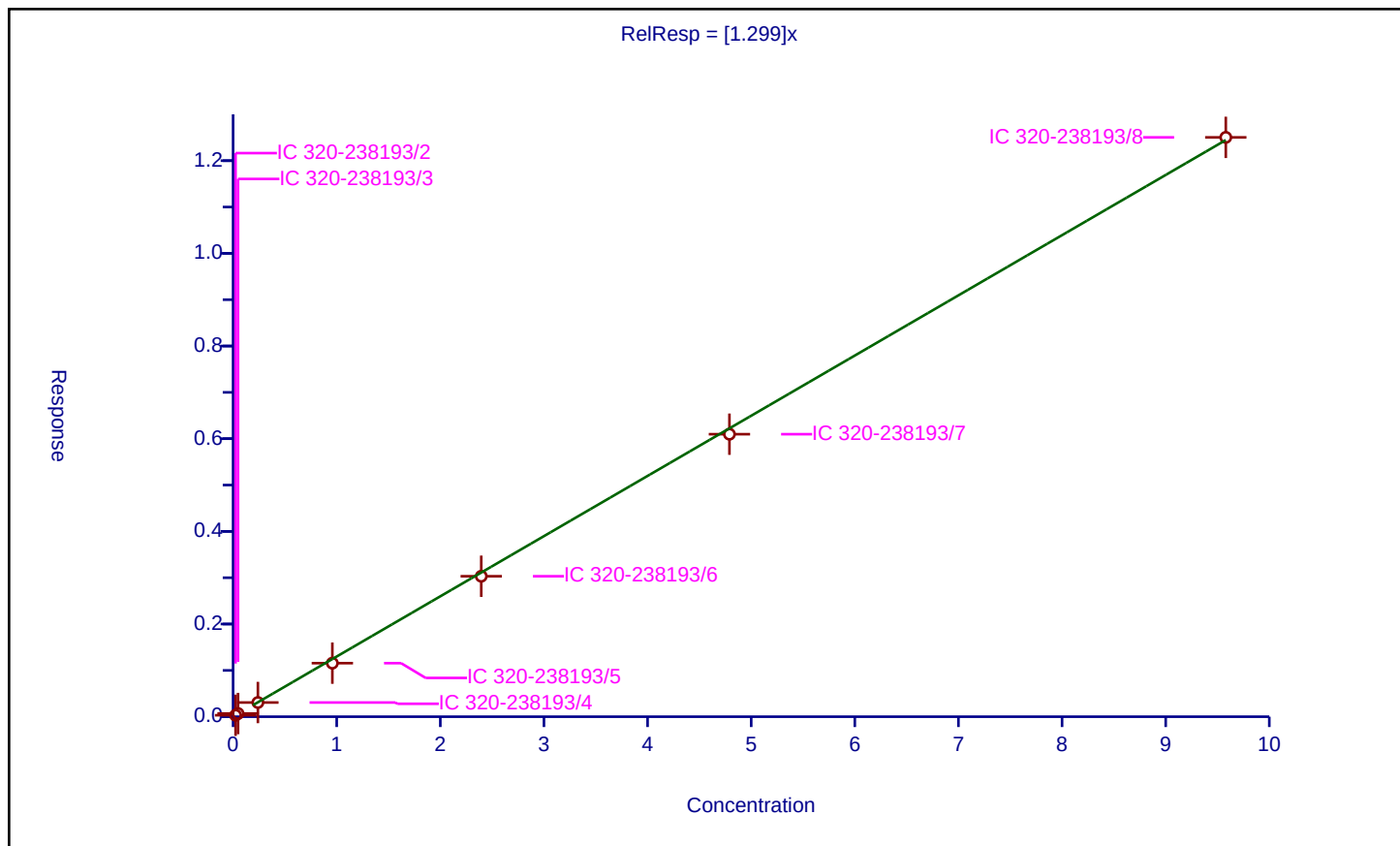
Curve Coefficients

Intercept: 0
 Slope: 1.299

Error Coefficients

Standard Error: 2320000
 Relative Standard Error: 5.6
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02395	0.031733	2.395	1070959.0	1.324981	Y
2	IC 320-238193/3	0.0479	0.068953	2.395	1065531.0	1.439517	Y
3	IC 320-238193/4	0.2395	0.306393	2.395	1066887.0	1.279301	Y
4	IC 320-238193/5	0.958	1.15562	2.395	1045687.0	1.206284	Y
5	IC 320-238193/6	2.395	3.031449	2.395	1039099.0	1.265741	Y
6	IC 320-238193/7	4.79	6.097565	2.395	1052330.0	1.272978	Y
7	IC 320-238193/8	9.58	12.503205	2.395	920670.0	1.305136	Y



Calibration

/ Perfluorononanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

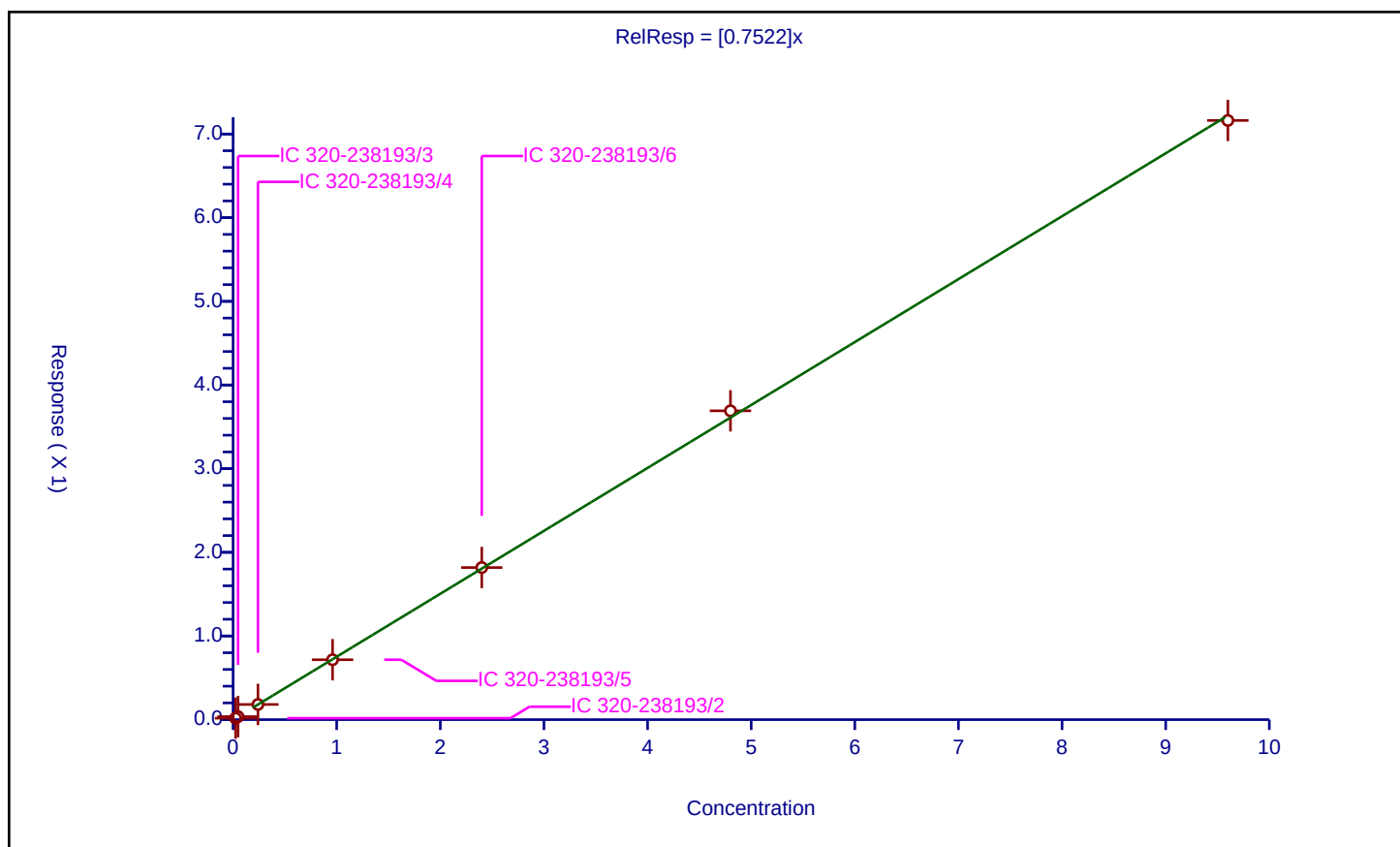
Curve Coefficients

Intercept: 0
 Slope: 0.7522

Error Coefficients

Standard Error: 4720000
 Relative Standard Error: 1.6
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.024	0.017583	2.39	3400422.0	0.732608	Y
2	IC 320-238193/3	0.048	0.036365	2.39	3430647.0	0.757605	Y
3	IC 320-238193/4	0.24	0.181554	2.39	3598367.0	0.756477	Y
4	IC 320-238193/5	0.96	0.716034	2.39	3408113.0	0.745868	Y
5	IC 320-238193/6	2.4	1.817911	2.39	3404908.0	0.757463	Y
6	IC 320-238193/7	4.8	3.691441	2.39	3471061.0	0.76905	Y
7	IC 320-238193/8	9.6	7.16179	2.39	3286355.0	0.74602	Y



Calibration

/ Perfluorodecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

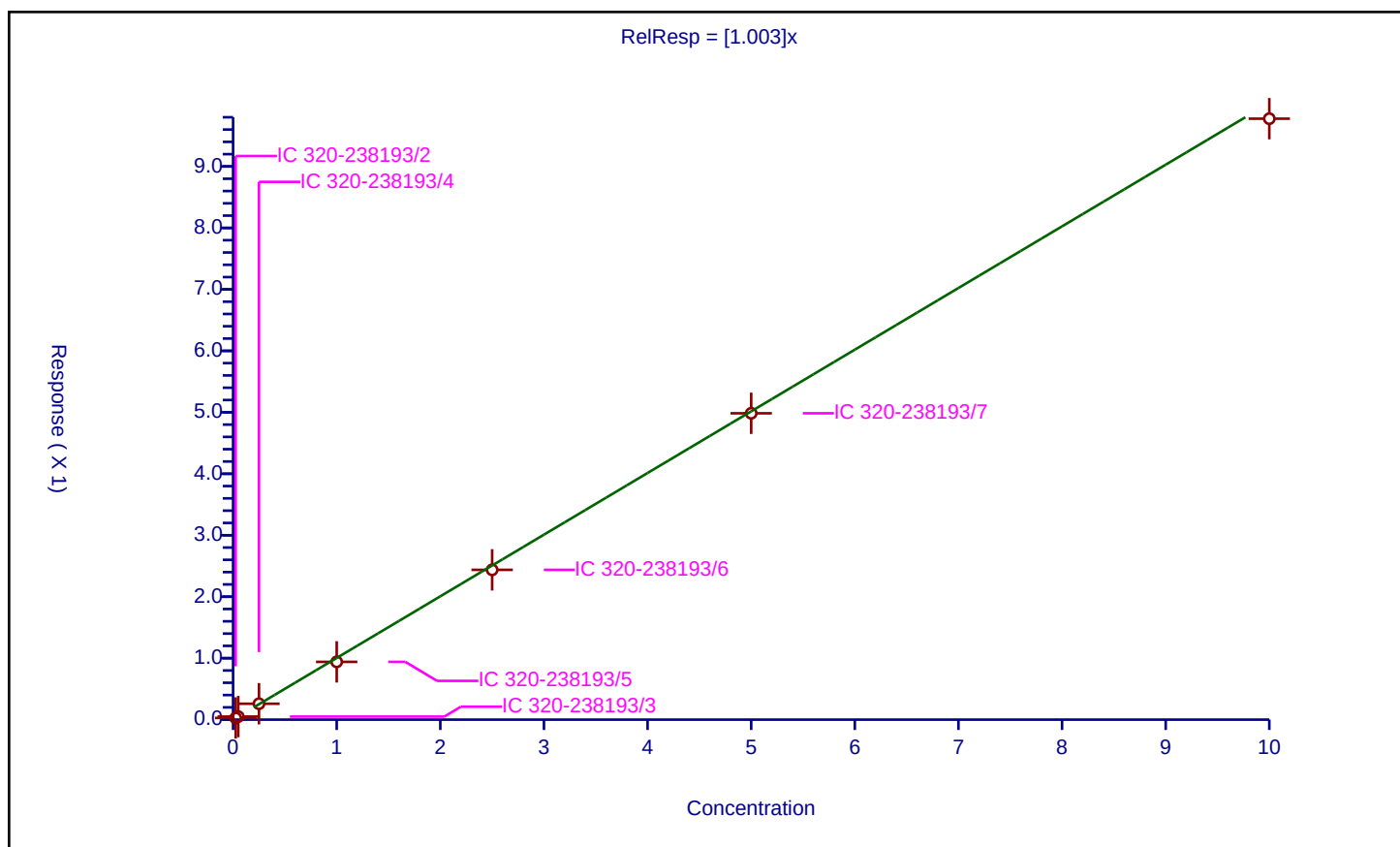
Curve Coefficients

Intercept: 0
 Slope: 1.003

Error Coefficients

Standard Error: 5490000
 Relative Standard Error: 5.1
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.027446	2.5	3043654.0	1.097825	Y
2	IC 320-238193/3	0.05	0.049999	2.5	3067735.0	0.999972	Y
3	IC 320-238193/4	0.25	0.258822	2.5	3074087.0	1.035286	Y
4	IC 320-238193/5	1.0	0.939869	2.5	3162481.0	0.939869	Y
5	IC 320-238193/6	2.5	2.437086	2.5	3093053.0	0.974835	Y
6	IC 320-238193/7	5.0	4.983908	2.5	3159574.0	0.996782	Y
7	IC 320-238193/8	10.0	9.777143	2.5	2921735.0	0.977714	Y



Calibration

/ Perfluorooctane Sulfonamide

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base: AREA
RF Rounding: 0

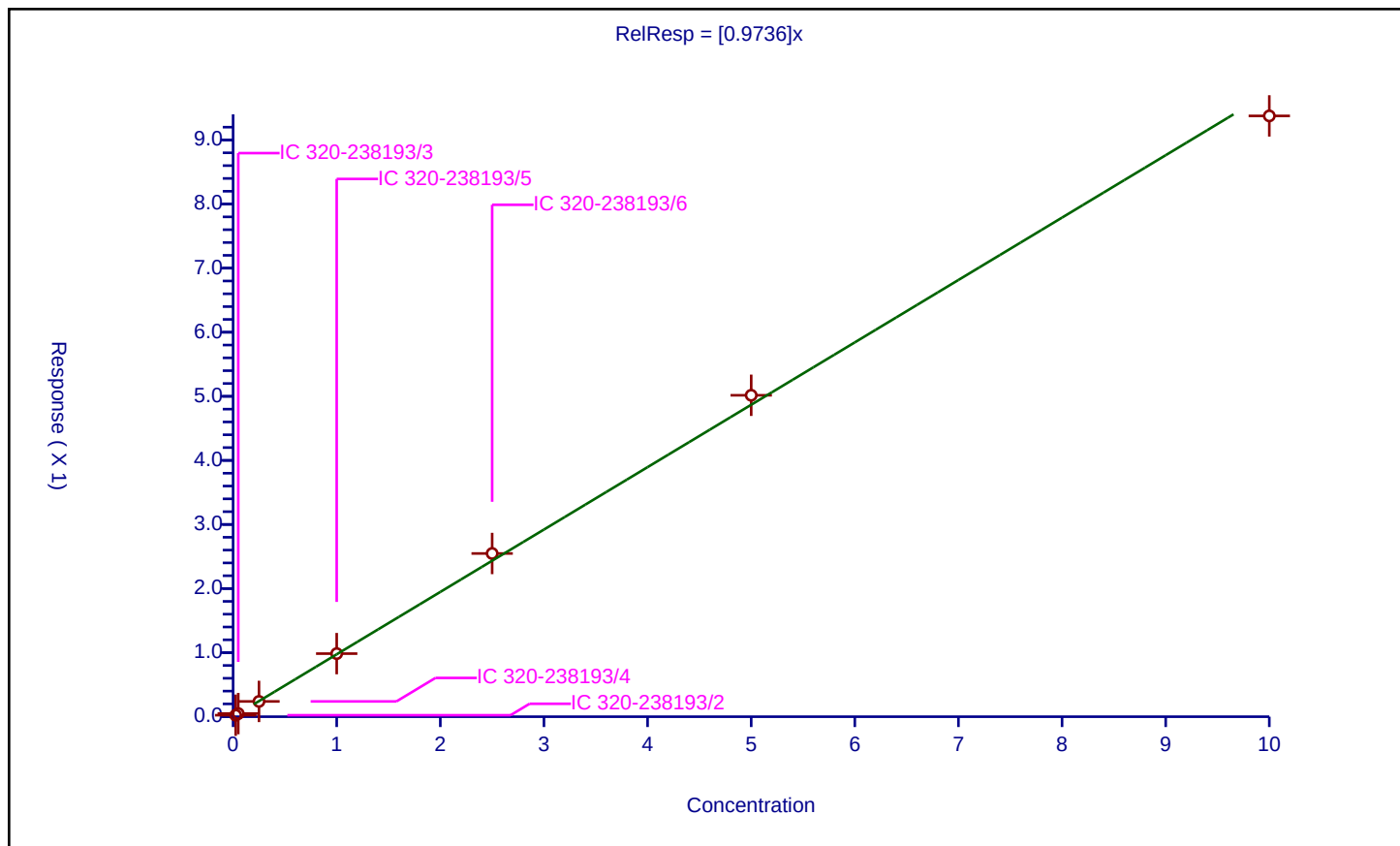
Curve Coefficients

Intercept: 0
Slope: 0.9736

Error Coefficients

Standard Error: 8230000
Relative Standard Error: 3.2
Correlation Coefficient: 0.996
Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.023501	2.5	4809407.0	0.940033	Y
2	IC 320-238193/3	0.05	0.048827	2.5	4875140.0	0.976536	Y
3	IC 320-238193/4	0.25	0.238614	2.5	4992636.0	0.954456	Y
4	IC 320-238193/5	1.0	0.984699	2.5	4677735.0	0.984699	Y
5	IC 320-238193/6	2.5	2.547227	2.5	4593505.0	1.018891	Y
6	IC 320-238193/7	5.0	5.016176	2.5	4781606.0	1.003235	Y
7	IC 320-238193/8	10.0	9.376014	2.5	4531636.0	0.937601	Y



Calibration

/ N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

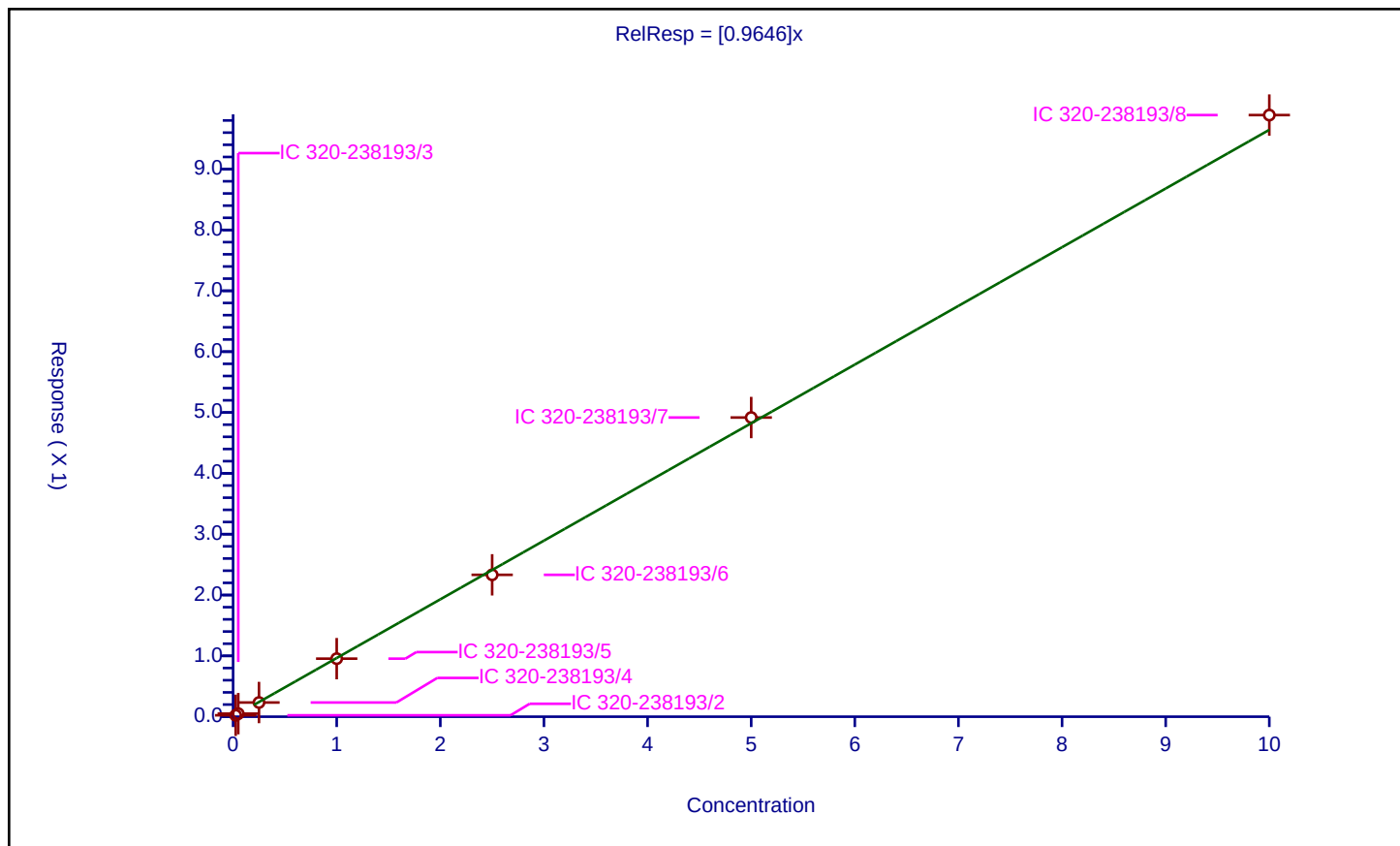
Curve Coefficients

Intercept: 0
 Slope: 0.9646

Error Coefficients

Standard Error: 2790000
 Relative Standard Error: 3.0
 Correlation Coefficient: 1.000
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.023776	2.5	1609182.0	0.951042	Y
2	IC 320-238193/3	0.05	0.05042	2.5	1580220.0	1.008404	Y
3	IC 320-238193/4	0.25	0.233393	2.5	1616798.0	0.933574	Y
4	IC 320-238193/5	1.0	0.954003	2.5	1547904.0	0.954003	Y
5	IC 320-238193/6	2.5	2.332061	2.5	1601576.0	0.932824	Y
6	IC 320-238193/7	5.0	4.917445	2.5	1562466.0	0.983489	Y
7	IC 320-238193/8	10.0	9.888298	2.5	1491160.0	0.98883	Y



Calibration

/ Perfluorodecane Sulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

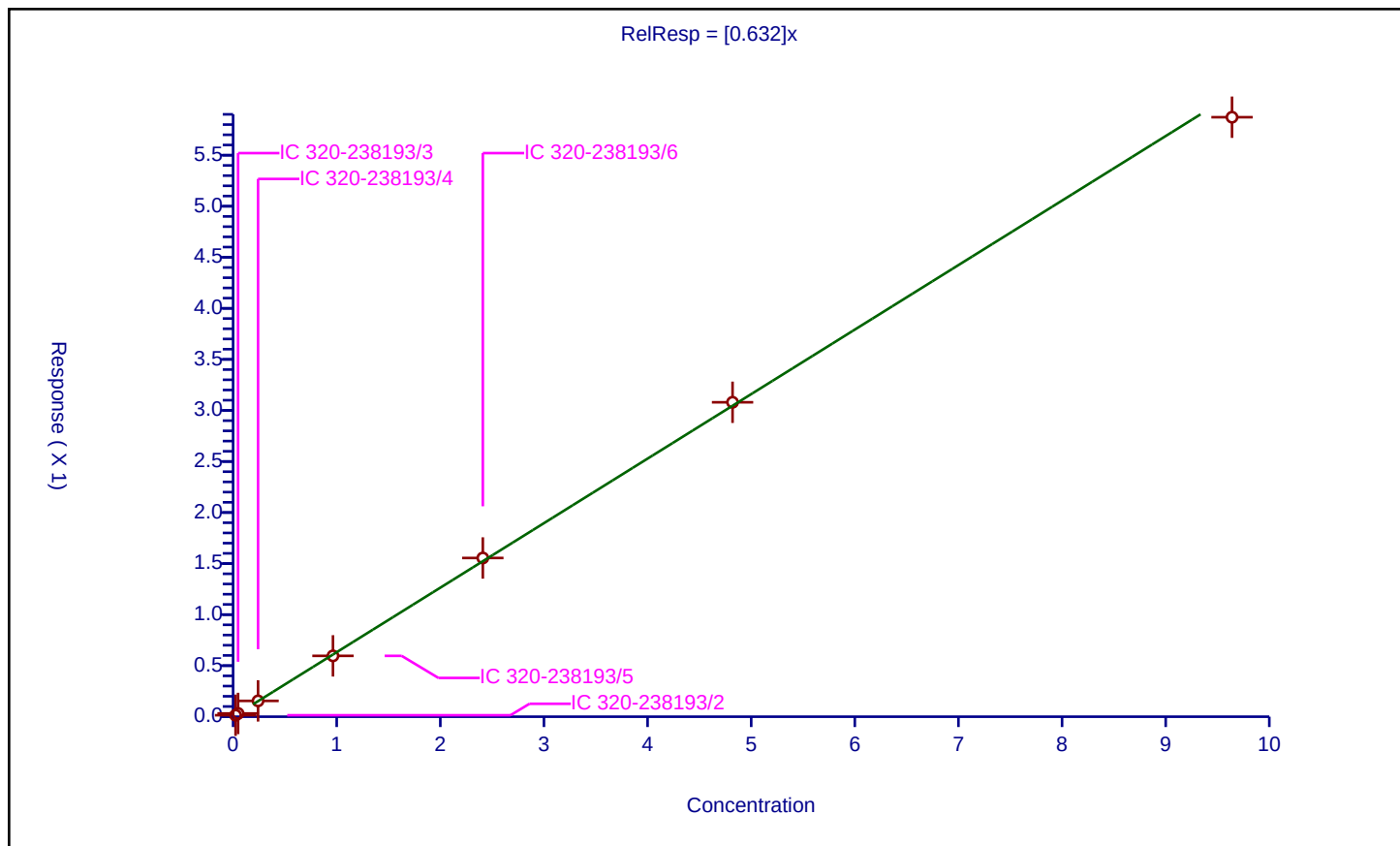
Curve Coefficients

Intercept: 0
 Slope: 0.632

Error Coefficients

Standard Error: 3890000
 Relative Standard Error: 3.4
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0241	0.014582	2.39	3400422.0	0.605067	Y
2	IC 320-238193/3	0.0482	0.03202	2.39	3430647.0	0.664315	Y
3	IC 320-238193/4	0.241	0.15494	2.39	3598367.0	0.642906	Y
4	IC 320-238193/5	0.964	0.595962	2.39	3408113.0	0.618218	Y
5	IC 320-238193/6	2.41	1.554675	2.39	3404908.0	0.645093	Y
6	IC 320-238193/7	4.82	3.079819	2.39	3471061.0	0.638967	Y
7	IC 320-238193/8	9.64	5.872006	2.39	3286355.0	0.609129	Y



Calibration

/ N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

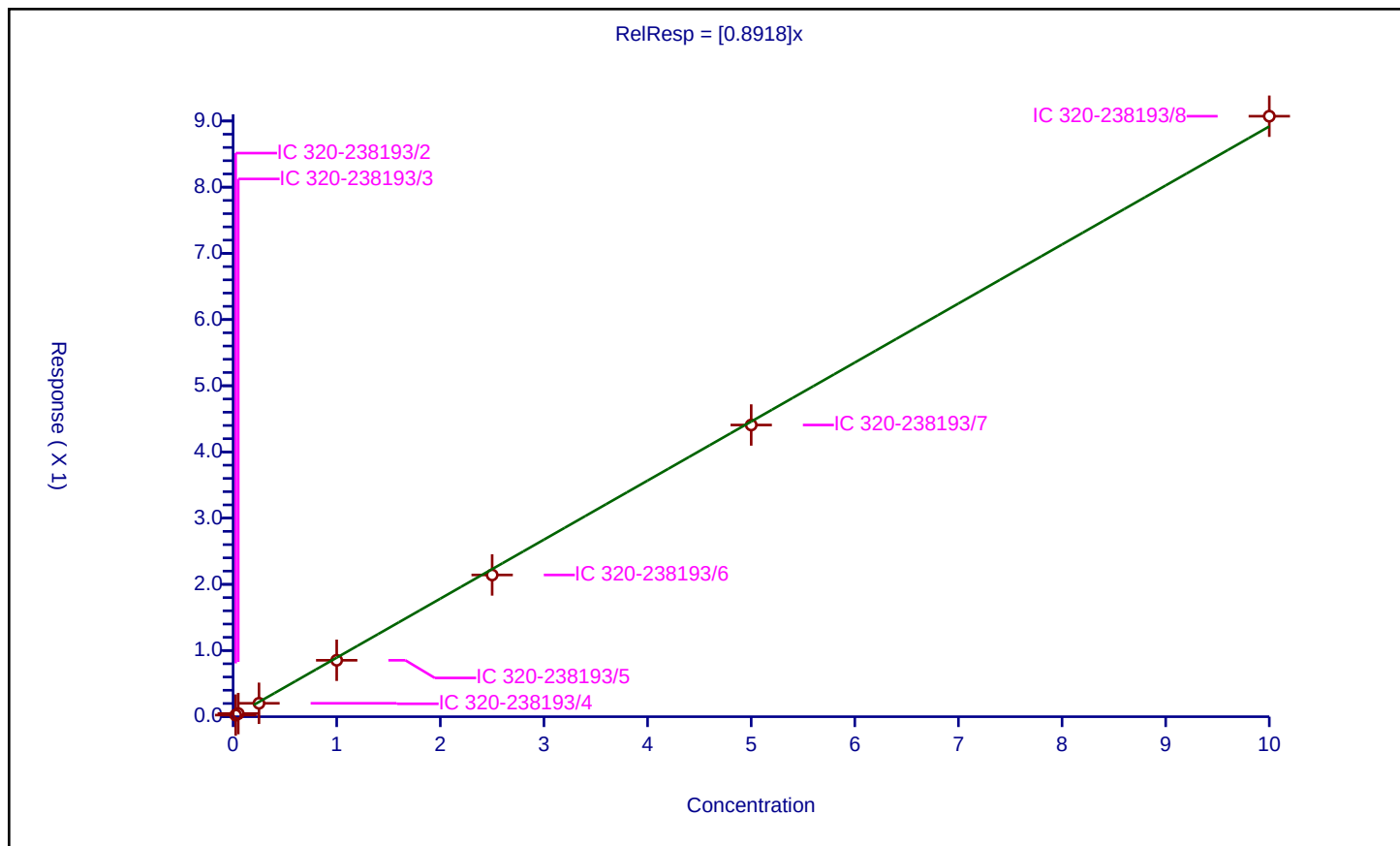
Curve Coefficients

Intercept: 0
 Slope: 0.8918

Error Coefficients

Standard Error: 2450000
 Relative Standard Error: 6.7
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.024612	2.5	1718969.0	0.984485	Y
2	IC 320-238193/3	0.05	0.047453	2.5	1684036.0	0.949059	Y
3	IC 320-238193/4	0.25	0.202793	2.5	1760050.0	0.81117	Y
4	IC 320-238193/5	1.0	0.852618	2.5	1663128.0	0.852618	Y
5	IC 320-238193/6	2.5	2.141459	2.5	1595779.0	0.856584	Y
6	IC 320-238193/7	5.0	4.407058	2.5	1597197.0	0.881412	Y
7	IC 320-238193/8	10.0	9.072174	2.5	1403844.0	0.907217	Y



Calibration

/ Perfluoroundecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

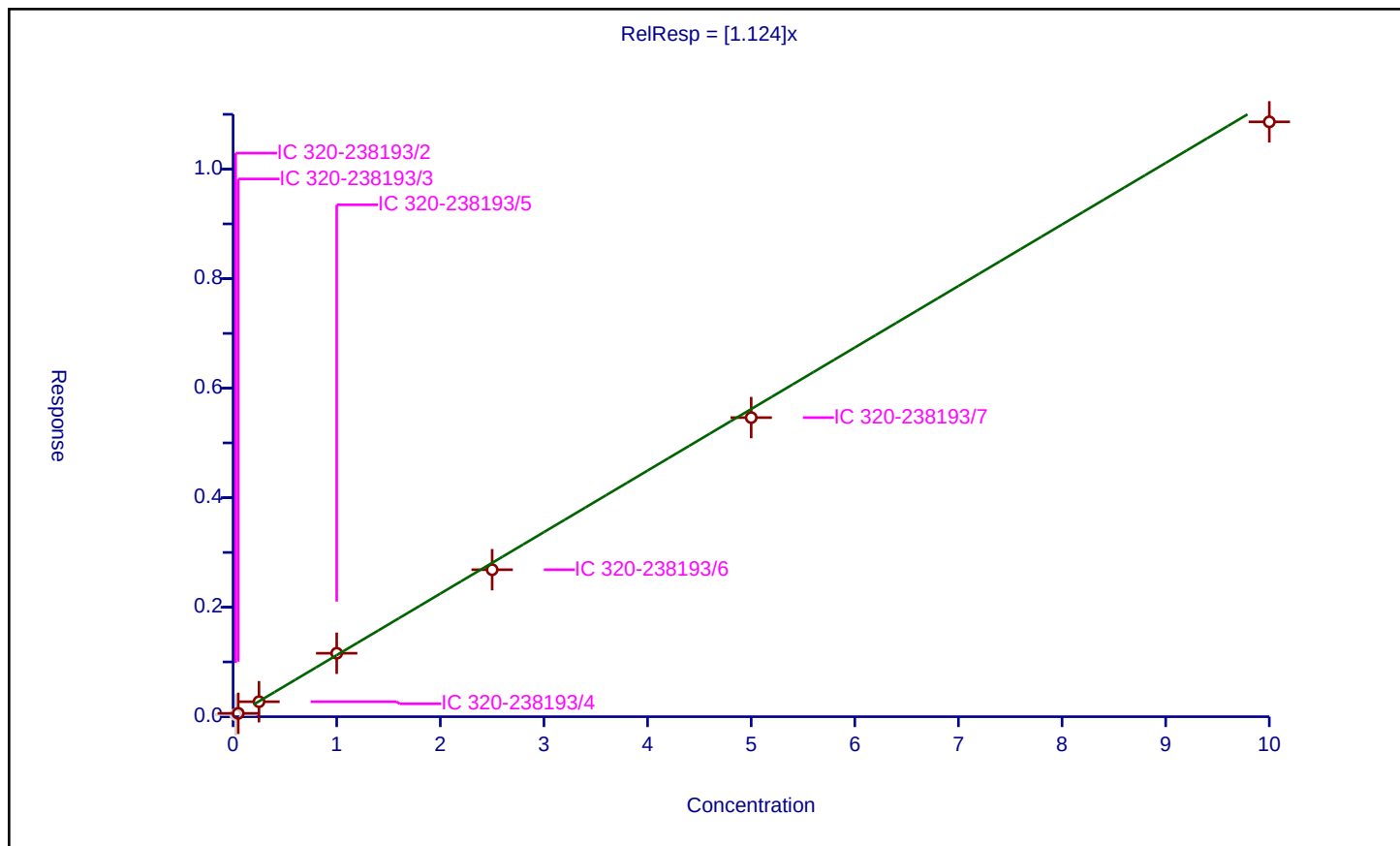
Curve Coefficients

Intercept: 0
 Slope: 1.124

Error Coefficients

Standard Error: 5210000
 Relative Standard Error: 5.5
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.038626	2.5	2534521.0	1.545026	N
2	IC 320-238193/3	0.05	0.061716	2.5	2456263.0	1.234314	Y
3	IC 320-238193/4	0.25	0.274014	2.5	2639555.0	1.096056	Y
4	IC 320-238193/5	1.0	1.158939	2.5	2425508.0	1.158939	Y
5	IC 320-238193/6	2.5	2.68457	2.5	2527555.0	1.073828	Y
6	IC 320-238193/7	5.0	5.462098	2.5	2455806.0	1.09242	Y
7	IC 320-238193/8	10.0	10.863244	2.5	2281933.0	1.086324	Y



Calibration

/ Perfluorododecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

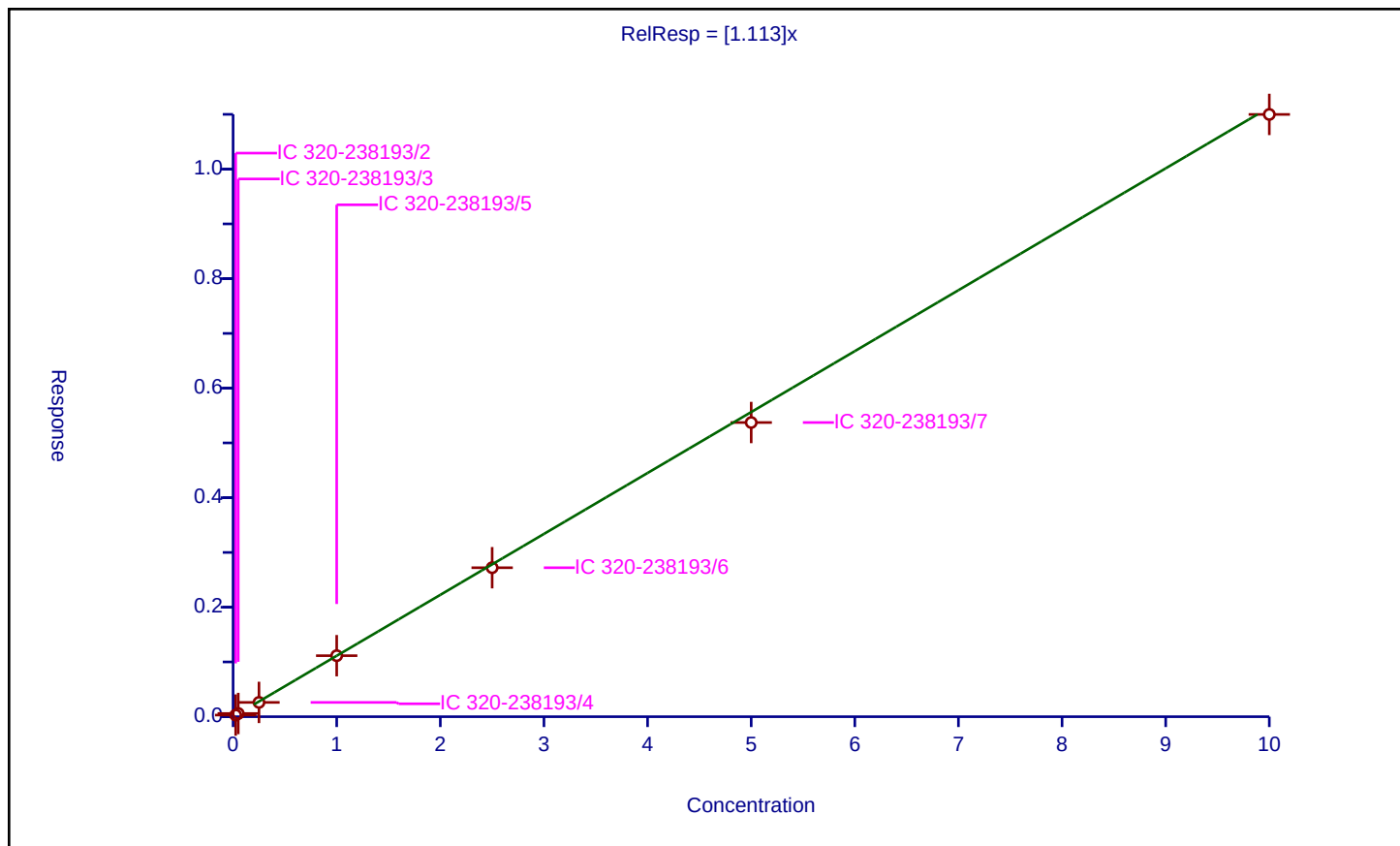
Curve Coefficients

Intercept: 0
 Slope: 1.113

Error Coefficients

Standard Error: 5090000
 Relative Standard Error: 4.8
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.029739	2.5	2591339.0	1.189578	Y
2	IC 320-238193/3	0.05	0.058862	2.5	2599869.0	1.177232	Y
3	IC 320-238193/4	0.25	0.261223	2.5	2785129.0	1.044892	Y
4	IC 320-238193/5	1.0	1.114482	2.5	2610480.0	1.114482	Y
5	IC 320-238193/6	2.5	2.720923	2.5	2668181.0	1.088369	Y
6	IC 320-238193/7	5.0	5.372521	2.5	2627551.0	1.074504	Y
7	IC 320-238193/8	10.0	10.998843	2.5	2422707.0	1.099884	Y



Calibration

/ Perfluorotridecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

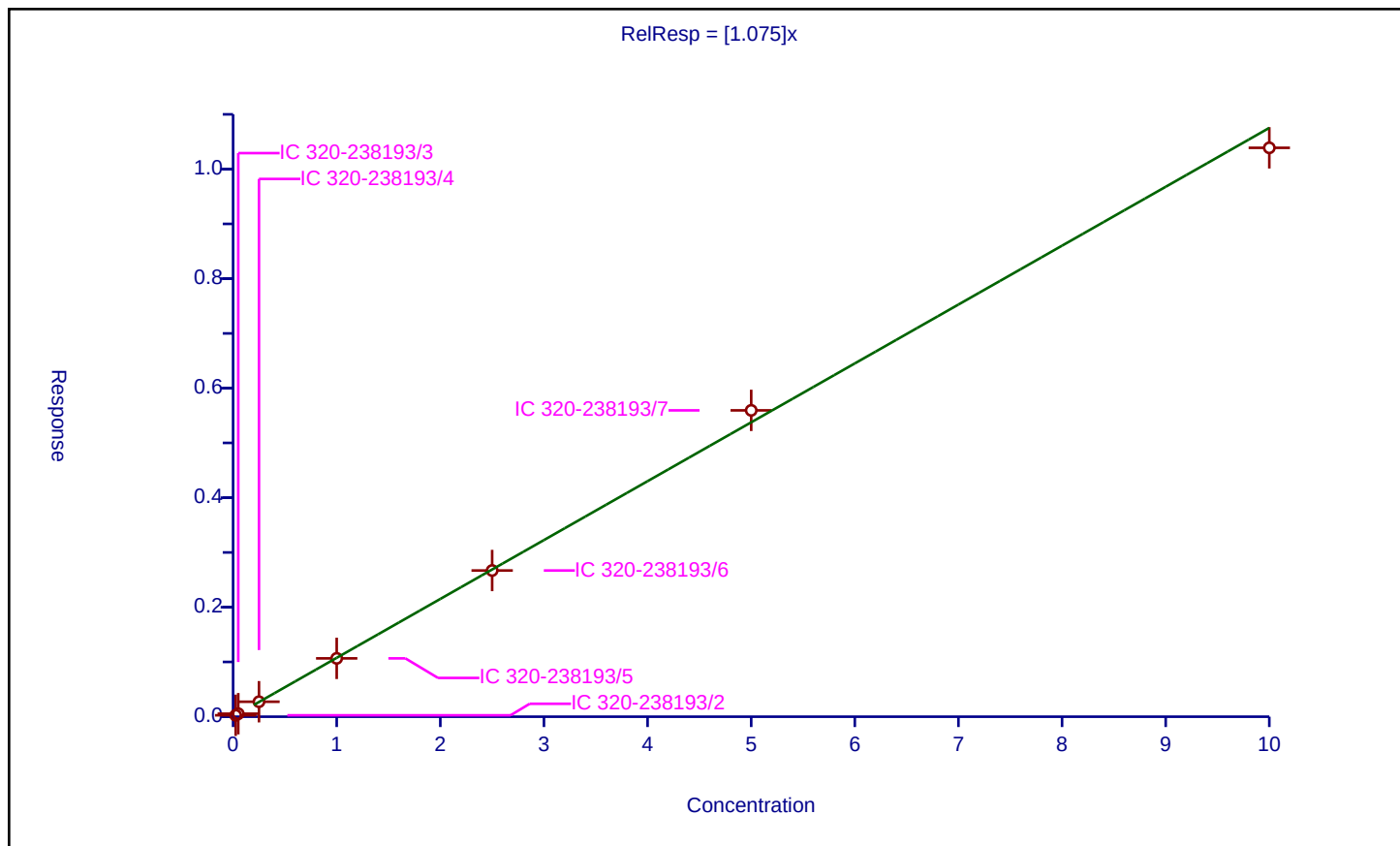
Curve Coefficients

Intercept: 0
 Slope: 1.075

Error Coefficients

Standard Error: 4920000
 Relative Standard Error: 2.8
 Correlation Coefficient: 0.994
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.026038	2.5	2591339.0	1.041508	Y
2	IC 320-238193/3	0.05	0.054986	2.5	2599869.0	1.099728	Y
3	IC 320-238193/4	0.25	0.273592	2.5	2785129.0	1.094369	Y
4	IC 320-238193/5	1.0	1.065564	2.5	2610480.0	1.065564	Y
5	IC 320-238193/6	2.5	2.670075	2.5	2668181.0	1.06803	Y
6	IC 320-238193/7	5.0	5.594154	2.5	2627551.0	1.118831	Y
7	IC 320-238193/8	10.0	10.388884	2.5	2422707.0	1.038888	Y



Calibration

/ Perfluorotetradecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

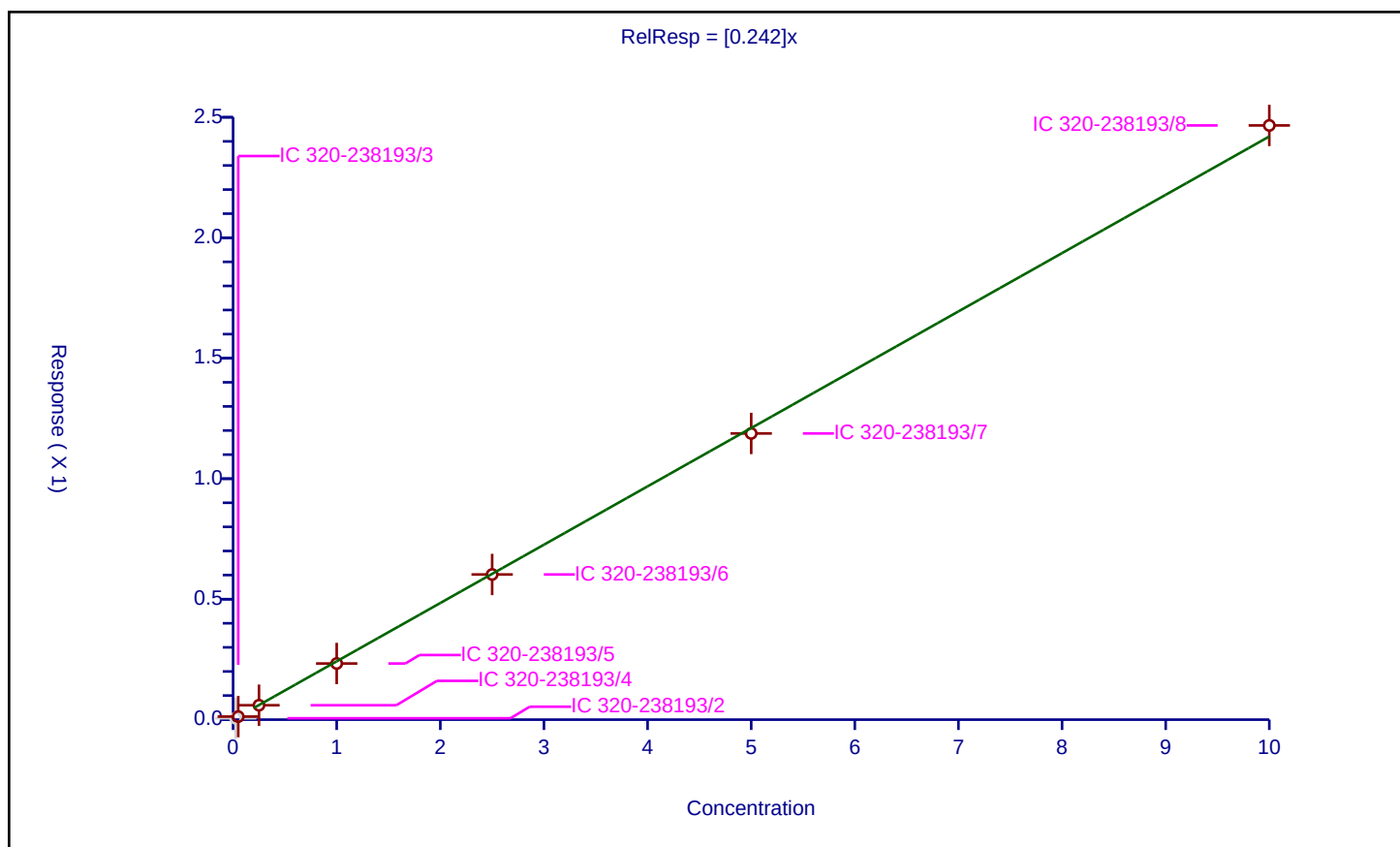
Curve Coefficients

Intercept: 0
 Slope: 0.242

Error Coefficients

Standard Error: 1580000
 Relative Standard Error: 3.2
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.005847	2.5	3447891.0	0.233882	N
2	IC 320-238193/3	0.05	0.01275	2.5	3344339.0	0.254998	Y
3	IC 320-238193/4	0.25	0.059754	2.5	3541707.0	0.239015	Y
4	IC 320-238193/5	1.0	0.233028	2.5	3313318.0	0.233028	Y
5	IC 320-238193/6	2.5	0.60248	2.5	3233399.0	0.240992	Y
6	IC 320-238193/7	5.0	1.187788	2.5	3382019.0	0.237558	Y
7	IC 320-238193/8	10.0	2.466112	2.5	3074334.0	0.246611	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: ICV 320-238193/10 Calibration Date: 08/06/2018 12:12

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.06LLICAL_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	0.9389	0.9111		2.43	2.50	-3.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.131		2.49	2.50	-0.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	75.88		2.21	2.21	-0.1	30.0
4:2 FTS	AveID	16.57	16.30		2.30	2.34	-1.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9745		2.39	2.50	-4.5	30.0
Perfluoropentanesulfonic acid	AveID	68.92	67.78		2.31	2.35	-1.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.095		2.58	2.50	3.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.006		2.12	2.28	-7.2	30.0
6:2 FTS	AveID	1.573	1.480		2.23	2.38	-5.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.105		2.44	2.50	-2.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.268		2.43	2.38	2.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.063		2.52	2.50	0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.062		2.29	2.31	-1.1	30.0
8:2 FTS	AveID	1.299	1.302		2.41	2.40	0.2	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7949		2.54	2.40	5.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9537		2.38	2.50	-4.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.033		2.65	2.50	6.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	1.046		2.71	2.50	8.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6548		2.50	2.41	3.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.9360		2.62	2.50	5.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.111		2.47	2.50	-1.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.112		2.50	2.50	-0.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.081		2.51	2.50	0.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2415		2.49	2.50	-0.2	30.0
13C4 PFBA	Ave	1.385	1.395		2.52	2.50	0.7	30.0
13C5 PFPeA	Ave	0.9537	0.9739		2.55	2.50	2.1	30.0
13C3-PFBS	Ave	0.0221	0.0228		2.41	2.33	3.5	30.0
13C2 PFHxA	Ave	1.082	1.136		2.62	2.50	5.0	30.0
13C4-PFHpA	Ave	1.065	1.049		2.46	2.50	-1.5	30.0
1802 PFHxS	Ave	1.366	1.389		2.41	2.37	1.7	30.0
M2-6:2FTS	Ave	0.2242	0.2398		2.54	2.38	7.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: ICV 320-238193/10 Calibration Date: 08/06/2018 12:12
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.06LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	1.001		2.56	2.50	2.4	30.0
13C5 PFNA	Ave	0.8770	0.8835		2.52	2.50	0.7	30.0
13C4 PFOS	Ave	0.8973	0.9046		2.41	2.39	0.8	30.0
M2-8:2FTS	Ave	0.2707	0.2722		2.41	2.40	0.5	30.0
13C2 PFDA	Ave	0.7695	0.8085		2.63	2.50	5.1	30.0
13C8 FOSA	Ave	1.188	1.221		2.57	2.50	2.7	30.0
d3-NMeFOSAA	Ave	0.3935	0.4029		2.56	2.50	2.4	30.0
d5-NEtFOSAA	Ave	0.4077	0.4067		2.49	2.50	-0.2	30.0
13C2 PFUnA	Ave	0.6189	0.6228		2.52	2.50	0.6	30.0
13C2 PFDoA	Ave	0.6541	0.6517		2.49	2.50	-0.4	30.0
13C2-PFTeDA	Ave	0.8335	0.8309		2.49	2.50	-0.3	30.0
13C2-PFHxDA	Ave	1.653	1.653		2.50	2.50	-0.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_010.d
 Lims ID: ICV Full
 Client ID:
 Sample Type: ICV
 Inject. Date: 06-Aug-2018 12:12:35 ALS Bottle#: 17 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist:
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:17:35 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: westendorfc

Date: 06-Aug-2018 14:44:08

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	1.391	1.395	-0.004	0.542	5296521	2.52		101	7091	
2 Perfluorobutyric acid										
212.90 > 169.00	1.391	1.397	-0.006	1.000	4825878	2.43			504	
D 3 13C5-PFPeA										
267.90 > 223.00	1.639	1.639	0.0	0.639	3698626	2.55		102	7119	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.639	1.643	-0.004	1.000	4183399	2.49			284	
D 47 13C3-PFBS										
301.90 > 83.00	1.670	1.675	-0.005	0.651	80665	2.41		104	325	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.670	1.676	-0.006	1.000	5824451	2.21			1937	
298.90 > 99.00	1.670	1.676	-0.006	1.000	2407614		2.42(1.25-3.74)		1183	
D 60 M2-4:2FTS										
329.00 > 81.00	1.875	1.875	0.0	0.731	561057	NC			886	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.875	1.875	0.0	1.123	1321953	2.30			6725	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.902	1.908	-0.006	1.000	4205198	2.39			977	
313.00 > 119.00	1.902	1.908	-0.006	1.000	400387		10.50(5.03-15.10)		846	
D 7 13C2 PFHxA										
315.00 > 270.00	1.902	1.908	-0.006	0.741	4315219	2.62		105	15192	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.923	1.930	-0.007	1.151	5526564	2.31			5906	
349.00 > 99.00	1.923	1.930	-0.007	1.151	2095463		2.64(1.36-4.07)		2107	
D 64 13C3 HFPO-DA										
332.10 > 287.00	1.996	2.003	-0.007	0.778	322162	NC			933	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	1.996	2.003	-0.007	1.000	741324	NC			344	
D 9 13C4-PFHpA										
367.00 > 322.00	2.224	2.227	-0.003	0.867	3985248	2.46		98.5	13174	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.224	2.228	-0.004	1.000	4365036	2.58			796	
363.00 > 169.00	2.224	2.228	-0.004	1.000	1653058		2.64(1.13-3.40)		2332	
D 11 18O2 PFHxS										
403.00 > 84.00	2.233	2.239	-0.006	0.870	4991823	2.41		102	6129	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.233	2.239	-0.006	1.000	4839695	2.12			4067	
399.00 > 99.00	2.233	2.239	-0.006	1.000	1675306		2.89(1.50-4.49)		1317	
65 ADONA										
377.00 > 251.00	2.266	2.271	-0.005	0.773	11858483	NC			9196	
377.00 > 85.00	2.266	2.271	-0.005	0.773	7230959		1.64(0.84-2.53)		6790	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.541	2.548	-0.007	1.000	1280328	2.23			1590	
D 12 M2-6:2FTS										
429.00 > 81.00	2.541	2.549	-0.008	0.990	865191	2.54		107	2048	
D 73 13C8 PFOA										
421.00 > 376.00	2.565	2.571	-0.006	1.000	7338024	NC			10284	
D 14 13C4 PFOA										
417.00 > 372.00	2.565	2.573	-0.008	1.000	3800480	2.56		102	6853	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.565	2.574	-0.009	1.000	4200537	2.44			410	
413.00 > 169.00	2.565	2.574	-0.009	1.000	2114411		1.99(0.84-2.52)		2903	
* 62 13C2-PFOA										
415.00 > 370.00	2.565	2.575	-0.010		3797956	2.50			5989	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.572	2.583	-0.011	0.877	4137002	2.43			2987	
449.00 > 99.00	2.572	2.583	-0.011	0.877	1077824		3.84(1.94-5.82)		1432	
D 72 13C8 PFOS										
507.00 > 99.00	2.927	2.938	-0.011	1.141	1637179	NC			4240	
20 Perfluorononanoic acid										
463.00 > 419.00	2.932	2.939	-0.007	1.002	3565093	2.52			1099	
463.00 > 169.00	2.927	2.939	-0.012	1.000	836654		4.26(1.90-5.69)		3309	
D 19 13C5 PFNA										
468.00 > 423.00	2.927	2.939	-0.012	1.141	3355305	2.52		101	5903	
D 18 13C4 PFOS										
503.00 > 80.00	2.932	2.939	-0.007	1.143	3284321	2.41		101	4465	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.932	2.940	-0.008	1.000	3376348	2.29			2781	
499.00 > 99.00	2.932	2.940	-0.008	1.000	758026		4.45(2.31-6.93)		1161	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.138	3.150	-0.012	1.070	6059178	NC			6074	
D 26 M2-8:2FTS										
529.00 > 81.00	3.271	3.284	-0.013	1.275	990254	2.41		101	3137	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.277	3.285	-0.007	1.118	2621562	2.54			5053	
549.00 > 99.00	3.277	3.285	-0.007	1.118	925714		2.83(1.33-3.97)		2112	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.271	3.286	-0.015	1.000	1292056	2.41			2763	
D 23 13C2 PFDA										
515.00 > 470.00	3.283	3.294	-0.011	1.280	3070618	2.63		105	4701	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.283	3.296	-0.013	1.000	2928556	2.38			1743	
513.00 > 169.00	3.283	3.296	-0.013	1.000	492806		5.94(2.36-7.09)		1454	
D 21 13C8 FOSA										
506.00 > 78.00	3.305	3.317	-0.012	1.288	4636545	2.57		103	4566	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.312	3.319	-0.007	1.002	4790545	2.65			4274	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.438	3.448	-0.010	1.340	1530216	2.56		102	2513	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.445	3.453	-0.008	1.002	1600813	2.71			1423	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.595	3.608	-0.013	1.226	2170741	2.50			5861	
599.00 > 99.00	3.595	3.608	-0.013	1.226	719544		3.02(1.39-4.16)		2645	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.604	3.616	-0.012	1.405	1544621	2.49		99.8	1098	
D 30 13C2 PFUnA										
565.00 > 520.00	3.613	3.620	-0.007	1.408	2365503	2.52		101	5330	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.613	3.622	-0.009	1.000	2627473	2.47			1492	
563.00 > 169.00	3.613	3.622	-0.009	1.000	445341		5.90(2.12-6.36)		1665	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.613	3.623	-0.010	1.002	1445786	2.62			2945	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.766	3.781	-0.015	1.284	9482077	NC			7397	
D 36 13C2 PFDoA										
615.00 > 570.00	3.899	3.913	-0.014	1.520	2474996	2.49		99.6	5677	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.899	3.913	-0.014	1.192	962597	NC			4544	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.899	3.913	-0.014	1.000	2751158	2.50			1368	
613.00 > 169.00	3.899	3.913	-0.014	1.000	638644		4.31(2.13-6.40)		3219	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.139	4.148	-0.009	1.411	946435	NC			6010	
699.00 > 99.00	4.139	4.148	-0.009	1.411	1287773		0.73(0.00-0.00)		3741	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.158	4.173	-0.015	1.066	2676685	2.51			1031	
663.00 > 169.00	4.158	4.173	-0.015	1.066	835828		3.20(1.25-3.76)		3211	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.390	4.399	-0.009	1.711	3155599	2.49		99.7	7430	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.390	4.400	-0.010	1.000	762188	2.49			3740	
713.00 > 219.00	4.390	4.400	-0.010	1.000	546353		1.40(0.71-2.13)		2085	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.789	4.799	-0.010	1.867	6279185	2.50		100.0	7044	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.796	4.801	-0.005	1.001	5908591	NC			1969	
813.00 > 169.00	4.789	4.801	-0.012	1.000	999181		5.91(2.86-8.58)		4590	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.126	5.136	-0.010	1.070	6210892	NC			1785	
913.00 > 169.00	5.126	5.136	-0.010	1.070	740263		8.39(3.83-11.48)		2920	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00013

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_010.d

Injection Date: 06-Aug-2018 12:12:35

Instrument ID: A8_N

Lims ID: ICV Full

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#:

17

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

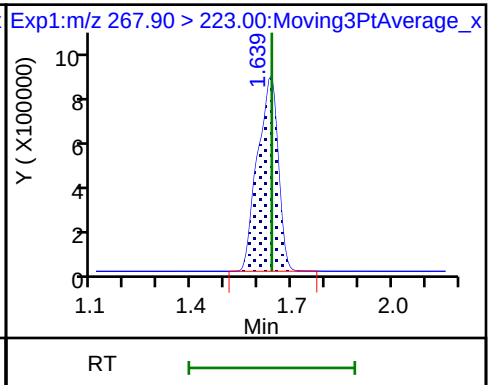
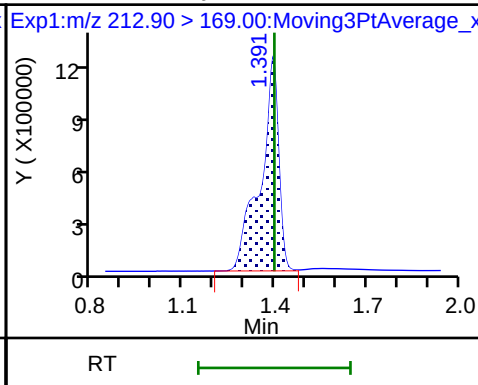
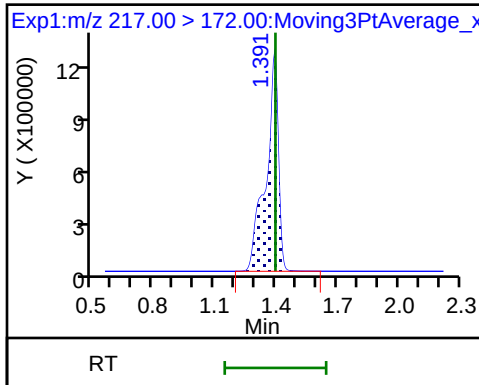
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

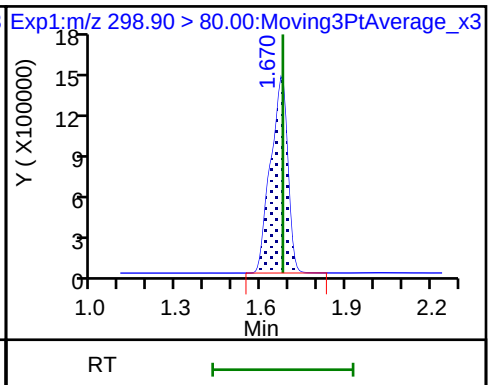
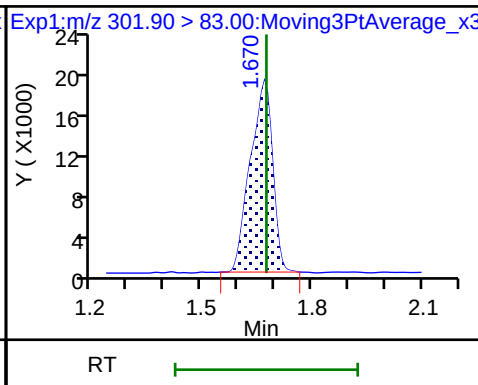
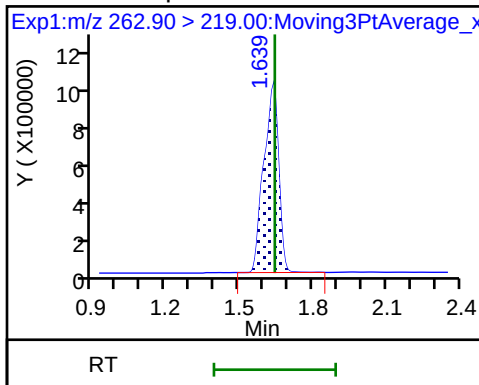
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

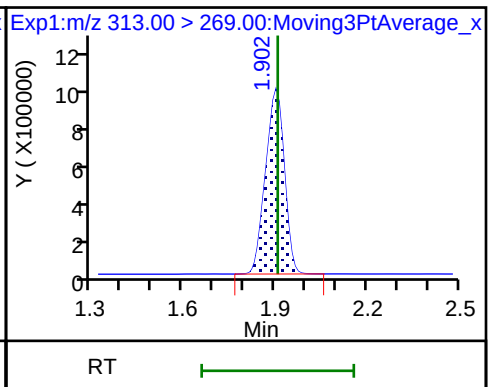
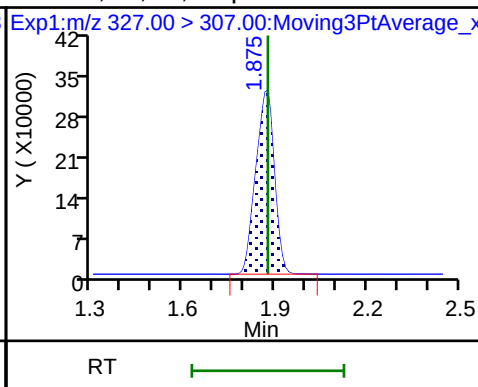
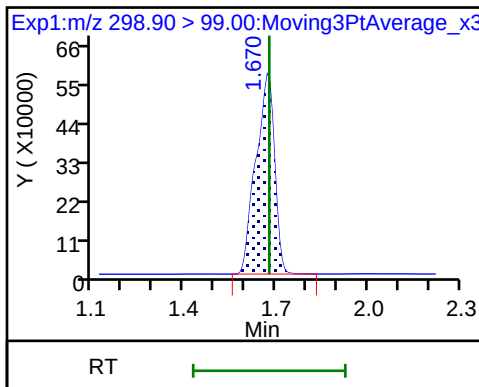
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfoni

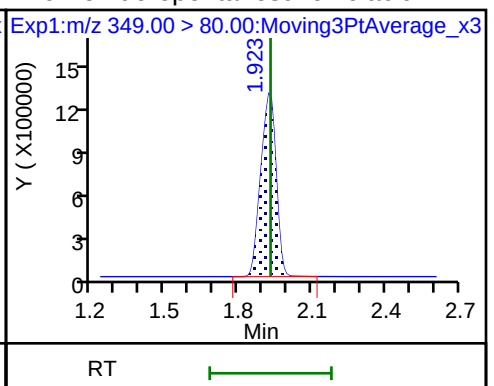
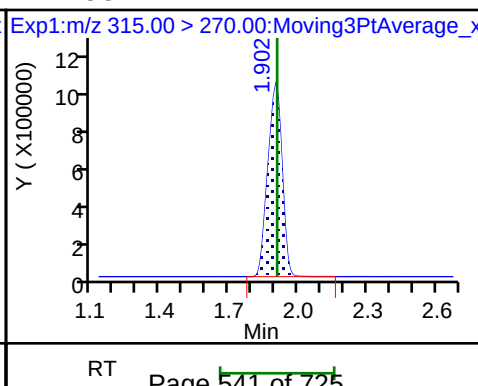
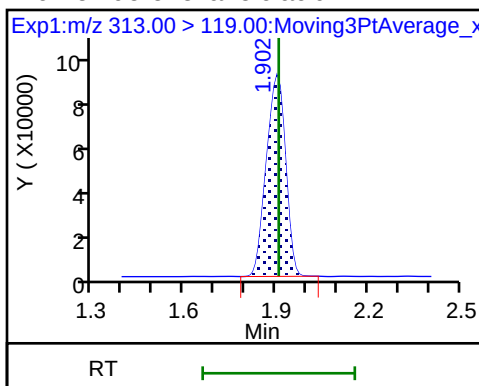
6 Perfluorohexanoic acid

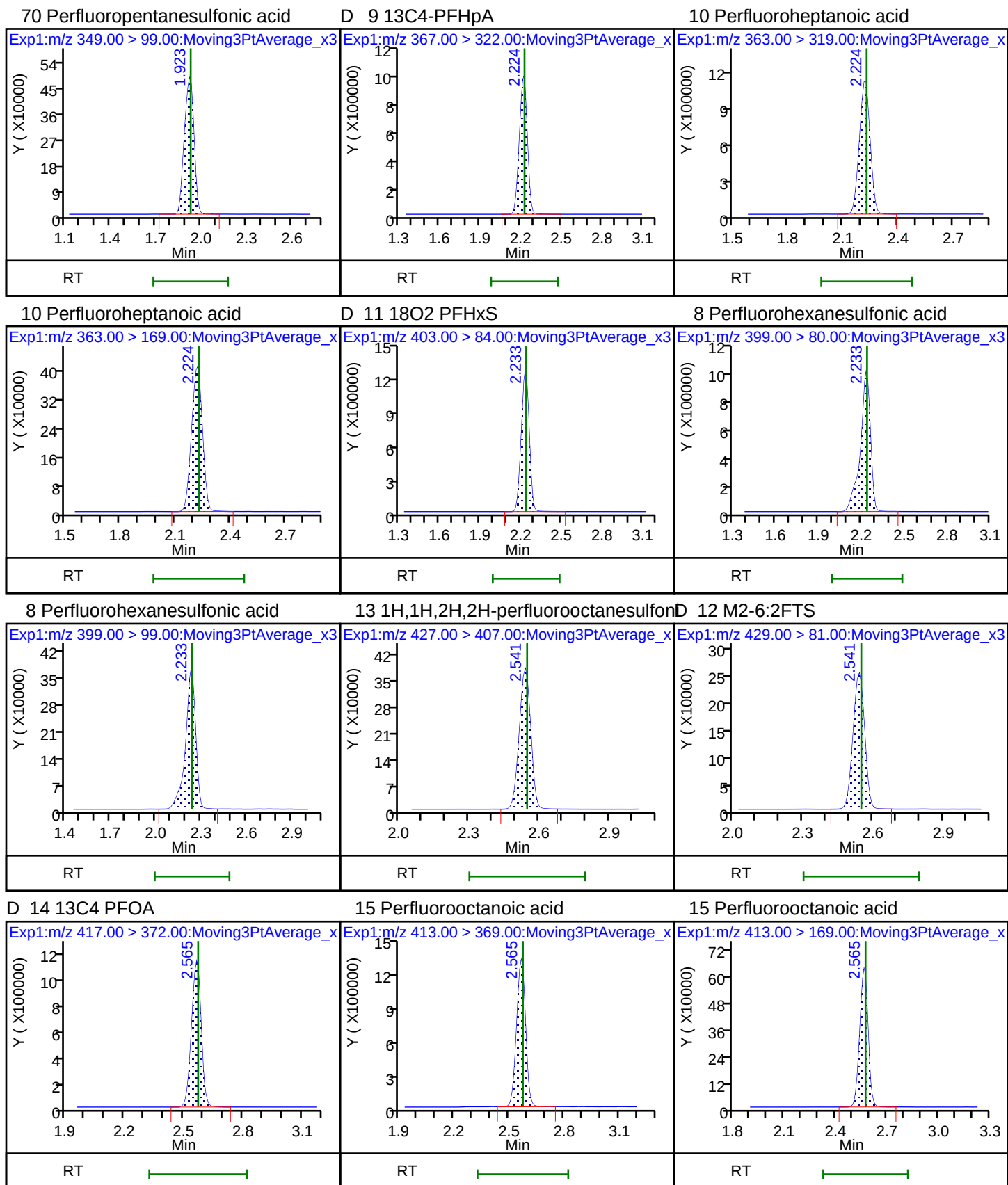


6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid

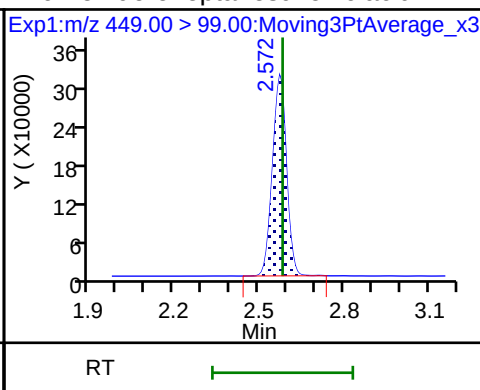
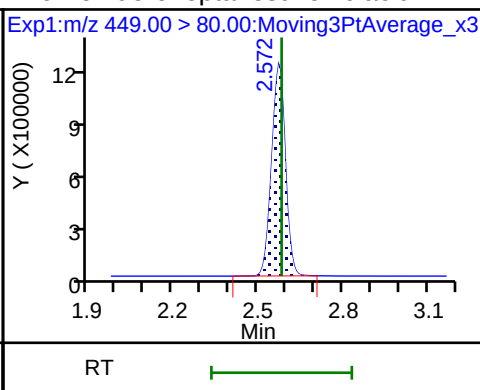
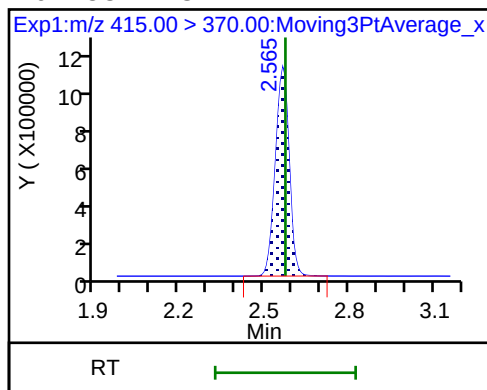




* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

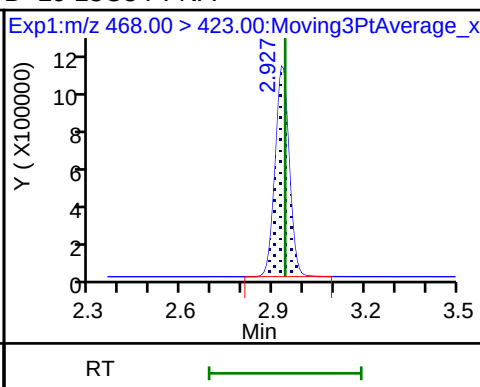
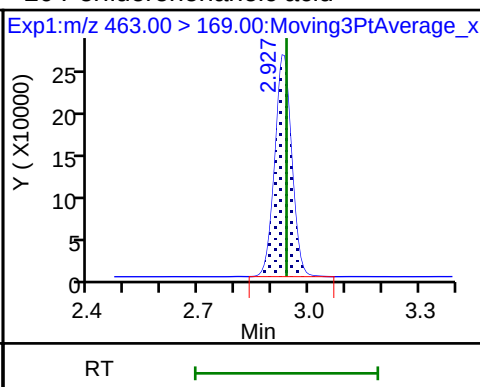
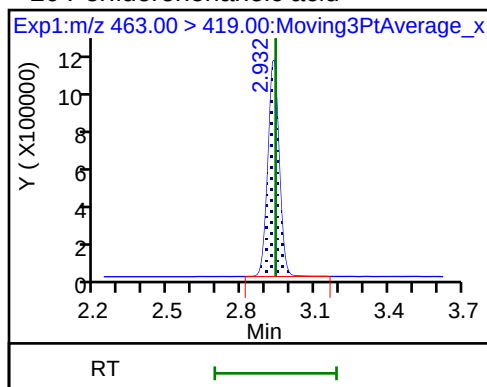
16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid

20 Perfluorononanoic acid

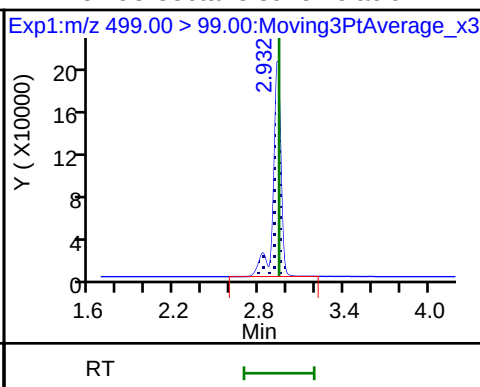
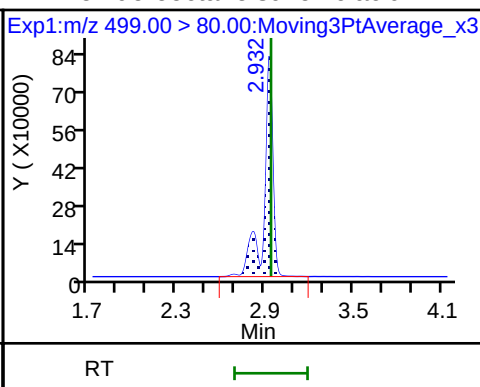
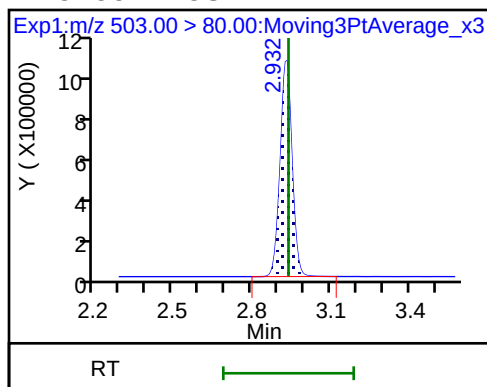
D 19 13C5 PFNA



D 18 13C4 PFOS

17 Perfluorooctane sulfonic acid

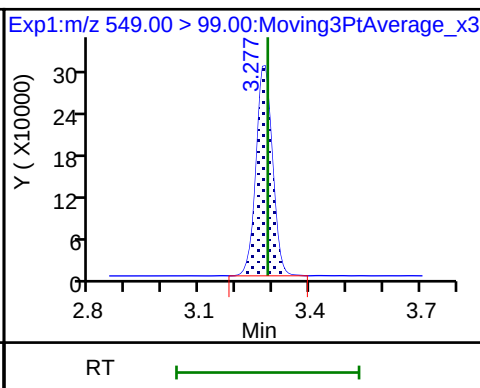
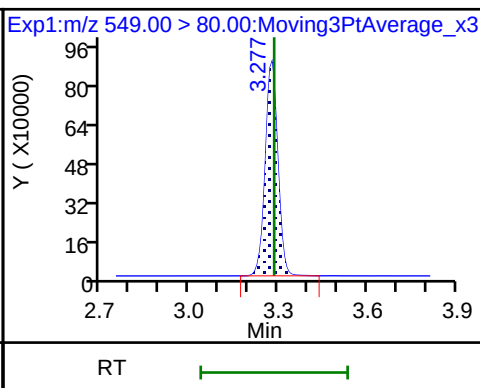
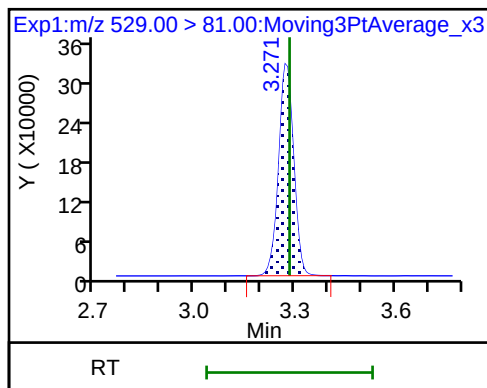
17 Perfluorooctane sulfonic acid



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid

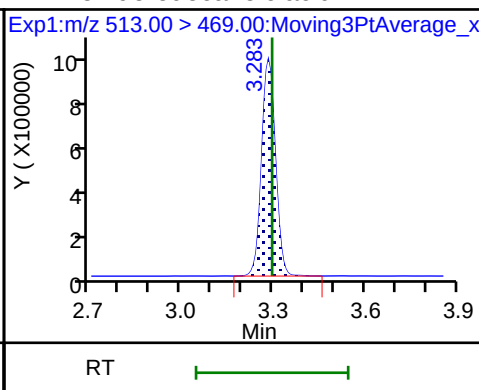
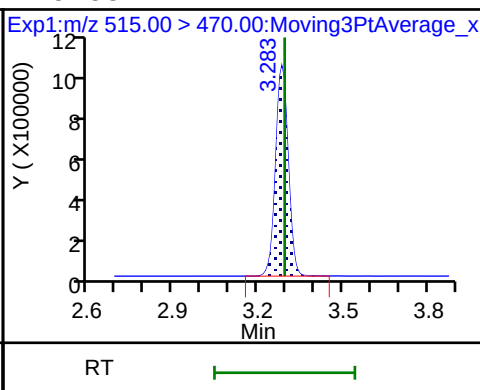
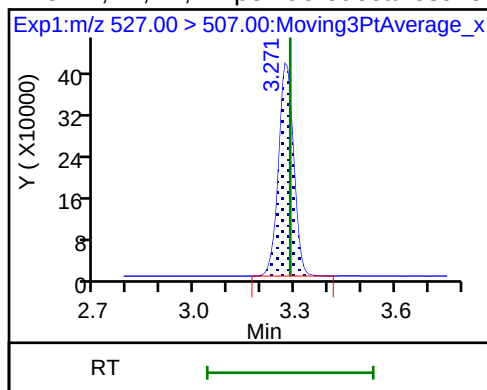
68 Perfluorononanesulfonic acid



25 1H,1H,2H,2H-perfluorodecanesulfonate

D 23 13C2 PFDA

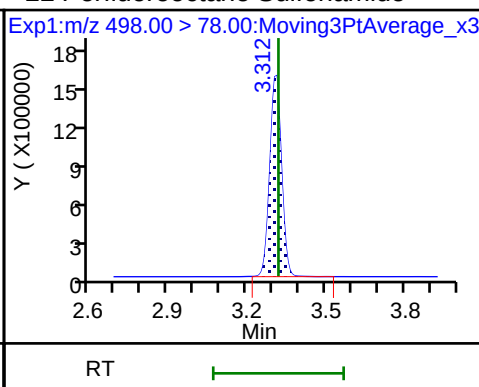
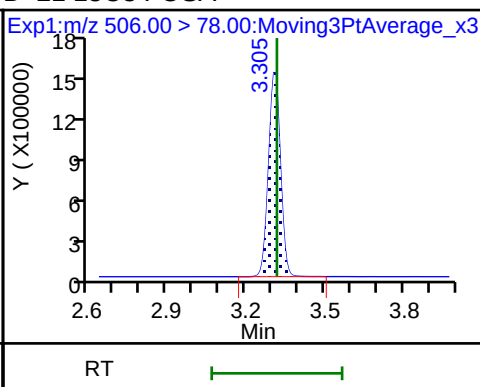
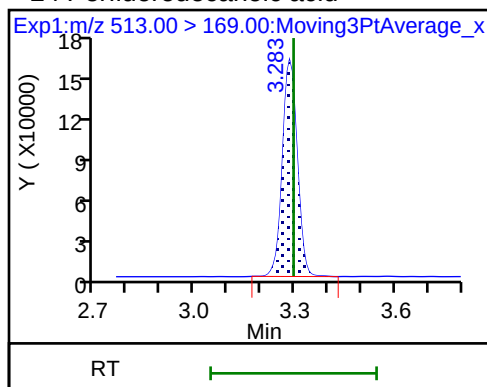
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 21 13C8 FOSA

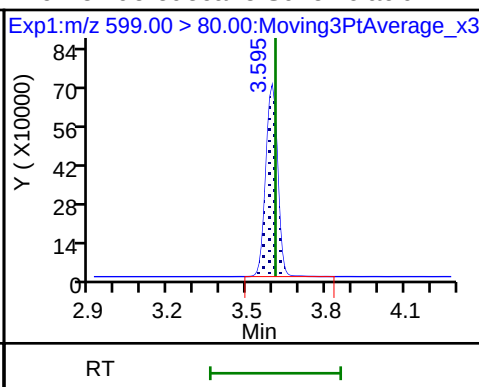
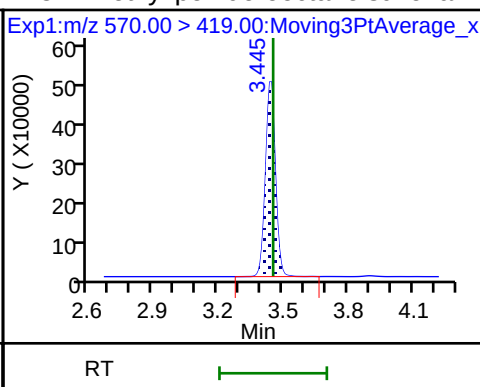
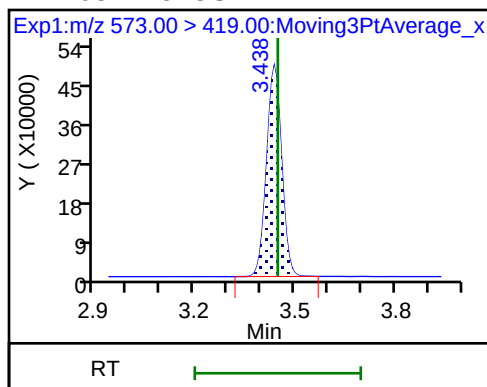
22 Perfluorooctane Sulfonamide



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonami

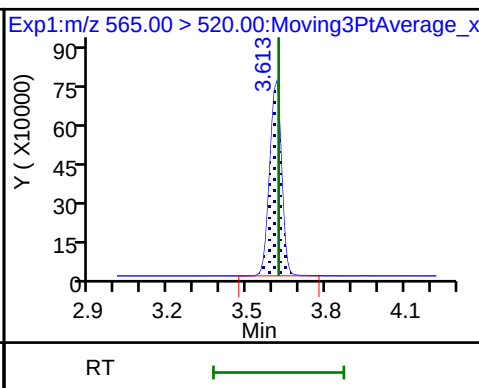
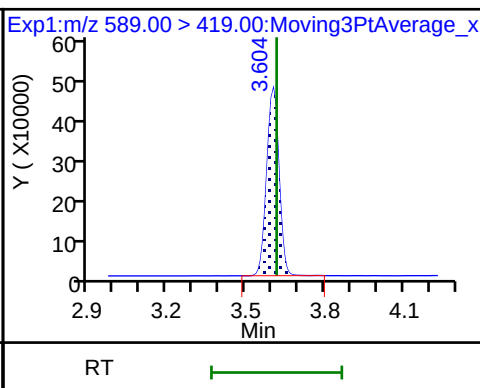
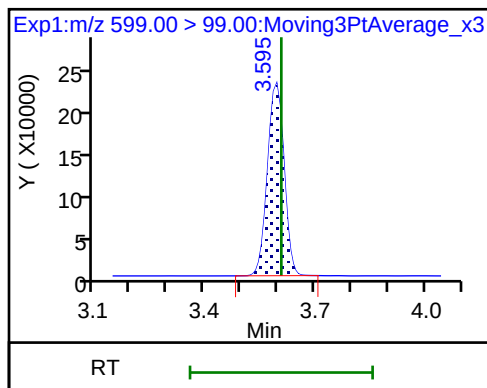
29 Perfluorodecane Sulfonic acid

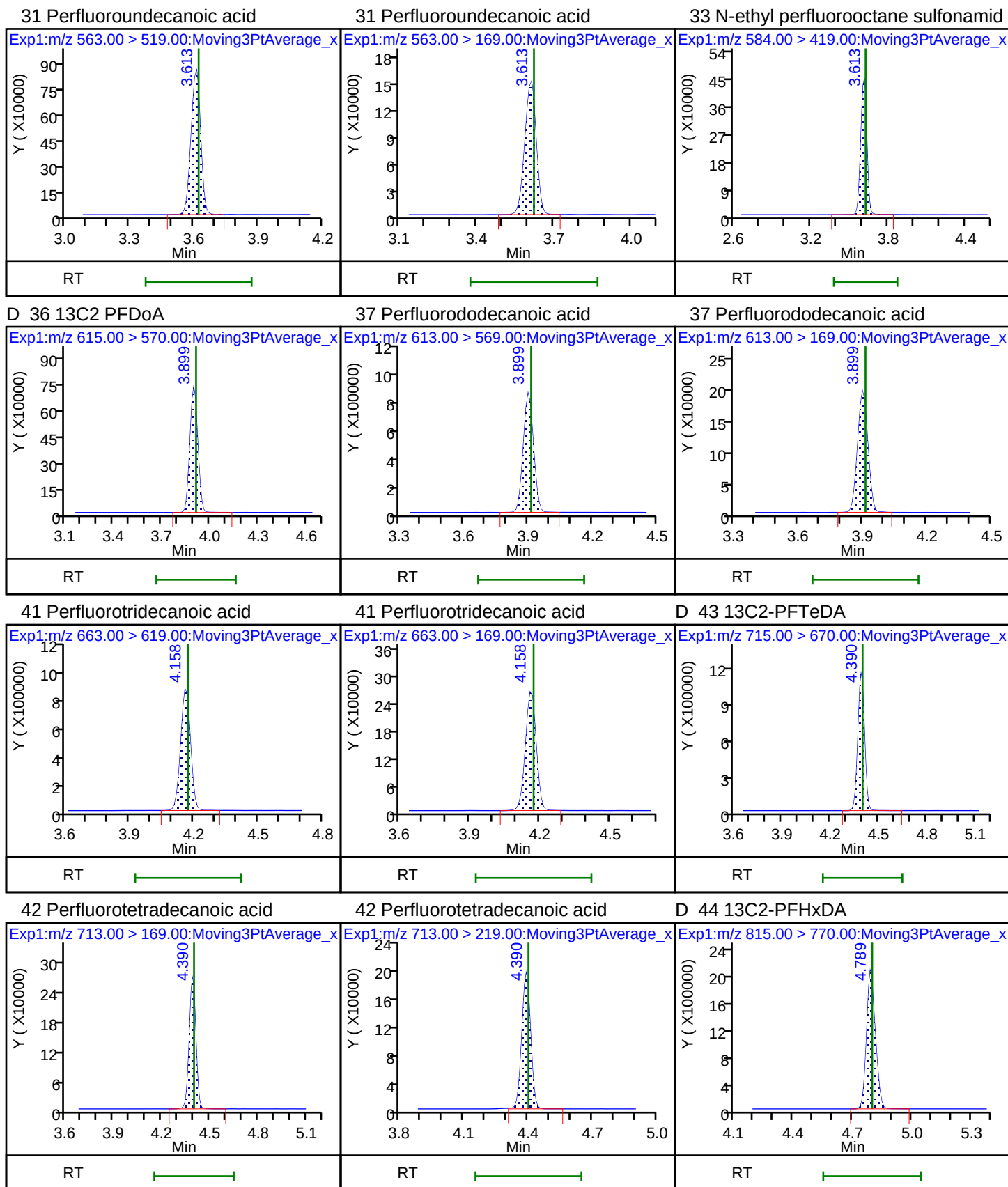


29 Perfluorodecane Sulfonic acid

D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCVL 320-239237/2 Calibration Date: 08/10/2018 08:08

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9376		0.0499	0.0500	-0.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.110		0.0488	0.0500	-2.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	79.34		0.0462	0.0442	4.5	30.0
4:2 FTS	AveID	16.57	18.14		0.400	0.0467	9.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.078		0.0528	0.0500	5.6	30.0
Perfluoropentanesulfonic acid	AveID	68.92	70.13		0.0477	0.0469	1.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.111		0.0523	0.0500	4.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.120		0.0470	0.0455	3.3	30.0
6:2 FTS	AveID	1.573	1.650		0.400	0.0474	4.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.197		0.0530	0.0501	5.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.380		0.0530	0.0476	11.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.055		0.0501	0.0500	0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.142		0.0494	0.0464	6.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.8826		0.0453	0.0500	-9.4	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.8022		0.0512	0.0480	6.6	30.0
8:2 FTS	AveID	1.299	1.349		0.400	0.0479	3.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9903		0.0494	0.0500	-1.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9290		0.400	0.0500	-3.7	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6506		0.0496	0.0482	2.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.063		0.0473	0.0500	-5.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8020		0.400	0.0500	-10.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.024		0.0460	0.0500	-8.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.114		0.0518	0.0500	3.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2600		0.0537	0.0500	7.4	30.0
13C4 PFBA	Ave	1.385	1.308		2.36	2.50	-5.5	30.0
13C5 PFPeA	Ave	0.9537	0.8727		2.29	2.50	-8.5	30.0
13C3-PFBS	Ave	0.0221	0.0190		2.00	2.33	-13.8	30.0
13C2 PFHxA	Ave	1.082	0.996		2.30	2.50	-8.0	30.0
13C4-PFHpA	Ave	1.065	0.9413		2.21	2.50	-11.6	30.0
18O2 PFHxS	Ave	1.366	1.212		2.10	2.37	-11.2	30.0
M2-6:2FTS	Ave	0.2242	0.2354		2.49	2.38	5.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-239237/2 Calibration Date: 08/10/2018 08:08
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9639		2.47	2.50	-1.4	30.0
13C4 PFOS	Ave	0.8973	0.8143		2.17	2.39	-9.2	30.0
13C5 PFNA	Ave	0.8770	0.7918		2.26	2.50	-9.7	30.0
13C8 FOSA	Ave	1.188	1.151		2.42	2.50	-3.1	30.0
M2-8:2FTS	Ave	0.2707	0.2559		2.26	2.40	-5.5	30.0
13C2 PFDA	Ave	0.7695	0.7132		2.32	2.50	-7.3	30.0
d3-NMeFOSAA	Ave	0.3935	0.3849		2.45	2.50	-2.2	30.0
d5-NEtFOSAA	Ave	0.4077	0.4273		2.62	2.50	4.8	30.0
13C2 PFUnA	Ave	0.6189	0.6258		2.53	2.50	1.1	30.0
13C2 PFDoA	Ave	0.6541	0.6622		2.53	2.50	1.2	30.0
13C2-PFTeDA	Ave	0.8335	0.8609		2.58	2.50	3.3	30.0
13C2-PFHxDA	Ave	1.653	1.401		2.12	2.50	-15.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_005.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 10-Aug-2018 08:08:10 ALS Bottle#: 21 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCVL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 13:55:19 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK035

First Level Reviewer: roycea

Date: 10-Aug-2018 12:40:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.404	1.406	-0.002	1.000	99399	0.0499		99.9	8.6	
D 1 13C4 PFBA										
217.00 > 172.00	1.404	1.411	-0.007	0.537	5300542	2.36		94.5	7573	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.660	1.655	0.006	1.000	78510	0.0488		97.6	6.0	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.660	1.662	-0.002	0.635	3535724	2.29		91.5	7318	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.692	1.695	-0.003	1.000	108061	0.0462		104	6.9	
298.90 > 99.00	1.692	1.695	-0.003	1.000	46639		2.32(1.25-3.74)		7.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.702	-0.010	0.647	71641	2.00		86.2	360	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.898	1.902	-0.004	1.122	26102	0.0511		109	312	
D 60 M2-4:2FTS										
329.00 > 81.00	1.898	1.912	-0.014	0.726	582630	NC			1042	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.928	1.933	-0.005	0.995	86980	0.0528		106	33.6	
313.00 > 119.00	1.939	1.933	0.006	1.000	7933		10.96(5.03-15.10)		20.5	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.943	-0.004	0.742	4035324	2.30		92.0	10622	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.959	1.965	-0.006	1.158	101351	0.0477		102	260	
349.00 > 99.00	1.959	1.965	-0.006	1.158	41347		2.45(1.36-4.07)		79.0	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.033	2.037	-0.004	0.778	333534	NC			743	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.033	2.038	-0.005	1.000	15645	NC			9.6	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.265	-0.007	0.864	3813861	2.21		88.4	7210	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.258	2.266	-0.008	1.000	84777	0.0523		105	18.2	
363.00 > 169.00	2.269	2.266	0.003	1.005	31045		2.73(1.13-3.40)		62.3	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.276	0.004	0.872	4647158	2.10		88.8	4725	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.269	2.277	-0.008	0.995	100120	0.0470		103	153	
399.00 > 99.00	2.280	2.277	0.003	1.000	32101		3.12(1.50-4.49)		56.3	
65 ADONA										
377.00 > 251.00	2.303	2.311	-0.008	0.771	221520	NC			802	
377.00 > 85.00	2.303	2.311	-0.008	0.771	136660		1.62(0.84-2.53)		324	
D 12 M2-6:2FTS										
429.00 > 81.00	2.588	2.592	-0.004	0.990	905984	2.49		105	2855	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.588	2.593	-0.005	1.000	29842	0.0497		105	91.8	
D 73 13C8 PFOA										
421.00 > 376.00	2.607	2.612	-0.005	0.997	7075827	NC			11841	
D 14 13C4 PFOA										
417.00 > 372.00	2.614	2.619	-0.005	1.000	3905285	2.47		98.6	5053	
* 62 13C2-PFOA										
415.00 > 370.00	2.614	2.620	-0.006		4051626	2.50			7059	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.614	2.620	-0.006	1.000	93604	0.0530		106	7.4	M
413.00 > 169.00	2.614	2.620	-0.006	1.000	48751		1.92(0.84-2.52)		120	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.622	2.628	-0.006	0.878	86691	0.0530		111	258	
449.00 > 99.00	2.622	2.628	-0.006	0.878	24529		3.53(1.94-5.82)		83.8	
D 72 13C8 PFOS										
507.00 > 99.00	2.986	2.984	0.002	1.142	1590697	NC			3649	
D 18 13C4 PFOS										
503.00 > 80.00	2.986	2.992	-0.006	1.142	3154175	2.17		90.8	3108	
D 19 13C5 PFNA										
468.00 > 423.00	2.986	2.992	-0.006	1.142	3207944	2.26		90.3	6617	
20 Perfluorononanoic acid										
463.00 > 419.00	2.986	2.993	-0.007	1.000	67701	0.0501		100	16.6	
463.00 > 169.00	2.986	2.993	-0.007	1.000	16696		4.05(1.90-5.69)		102	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.986	2.993	-0.007	1.000	69961	0.0494		106	127	
499.00 > 99.00	2.986	2.993	-0.007	1.000	15957		4.38(2.31-6.93)		66.5	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.204	3.203	0.001	1.073	100956	NC			439	
D 21 13C8 FOSA										
506.00 > 78.00	3.321	3.326	-0.005	1.270	4663832	2.42		96.9	4816	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.321	3.327	-0.006	1.000	82326	0.0453		90.6	649	
D 26 M2-8:2FTS										
529.00 > 81.00	3.335	3.340	-0.005	1.276	993299	2.26		94.5	3185	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.335	3.342	-0.007	1.117	50815	0.0512		107	229	
549.00 > 99.00	3.335	3.342	-0.007	1.117	15595		3.26(1.33-3.97)		87.9	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.342	3.342	0.0	1.002	26794	0.0497		104	78.1	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.350	3.349	0.001	1.000	57235	0.0494		98.7	43.5	
513.00 > 169.00	3.357	3.349	0.008	1.002	9697		5.90(2.36-7.09)		80.1	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.355	-0.005	1.281	2889722	2.32		92.7	4707	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.508	3.506	0.002	1.342	1559539	2.45		97.8	2649	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.516	3.507	0.009	1.002	28976	0.0482		96.3	34.8	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.662	3.667	-0.005	1.226	41383	0.0496		103	221	
599.00 > 99.00	3.670	3.667	0.003	1.229	17012		2.43(1.39-4.16)		141	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.677	3.674	0.003	1.406	1731203	2.62		105	1284	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.677	3.675	0.002	0.998	53901	0.0473		94.6	40.1	
563.00 > 169.00	3.677	3.675	0.002	0.998	8771		6.15(2.12-6.36)		77.5	
D 30 13C2 PFUnA										
565.00 > 520.00	3.685	3.682	0.003	1.410	2535455	2.53		101	5843	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.685	3.683	0.002	1.002	27768	0.0450		89.9	98.6	
35 MeFOSA										
512.00 > 169.00	3.818	3.816	0.002		24514	NC			168	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.844	3.841	0.003	1.287	170243	NC			808	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.979	0.004	1.000	54924	0.0460		92.0	40.7	
613.00 > 169.00	3.983	3.979	0.004	1.000	15202		3.61(2.13-6.40)		99.9	
D 36 13C2 PFDaA										
615.00 > 570.00	3.983	3.987	-0.004	1.523	2683059	2.53		101	5734	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.983	3.987	-0.004	1.194	20725	NC			223	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.220	4.217	0.003	1.413	19172	NC			70.0	
699.00 > 99.00	4.220	4.217	0.003	1.413	25332		0.76(0.00-0.00)		383	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.249	4.246	0.003	1.067	59761	0.0518		104	28.2	
663.00 > 169.00	4.249	4.246	0.003	1.067	19035		3.14(1.25-3.76)		184	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.488	4.486	0.002	1.000	18136	0.0537		107	174	
713.00 > 219.00	4.478	4.486	-0.008	0.998	11157		1.63(0.71-2.13)		141	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.488	4.493	-0.005	1.717	3487895	2.58		103	4840	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.910	4.908	0.002	1.000	150511	NC			25.4	
813.00 > 169.00	4.910	4.908	0.002	1.000	25789		5.84(2.86-8.58)		246	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.910	4.917	-0.007	1.878	5676085	2.12		84.7	5643	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.268	5.273	-0.005	1.073	103127	NC			13.1	
913.00 > 169.00	5.268	5.273	-0.005	1.073	12561		8.21(3.83-11.48)		128	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_005.d

Injection Date: 10-Aug-2018 08:08:10

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 21

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

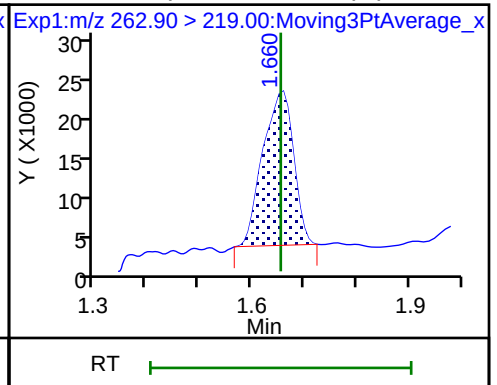
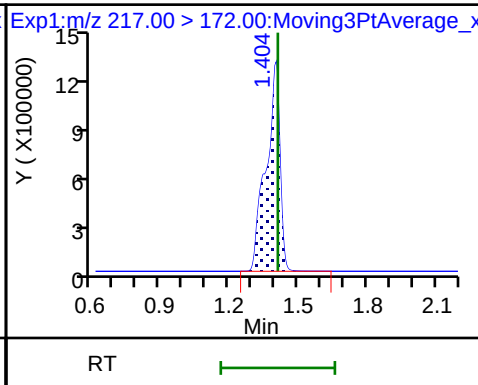
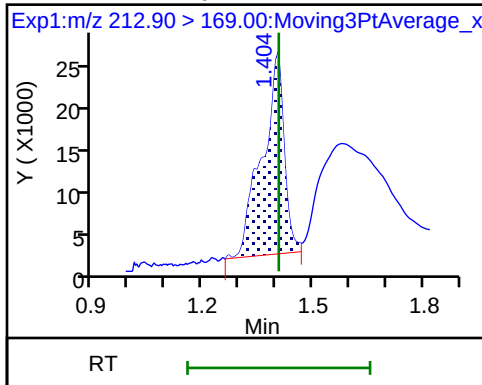
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

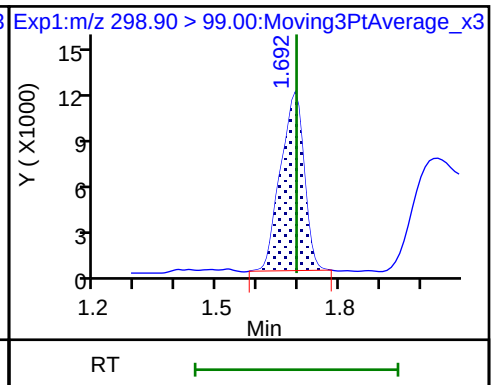
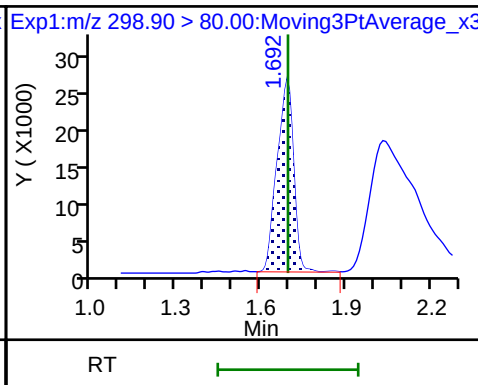
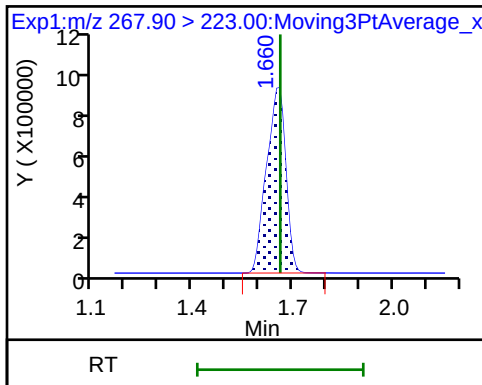
4 Perfluoropentanoic acid (M)



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

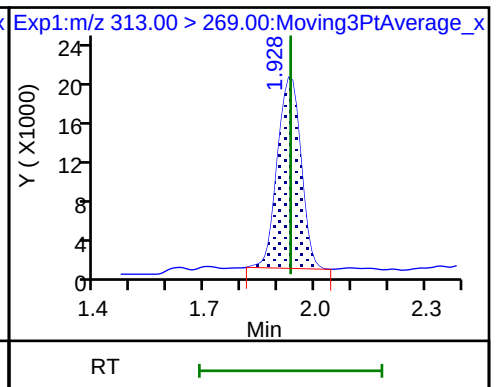
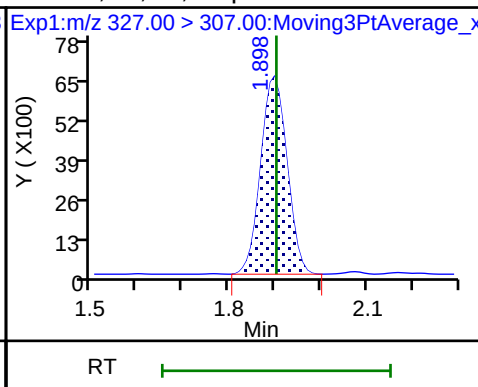
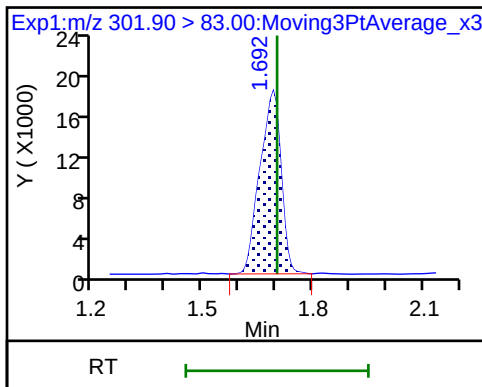
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

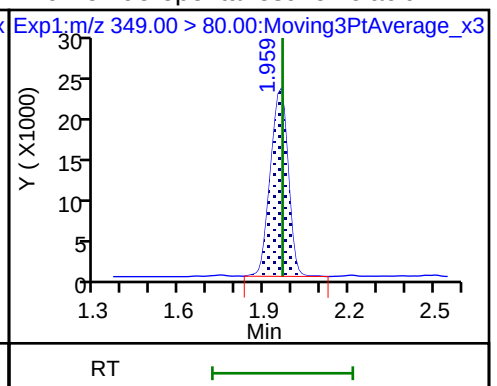
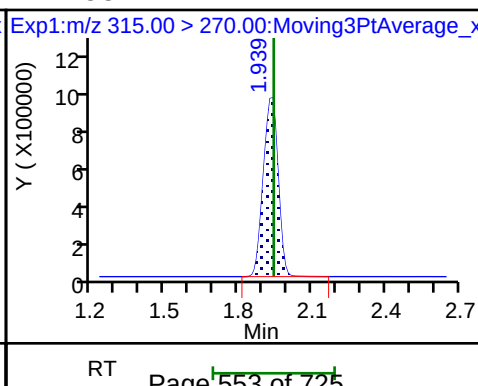
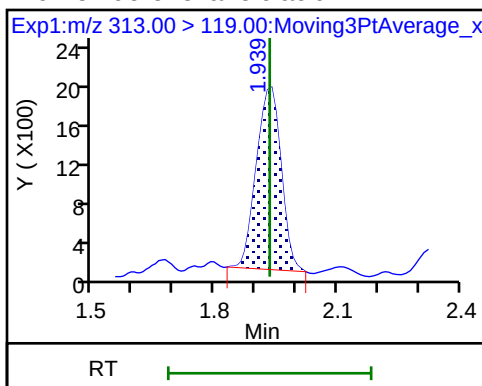
6 Perfluorohexanoic acid

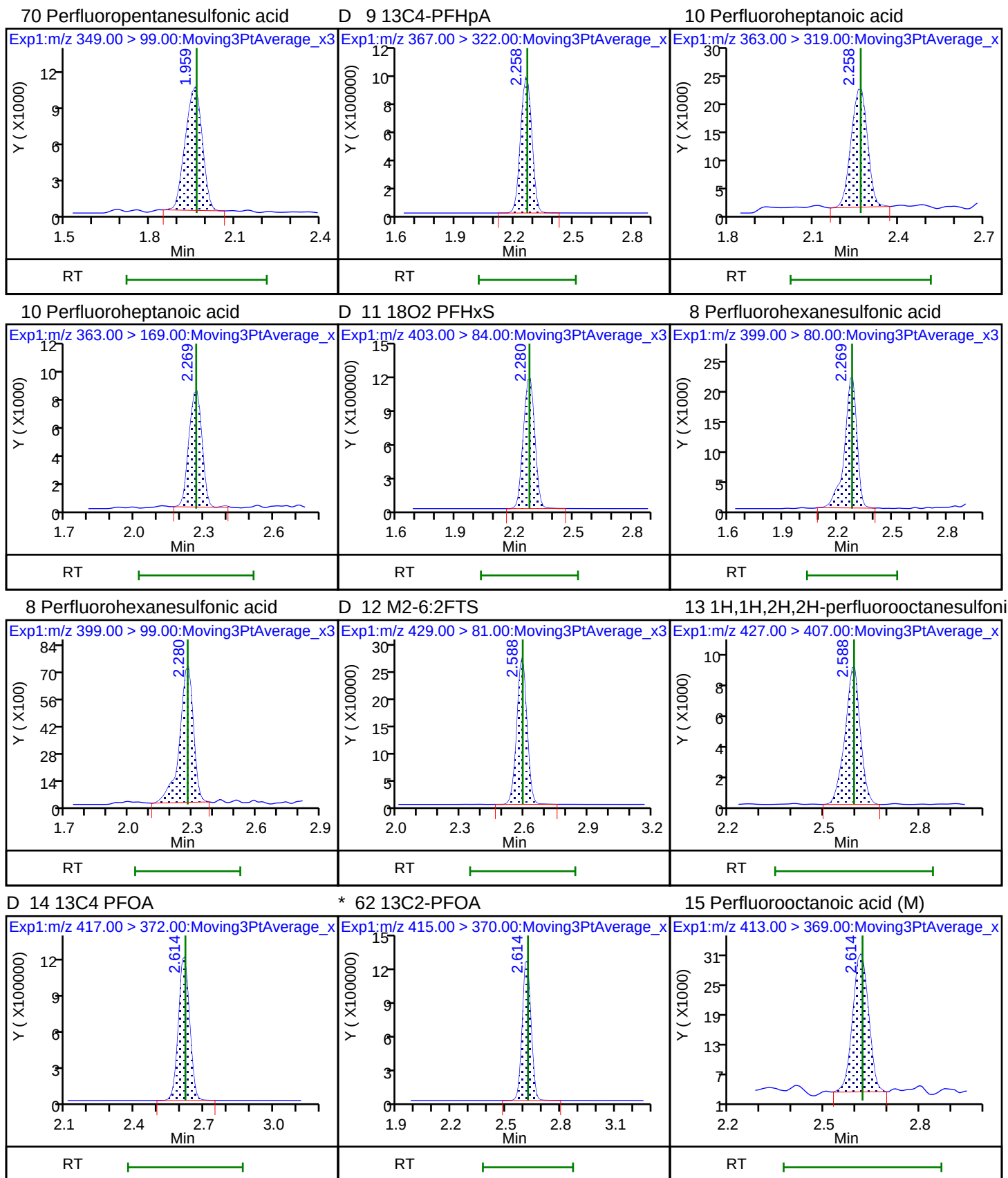


6 Perfluorohexanoic acid

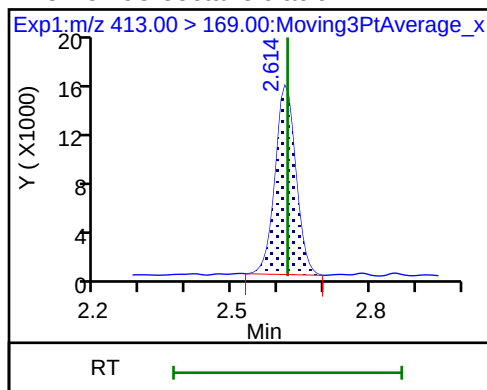
D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid

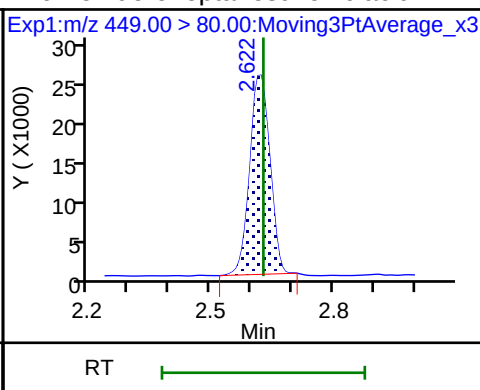




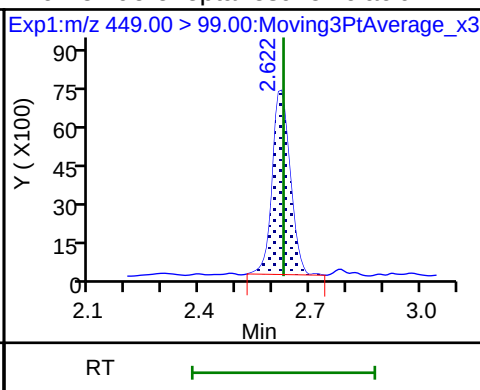
15 Perfluorooctanoic acid



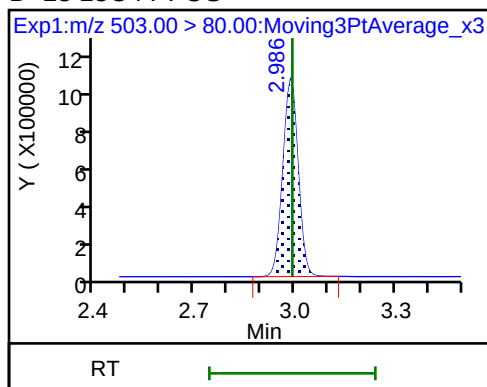
16 Perfluoroheptanesulfonic acid



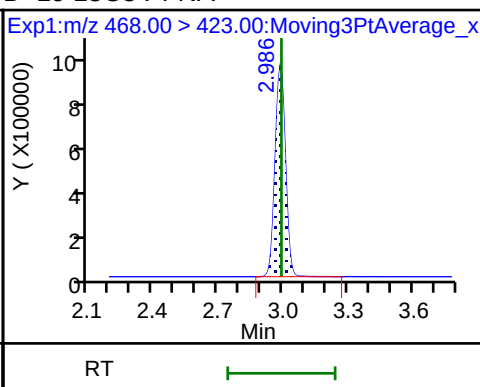
16 Perfluoroheptanesulfonic acid



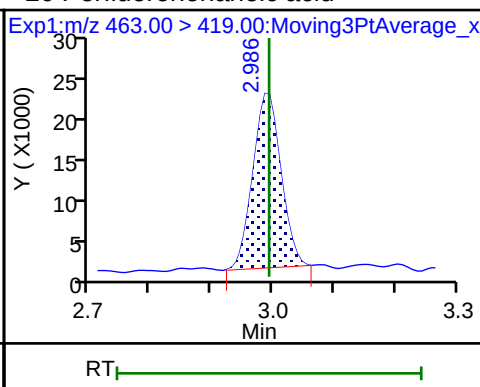
D 18 13C4 PFOS



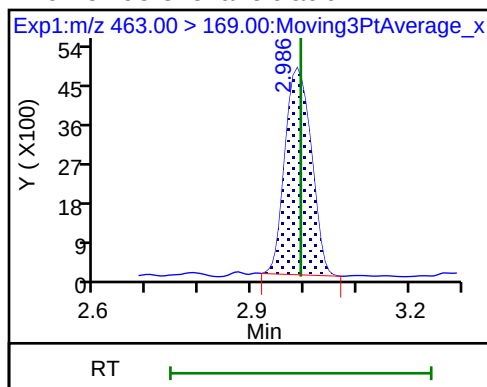
D 19 13C5 PFNA



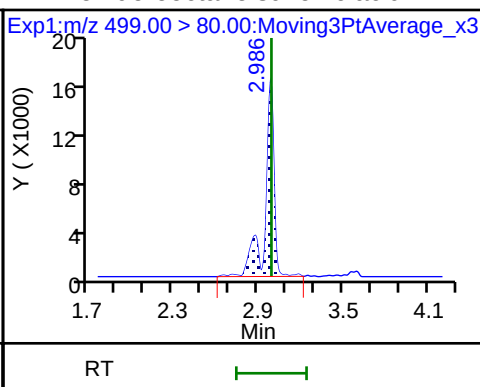
20 Perfluorononanoic acid



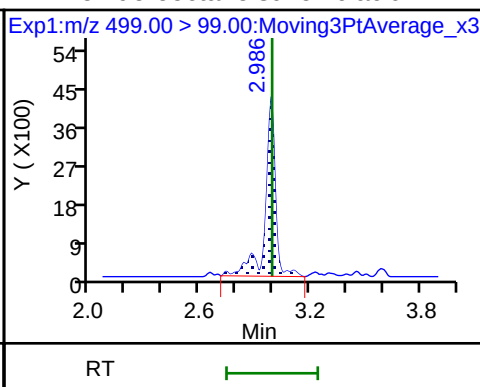
20 Perfluorononanoic acid



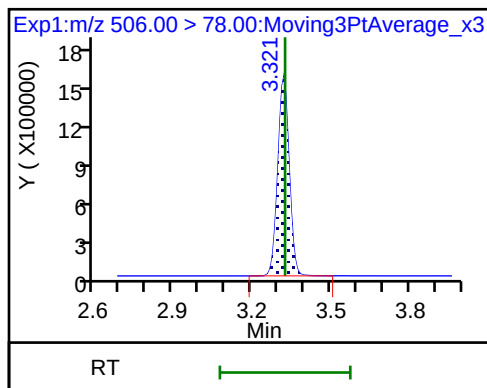
17 Perfluorooctane sulfonic acid



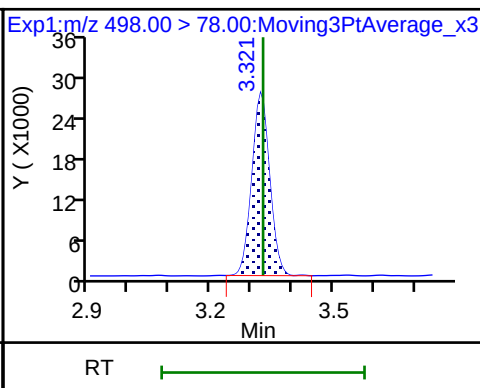
17 Perfluorooctane sulfonic acid



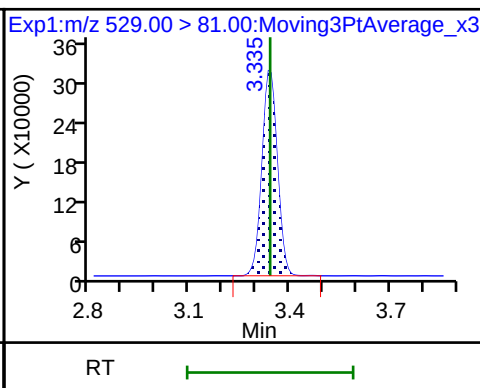
D 21 13C8 FOSA

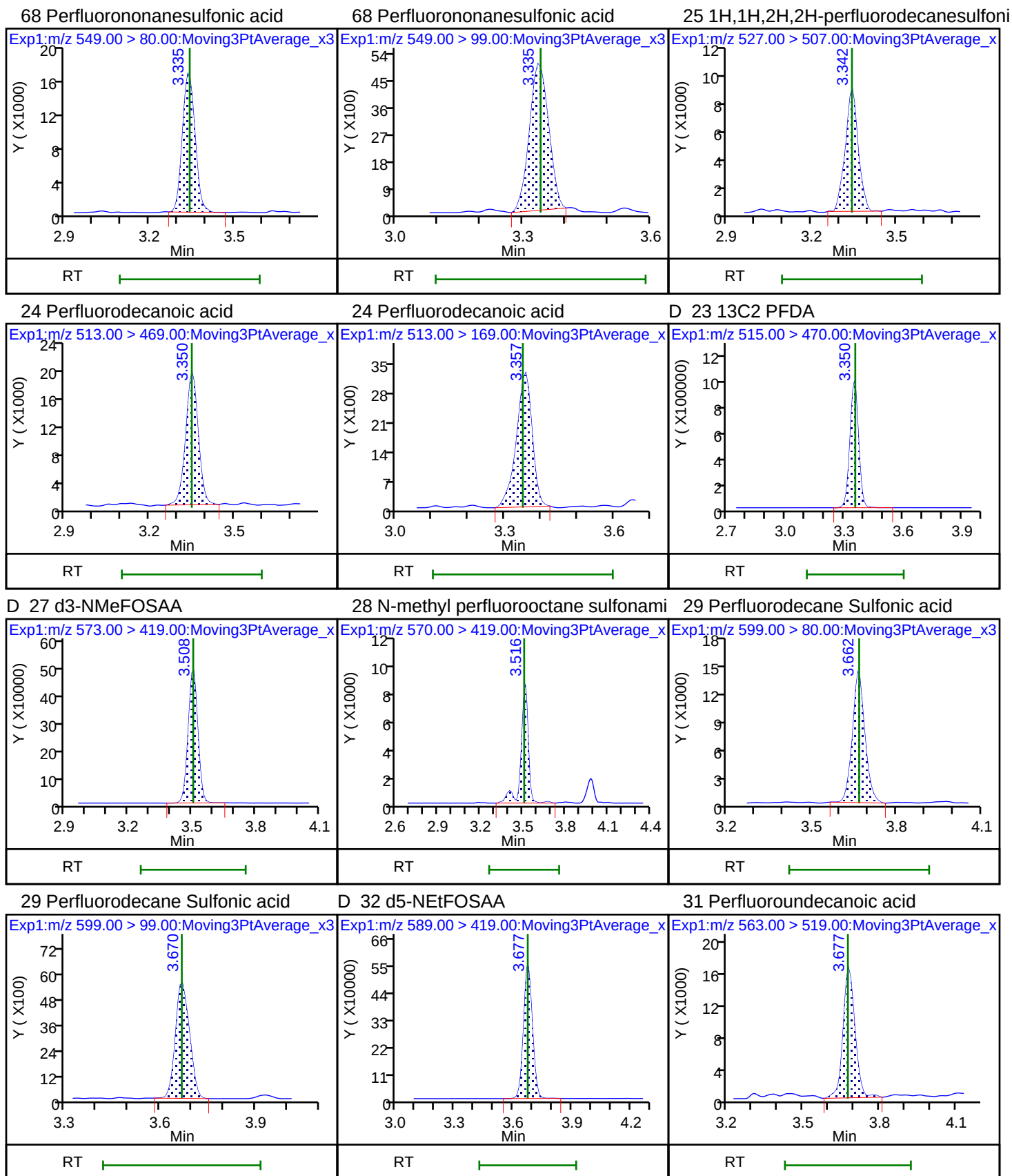


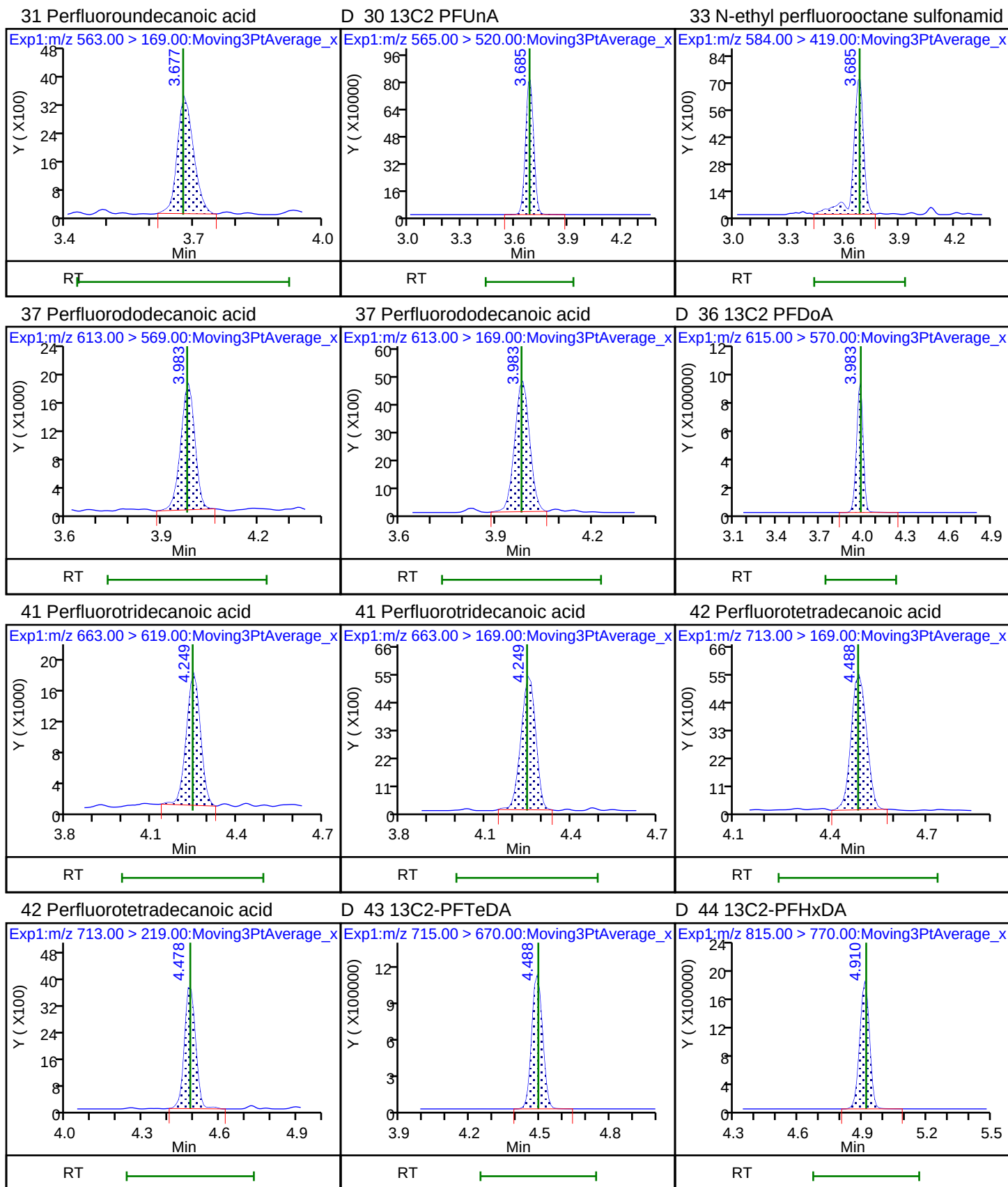
22 Perfluorooctane Sulfonamide



D 26 M2-8:2FTS







TestAmerica Sacramento

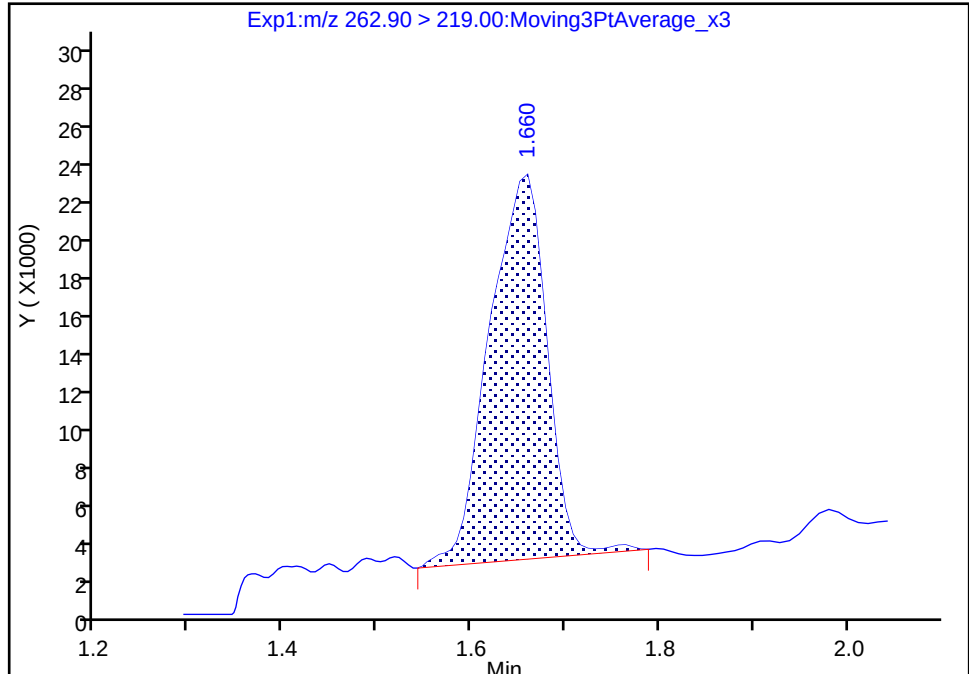
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_005.d
Injection Date: 10-Aug-2018 08:08:10 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

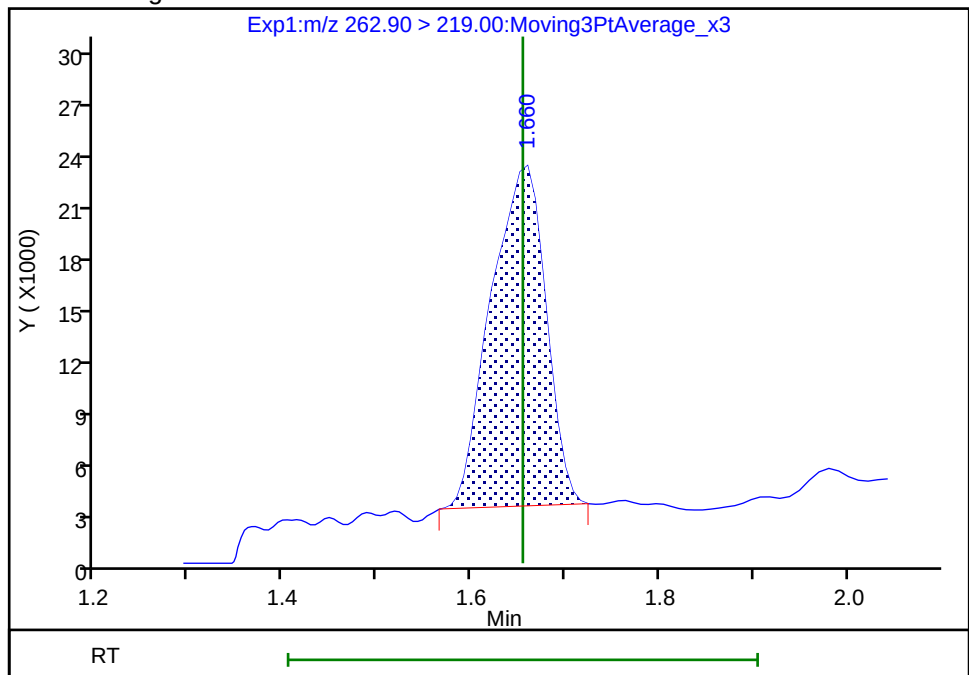
RT: 1.66
Area: 84089
Amount: 0.052257
Amount Units: ng/ml

Processing Integration Results



RT: 1.66
Area: 78510
Amount: 0.048790
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:52:57
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 559 of 725

TestAmerica Sacramento

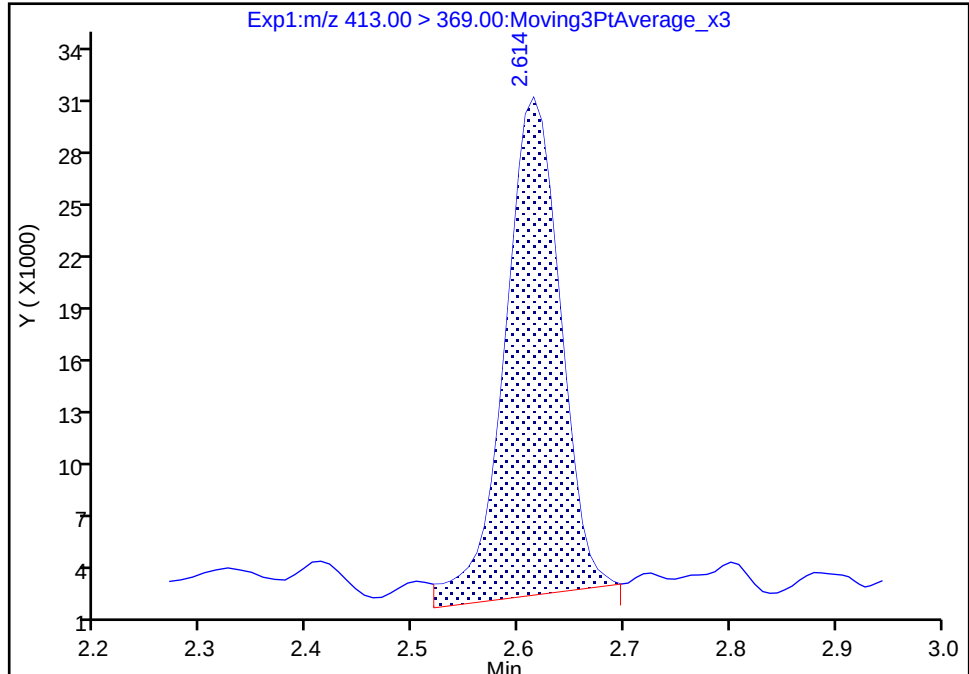
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_005.d
Injection Date: 10-Aug-2018 08:08:10 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

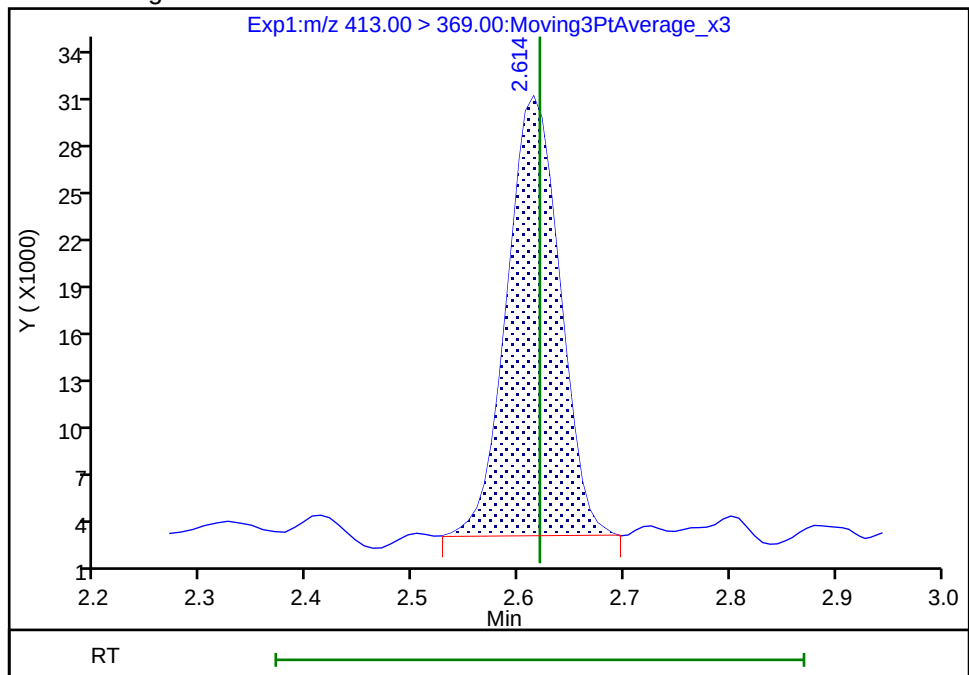
RT: 2.61
Area: 100644
Amount: 0.056982
Amount Units: ng/ml

Processing Integration Results



RT: 2.61
Area: 93604
Amount: 0.052996
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:53:12
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 560 of 725

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239237/3 Calibration Date: 08/10/2018 08:15

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.8970		0.955	1.00	-4.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.054		0.926	1.00	-7.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	71.94		0.837	0.884	-5.3	30.0
4:2 FTS	AveID	16.57	16.08		0.907	0.934	-2.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9799		0.960	1.00	-4.0	30.0
Perfluoropentanesulfonic acid	AveID	68.92	66.17		0.900	0.938	-4.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.047		0.986	1.00	-1.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.048		0.880	0.910	-3.3	30.0
6:2 FTS	AveID	1.573	1.451		0.874	0.948	-7.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.075		0.951	1.00	-4.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.286		0.988	0.952	3.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.022		0.971	1.00	-2.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.069		0.924	0.928	-0.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9435		0.969	1.00	-3.1	30.0
8:2 FTS	AveID	1.299	1.240		0.914	0.958	-4.6	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.8070		1.03	0.960	7.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.008		1.00	1.00	0.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9567		0.992	1.00	-0.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6987		1.07	0.964	10.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	0.9059		0.806	1.00	-19.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8174		0.917	1.00	-8.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.045		0.940	1.00	-6.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.080		1.00	1.00	0.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2352		0.972	1.00	-2.8	30.0
13C4 PFBA	Ave	1.385	1.342		2.42	2.50	-3.1	30.0
13C5 PFPeA	Ave	0.9537	0.8798		2.31	2.50	-7.8	30.0
13C3-PFBS	Ave	0.0221	0.0213		2.25	2.33	-3.2	30.0
13C2 PFHxA	Ave	1.082	0.9854		2.28	2.50	-8.9	30.0
13C4-PFHpA	Ave	1.065	0.9922		2.33	2.50	-6.8	30.0
18O2 PFHxS	Ave	1.366	1.222		2.12	2.37	-10.5	30.0
M2-6:2FTS	Ave	0.2242	0.2453		2.60	2.38	9.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239237/3 Calibration Date: 08/10/2018 08:15
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9614		2.46	2.50	-1.6	30.0
13C4 PFOS	Ave	0.8973	0.8196		2.18	2.39	-8.7	30.0
13C5 PFNA	Ave	0.8770	0.8102		2.31	2.50	-7.6	30.0
13C8 FOSA	Ave	1.188	1.174		2.47	2.50	-1.2	30.0
M2-8:2FTS	Ave	0.2707	0.2711		2.40	2.40	0.1	30.0
13C2 PFDA	Ave	0.7695	0.7195		2.34	2.50	-6.5	30.0
d3-NMeFOSAA	Ave	0.3935	0.3879		2.46	2.50	-1.4	30.0
d5-NEtFOSAA	Ave	0.4077	0.4325		2.65	2.50	6.1	30.0
13C2 PFUnA	Ave	0.6189	0.6090		2.46	2.50	-1.6	30.0
13C2 PFDoA	Ave	0.6541	0.6353		2.43	2.50	-2.9	30.0
13C2-PFTeDA	Ave	0.8335	0.8820		2.65	2.50	5.8	30.0
13C2-PFHxDA	Ave	1.653	1.434		2.17	2.50	-13.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_006.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 10-Aug-2018 08:15:58 ALS Bottle#: 13 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L4
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 13:55:23 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK035

First Level Reviewer: hannigana

Date: 10-Aug-2018 13:55:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobutyric acid										
212.90 > 169.00	1.406	1.406	0.0	1.004	2045129	0.9554		95.5	188	
D 1 13C4 PFBA										
217.00 > 172.00	1.402	1.411	-0.009	0.535	5699980	2.42		96.9	9423	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.655	1.655	0.0	1.000	1574506	0.9262		92.6	122	
D 3 13C5-PFPeA										
267.90 > 223.00	1.655	1.662	-0.008	0.631	3735472	2.31		92.2	8620	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.695	1.695	0.0	1.005	2305056	0.8372		94.7	144	
298.90 > 99.00	1.695	1.695	0.0	1.005	950379		2.43(1.25-3.74)		138	
D 47 13C3-PFBS										
301.90 > 83.00	1.687	1.702	-0.015	0.644	84273	2.25		96.8	395	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.902	1.902	0.0	1.128	544466	0.9065		97.1	4656	
D 60 M2-4:2FTS										
329.00 > 81.00	1.902	1.912	-0.010	0.726	593797	NC			993	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.933	1.933	0.0	1.000	1640017	0.9601		96.0	645	
313.00 > 119.00	1.933	1.933	0.0	1.000	160362		10.23(5.03-15.10)		423	
D 7 13C2 PFHxA										
315.00 > 270.00	1.933	1.943	-0.010	0.738	4184222	2.28		91.1	11026	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.965	1.965	0.0	1.165	2249584	0.9005		96.0	3619	
349.00 > 99.00	1.965	1.965	0.0	1.165	856633		2.63(1.36-4.07)		1366	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.038	2.037	0.001	0.778	326777	NC			800	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.038	2.038	0.0	1.000	300188	NC			193	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.265	0.001	0.865	4212885	2.33		93.2	8477	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.266	0.0	1.000	1764789	0.9863		98.6	390	
363.00 > 169.00	2.266	2.266	0.0	1.000	644127		2.74(1.13-3.40)		1115	
D 11 18O2 PFHxS										
403.00 > 84.00	2.277	2.276	0.001	0.869	4907225	2.12		89.5	4699	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.277	2.277	0.0	1.000	1979730	0.8801		96.7	1383	
399.00 > 99.00	2.277	2.277	0.0	1.000	678216		2.92(1.50-4.49)		817	
65 ADONA										
377.00 > 251.00	2.311	2.311	0.0	0.772	4917000	NC			7118	
377.00 > 85.00	2.311	2.311	0.0	0.772	2982100		1.65(0.84-2.53)		4534	
D 12 M2-6:2FTS										
429.00 > 81.00	2.593	2.592	0.001	0.990	989342	2.60		109	3228	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.593	2.593	0.0	1.000	572844	0.8740		92.2	1589	
D 73 13C8 PFOA										
421.00 > 376.00	2.613	2.612	0.001	0.997	7399443	NC			13539	
D 14 13C4 PFOA										
417.00 > 372.00	2.620	2.619	0.001	1.000	4082053	2.46		98.4	5915	
* 62 13C2-PFOA										
415.00 > 370.00	2.620	2.620	0.0		4246064	2.50			5987	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.620	2.620	0.0	1.000	1756619	0.9515		95.1	143	
413.00 > 169.00	2.620	2.620	0.0	1.000	891555		1.97(0.84-2.52)		1232	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.628	2.628	0.0	0.878	1704395	0.9882		104	2676	
449.00 > 99.00	2.628	2.628	0.0	0.878	483508		3.53(1.94-5.82)		1072	
D 72 13C8 PFOS										
507.00 > 99.00	2.985	2.984	0.001	1.139	1675128	NC			3758	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.142	3326788	2.18		91.3	3479	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.142	3440252	2.31		92.4	5040	
20 Perfluorononanoic acid										
463.00 > 419.00	2.993	2.993	0.0	1.000	1406857	0.9706		97.1	361	
463.00 > 169.00	2.993	2.993	0.0	1.000	334232		4.21(1.90-5.69)		1667	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.993	0.0	1.000	1381229	0.9241		99.6	1375	
499.00 > 99.00	2.993	2.993	0.0	1.000	331024		4.17(2.31-6.93)		990	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.203	3.203	0.0	1.070	2277722	NC			3812	
D 21 13C8 FOSA										
506.00 > 78.00	3.320	3.326	-0.006	1.267	4986550	2.47		98.8	6881	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.327	3.327	0.0	1.002	1881872	0.9690		96.9	3208	
D 26 M2-8:2FTS										
529.00 > 81.00	3.342	3.340	0.002	1.275	1102624	2.40		100	4061	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.342	3.342	0.0	1.116	1078400	1.03		107	3388	
549.00 > 99.00	3.342	3.342	0.0	1.116	394071		2.74(1.33-3.97)		1276	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.342	3.342	0.0	1.000	546819	0.9143		95.4	1567	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.349	3.349	0.0	1.000	1231736	1.00		100	855	
513.00 > 169.00	3.349	3.349	0.0	1.000	204601		6.02(2.36-7.09)		280	
D 23 13C2 PFDA										
515.00 > 470.00	3.349	3.355	-0.006	1.278	3054961	2.34		93.5	4972	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.507	3.506	0.001	1.338	1647136	2.46		98.6	3114	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.507	3.507	0.0	1.000	630292	0.99		99.2	461	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.667	3.667	0.0	1.225	937550	1.07		111	3922	
599.00 > 99.00	3.667	3.667	0.0	1.225	315936		2.97(1.39-4.16)		1805	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.675	3.674	0.001	1.402	1836297	2.65		106	1682	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.675	3.675	0.0	0.998	936987	0.8062		80.6	679	
563.00 > 169.00	3.683	3.675	0.008	1.000	197660		4.74(2.12-6.36)		1330	
D 30 13C2 PFUnA										
565.00 > 520.00	3.683	3.682	0.001	1.406	2585810	2.46		98.4	5530	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.683	3.683	0.0	1.002	600423	0.9166		91.7	1359	
35 MeFOSA										
512.00 > 169.00	3.816	3.816	0.0		549974	NC			603	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.841	3.841	0.0	1.283	3814970	NC			6316	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.979	3.979	0.0	1.000	1127973	0.9395		94.0	731	
613.00 > 169.00	3.979	3.979	0.0	1.000	269046		4.19(2.13-6.40)		1481	
D 36 13C2 PFDaA										
615.00 > 570.00	3.979	3.987	-0.008	1.518	2697470	2.43		97.1	4304	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.987	3.987	0.0	1.193	402766	NC			2395	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.217	4.217	0.0	1.409	413989	NC			1132	
699.00 > 99.00	4.217	4.217	0.0	1.409	538250		0.77(0.00-0.00)		3256	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.246	4.246	0.0	1.067	1165493	1.00		100	469	
663.00 > 169.00	4.246	4.246	0.0	1.067	352121		3.31(1.25-3.76)		1743	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.486	4.486	0.0	1.000	352306	0.9717		97.2	2745	
713.00 > 219.00	4.486	4.486	0.0	1.000	226754		1.55(0.71-2.13)		1472	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.486	4.493	-0.007	1.712	3744906	2.65		106	6509	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.908	4.908	0.0	1.000	2200653	NC			304	
813.00 > 169.00	4.908	4.908	0.0	1.000	380606		5.78(2.86-8.58)		2413	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.908	4.917	-0.009	1.873	6090115	2.17		86.7	6982	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.273	5.273	0.0	1.074	2192157	NC			226	
913.00 > 169.00	5.266	5.273	-0.007	1.073	265373		8.26(3.83-11.48)		1617	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_006.d

Injection Date: 10-Aug-2018 08:15:58

Instrument ID: A8_N

Lims ID: CCV L4

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 13

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

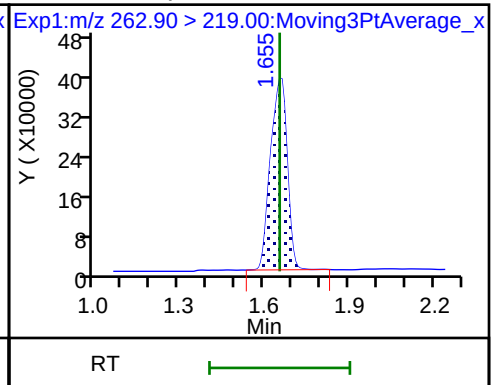
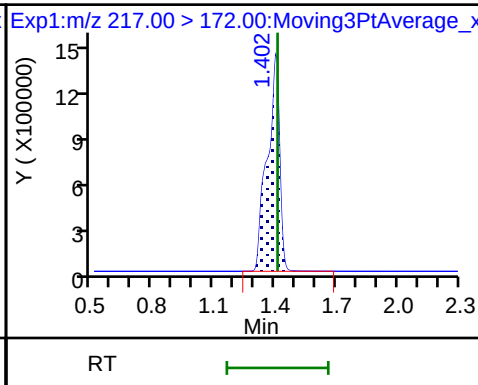
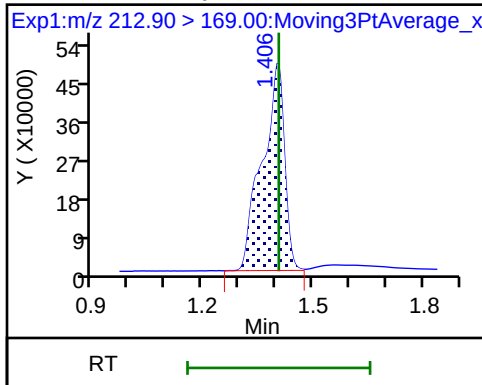
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid

D 1 13C4 PFBA

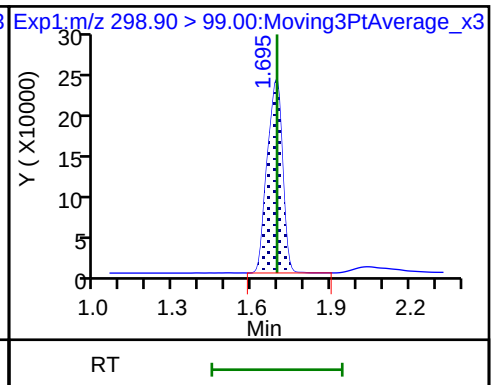
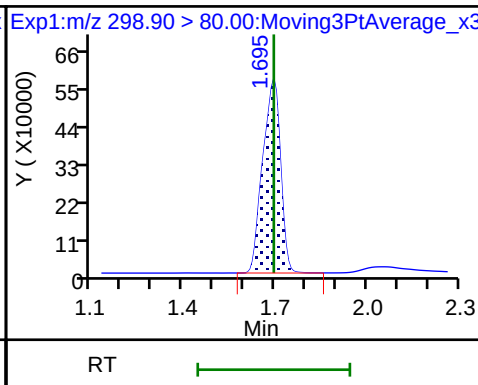
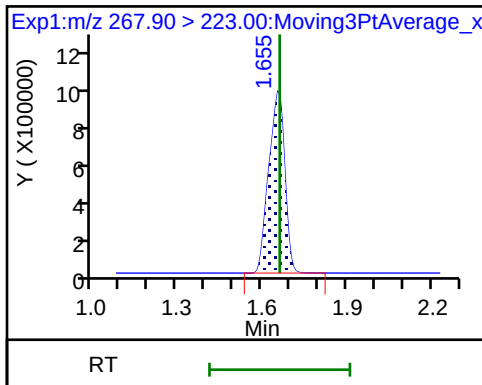
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

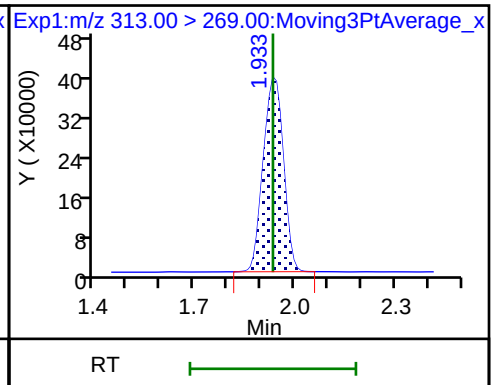
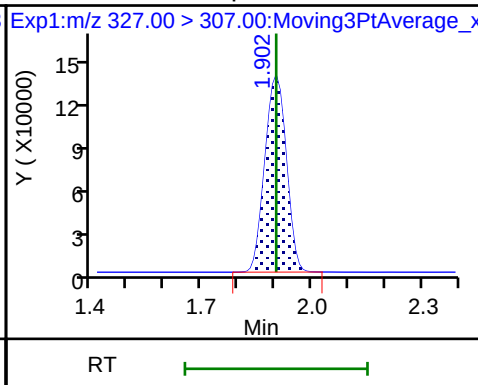
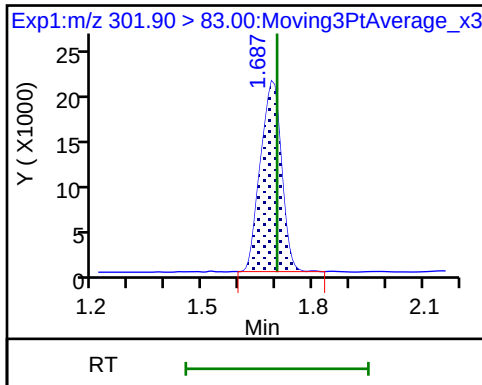
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni

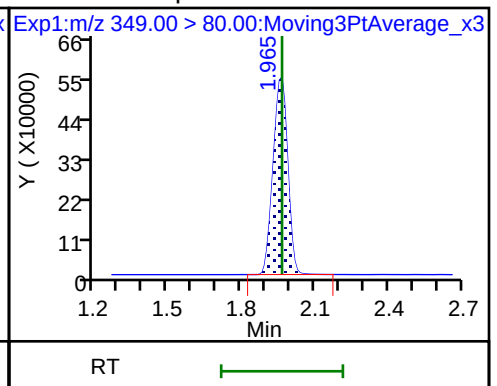
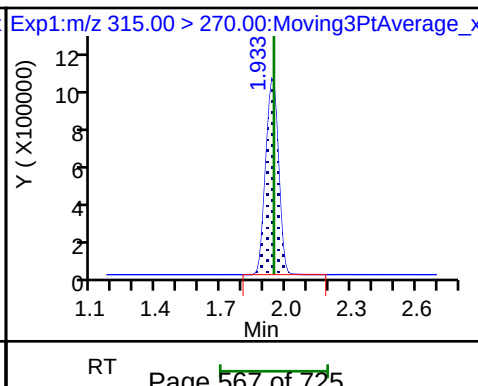
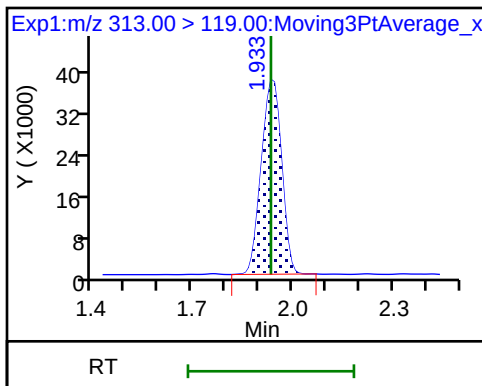
6 Perfluorohexanoic acid

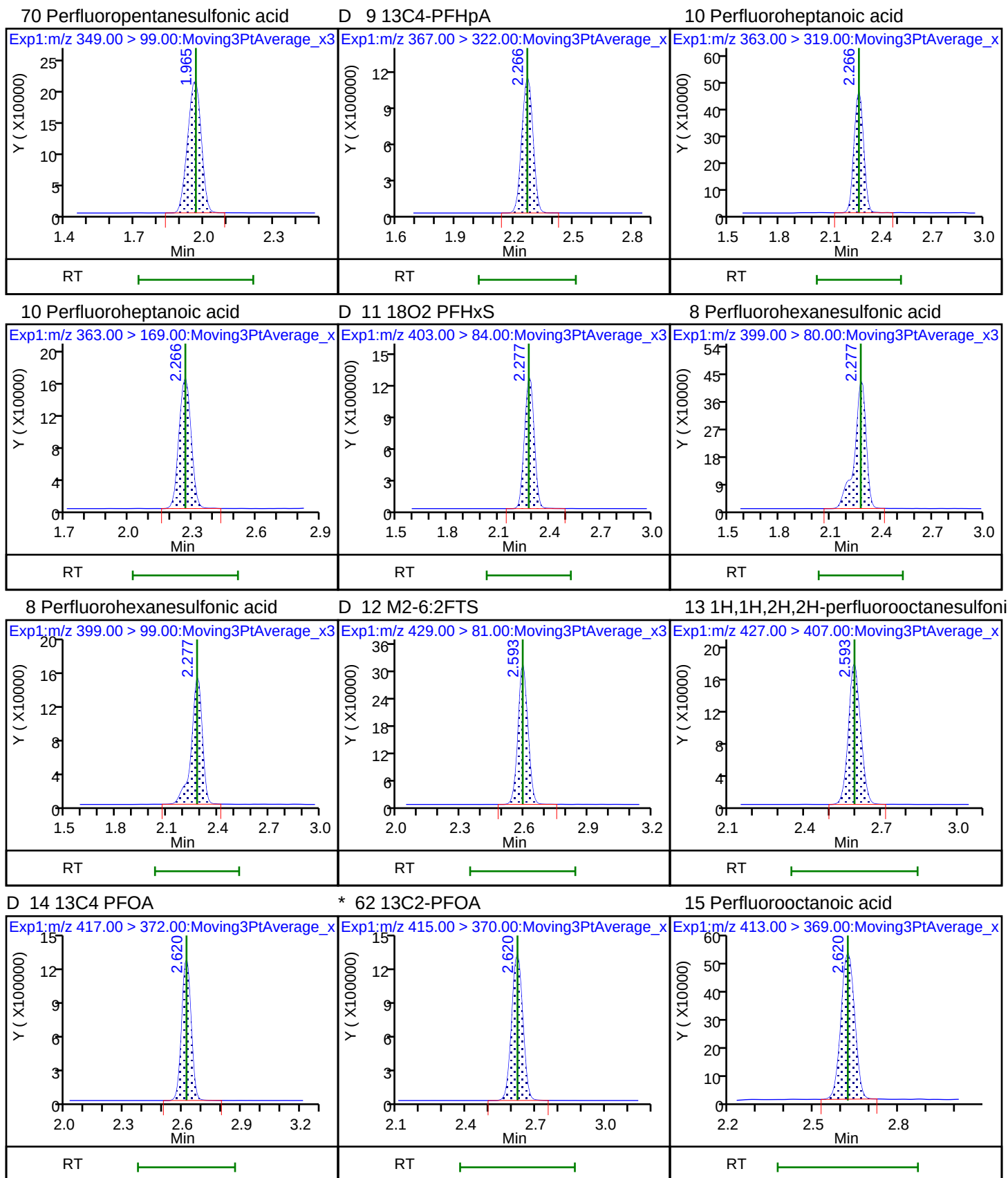


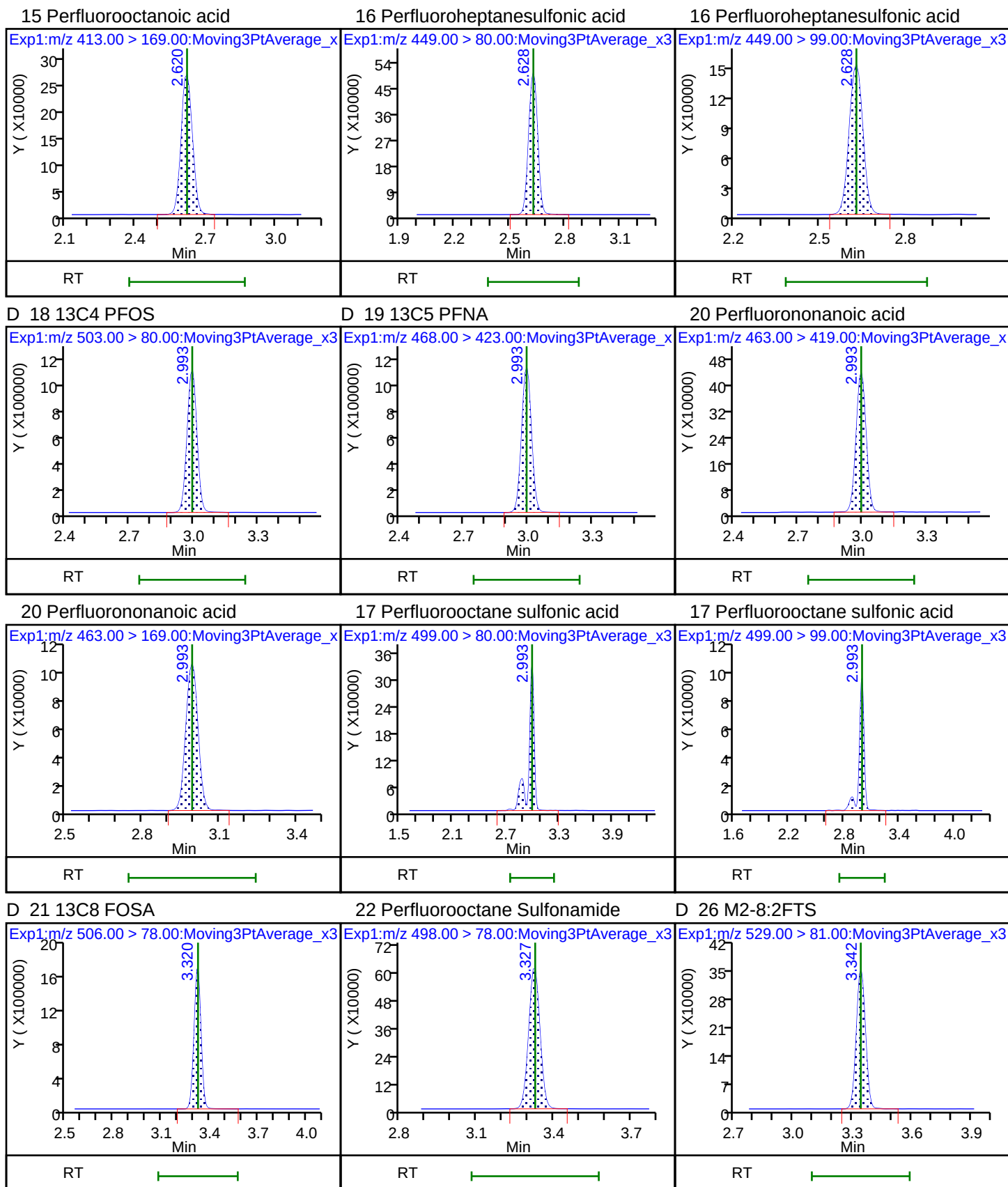
6 Perfluorohexanoic acid

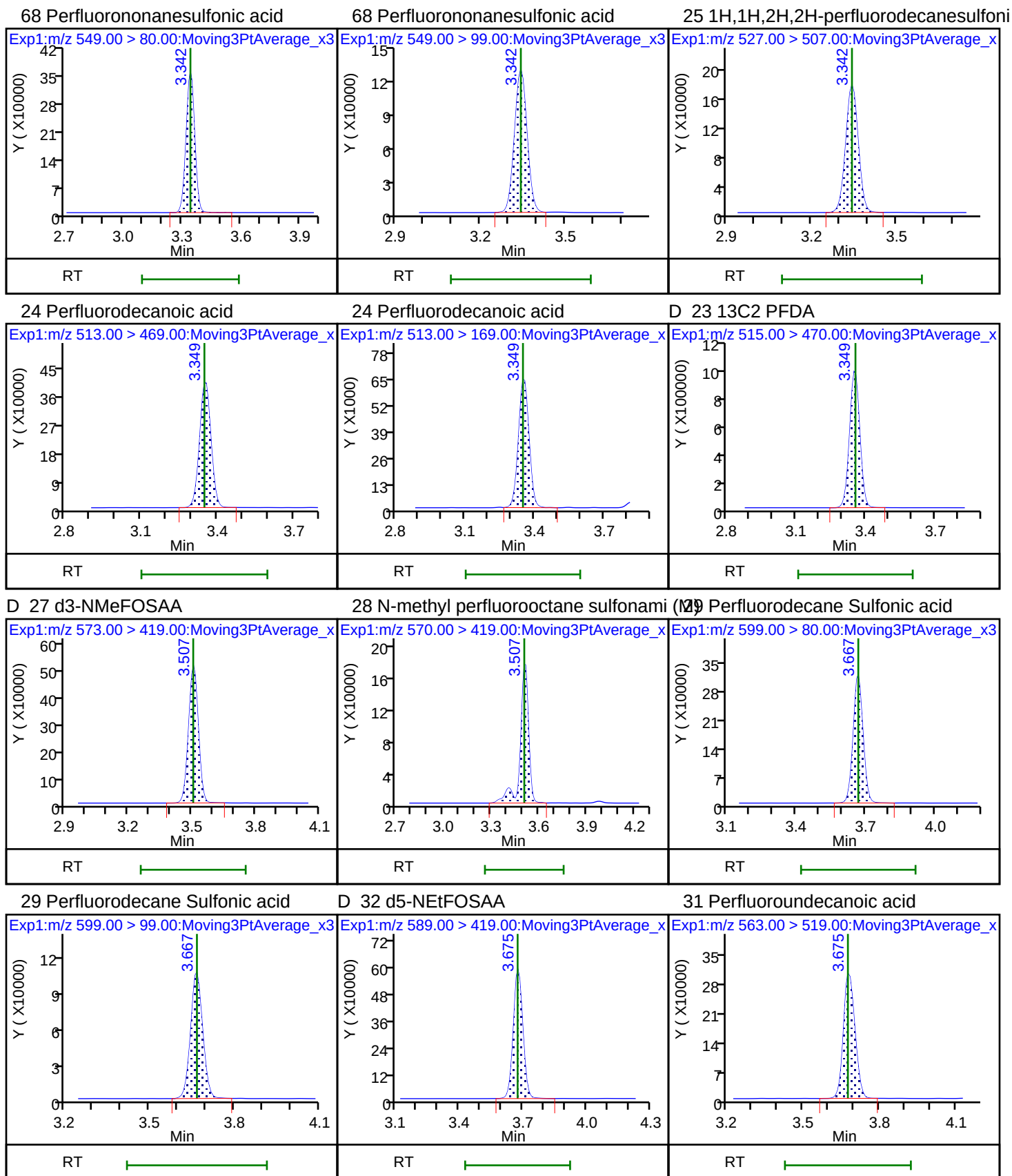
D 7 13C2 PFHxA

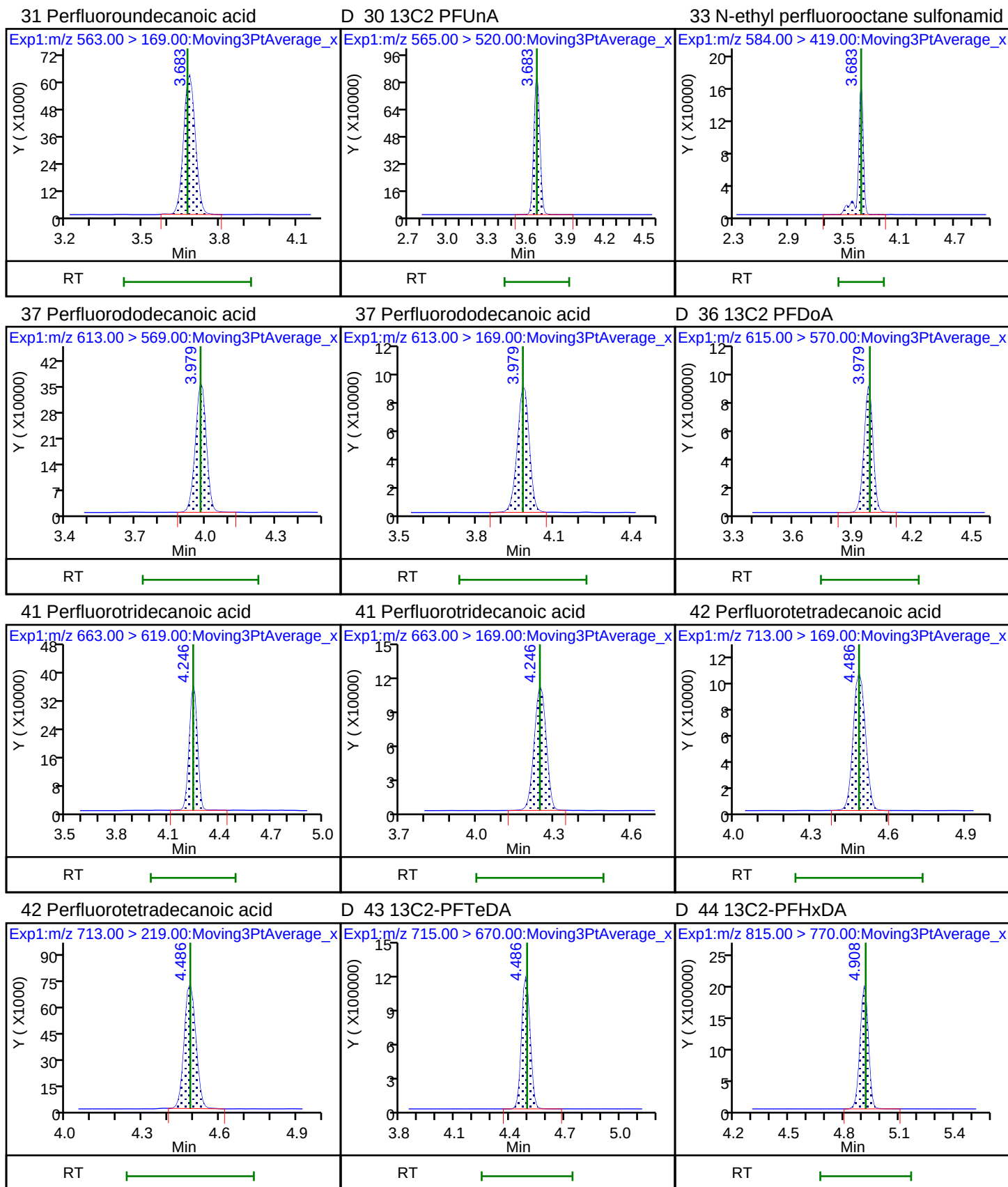
70 Perfluoropentanesulfonic acid











TestAmerica Sacramento

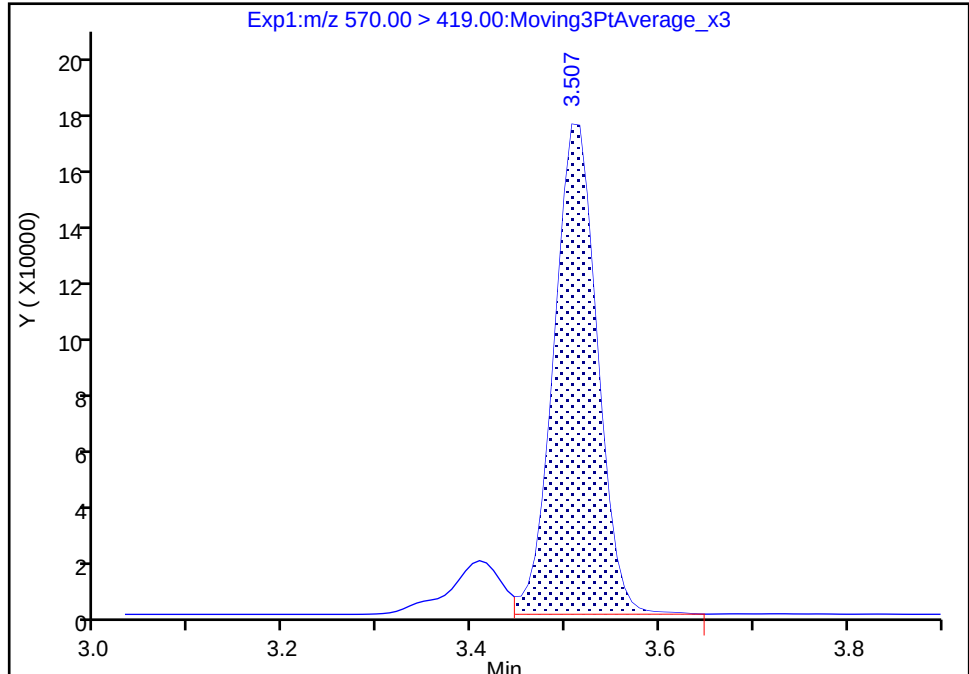
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_006.d
Injection Date: 10-Aug-2018 08:15:58 Instrument ID: A8_N
Lims ID: CCV L4
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

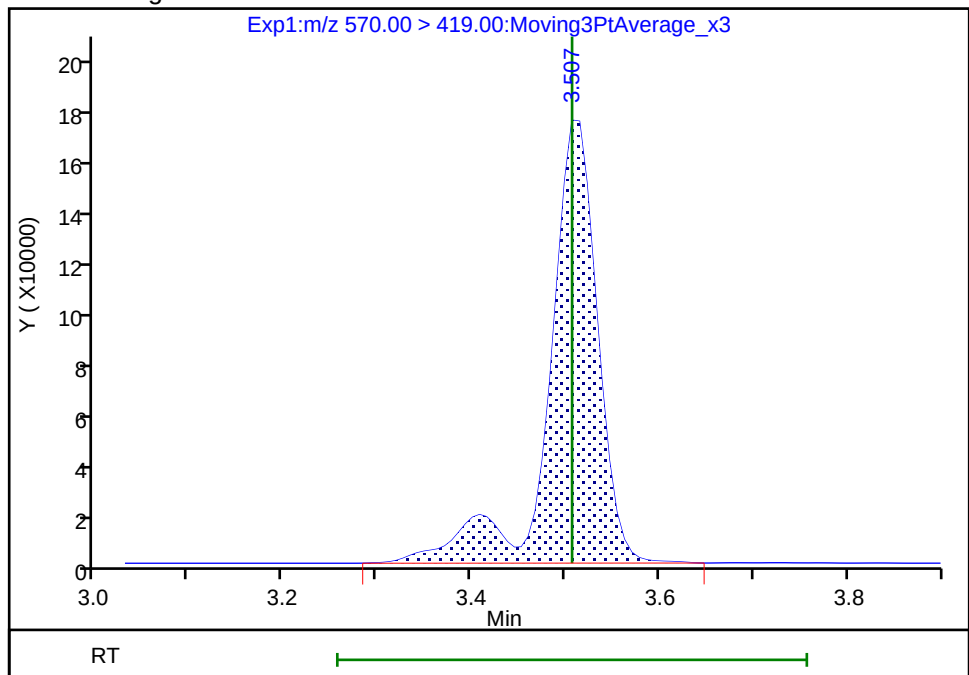
RT: 3.51
Area: 557591
Amount: 0.877367
Amount Units: ng/ml

Processing Integration Results



RT: 3.51
Area: 630292
Amount: 0.991762
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:54:45
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 573 of 725

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239237/14 Calibration Date: 08/10/2018 09:42

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLA_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9172		2.44	2.50	-2.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.090		2.39	2.50	-4.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	74.08		2.16	2.21	-2.5	30.0
4:2 FTS	AveID	16.57	16.23		2.29	2.34	-2.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.002		2.45	2.50	-1.8	30.0
Perfluoropentanesulfonic acid	AveID	68.92	67.18		2.29	2.35	-2.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.091		2.57	2.50	2.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.016		2.13	2.28	-6.3	30.0
6:2 FTS	AveID	1.573	1.465		2.21	2.37	-6.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.044		2.31	2.50	-7.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.351		2.60	2.38	9.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.041		2.47	2.50	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.103		2.38	2.32	2.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9772		2.51	2.50	0.4	30.0
8:2 FTS	AveID	1.299	1.331		2.45	2.40	2.5	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.8181		2.61	2.40	8.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.024		2.55	2.50	2.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9748		2.53	2.50	1.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6802		2.59	2.41	7.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	0.9766		2.17	2.50	-13.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8355		2.34	2.50	-6.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.092		2.45	2.50	-1.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.057		2.46	2.50	-1.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2450		2.53	2.50	1.2	30.0
13C4 PFBA	Ave	1.385	1.372		2.48	2.50	-1.0	30.0
13C5 PFPeA	Ave	0.9537	0.8975		2.35	2.50	-5.9	30.0
13C3-PFBS	Ave	0.0221	0.0212		2.24	2.33	-3.7	30.0
13C2 PFHxA	Ave	1.082	1.017		2.35	2.50	-6.0	30.0
13C4-PFHpA	Ave	1.065	0.9424		2.21	2.50	-11.5	30.0
18O2 PFHxS	Ave	1.366	1.257		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2242	0.2304		2.44	2.38	2.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239237/14 Calibration Date: 08/10/2018 09:42
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLA_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	1.003		2.57	2.50	2.6	30.0
13C4 PFOS	Ave	0.8973	0.8171		2.18	2.39	-8.9	30.0
13C5 PFNA	Ave	0.8770	0.7899		2.25	2.50	-9.9	30.0
13C8 FOSA	Ave	1.188	1.139		2.40	2.50	-4.2	30.0
M2-8:2FTS	Ave	0.2707	0.2458		2.17	2.40	-9.2	30.0
13C2 PFDA	Ave	0.7695	0.7175		2.33	2.50	-6.8	30.0
d3-NMeFOSAA	Ave	0.3935	0.3829		2.43	2.50	-2.7	30.0
d5-NEtFOSAA	Ave	0.4077	0.4182		2.56	2.50	2.6	30.0
13C2 PFUnA	Ave	0.6189	0.5893		2.38	2.50	-4.8	30.0
13C2 PFDoA	Ave	0.6541	0.6426		2.46	2.50	-1.8	30.0
13C2-PFTeDA	Ave	0.8335	0.8479		2.54	2.50	1.7	30.0
13C2-PFHxDA	Ave	1.653	1.466		2.22	2.50	-11.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_017.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 10-Aug-2018 09:42:08 ALS Bottle#: 14 Worklist Smp#: 14
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 14:12:29 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK035

First Level Reviewer: hannigana

Date: 10-Aug-2018 14:10:38

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	1.408	1.411	-0.003	0.539	5539914	2.48		99.0	8231	
2 Perfluorobutyric acid										
212.90 > 169.00	1.408	1.408	0.0	1.000	5081119	2.44		97.7	449	
D 3 13C5-PFPeA										
267.90 > 223.00	1.660	1.662	-0.002	0.635	3625161	2.35		94.1	7885	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.660	1.660	0.0	1.000	3950064	2.39		95.8	304	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.700	1.700	0.0	1.005	5619409	2.16		97.5	359	
298.90 > 99.00	1.700	1.700	0.0	1.005	2350094		2.39(1.25-3.74)		334	
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.702	-0.010	0.647	79807	2.24		96.3	419	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.898	1.898	0.0	1.122	1301037	2.29		98.0	9679	
D 60 M2-4:2FTS										
329.00 > 81.00	1.898	1.912	-0.014	0.726	561109	NC			993	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.943	-0.004	0.742	4109445	2.35		94.0	7111	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.939	0.0	1.000	4118347	2.45		98.2	1360	
313.00 > 119.00	1.939	1.939	0.0	1.000	367904		11.19(5.03-15.10)		895	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.959	1.959	0.0	1.158	5407479	2.29		97.5	4919	
349.00 > 99.00	1.959	1.959	0.0	1.158	1982665		2.73(1.36-4.07)		3354	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.033	2.037	-0.004	0.778	313237	NC			758	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.033	2.033	0.0	1.000	752608	NC			481	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.265	-0.007	0.864	3806802	2.21		88.5	6329	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.258	2.258	0.0	1.000	4154718	2.57		103	862	
363.00 > 169.00	2.258	2.258	0.0	1.000	1659096		2.50(1.13-3.40)		2432	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.276	0.004	0.872	4803789	2.18		92.1	6780	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.280	0.0	1.000	4693155	2.13		93.7	3056	
399.00 > 99.00	2.280	2.280	0.0	1.000	1611210		2.91(1.50-4.49)		1957	
65 ADONA										
377.00 > 251.00	2.303	2.303	0.0	0.771	11812373	NC			11418	
377.00 > 85.00	2.303	2.303	0.0	0.771	6997591		1.69(0.84-2.53)		9915	
D 12 M2-6:2FTS										
429.00 > 81.00	2.588	2.592	-0.004	0.990	883952	2.44		103	2715	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.588	2.588	0.0	1.000	1291844	2.21		93.1	3079	
D 73 13C8 PFOA										
421.00 > 376.00	2.607	2.612	-0.005	0.997	6907694	NC			15404	
D 14 13C4 PFOA										
417.00 > 372.00	2.614	2.619	-0.005	1.000	4051112	2.57		103	6570	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.614	2.614	0.0	1.000	4235242	2.31		92.4	337	
413.00 > 169.00	2.614	2.614	0.0	1.000	2196730		1.93(0.84-2.52)		2825	
* 62 13C2-PFOA										
415.00 > 370.00	2.614	2.614	0.0		4039296	2.50			5976	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.622	2.622	0.0	0.878	4246347	2.60		109	3584	
449.00 > 99.00	2.622	2.622	0.0	0.878	1103944		3.85(1.94-5.82)		2336	
D 72 13C8 PFOS										
507.00 > 99.00	2.980	2.984	-0.004	1.140	1600772	NC			4994	
D 18 13C4 PFOS										
503.00 > 80.00	2.987	2.992	-0.005	1.143	3155170	2.18		91.1	3684	
D 19 13C5 PFNA										
468.00 > 423.00	2.987	2.992	-0.005	1.143	3190436	2.25		90.1	5173	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.987	2.987	0.0	1.000	3377414	2.38		103	3038	
499.00 > 99.00	2.987	2.987	0.0	1.000	734968		4.60(2.31-6.93)		1144	
20 Perfluorononanoic acid										
463.00 > 419.00	2.987	2.987	0.0	1.000	3321022	2.47		98.8	764	
463.00 > 169.00	2.987	2.987	0.0	1.000	791256		4.20(1.90-5.69)		3200	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.197	3.197	0.0	1.070	5699188	NC			5531	
D 21 13C8 FOSA										
506.00 > 78.00	3.322	3.326	-0.004	1.271	4600916	2.40		95.8	5363	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.322	3.322	0.0	1.000	4495767	2.51		100	4731	
D 26 M2-8:2FTS										
529.00 > 81.00	3.336	3.340	-0.004	1.276	951146	2.17		90.8	2654	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.336	3.336	0.0	1.117	2591876	2.61		109	3456	
549.00 > 99.00	3.336	3.336	0.0	1.117	900499		2.88(1.33-3.97)		2571	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.336	3.336	0.0	1.000	1265941	2.45		102	2538	
D 23 13C2 PFDA										
515.00 > 470.00	3.344	3.355	-0.011	1.279	2898026	2.33		93.2	5296	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.351	3.351	0.0	1.002	2967182	2.55		102	2060	
513.00 > 169.00	3.344	3.351	-0.007	1.000	501970		5.91(2.36-7.09)		346	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.501	3.506	-0.005	1.339	1546772	2.43		97.3	3717	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.509	3.509	0.0	1.002	1507723	2.53		101	1148	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.671	3.674	-0.003	1.404	1689216	2.56		103	1480	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.664	3.664	0.0	1.226	2164092	2.59		108	5838	
599.00 > 99.00	3.664	3.664	0.0	1.226	710041		3.05(1.39-4.16)		3197	
D 30 13C2 PFUnA										
565.00 > 520.00	3.679	3.682	-0.003	1.407	2380360	2.38		95.2	3791	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.671	3.671	0.0	0.998	2324598	2.17		86.9	1495	
563.00 > 169.00	3.679	3.671	0.008	1.000	453514		5.13(2.12-6.36)		1888	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.679	3.679	0.0	1.002	1411377	2.34		93.7	1735	
35 MeFOSA										
512.00 > 169.00	3.821	3.821	0.0		1286844	NC			685	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.837	3.837	0.0	1.284	9324305	NC			8989	
D 36 13C2 PFDaA										
615.00 > 570.00	3.976	3.987	-0.011	1.521	2595794	2.46		98.2	5335	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.985	3.985	0.0	1.194	915716	NC			2756	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.976	3.976	0.0	1.000	2834420	2.45		98.1	1818	
613.00 > 169.00	3.976	3.976	0.0	1.000	631357		4.49(2.13-6.40)		2307	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.223	4.223	0.0	1.414	950150	NC			2121	
699.00 > 99.00	4.223	4.223	0.0	1.414	1328502		0.72(0.00-0.00)		5211	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.251	4.251	0.0	1.069	2744598	2.46		98.3	1082	
663.00 > 169.00	4.242	4.251	-0.009	1.067	878579		3.12(1.25-3.76)		4094	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.483	4.493	-0.010	1.715	3424982	2.54		102	6245	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.483	4.483	0.0	1.000	839076	2.53		101	4979	
713.00 > 219.00	4.483	4.483	0.0	1.000	562029		1.49(0.71-2.13)		2633	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.917	4.917	0.0	1.881	5920820	2.22		88.6	6633	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.917	4.917	0.0	1.000	5236756	NC			725	
813.00 > 169.00	4.917	4.917	0.0	1.000	922958		5.67(2.86-8.58)		3991	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.272	5.272	0.0	1.072	5931070	NC			563	
913.00 > 169.00	5.272	5.272	0.0	1.072	704185		8.42(3.83-11.48)		2833	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL5_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_017.d

Injection Date: 10-Aug-2018 09:42:08

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 14

Worklist Smp#: 14

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

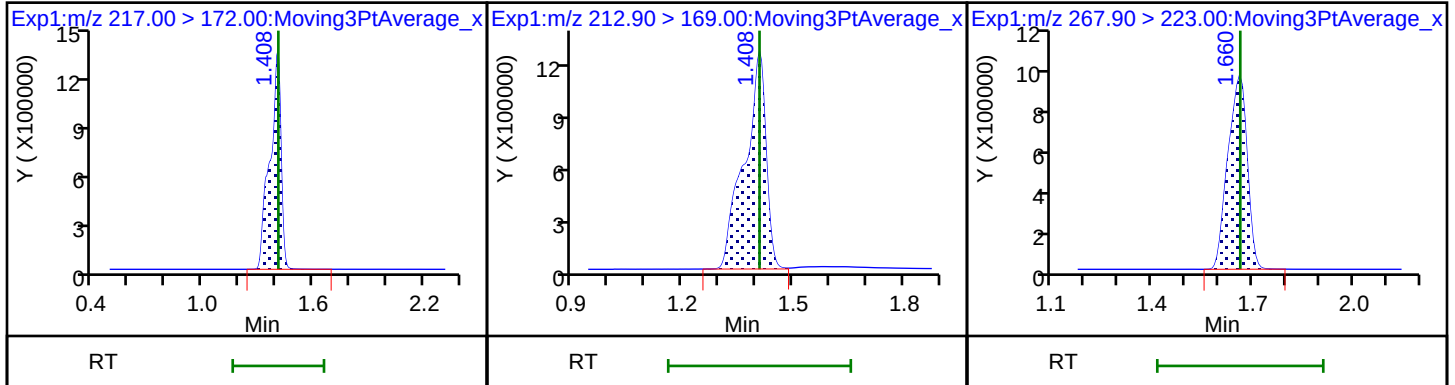
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

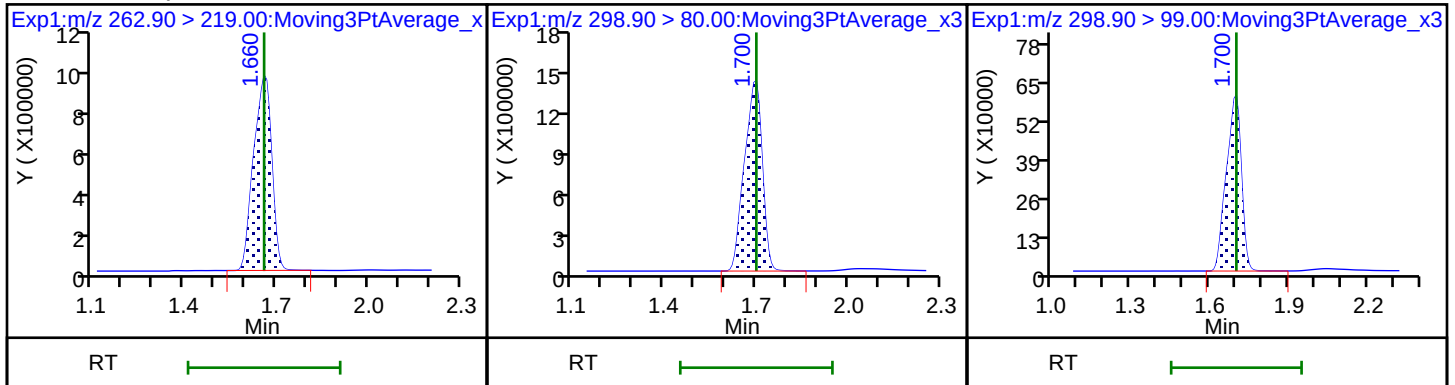
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

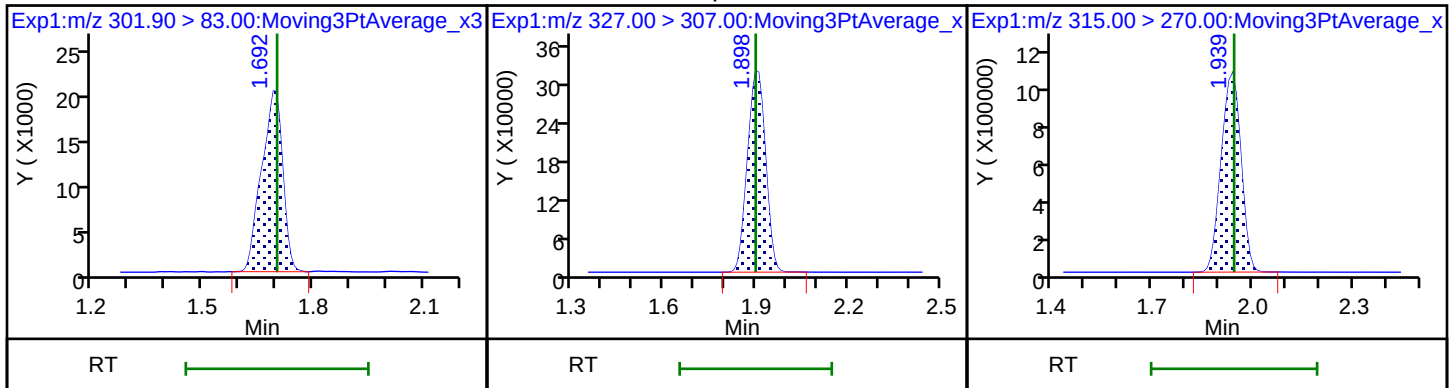
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfonate

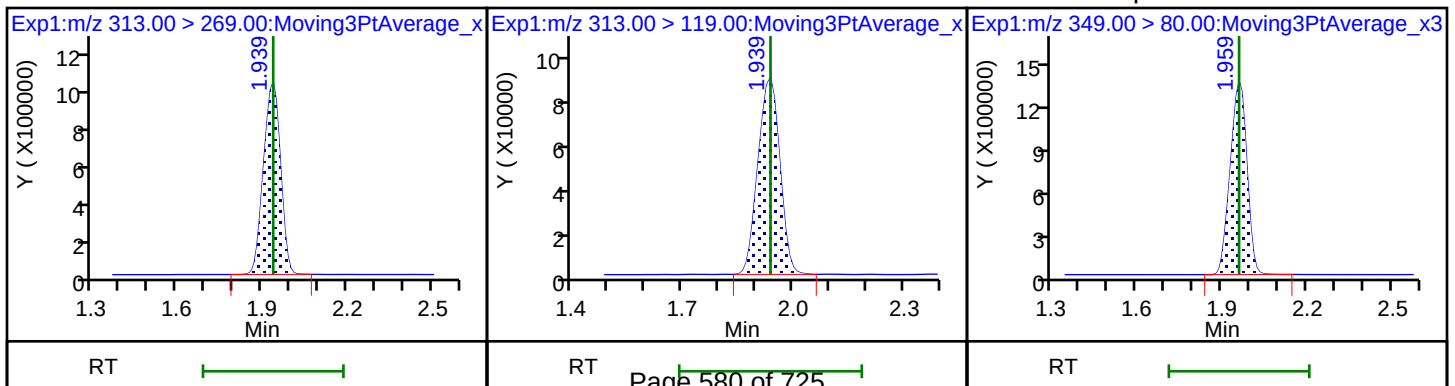
D 7 13C2 PFHxA

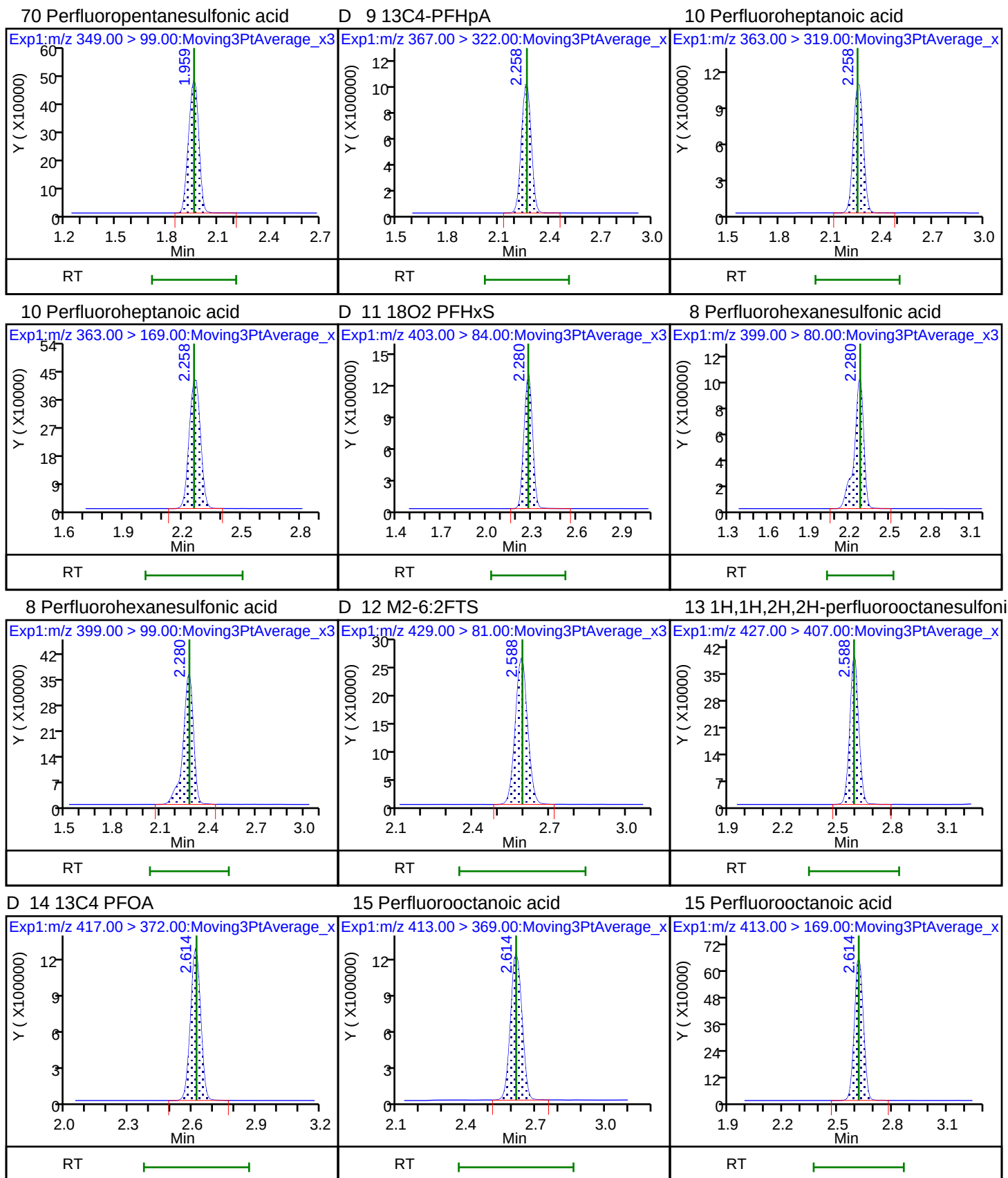


6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

70 Perfluoropentanesulfonic acid

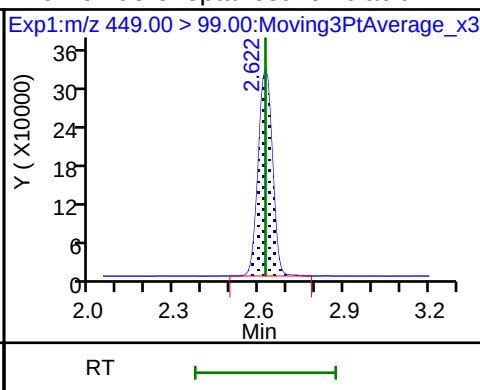
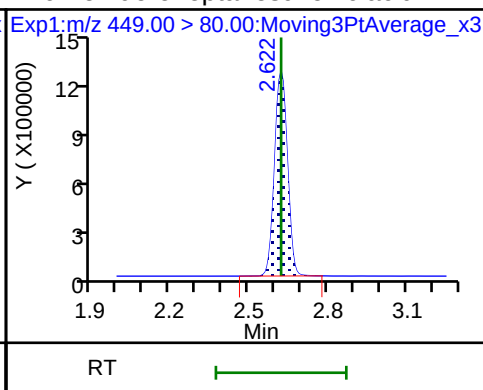
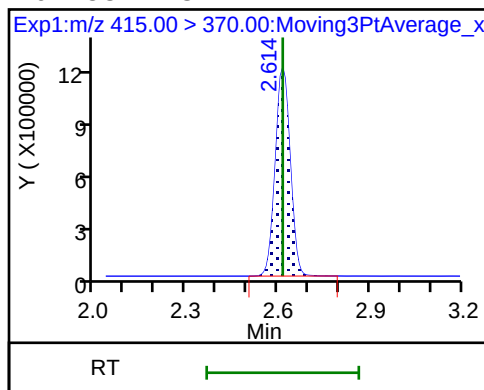




* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

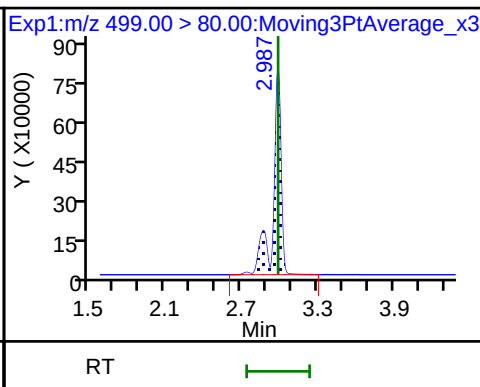
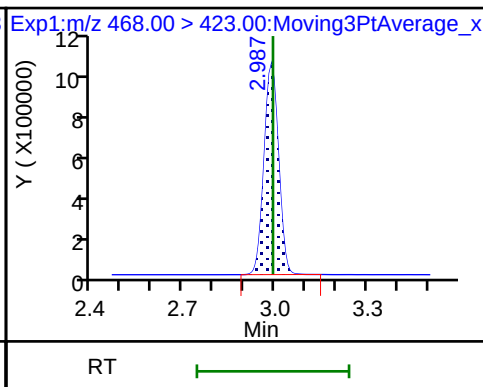
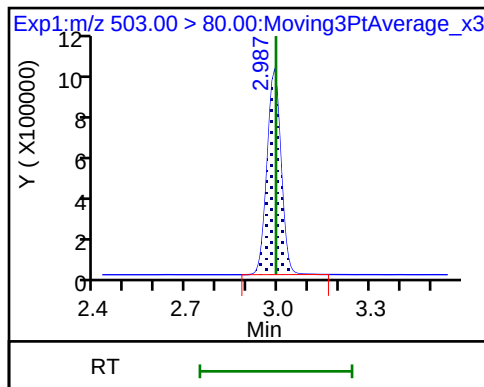
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

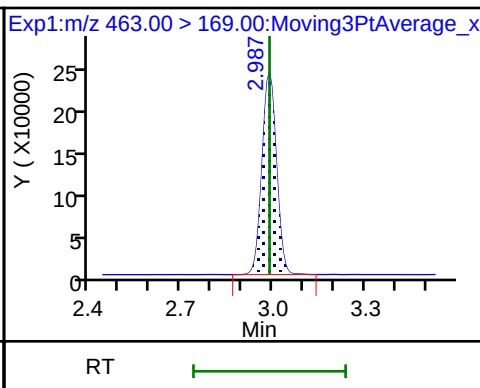
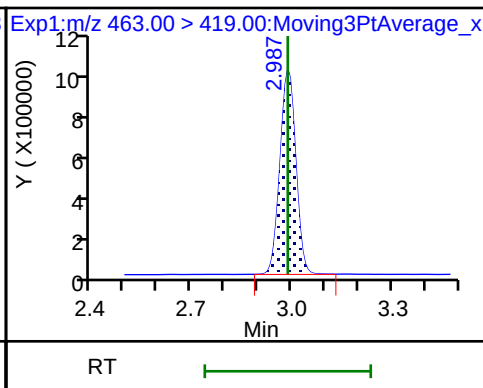
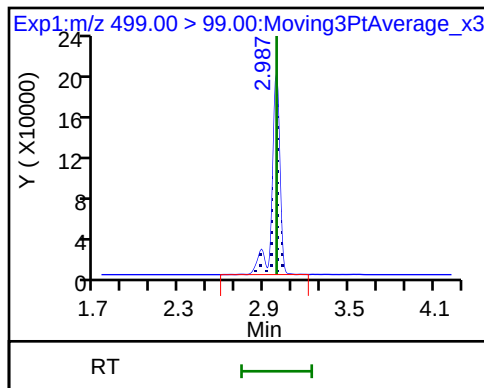
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid

20 Perfluorononanoic acid

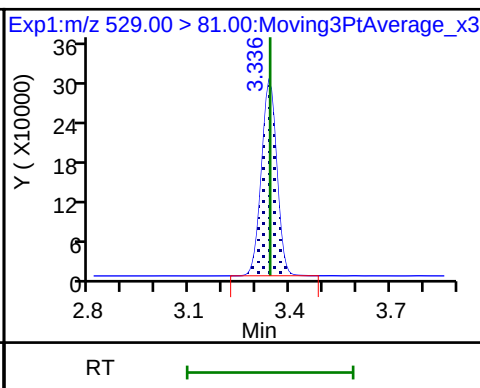
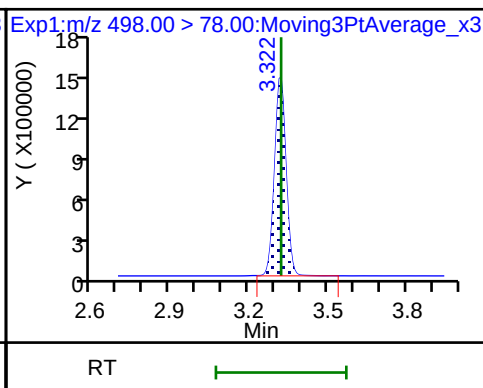
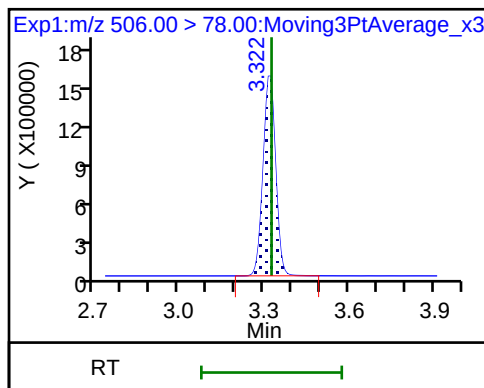
20 Perfluorononanoic acid

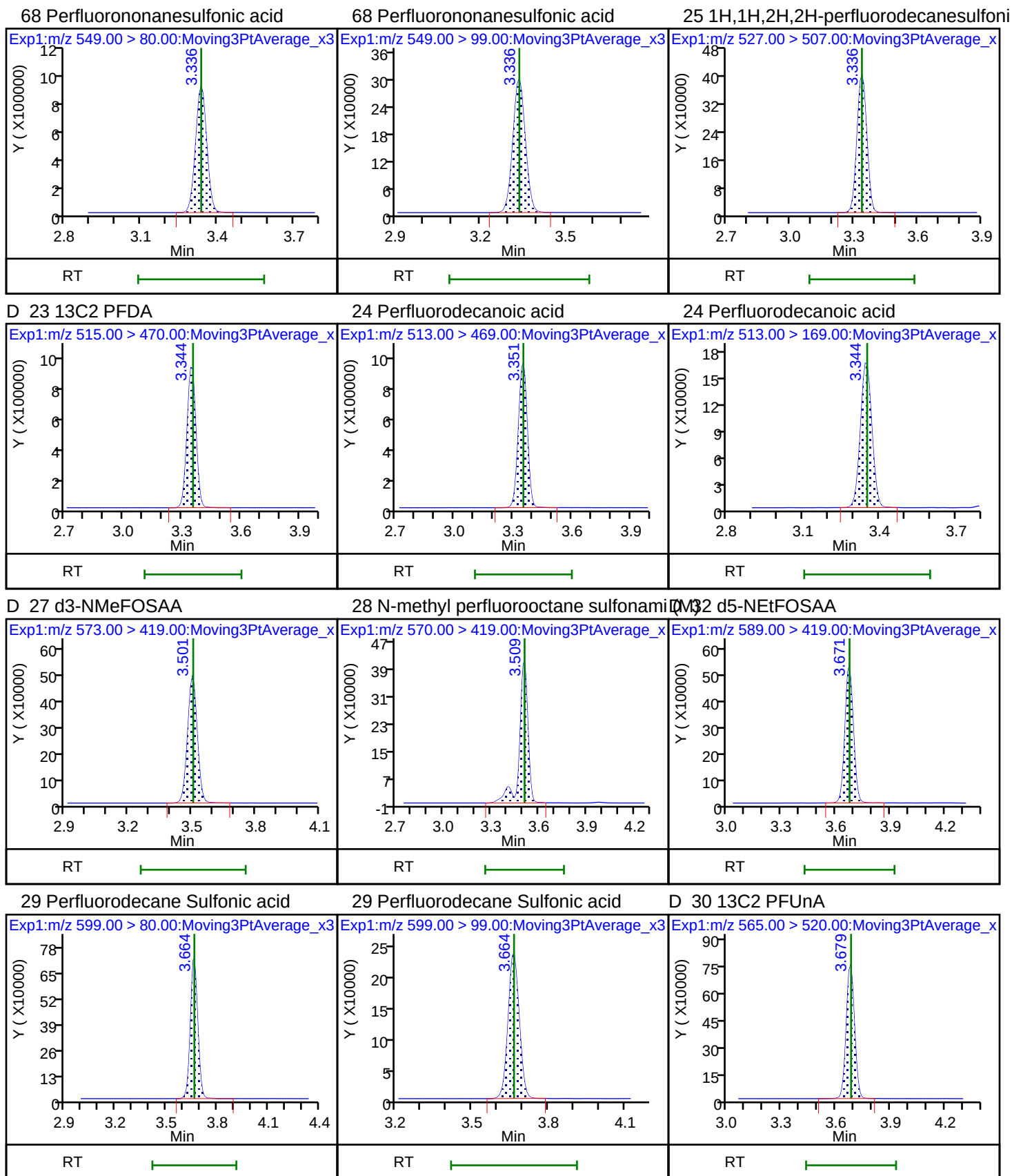


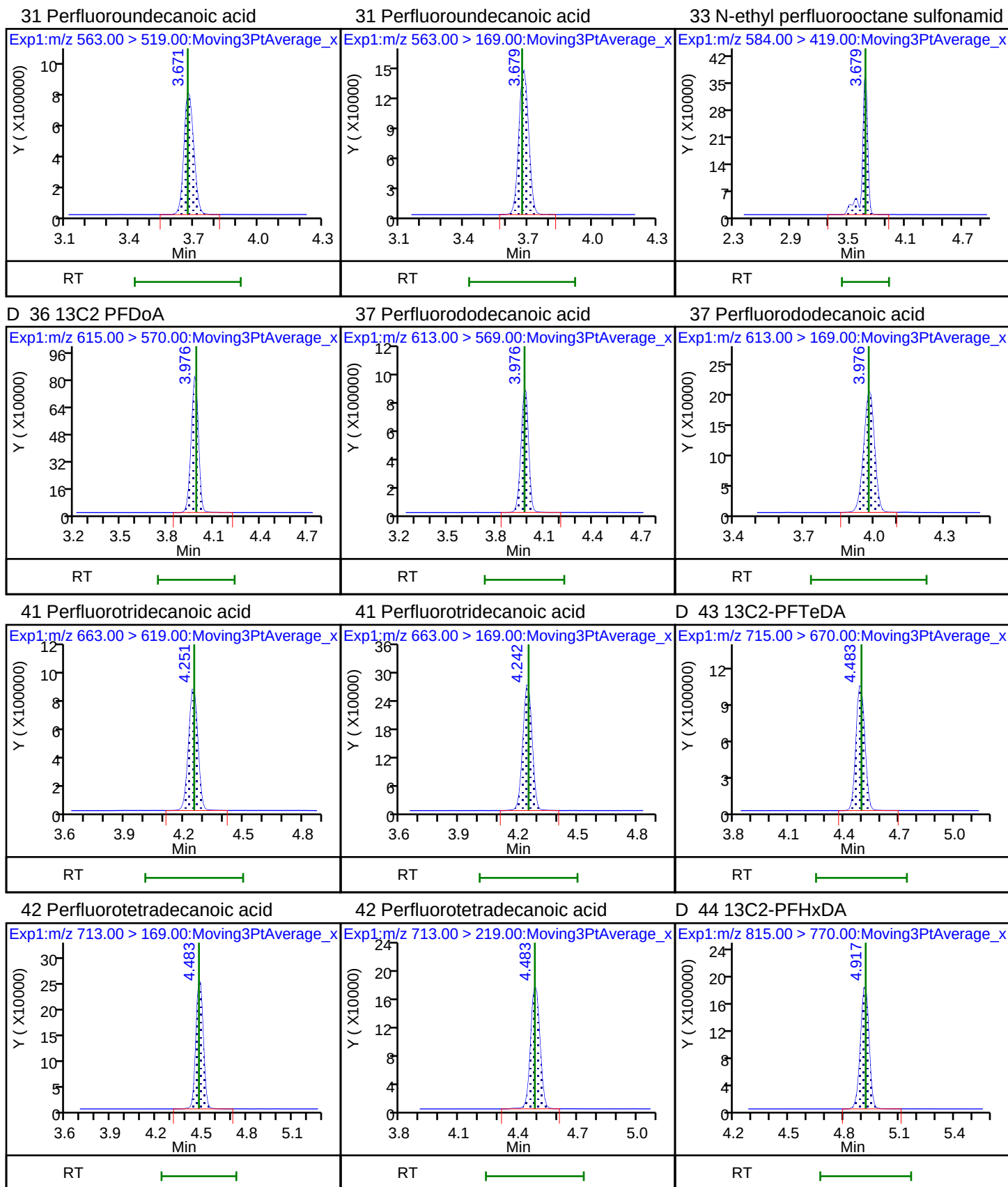
D 21 13C8 FOSA

22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS







TestAmerica Sacramento

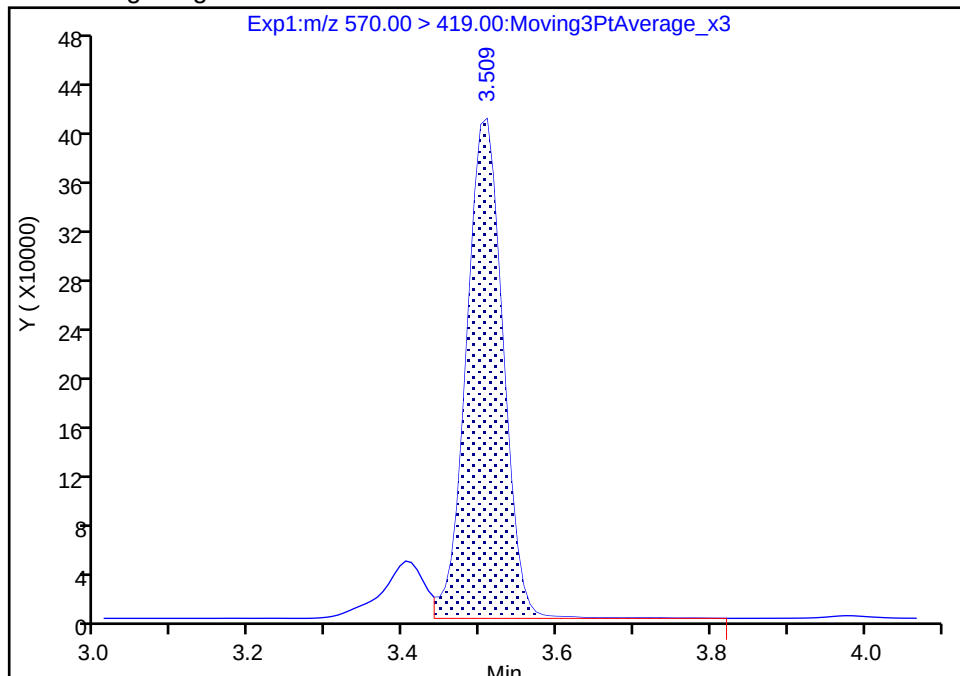
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_017.d
Injection Date: 10-Aug-2018 09:42:08 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

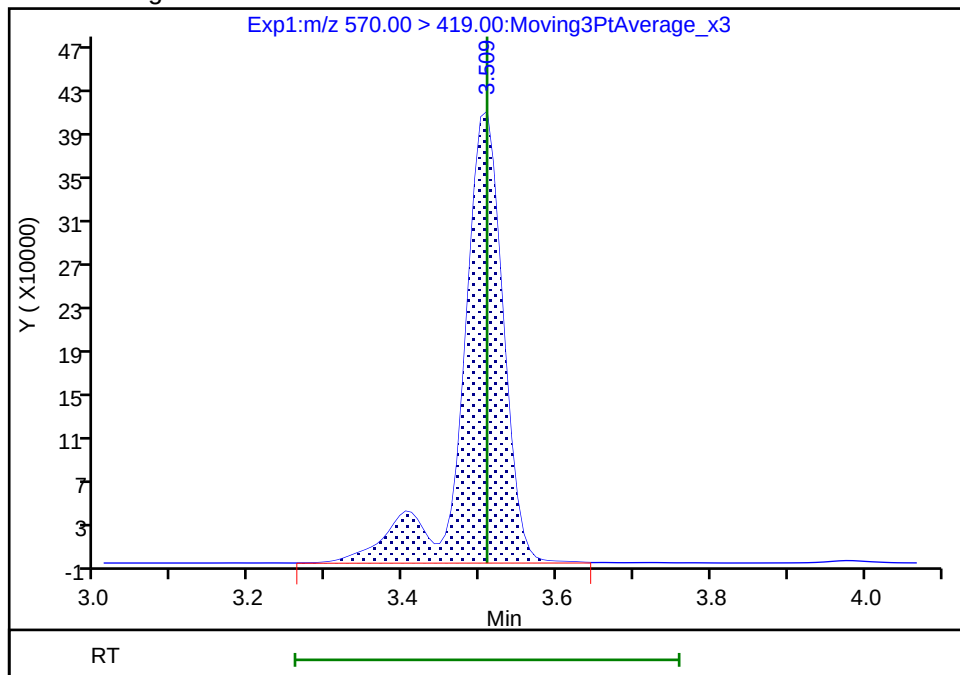
RT: 3.51
Area: 1331538
Amount: 2.231116
Amount Units: ng/ml

Processing Integration Results



RT: 3.51
Area: 1507723
Amount: 2.526331
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 14:10:23
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 586 of 725

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCVL 320-239308/2 Calibration Date: 08/10/2018 16:41

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLAAAX_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.8499		0.0453	0.0500	-9.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.219		0.0535	0.0500	7.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	77.41		0.0450	0.0442	1.9	30.0
4:2 FTS	AveID	16.57	15.43		0.400	0.0467	-6.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.077		0.0527	0.0500	5.5	30.0
Perfluoropentanesulfonic acid	AveID	68.92	68.83		0.0468	0.0469	-0.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.032		0.0486	0.0500	-2.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.146		0.0481	0.0455	5.7	30.0
6:2 FTS	AveID	1.573	1.377		0.400	0.0474	-12.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.254		0.0555	0.0501	10.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.256		0.0483	0.0476	1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	0.9887		0.0469	0.0500	-6.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.084		0.0468	0.0464	1.0	30.0
8:2 FTS	AveID	1.299	1.171		0.400	0.0479	-9.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.8606		0.0442	0.0500	-11.6	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7435		0.0474	0.0480	-1.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.034		0.0515	0.0500	3.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9228		0.400	0.0500	-4.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6398		0.0488	0.0482	1.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.210		0.0539	0.0500	7.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.9297		0.0521	0.0500	4.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.157		0.0520	0.0500	4.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.136		0.0528	0.0500	5.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2395		0.0495	0.0500	-1.0	30.0
13C4 PFBA	Ave	1.385	1.292		2.33	2.50	-6.7	30.0
13C5 PFPeA	Ave	0.9537	0.8485		2.22	2.50	-11.0	30.0
13C3-PFBS	Ave	0.0221	0.0199		2.09	2.33	-9.9	30.0
13C2 PFHxA	Ave	1.082	0.9799		2.26	2.50	-9.5	30.0
13C4-PFHpA	Ave	1.065	0.9566		2.25	2.50	-10.2	30.0
18O2 PFHxS	Ave	1.366	1.211		2.10	2.37	-11.3	30.0
M2-6:2FTS	Ave	0.2242	0.2133		2.26	2.38	-4.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-239308/2 Calibration Date: 08/10/2018 16:41
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLAAAX_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9737		2.49	2.50	-0.4	30.0
13C4 PFOS	Ave	0.8973	0.8176		2.18	2.39	-8.9	30.0
13C5 PFNA	Ave	0.8770	0.8231		2.35	2.50	-6.1	30.0
13C8 FOSA	Ave	1.188	1.111		2.34	2.50	-6.5	30.0
M2-8:2FTS	Ave	0.2707	0.2439		2.16	2.40	-9.9	30.0
13C2 PFDA	Ave	0.7695	0.7241		2.35	2.50	-5.9	30.0
d3-NMeFOSAA	Ave	0.3935	0.3592		2.28	2.50	-8.7	30.0
d5-NEtFOSAA	Ave	0.4077	0.3804		2.33	2.50	-6.7	30.0
13C2 PFUnA	Ave	0.6189	0.5848		2.36	2.50	-5.5	30.0
13C2 PFDoA	Ave	0.6541	0.6084		2.33	2.50	-7.0	30.0
13C2-PFTeDA	Ave	0.8335	0.8020		2.41	2.50	-3.8	30.0
13C2-PFHxDA	Ave	1.653	1.301		1.97	2.50	-21.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_005.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 10-Aug-2018 16:41:09 ALS Bottle#: 21 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCVL
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 13-Aug-2018 08:56:09 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

First Level Reviewer: mongkols

Date: 13-Aug-2018 08:41:20

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	1.406	1.411	-0.005	0.538	5571874	2.33		93.3	7851	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.406	1.411	-0.005	1.000	94708	0.0453		90.5	5.3	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.662	-0.008	0.633	3658793	2.22		89.0	5199	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.654	1.662	-0.008	1.000	89166	0.0535		107	4.8	
D 47 13C3-PFBS										
301.90 > 83.00	1.695	1.702	-0.007	0.649	79662	2.09		90.1	263	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.695	1.702	-0.007	1.000	117237	0.0450		102	10.8	
298.90 > 99.00	1.695	1.702	-0.007	1.000	49513		2.37(1.25-3.74)		9.5	
D 60 M2-4:2FTS										
329.00 > 81.00	1.902	1.912	-0.010	0.728	574282	NC			659	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.902	1.912	-0.010	1.122	24695	0.0435		93.1	321	
D 7 13C2 PFHxA										
315.00 > 270.00	1.933	1.943	-0.010	0.740	4225222	2.26		90.5	7323	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.933	1.944	-0.011	1.000	90973	0.0527		105	14.1	
313.00 > 119.00	1.944	1.944	0.0	1.005	8838		10.29(5.03-15.10)		12.2	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.965	1.965	0.0	1.159	110606	0.0468		99.9	288	
349.00 > 99.00	1.954	1.965	-0.011	1.153	44309		2.50(1.36-4.07)		38.3	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.027	2.038	-0.011	0.995	17770	NC			6.8	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.038	2.048	-0.010	0.780	328328	NC			751	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.266	0.0	1.005	85175	0.0486		97.2	13.5	M
363.00 > 169.00	2.266	2.266	0.0	1.005	34569		2.46(1.13-3.40)		41.7	M
D 9 13C4-PFHpA										
367.00 > 322.00	2.255	2.277	-0.022	0.863	4125046	2.25		89.8	6430	
D 11 18O2 PFHxS										
403.00 > 84.00	2.277	2.288	-0.011	0.872	4941291	2.10		88.7	4965	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.277	2.288	-0.011	1.000	108900	0.0481		106	171	M
399.00 > 99.00	2.266	2.288	-0.022	0.995	35211		3.09(1.50-4.49)		29.1	M
65 ADONA										
377.00 > 251.00	2.299	2.311	-0.011	0.772	233774	NC			526	
377.00 > 85.00	2.299	2.311	-0.011	0.772	133149		1.76(0.84-2.53)		146	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.593	2.593	0.0	1.003	24014	0.0415		87.5	60.2	
D 12 M2-6:2FTS										
429.00 > 81.00	2.586	2.599	-0.012	0.990	873871	2.26		95.2	1685	
D 73 13C8 PFOA										
421.00 > 376.00	2.605	2.620	-0.015	0.997	7471781	NC			11512	
* 62 13C2-PFOA										
415.00 > 370.00	2.613	2.620	-0.008		4312113	2.50			6087	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.613	2.620	-0.008	1.000	105446	0.0555		111	10.1	
413.00 > 169.00	2.605	2.620	-0.015	0.997	52188		2.02(0.84-2.52)		68.3	
D 14 13C4 PFOA										
417.00 > 372.00	2.613	2.627	-0.015	1.000	4198653	2.49		99.6	8988	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.620	2.628	-0.008	0.880	84316	0.0483		101	208	
449.00 > 99.00	2.613	2.628	-0.016	0.877	26376		3.20(1.94-5.82)		41.5	
20 Perfluorononanoic acid										
463.00 > 419.00	2.985	2.993	-0.008	1.000	70185	0.0469		93.9	16.3	
463.00 > 169.00	2.985	2.993	-0.008	1.000	17971		3.91(1.90-5.69)		60.6	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.985	2.993	-0.008	1.003	70940	0.0468		101	117	M
499.00 > 99.00	2.985	2.993	-0.008	1.003	14456		4.91(2.31-6.93)		17.1	M
D 18 13C4 PFOS										
503.00 > 80.00	2.978	3.000	-0.022	1.140	3370606	2.18		91.1	4766	
D 19 13C5 PFNA										
468.00 > 423.00	2.985	3.000	-0.015	1.143	3549429	2.35		93.9	7937	
D 72 13C8 PFOS										
507.00 > 99.00	2.978	3.000	-0.022	1.140	1692883	NC			3288	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.195	3.203	-0.008	1.073	109832	NC			334	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.327	3.327	0.0	1.002	82486	0.0442		88.4	622	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.320	3.333	-0.013	1.271	4792183	2.34		93.5	6479	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.334	3.342	-0.008	1.120	50328	0.0474		98.8	341	
549.00 > 99.00	3.334	3.342	-0.008	1.120	18527		2.72(1.33-3.97)		65.5	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.327	3.342	-0.015	0.998	23594	0.0432		90.1	178	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.342	3.349	-0.007	1.000	64549	0.0515		103	31.1	
513.00 > 169.00	3.342	3.349	-0.007	1.000	9657		6.68(2.36-7.09)		35.4	
D 26 M2-8:2FTS										
529.00 > 81.00	3.334	3.355	-0.021	1.276	1007699	2.16		90.1	2224	
D 23 13C2 PFDA										
515.00 > 470.00	3.342	3.363	-0.021	1.279	3122373	2.35		94.1	6375	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.499	3.507	-0.008	1.000	28585	0.0478		95.7	18.2	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.499	3.522	-0.023	1.339	1548863	2.28		91.3	2947	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.661	3.661	0.0	1.229	43489	0.0488		101	318	
599.00 > 99.00	3.654	3.661	-0.007	1.227	16080		2.70(1.39-4.16)		76.0	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.667	3.675	-0.008	0.998	61035	0.0539		108	33.0	
563.00 > 169.00	3.675	3.675	0.0	1.000	13016		4.69(2.12-6.36)		90.1	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.661	3.682	-0.021	1.401	1640420	2.33		93.3	1470	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.675	3.684	-0.009	1.004	30503	0.0521		104	92.7	
D 30 13C2 PFUnA										
565.00 > 520.00	3.675	3.691	-0.016	1.407	2521614	2.36		94.5	5416	
35 MeFOSA										
512.00 > 169.00	3.824	3.825	-0.001		25367	NC			154	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.833	3.842	-0.009	1.287	190506	NC			897	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.970	3.981	-0.011	1.000	60712	0.0520		104	30.0	
613.00 > 169.00	3.970	3.981	-0.011	1.000	15515		3.91(2.13-6.40)		89.4	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.979	3.981	-0.002	1.193	14954	NC			132	
D 36 13C2 PFDaA										
615.00 > 570.00	3.970	3.987	-0.017	1.520	2623504	2.33		93.0	4752	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.217	4.219	-0.002	1.416	19707	NC			77.0	
699.00 > 99.00	4.217	4.219	-0.002	1.416	28421		0.69(0.00-0.00)		218	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.236	4.248	-0.012	1.067	59606	0.0528		106	23.7	
663.00 > 169.00	4.236	4.248	-0.012	1.067	19080		3.12(1.25-3.76)		103	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.475	4.477	-0.002	1.000	16566	0.0495		99.0	118	
713.00 > 219.00	4.475	4.477	-0.002	1.000	10381		1.60(0.71-2.13)		101	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.475	4.494	-0.019	1.713	3458173	2.41		96.2	6196	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.898	4.910	-0.012	1.000	144254	NC			31.3	
813.00 > 169.00	4.898	4.910	-0.012	1.000	25468		5.66(2.86-8.58)		195	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.898	4.917	-0.019	1.875	5608358	1.97		78.7	5439	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.252	5.261	-0.009	1.072	107754	NC			15.2	
913.00 > 169.00	5.252	5.261	-0.009	1.072	12551		8.59(3.83-11.48)		133	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_005.d

Injection Date: 10-Aug-2018 16:41:09

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 21

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

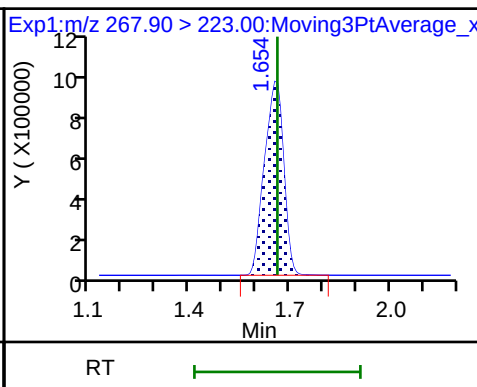
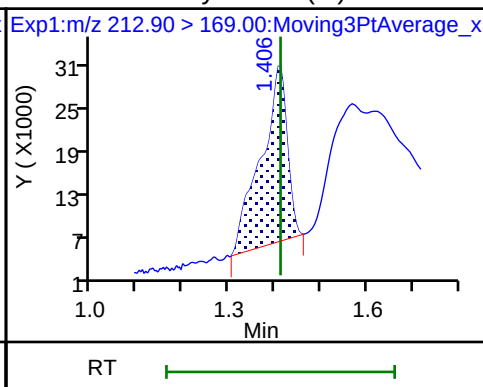
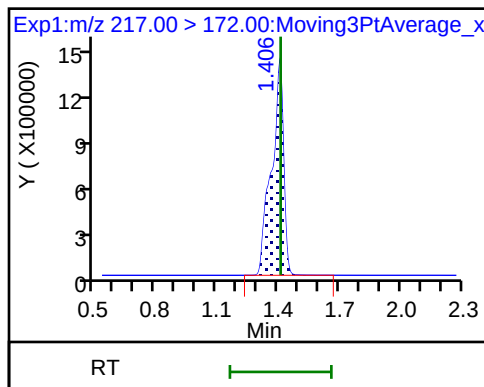
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

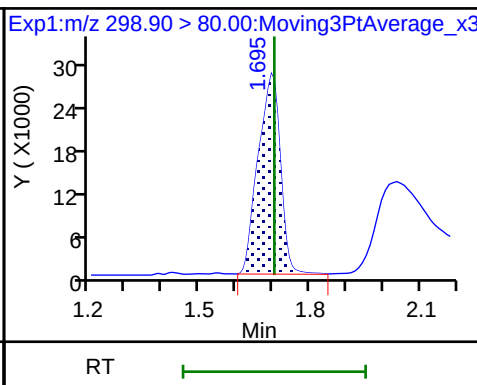
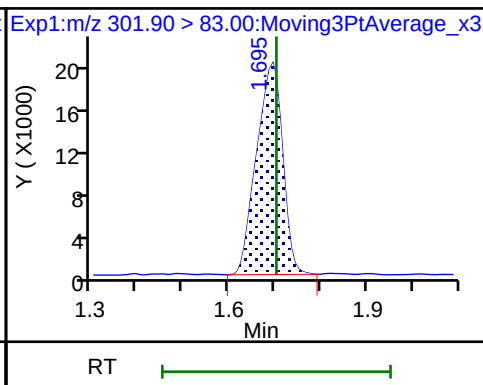
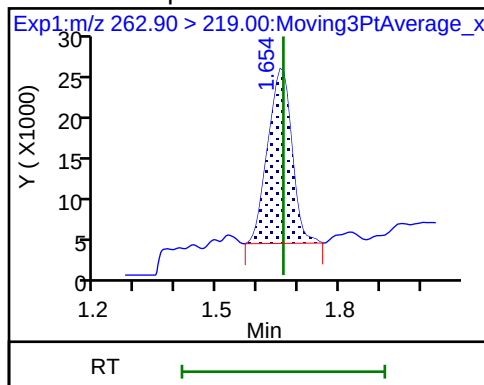
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

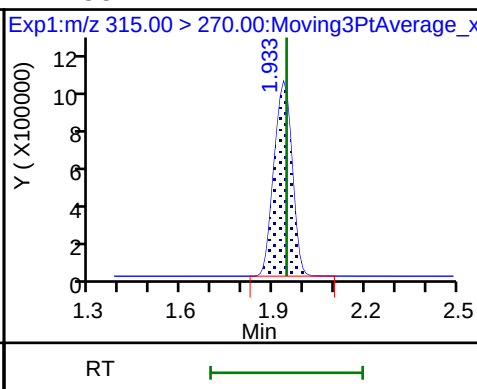
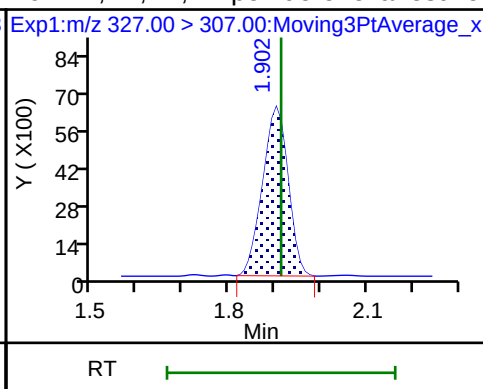
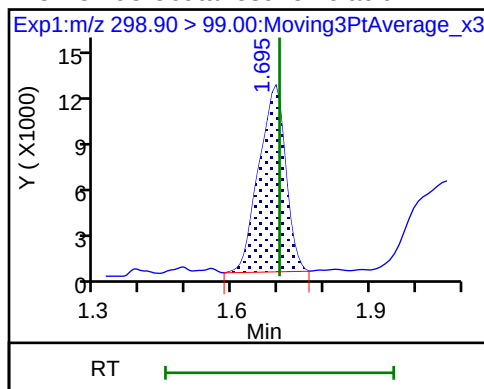
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

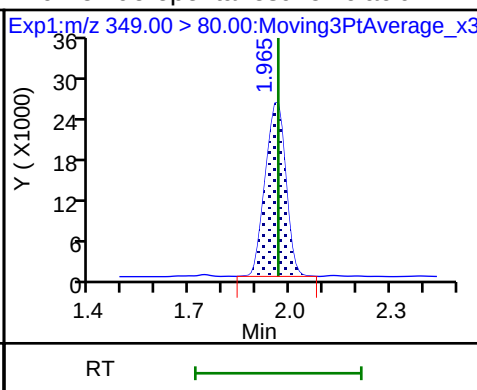
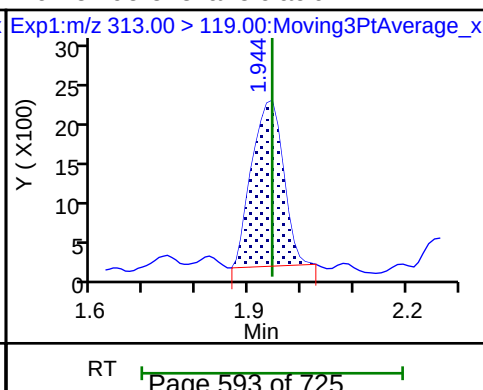
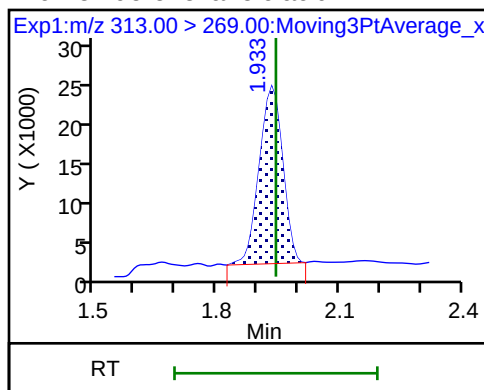
D 7 13C2 PFHxA

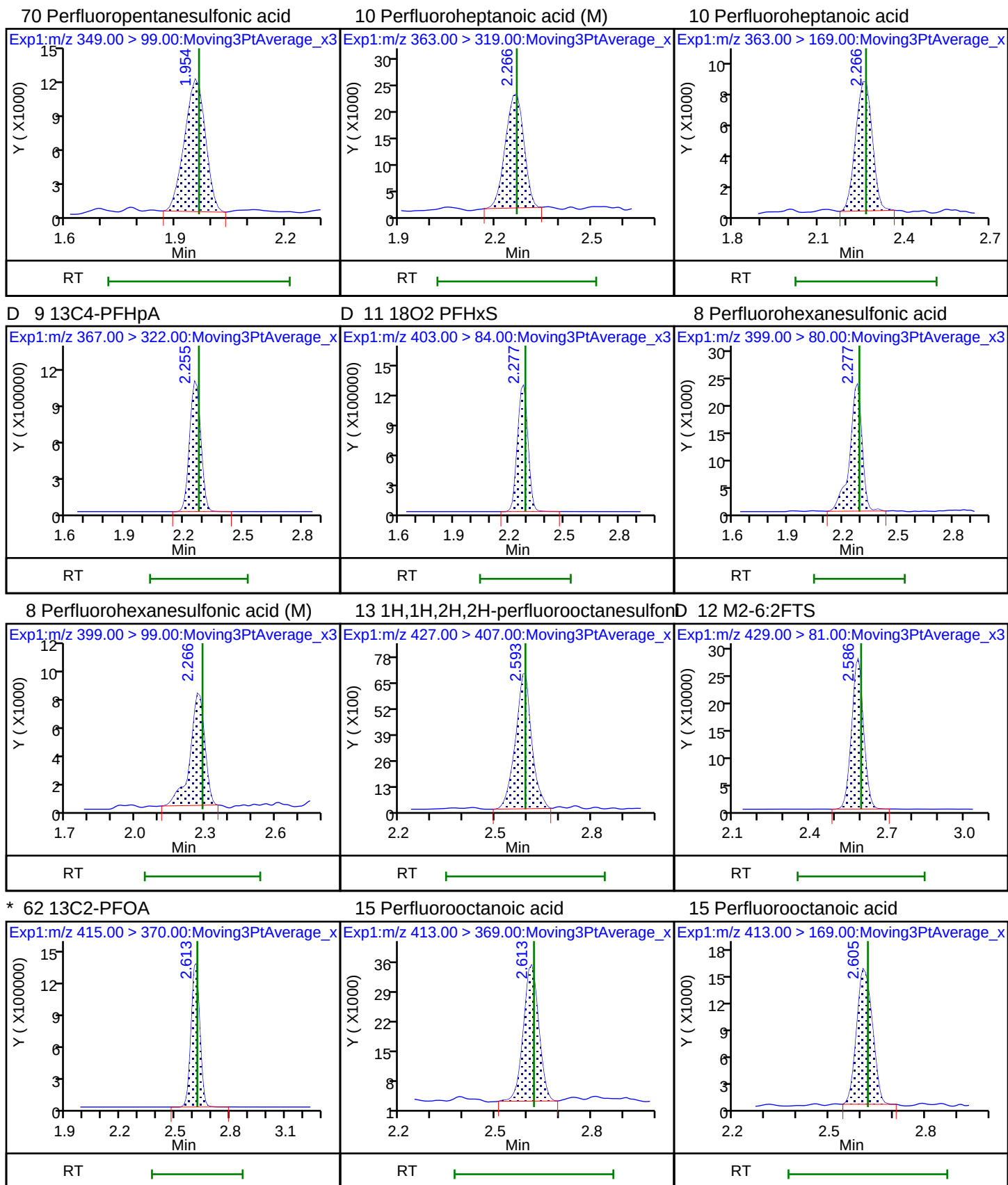


6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

70 Perfluoropentanesulfonic acid

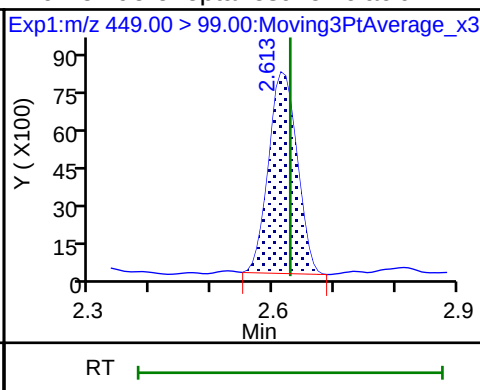
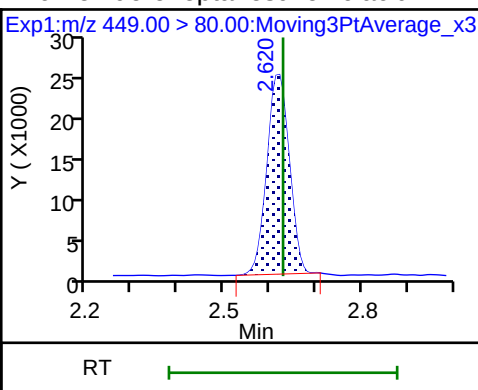
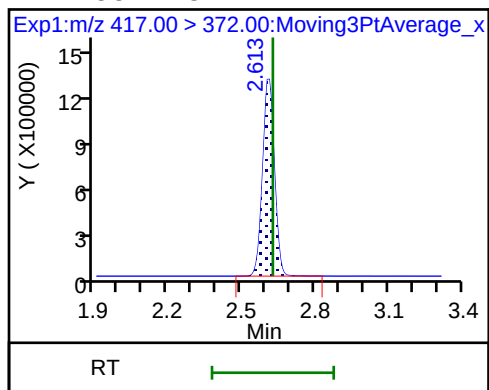




D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

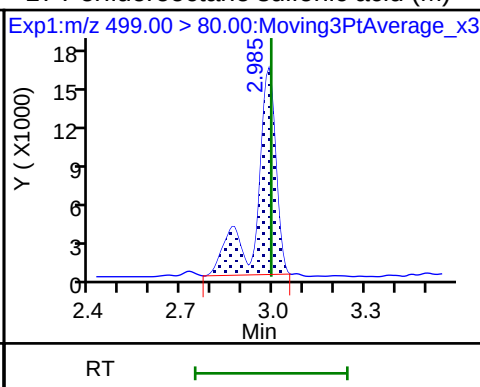
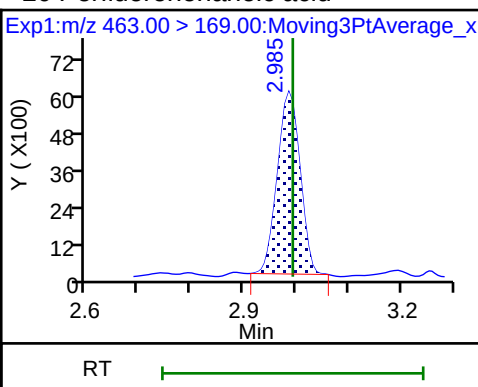
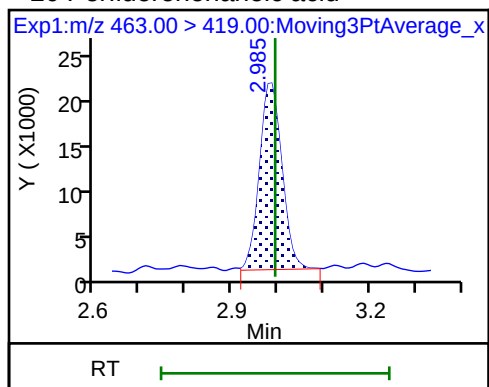
16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid

20 Perfluorononanoic acid

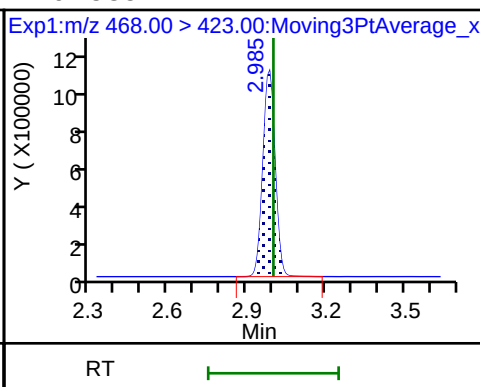
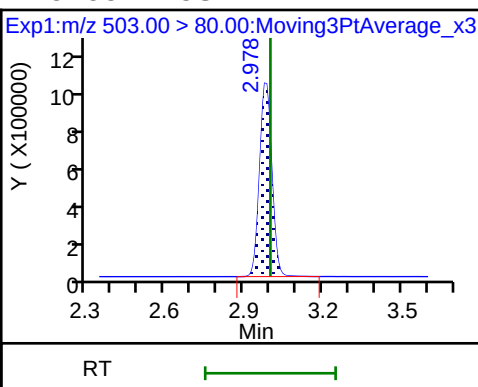
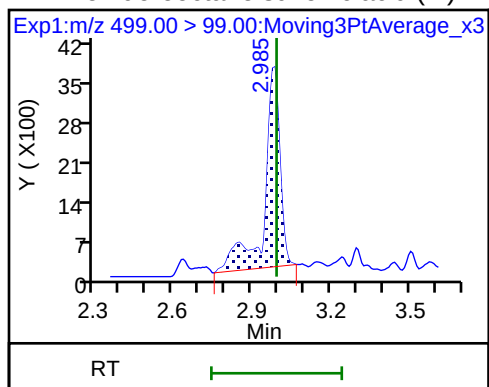
17 Perfluorooctane sulfonic acid (M)



17 Perfluorooctane sulfonic acid (M)

D 18 13C4 PFOS

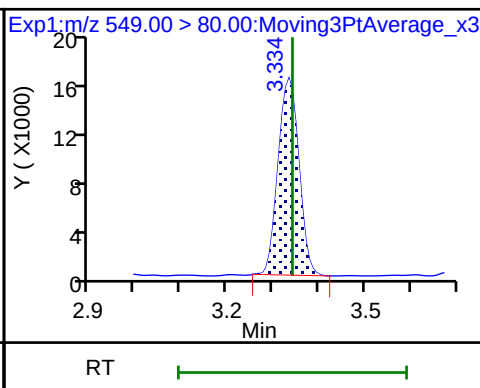
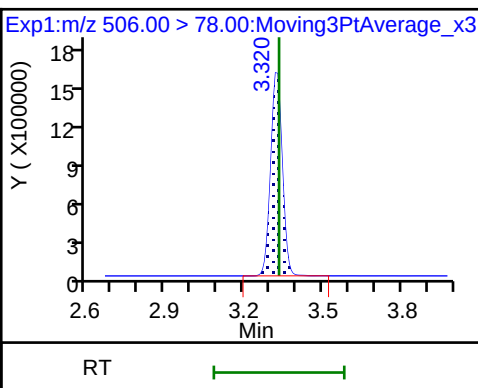
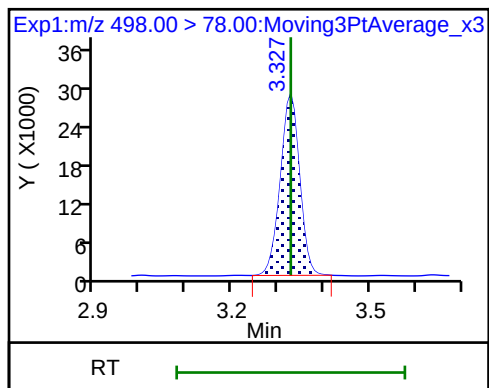
D 19 13C5 PFNA



22 Perfluorooctane Sulfonamide

D 21 13C8 FOSA

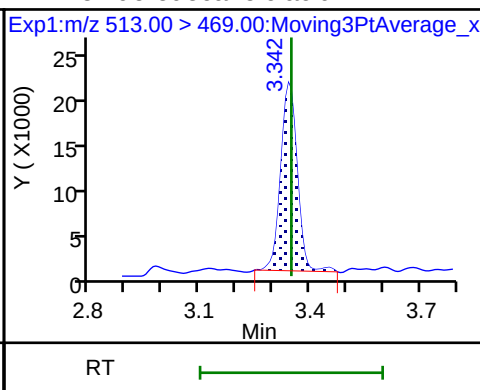
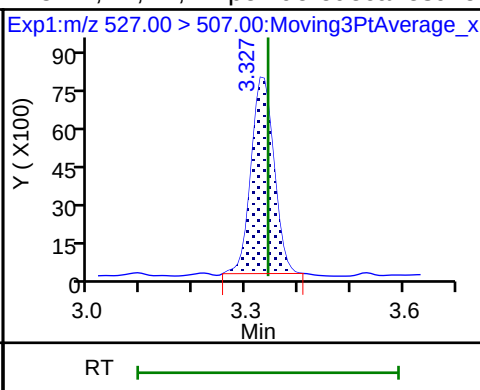
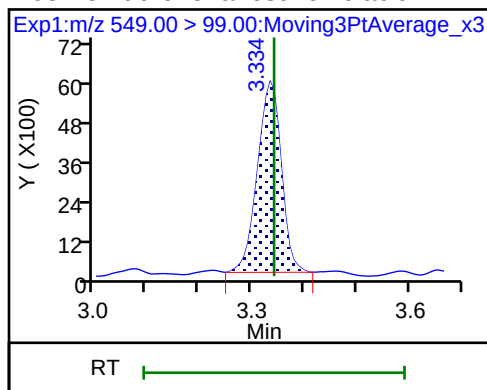
68 Perfluorononanesulfonic acid



68 Perfluorononanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

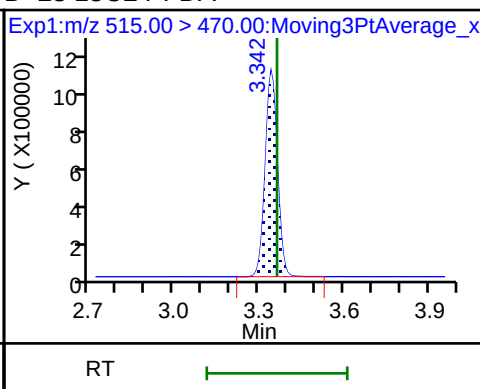
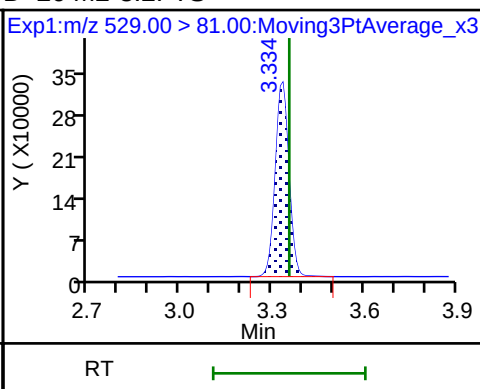
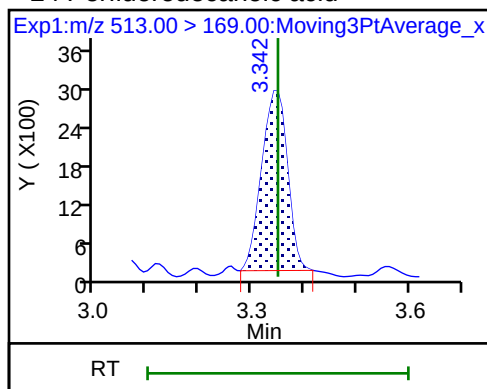
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 26 M2-8:2FTS

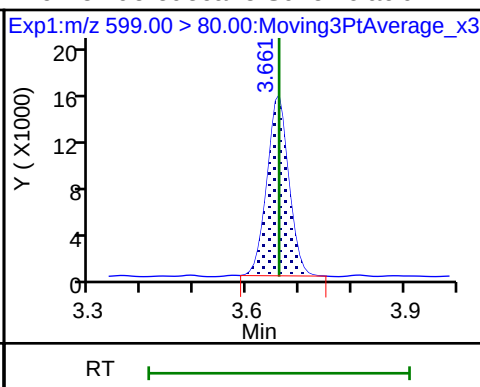
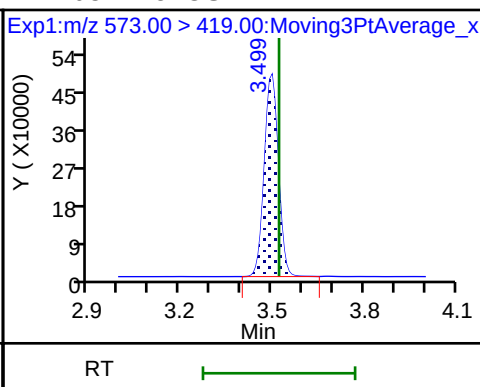
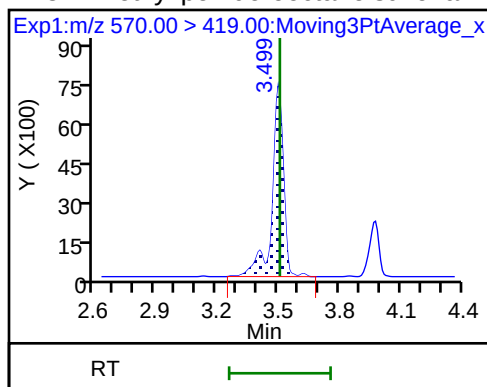
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamid

D 27 d3-NMeFOSAA

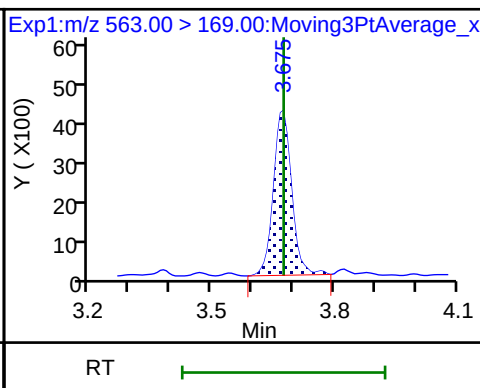
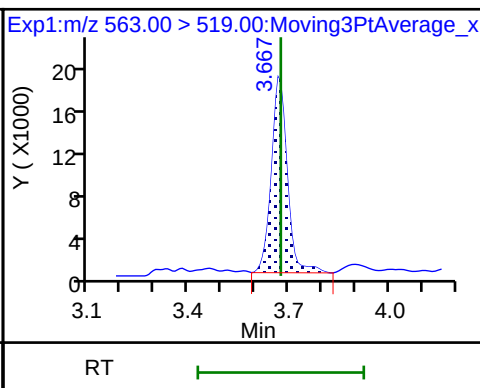
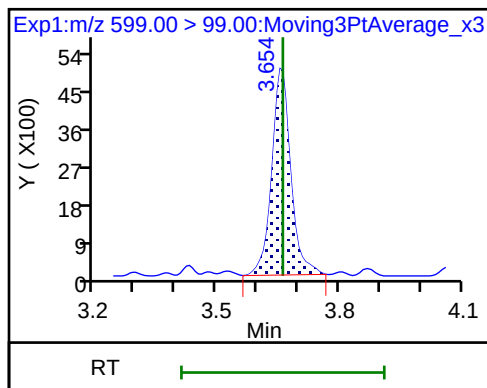
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

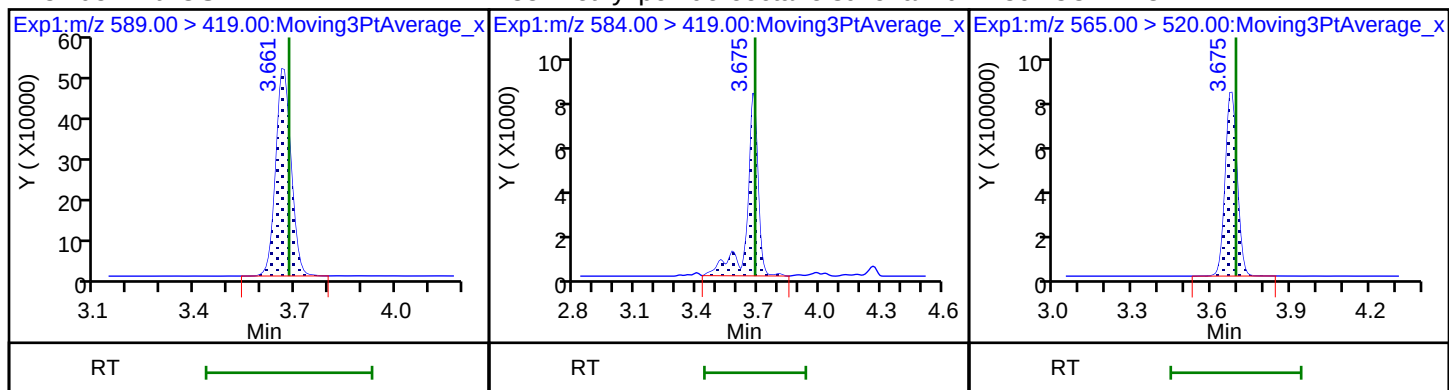
31 Perfluoroundecanoic acid

31 Perfluoroundecanoic acid



D 32 d5-NEtFOSAA

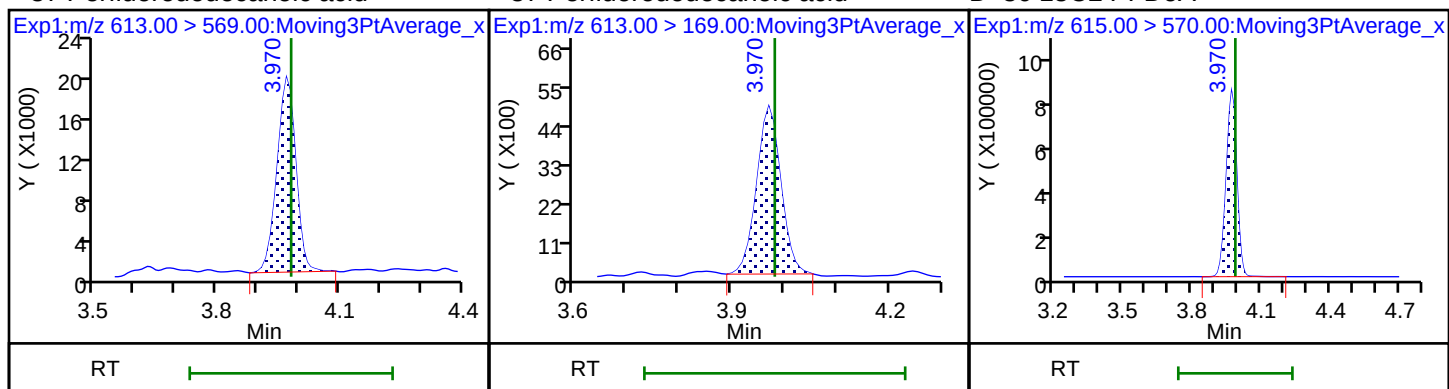
33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

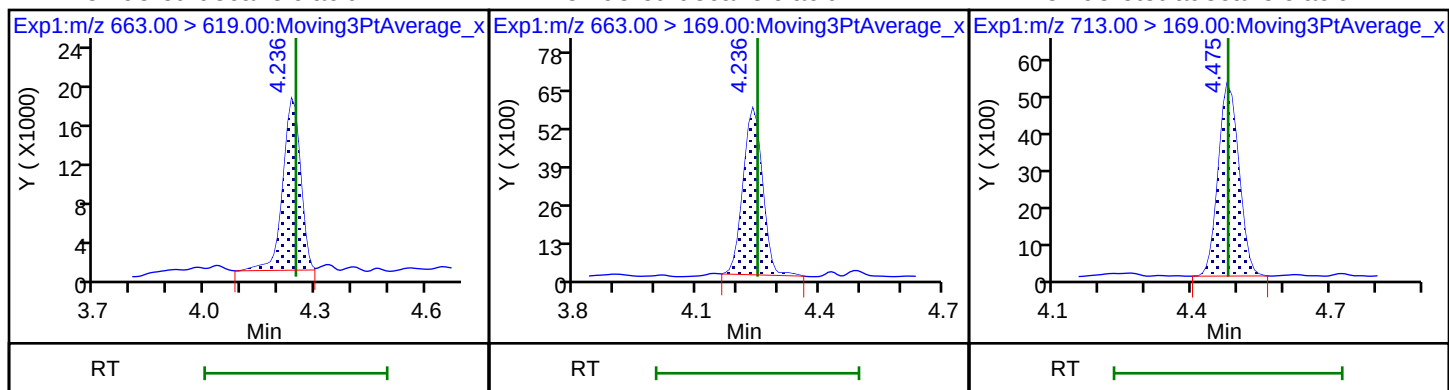
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

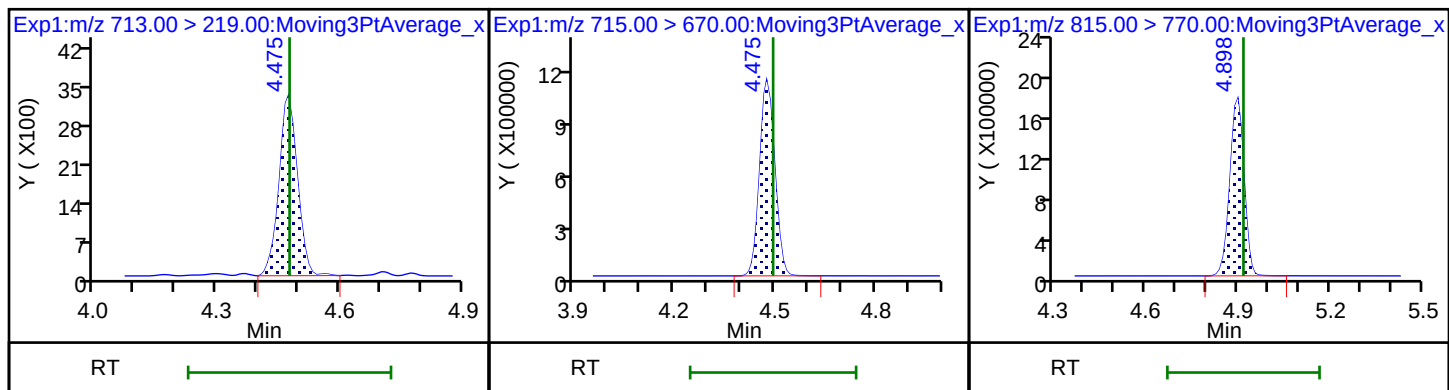
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento

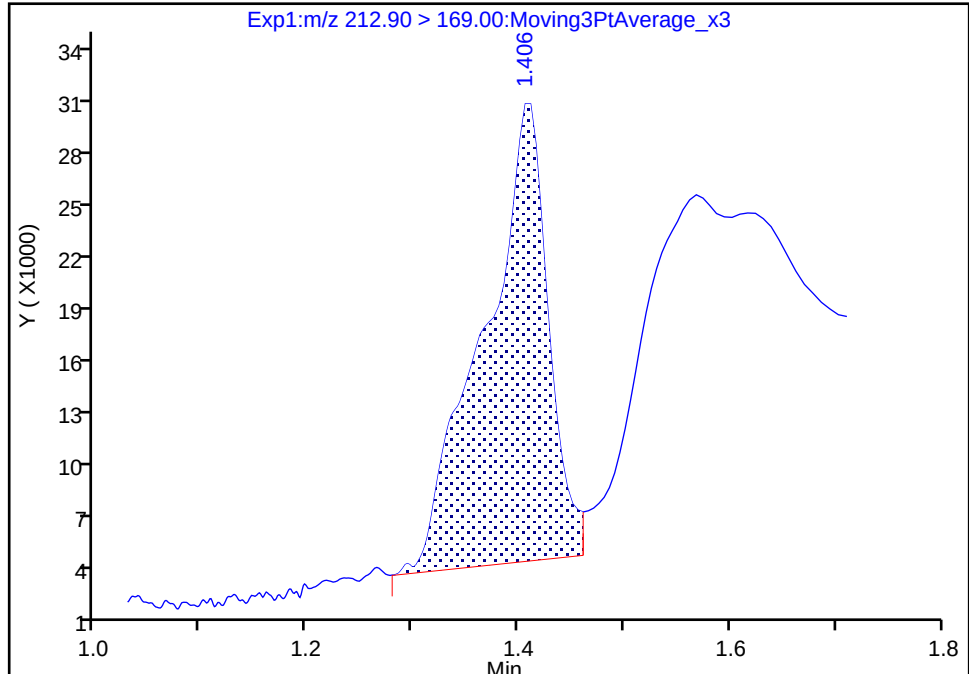
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_005.d
Injection Date: 10-Aug-2018 16:41:09 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

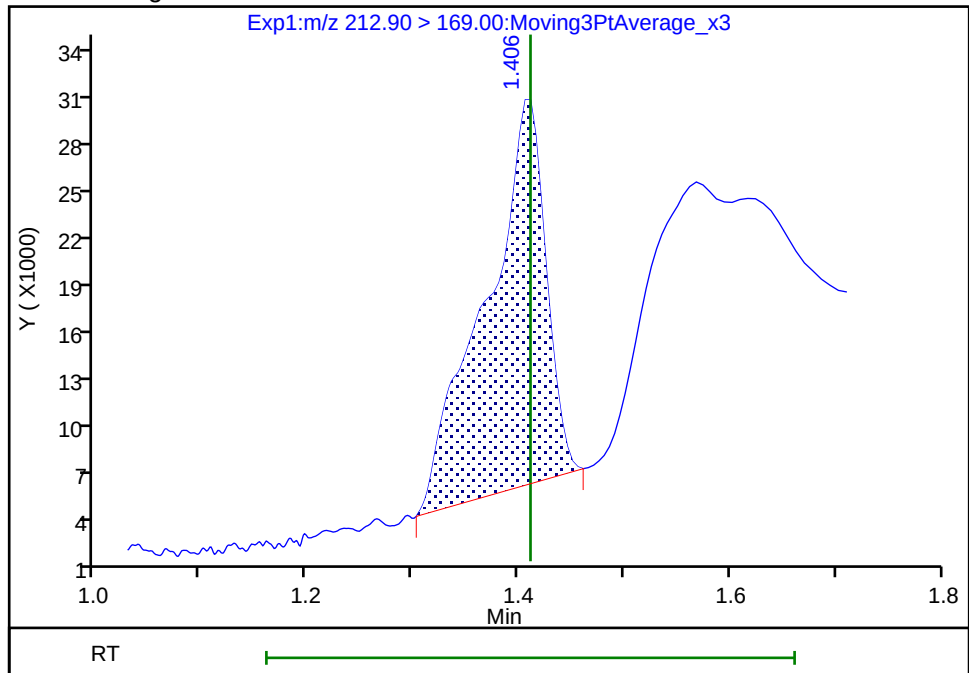
RT: 1.41
Area: 108796
Amount: 0.051993
Amount Units: ng/ml

Processing Integration Results



RT: 1.41
Area: 94708
Amount: 0.045260
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 13-Aug-2018 08:39:30
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 599 of 725

TestAmerica Sacramento

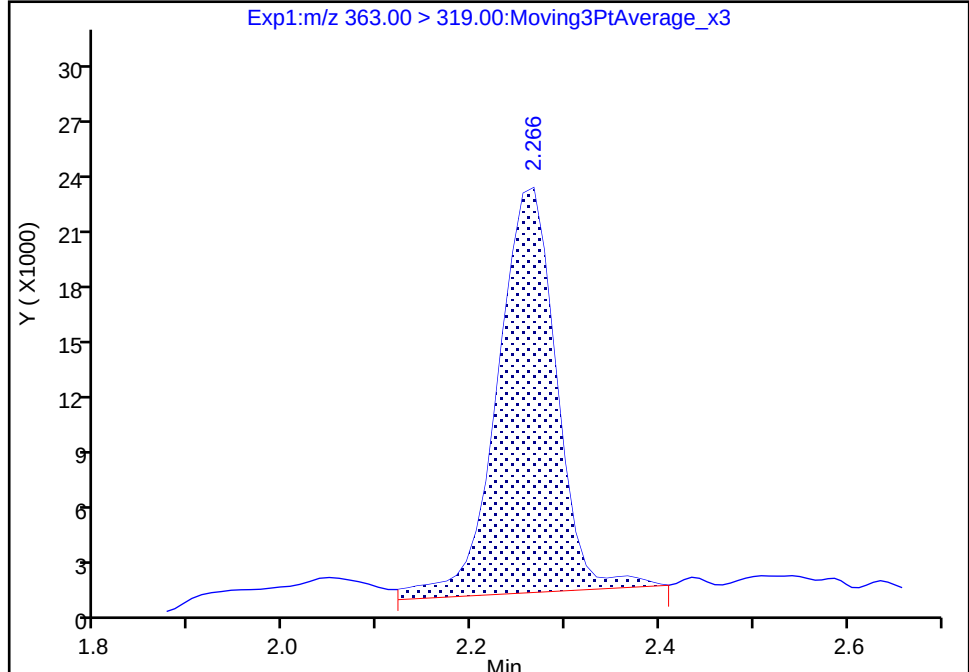
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_005.d
Injection Date: 10-Aug-2018 16:41:09 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

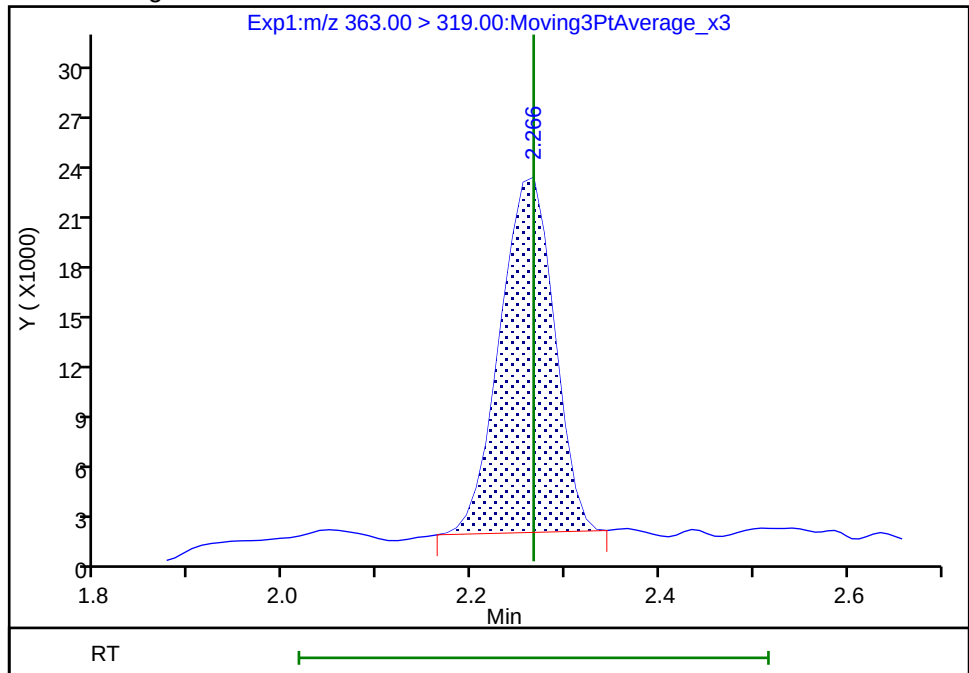
RT: 2.27
Area: 95663
Amount: 0.054600
Amount Units: ng/ml

Processing Integration Results



RT: 2.27
Area: 85175
Amount: 0.048614
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

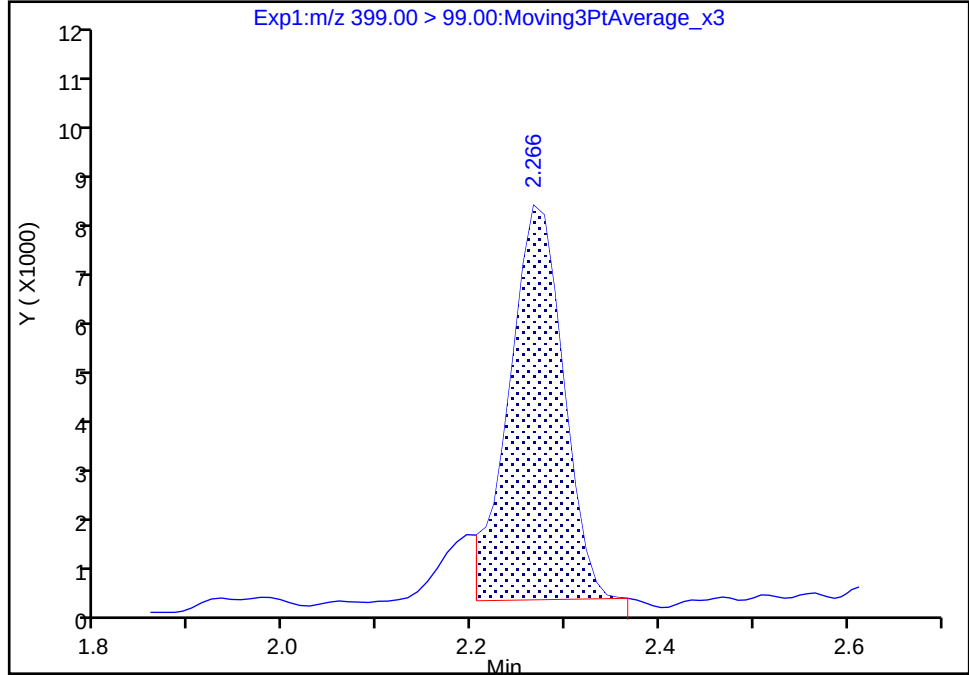
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_005.d
Injection Date: 10-Aug-2018 16:41:09 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

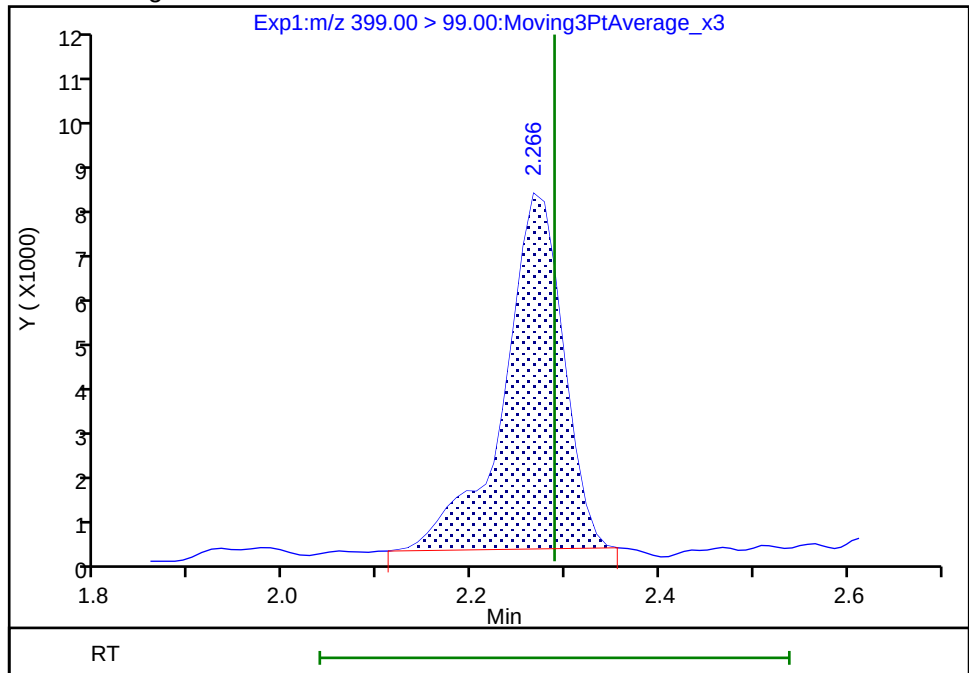
RT: 2.27
Area: 32005
Amount: 0.048080
Amount Units: ng/ml

Processing Integration Results



RT: 2.27
Area: 35211
Amount: 0.048080
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

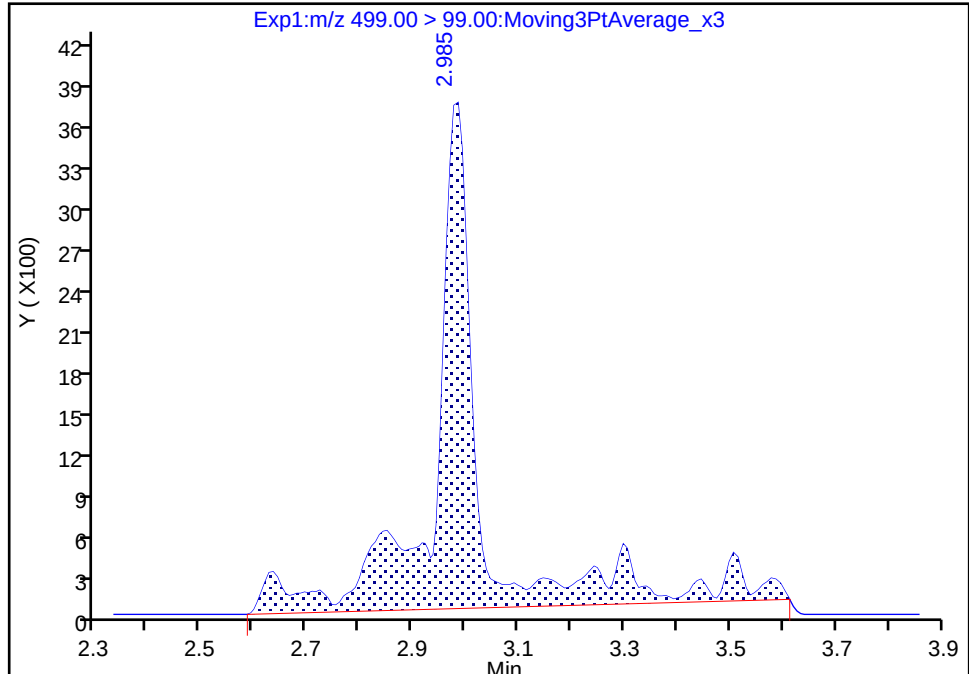
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_005.d
Injection Date: 10-Aug-2018 16:41:09 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

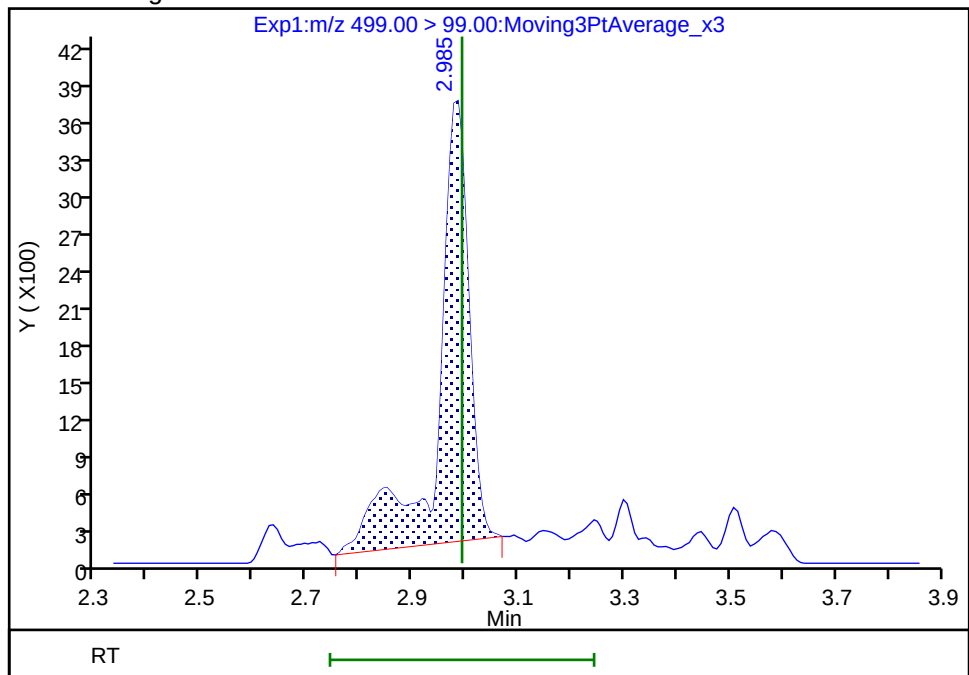
RT: 2.99
Area: 22827
Amount: 0.050012
Amount Units: ng/ml

Processing Integration Results



RT: 2.99
Area: 14456
Amount: 0.046847
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 13-Aug-2018 08:39:00
Audit Action: Manually Integrated

Audit Reason: Baseline
Page 602 of 725

TestAmerica Sacramento

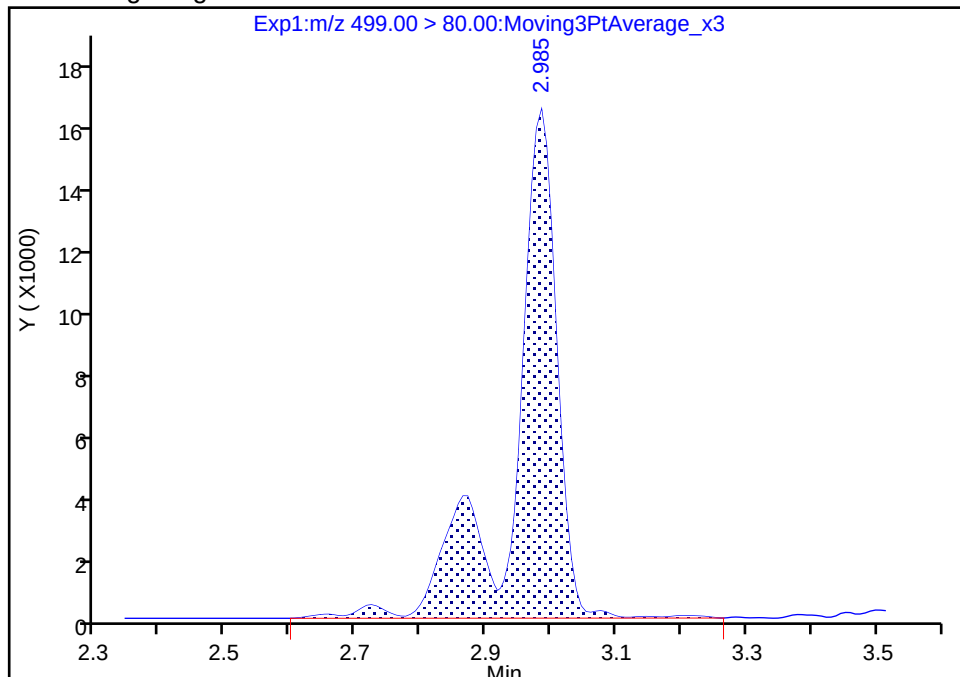
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_005.d
Injection Date: 10-Aug-2018 16:41:09 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 21 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

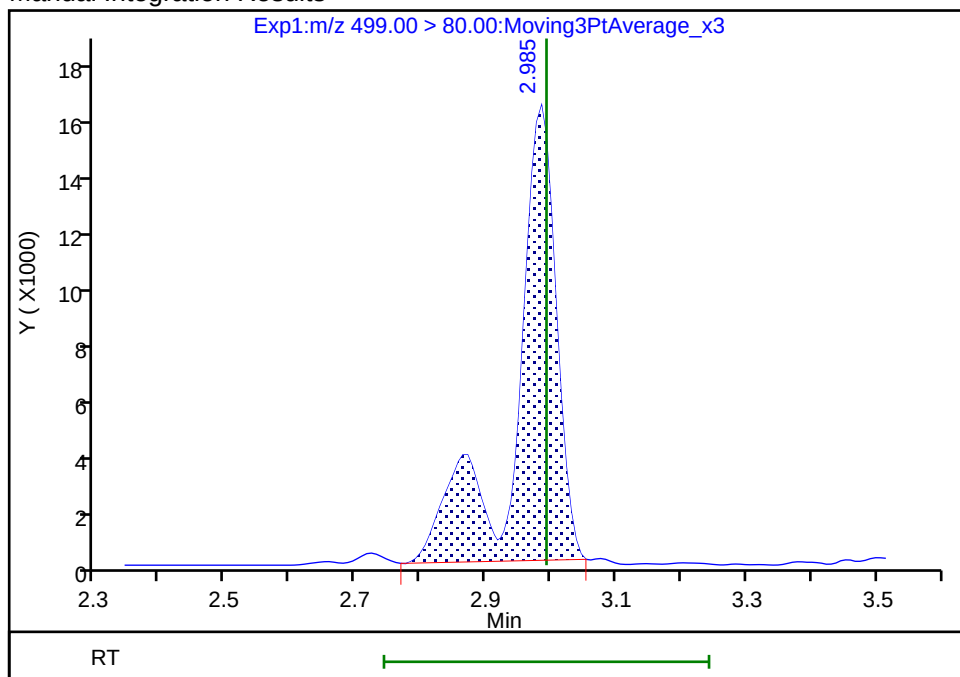
RT: 2.99
Area: 75734
Amount: 0.050012
Amount Units: ng/ml

Processing Integration Results



RT: 2.99
Area: 70940
Amount: 0.046847
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 13-Aug-2018 08:39:08

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239308/3 Calibration Date: 08/10/2018 16:48

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLAAAX_045.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9018		2.40	2.50	-3.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.117		2.45	2.50	-1.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	75.51		2.20	2.21	-0.6	30.0
4:2 FTS	AveID	16.57	15.65		2.20	2.34	-5.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9815		2.40	2.50	-3.8	30.0
Perfluoropentanesulfonic acid	AveID	68.92	70.76		2.41	2.35	2.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.092		2.57	2.50	2.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.038		2.18	2.28	-4.3	30.0
6:2 FTS	AveID	1.573	1.579		2.38	2.37	0.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.122		2.48	2.50	-0.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.313		2.52	2.38	6.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.019		2.42	2.50	-3.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.082		2.34	2.32	0.8	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9690		2.49	2.50	-0.5	30.0
8:2 FTS	AveID	1.299	1.264		2.33	2.40	-2.7	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.8054		2.57	2.40	7.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.998		2.49	2.50	-0.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9599		2.49	2.50	-0.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6676		2.55	2.41	5.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	0.9921		2.21	2.50	-11.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8298		2.33	2.50	-6.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.089		2.45	2.50	-2.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.097		2.55	2.50	2.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2401		2.48	2.50	-0.8	30.0
13C4 PFBA	Ave	1.385	1.363		2.46	2.50	-1.6	30.0
13C5 PFPeA	Ave	0.9537	0.8970		2.35	2.50	-5.9	30.0
13C3-PFBS	Ave	0.0221	0.0211		2.22	2.33	-4.4	30.0
13C2 PFHxA	Ave	1.082	1.032		2.38	2.50	-4.6	30.0
13C4-PFHpA	Ave	1.065	0.9773		2.29	2.50	-8.2	30.0
18O2 PFHxS	Ave	1.366	1.258		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2242	0.2159		2.29	2.38	-3.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239308/3 Calibration Date: 08/10/2018 16:48
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLAAAX_045.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9682		2.48	2.50	-0.9	30.0
13C4 PFOS	Ave	0.8973	0.8474		2.26	2.39	-5.6	30.0
13C5 PFNA	Ave	0.8770	0.8312		2.37	2.50	-5.2	30.0
13C8 FOSA	Ave	1.188	1.183		2.49	2.50	-0.5	30.0
M2-8:2FTS	Ave	0.2707	0.2500		2.21	2.40	-7.7	30.0
13C2 PFDA	Ave	0.7695	0.7349		2.39	2.50	-4.5	30.0
d3-NMeFOSAA	Ave	0.3935	0.3743		2.38	2.50	-4.9	30.0
d5-NEtFOSAA	Ave	0.4077	0.4089		2.51	2.50	0.3	30.0
13C2 PFUnA	Ave	0.6189	0.6107		2.47	2.50	-1.3	30.0
13C2 PFDoA	Ave	0.6541	0.6256		2.39	2.50	-4.4	30.0
13C2-PFTeDA	Ave	0.8335	0.8579		2.57	2.50	2.9	30.0
13C2-PFHxDA	Ave	1.653	1.423		2.15	2.50	-13.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_045.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 10-Aug-2018 16:48:58 ALS Bottle#: 14 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 13-Aug-2018 08:57:02 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK026

First Level Reviewer: roycea

Date: 12-Aug-2018 12:19:30

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	1.409	1.411	-0.002	0.538	5324931	2.46		98.4	6490	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.409	1.409	0.0	1.000	4802240	2.40		96.1	287	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.660	1.662	-0.002	0.634	3505519	2.35		94.1	6663	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.660	1.660	0.0	1.000	3916632	2.45		98.2	217	
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.702	-0.010	0.647	76599	2.22		95.6	272	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.700	1.700	0.0	1.005	5497947	2.20		99.4	472	
298.90 > 99.00	1.700	1.700	0.0	1.005	2315437		2.37(1.25-3.74)		372	
D 60 M2-4:2FTS										
329.00 > 81.00	1.898	1.912	-0.014	0.725	544705	NC			729	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.898	1.898	0.0	1.122	1203616	2.20		94.4	5803	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.943	-0.004	0.741	4032604	2.38		95.4	8653	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.939	0.0	1.000	3957793	2.40		96.2	567	
313.00 > 119.00	1.939	1.939	0.0	1.000	354327		11.17(5.03-15.10)		447	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.960	1.960	0.0	1.158	5467116	2.41		103	6484	
349.00 > 99.00	1.960	1.960	0.0	1.158	2002930		2.73(1.36-4.07)		1334	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.033	2.033	0.0	1.000	711527	NC			294	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.033	2.048	-0.015	0.777	282966	NC			798	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.258	2.258	0.0	1.000	4169956	2.57		103	642	
363.00 > 169.00	2.258	2.258	0.0	1.000	1539550		2.71(1.13-3.40)		1703	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.277	-0.019	0.863	3819196	2.29		91.8	7422	
D 11 18O2 PFHxS										
403.00 > 84.00	2.281	2.288	-0.008	0.872	4651512	2.18		92.1	6106	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.281	0.0	1.000	4643621	2.18		95.7	3501	
399.00 > 99.00	2.281	2.281	0.0	1.000	1562628		2.97(1.50-4.49)		943	
65 ADONA										
377.00 > 251.00	2.303	2.303	0.0	0.771	11204174	NC			11128	
377.00 > 85.00	2.303	2.303	0.0	0.771	6956701		1.61(0.84-2.53)		5641	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.588	2.588	0.0	1.000	1262607	2.38		100	2304	
D 12 M2-6:2FTS										
429.00 > 81.00	2.588	2.599	-0.010	0.989	801498	2.29		96.3	1695	
D 73 13C8 PFOA										
421.00 > 376.00	2.609	2.620	-0.011	0.997	6902470	NC			10543	
* 62 13C2-PFOA										
415.00 > 370.00	2.616	2.616	0.0		3907854	2.50			4624	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.616	2.616	0.0	1.000	4248178	2.48		99.2	360	
413.00 > 169.00	2.616	2.616	0.0	1.000	2158466		1.97(0.84-2.52)		1991	
D 14 13C4 PFOA										
417.00 > 372.00	2.616	2.627	-0.011	1.000	3783435	2.48		99.1	5519	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.624	2.624	0.0	0.879	4139461	2.52		106	3737	
449.00 > 99.00	2.616	2.624	-0.008	0.876	1120859		3.69(1.94-5.82)		1248	
20 Perfluorononanoic acid										
463.00 > 419.00	2.986	2.986	0.0	1.000	3309672	2.42		96.7	738	
463.00 > 169.00	2.986	2.986	0.0	1.000	783222		4.23(1.90-5.69)		1530	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.986	2.986	0.0	1.000	3325557	2.34		101	2203	
499.00 > 99.00	2.986	2.986	0.0	1.000	740052		4.49(2.31-6.93)		1066	
D 18 13C4 PFOS										
503.00 > 80.00	2.986	3.000	-0.014	1.141	3165896	2.26		94.4	3417	
D 19 13C5 PFNA										
468.00 > 423.00	2.986	3.000	-0.014	1.141	3248117	2.37		94.8	6253	
D 72 13C8 PFOS										
507.00 > 99.00	2.979	3.000	-0.021	1.139	1560857	NC			3964	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.196	3.196	0.0	1.070	5603954	NC			4790	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.328	3.328	0.0	1.002	4480126	2.49		99.5	5324	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.321	3.333	-0.012	1.269	4623248	2.49		99.5	6600	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.335	3.335	0.0	1.117	2560402	2.57		107	3885	
549.00 > 99.00	3.335	3.335	0.0	1.117	902785		2.84(1.33-3.97)		2064	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.335	3.335	0.0	1.000	1182621	2.33		97.3	3232	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.350	3.350	0.0	1.002	2866529	2.49		99.5	1252	
513.00 > 169.00	3.350	3.350	0.0	1.002	500781		5.72(2.36-7.09)		395	
D 26 M2-8:2FTS										
529.00 > 81.00	3.335	3.355	-0.020	1.275	935813	2.21		92.3	1953	
D 23 13C2 PFDA										
515.00 > 470.00	3.342	3.363	-0.021	1.278	2871879	2.39		95.5	6921	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.508	3.508	0.0	1.002	1403804	2.49		99.5	891	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.500	3.522	-0.022	1.338	1462526	2.38		95.1	2192	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.656	3.656	0.0	1.224	2131071	2.55		106	5681	
599.00 > 99.00	3.656	3.656	0.0	1.224	717508		2.97(1.39-4.16)		2613	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.670	3.670	0.0	0.998	2367664	2.21		88.3	1113	
563.00 > 169.00	3.677	3.670	0.007	1.000	452137		5.24(2.12-6.36)		1580	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.670	3.682	-0.012	1.403	1597952	2.51		100	1706	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.677	3.677	0.0	1.002	1326035	2.33		93.1	2330	
D 30 13C2 PFUnA										
565.00 > 520.00	3.677	3.691	-0.014	1.405	2386598	2.47		98.7	5666	
35 MeFOSA										
512.00 > 169.00	3.827	3.827	0.0		1302948	NC			740	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.835	3.835	0.0	1.284	9291720	NC			10534	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.974	3.974	0.0	1.000	2662846	2.45		97.9	1381	
613.00 > 169.00	3.974	3.974	0.0	1.000	620230		4.29(2.13-6.40)		2055	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.974	3.974	0.0	1.192	856451	NC			4779	
D 36 13C2 PFDaA										
615.00 > 570.00	3.974	3.987	-0.013	1.519	2444884	2.39		95.6	3795	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.211	4.211	0.0	1.410	956637	NC			2850	
699.00 > 99.00	4.211	4.211	0.0	1.410	1325286		0.72(0.00-0.00)		3814	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.240	4.240	0.0	1.067	2680891	2.55		102	1084	
663.00 > 169.00	4.240	4.240	0.0	1.067	841473		3.19(1.25-3.76)		2783	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.482	4.482	0.0	1.002	805025	2.48		99.2	3284	
713.00 > 219.00	4.471	4.482	-0.011	1.000	530037		1.52(0.71-2.13)		1514	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.471	4.494	-0.023	1.709	3352504	2.57		103	6018	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.897	4.897	0.0	1.000	4928319	NC			827	
813.00 > 169.00	4.897	4.897	0.0	1.000	833371		5.91(2.86-8.58)		2890	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.897	4.917	-0.020	1.872	5561270	2.15		86.1	7174	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.251	5.251	0.0	1.072	5389811	NC			590	
913.00 > 169.00	5.251	5.251	0.0	1.072	640879		8.41(3.83-11.48)		2724	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL5_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_045.d

Injection Date: 10-Aug-2018 16:48:58

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 14

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

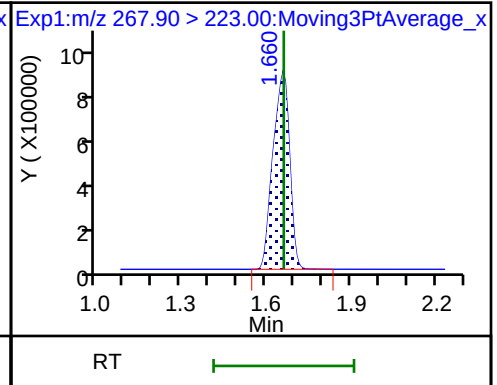
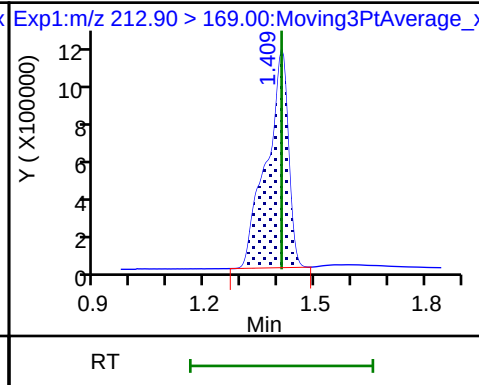
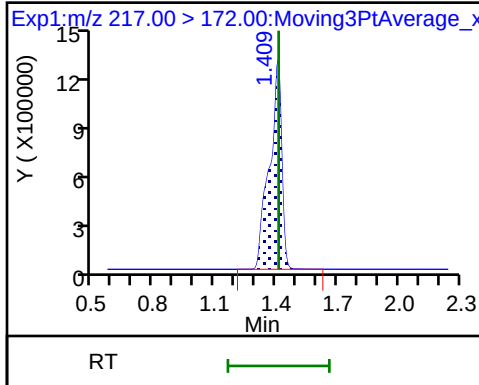
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

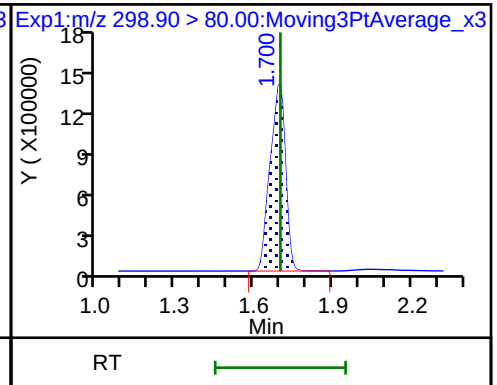
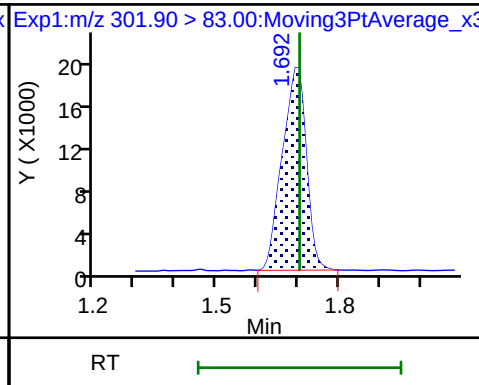
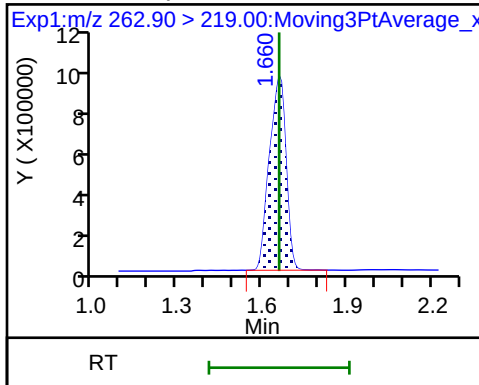
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

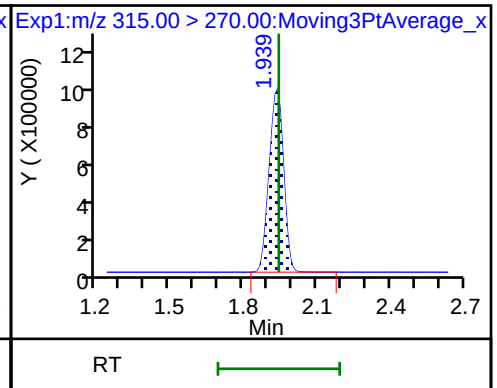
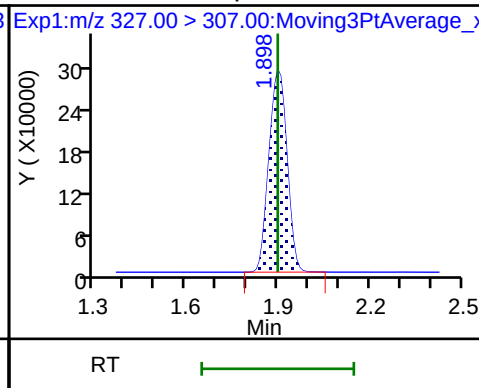
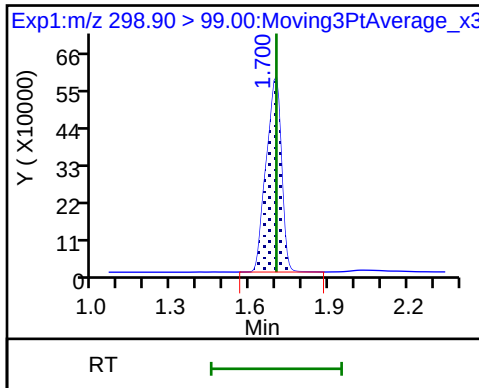
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

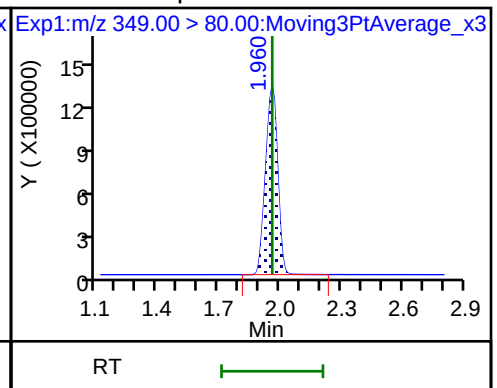
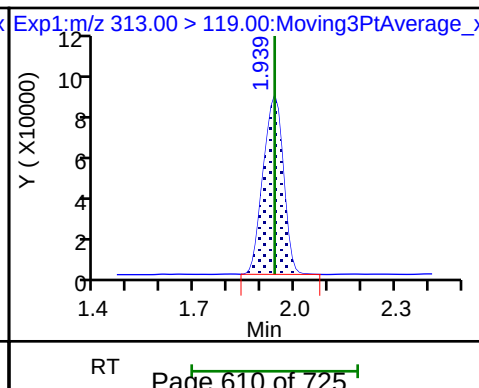
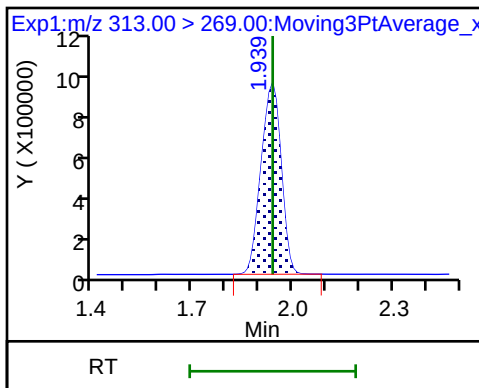
D 7 13C2 PFHxA

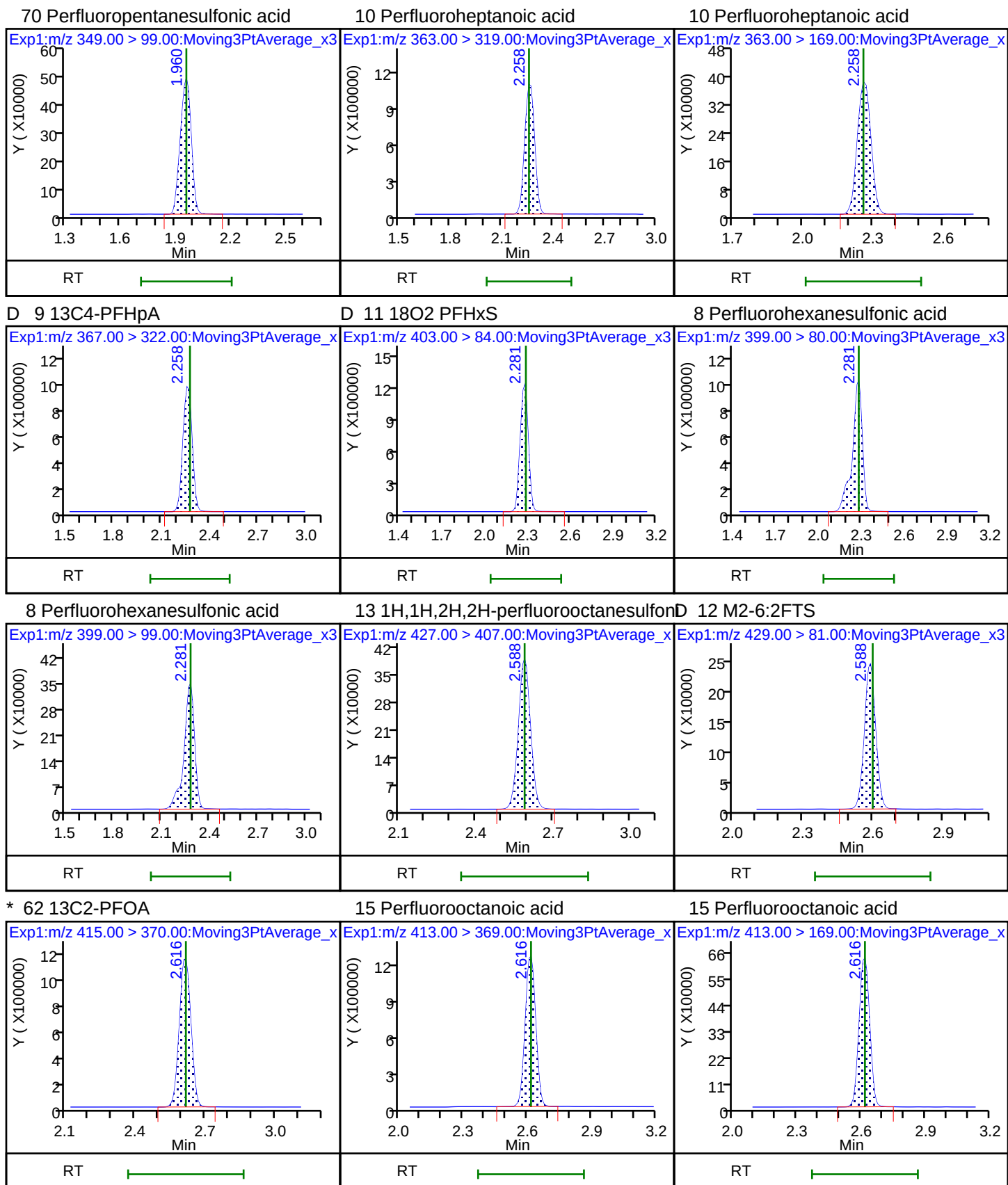


6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

70 Perfluoropentanesulfonic acid

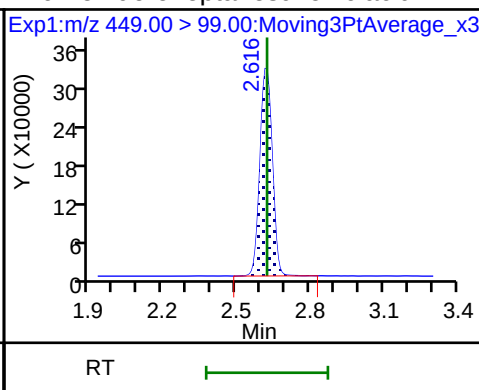
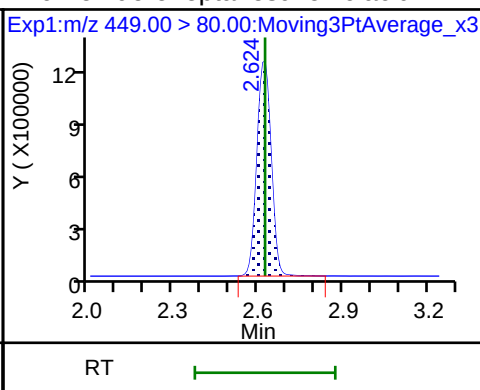
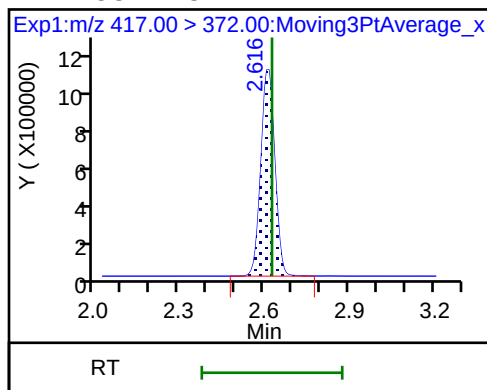




D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid

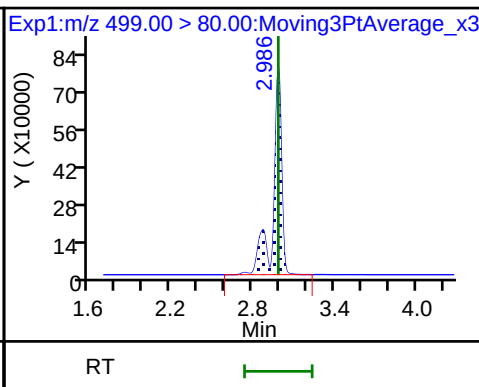
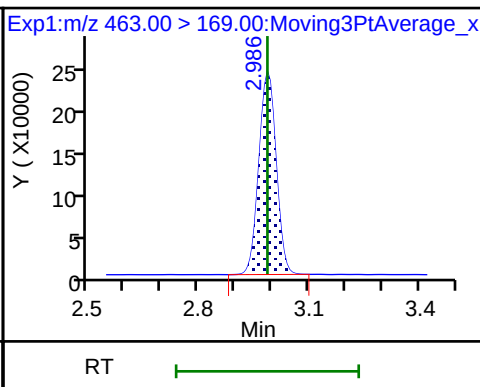
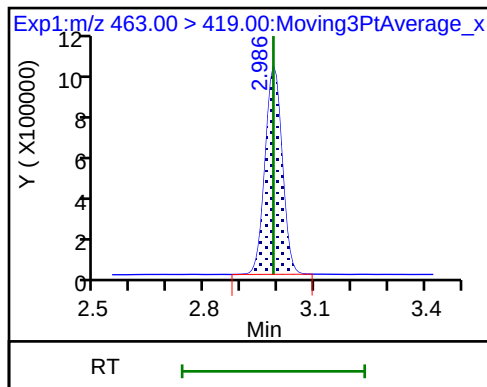
16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid

20 Perfluorononanoic acid

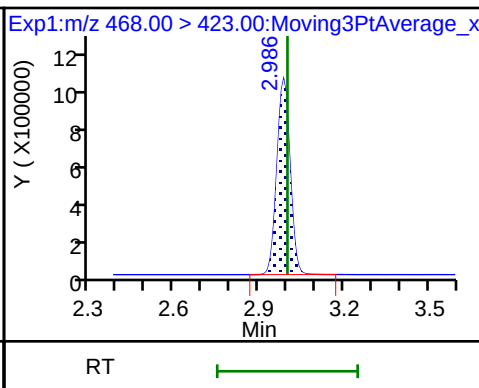
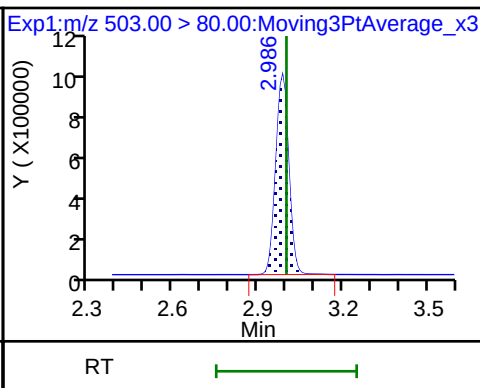
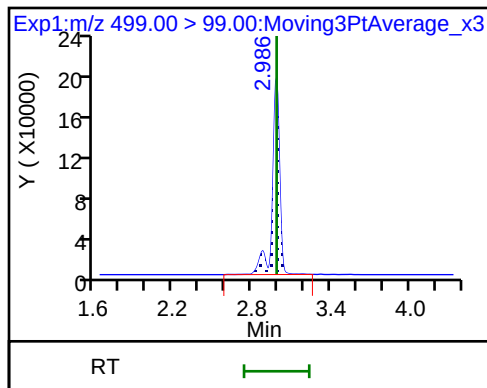
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid

D 18 13C4 PFOS

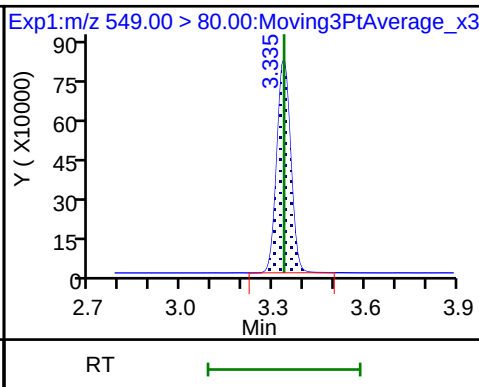
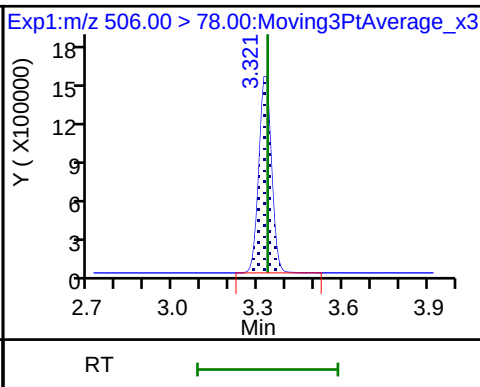
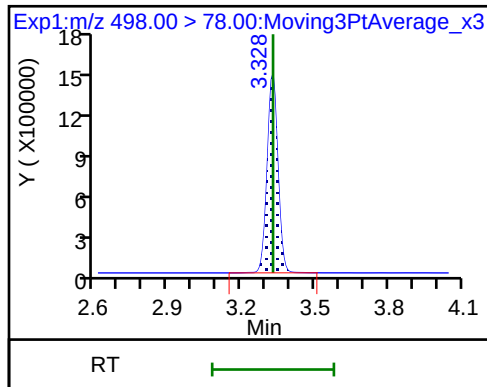
D 19 13C5 PFNA



22 Perfluorooctane Sulfonamide

D 21 13C8 FOSA

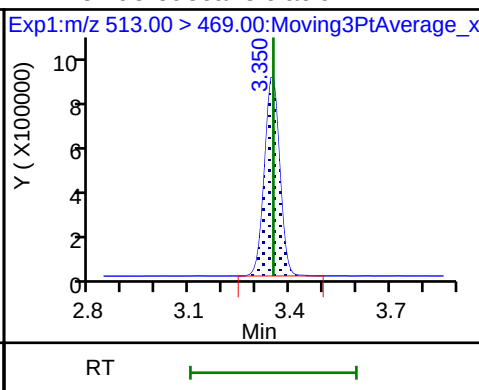
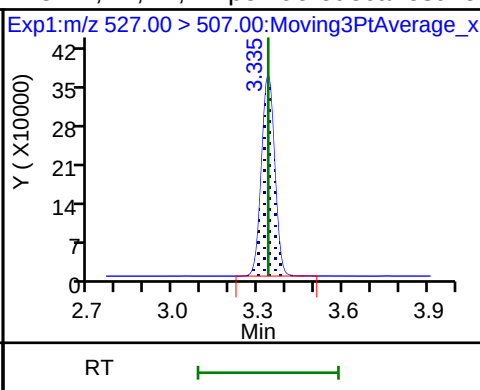
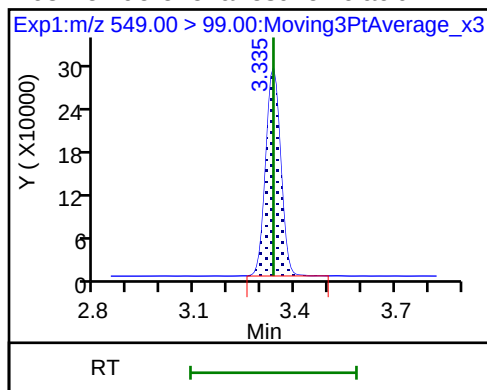
68 Perfluorononanesulfonic acid



68 Perfluorononanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

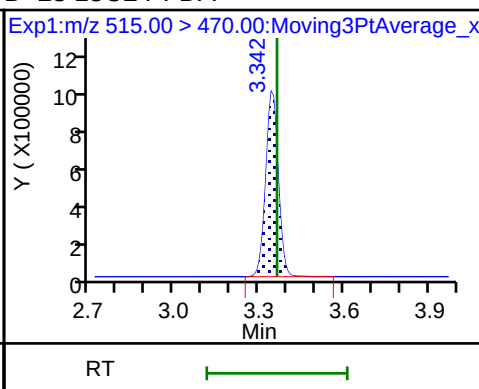
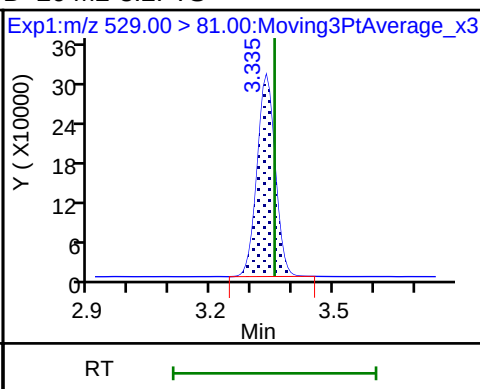
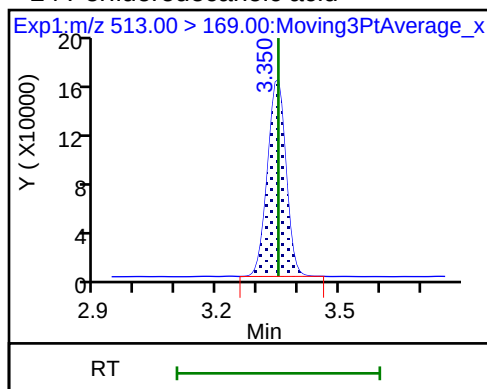
24 Perfluorodecanoic acid



24 Perfluorodecanoic acid

D 26 M2-8:2FTS

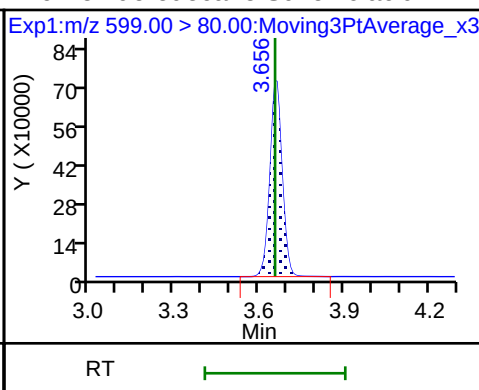
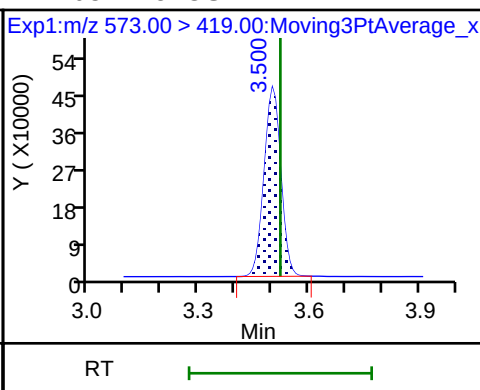
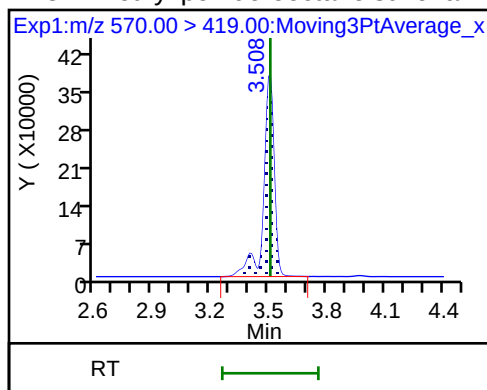
D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamid

D 27 d3-NMeFOSAA

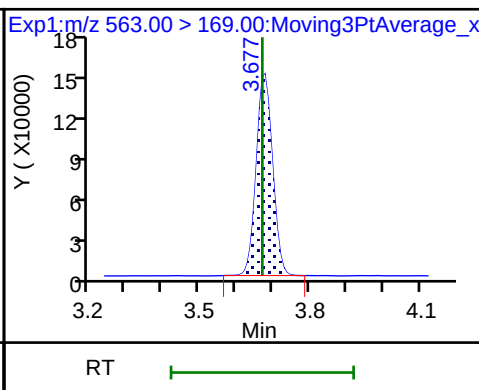
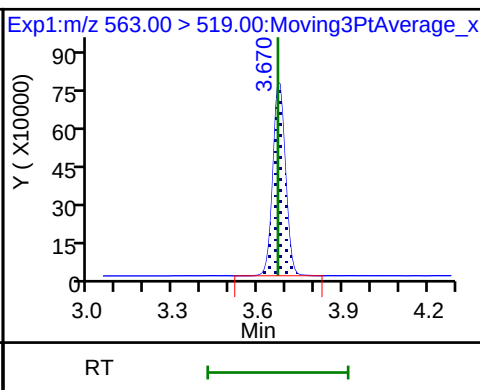
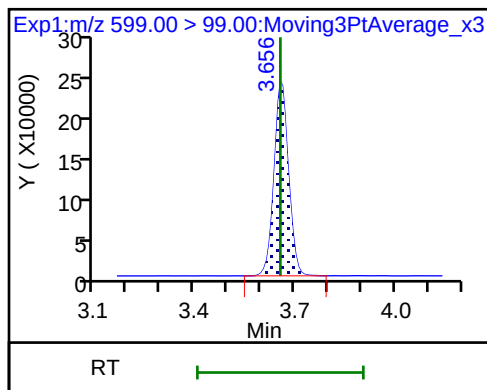
29 Perfluorodecane Sulfonic acid



29 Perfluorodecane Sulfonic acid

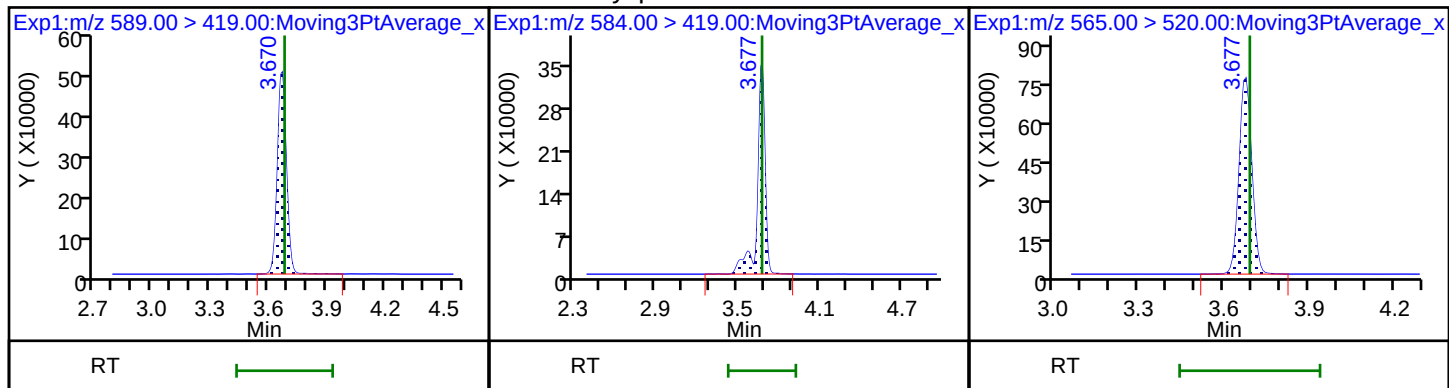
31 Perfluoroundecanoic acid

31 Perfluoroundecanoic acid



D 32 d5-NEtFOSAA

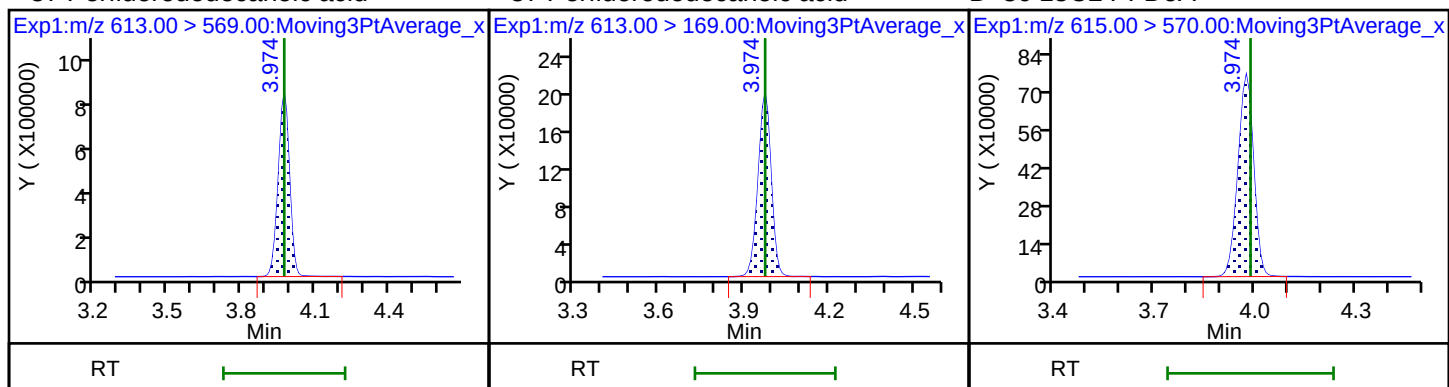
33 N-ethyl perfluorooctane sulfonamid D 30 13C2 PFUnA



37 Perfluorododecanoic acid

37 Perfluorododecanoic acid

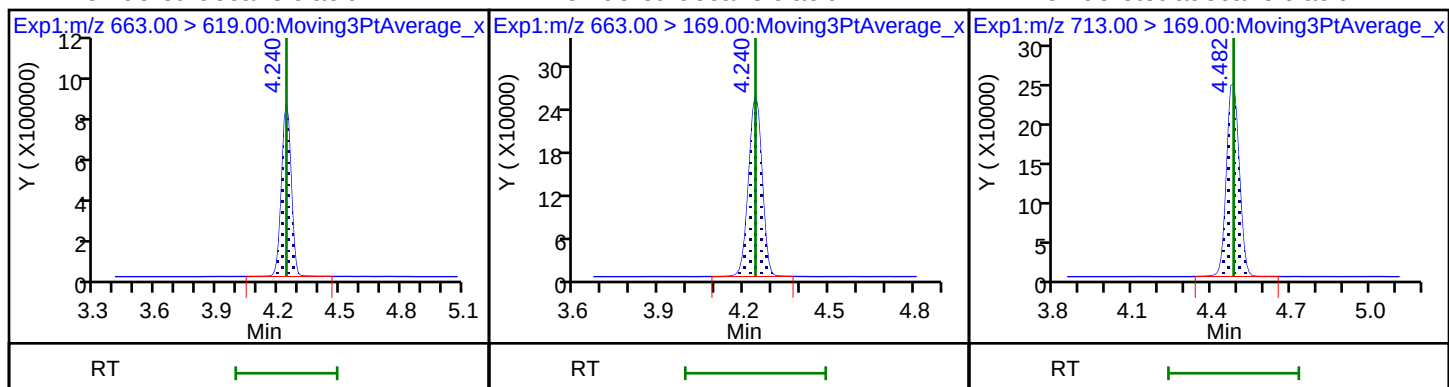
D 36 13C2 PFDa



41 Perfluorotridecanoic acid

41 Perfluorotridecanoic acid

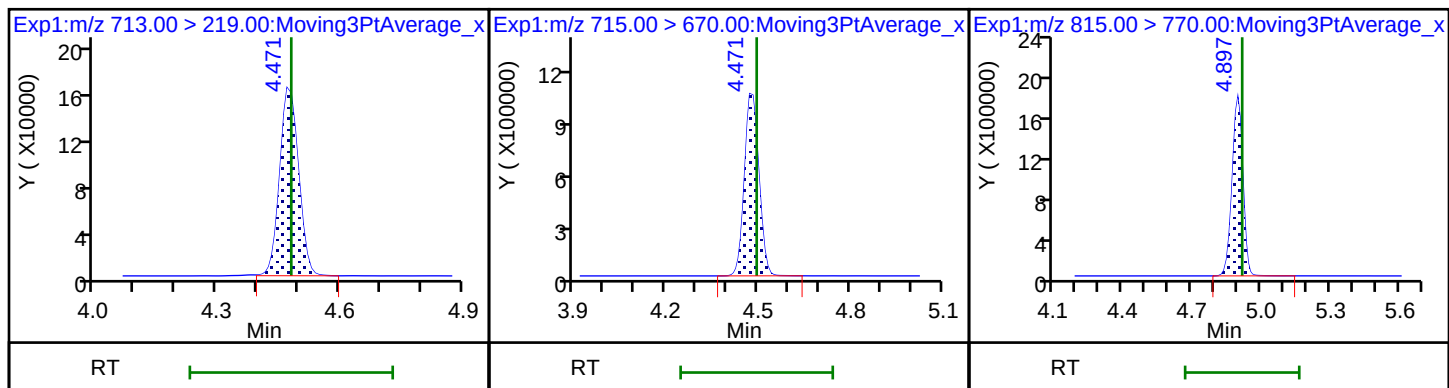
42 Perfluorotetradecanoic acid



42 Perfluorotetradecanoic acid

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



TestAmerica Sacramento

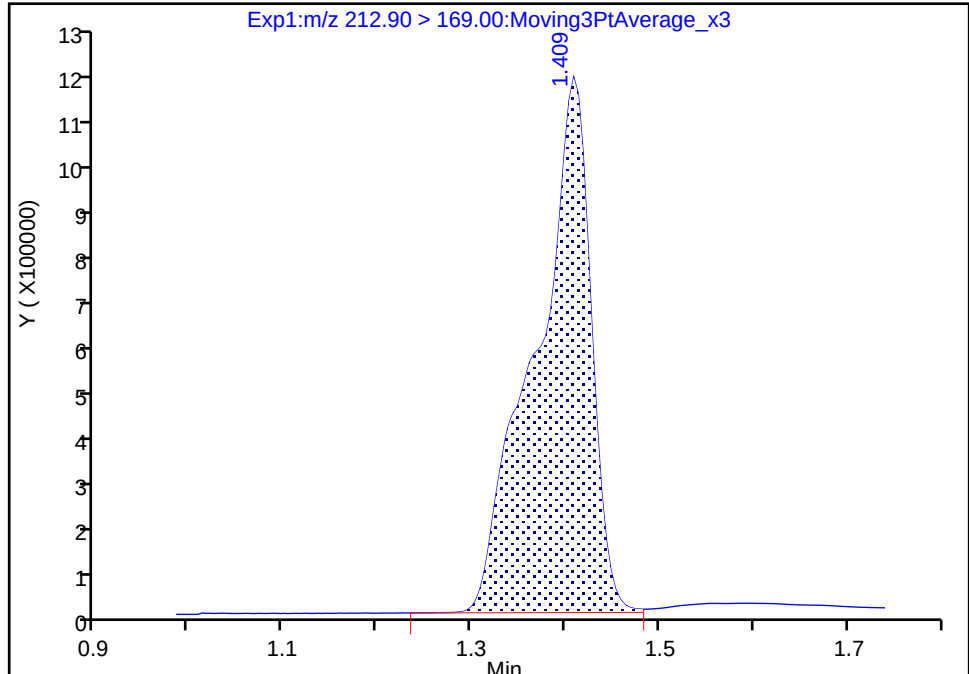
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_045.d
Injection Date: 10-Aug-2018 16:48:58 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 14 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

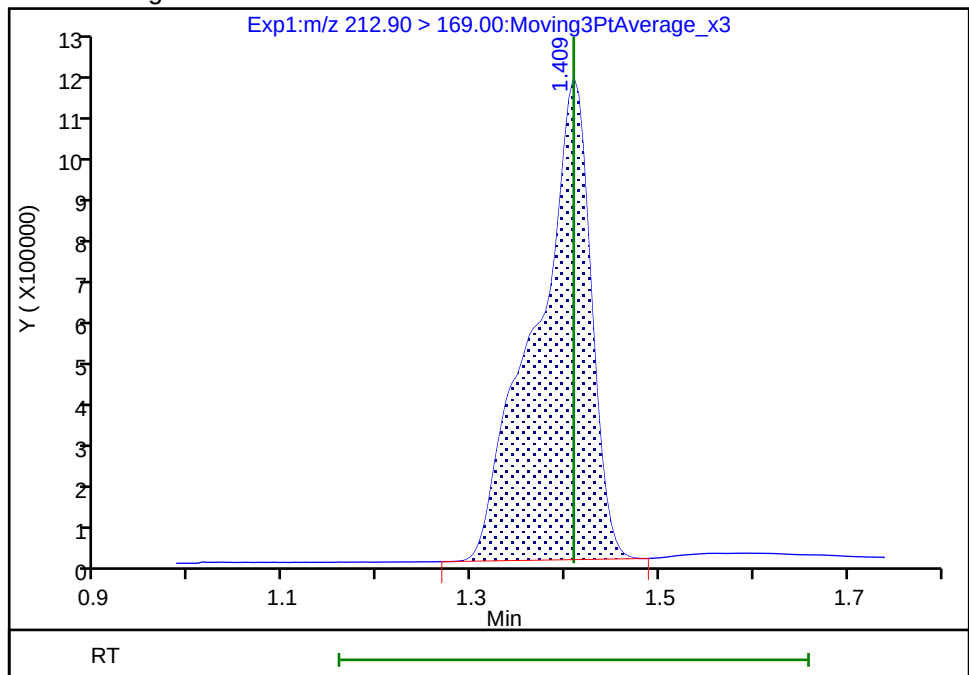
RT: 1.41
Area: 4852395
Amount: 2.426470
Amount Units: ng/ml

Processing Integration Results



RT: 1.41
Area: 4802240
Amount: 2.401390
Amount Units: ng/ml

Manual Integration Results



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239343/1 Calibration Date: 08/10/2018 20:04

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLAAAX_079.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.8974		0.956	1.00	-4.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.069		0.940	1.00	-6.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	75.92		0.884	0.884	-0.0	30.0
4:2 FTS	AveID	16.57	16.77		0.945	0.934	1.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9681		0.949	1.00	-5.1	30.0
Perfluoropentanesulfonic acid	AveID	68.92	67.99		0.925	0.938	-1.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.015		0.956	1.00	-4.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.006		0.844	0.910	-7.2	30.0
6:2 FTS	AveID	1.573	1.504		0.906	0.948	-4.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.081		0.957	1.00	-4.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.301		1.00	0.952	5.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.056		1.00	1.00	0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.054		0.911	0.928	-1.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9721		0.998	1.00	-0.2	30.0
8:2 FTS	AveID	1.299	1.296		0.956	0.958	-0.3	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7685		0.981	0.960	2.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9936		0.990	1.00	-1.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9746		1.01	1.00	1.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6682		1.02	0.964	5.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.000		0.890	1.00	-11.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.7818		0.877	1.00	-12.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.034		0.929	1.00	-7.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.019		0.948	1.00	-5.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2427		1.00	1.00	0.3	30.0
13C4 PFBA	Ave	1.385	1.302		2.35	2.50	-6.0	30.0
13C5 PFPeA	Ave	0.9537	0.8697		2.28	2.50	-8.8	30.0
13C3-PFBS	Ave	0.0221	0.0200		2.11	2.33	-9.4	30.0
13C2 PFHxA	Ave	1.082	0.9778		2.26	2.50	-9.6	30.0
13C4-PFHpA	Ave	1.065	0.9513		2.23	2.50	-10.7	30.0
18O2 PFHxS	Ave	1.366	1.180		2.04	2.37	-13.6	30.0
M2-6:2FTS	Ave	0.2242	0.2338		2.48	2.38	4.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239343/1 Calibration Date: 08/10/2018 20:04
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLAAAX_079.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9569		2.45	2.50	-2.1	30.0
13C4 PFOS	Ave	0.8973	0.8111		2.16	2.39	-9.6	30.0
13C5 PFNA	Ave	0.8770	0.7896		2.25	2.50	-10.0	30.0
13C8 FOSA	Ave	1.188	1.097		2.31	2.50	-7.7	30.0
M2-8:2FTS	Ave	0.2707	0.2685		2.38	2.40	-0.8	30.0
13C2 PFDA	Ave	0.7695	0.7124		2.31	2.50	-7.4	30.0
d3-NMeFOSAA	Ave	0.3935	0.3772		2.40	2.50	-4.1	30.0
d5-NEtFOSAA	Ave	0.4077	0.4210		2.58	2.50	3.3	30.0
13C2 PFUnA	Ave	0.6189	0.5901		2.38	2.50	-4.6	30.0
13C2 PFDoA	Ave	0.6541	0.6469		2.47	2.50	-1.1	30.0
13C2-PFTeDA	Ave	0.8335	0.8417		2.52	2.50	1.0	30.0
13C2-PFHxDA	Ave	1.653	1.420		2.15	2.50	-14.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_079.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 10-Aug-2018 20:04:31 ALS Bottle#: 13 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@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 16-Aug-2018 12:58:06 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: mongkols

Date: 16-Aug-2018 12:54:09

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	1.409	1.406	0.003	0.537	5442822	2.35		94.0	8620	
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.414	0.0	1.004	1953843	0.9559		95.6	191	
D 3 13C5-PFPeA										
267.90 > 223.00	1.660	1.655	0.005	0.633	3634530	2.28		91.2	9584	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.660	1.660	0.0	1.000	1554739	0.9399		94.0	124	
D 47 13C3-PFBS										
301.90 > 83.00	1.700	1.696	0.004	0.648	77701	2.11		90.6	400	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.700	1.700	0.0	1.000	2242937	0.8836		100.0	195	
298.90 > 99.00	1.700	1.700	0.0	1.000	957536		2.34(1.25-3.74)		209	
D 60 M2-4:2FTS										
329.00 > 81.00	1.907	1.903	0.004	0.727	630544	NC			1430	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.907	1.907	0.0	1.122	523488	0.9453		101	3800	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.934	0.005	0.739	4086174	2.26		90.4	8792	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.939	0.0	1.000	1582333	0.9485		94.9	597	
313.00 > 119.00	1.939	1.939	0.0	1.000	148031		10.69(5.03-15.10)		372	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.960	1.960	0.0	1.153	2131321	0.9253		98.6	3507	
349.00 > 99.00	1.960	1.960	0.0	1.153	796143		2.68(1.36-4.07)		1936	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.033	2.028	0.005	0.775	306253	NC			944	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.043	2.043	0.0	1.005	294096	NC			162	
D 9 13C4-PFHpA										
367.00 > 322.00	2.269	2.256	0.013	0.866	3975386	2.23		89.3	6797	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.269	2.269	0.0	1.000	1613625	0.9556		95.6	366	
363.00 > 169.00	2.269	2.269	0.0	1.000	665406		2.43(1.13-3.40)		971	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.278	0.002	0.870	4663905	2.04		86.4	5774	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.280	0.0	1.000	1804919	0.8443		92.8	1403	
399.00 > 99.00	2.280	2.280	0.0	1.000	665088		2.71(1.50-4.49)		951	
65 ADONA										
377.00 > 251.00	2.314	2.314	0.0	0.773	4747141	NC			9518	
377.00 > 85.00	2.314	2.314	0.0	0.773	2771119		1.71(0.84-2.53)		4467	
D 12 M2-6:2FTS										
429.00 > 81.00	2.595	2.594	0.001	0.990	928250	2.48		104	2266	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.595	2.595	0.0	1.000	557276	0.9062		95.6	1411	
D 73 13C8 PFOA										
421.00 > 376.00	2.614	2.613	0.001	0.997	7192505	NC			6936	
D 14 13C4 PFOA										
417.00 > 372.00	2.622	2.613	0.009	1.000	3998852	2.45		97.9	7188	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.622	2.622	0.0	1.000	1730812	0.9570		95.6	146	
413.00 > 169.00	2.614	2.622	-0.008	0.997	879755		1.97(0.84-2.52)		1242	
* 62 13C2-PFOA										
415.00 > 370.00	2.622	2.622	0.0		4178906	2.50			6788	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.630	2.630	0.0	0.878	1679067	1.00		105	2788	
449.00 > 99.00	2.630	2.630	0.0	0.878	450488		3.73(1.94-5.82)		1231	
D 72 13C8 PFOS										
507.00 > 99.00	2.986	2.986	0.0	1.139	1623236	NC			2597	
D 19 13C5 PFNA										
468.00 > 423.00	2.994	2.993	0.001	1.142	3299658	2.25		90.0	4800	
D 18 13C4 PFOS										
503.00 > 80.00	2.994	2.993	0.001	1.142	3240239	2.16		90.4	3079	
20 Perfluorononanoic acid										
463.00 > 419.00	2.994	2.994	0.0	1.000	1393154	1.00		100	373	
463.00 > 169.00	2.994	2.994	0.0	1.000	332938		4.18(1.90-5.69)		1391	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.994	2.994	0.0	1.000	1325557	0.9106		98.1	1505	
499.00 > 99.00	2.994	2.994	0.0	1.000	298554		4.44(2.31-6.93)		1096	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.204	3.204	0.0	1.070	2285244	NC			3623	
D 21 13C8 FOSA										
506.00 > 78.00	3.328	3.327	0.001	1.269	4585571	2.31		92.3	6460	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.328	3.328	0.0	1.000	1782960	1.00		99.8	2424	
D 26 M2-8:2FTS										
529.00 > 81.00	3.342	3.342	0.0	1.275	1074763	2.38		99.2	3283	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.342	3.342	0.0	1.116	1000190	0.9808		102	2413	
549.00 > 99.00	3.342	3.342	0.0	1.116	356758		2.80(1.33-3.97)		1492	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.342	3.342	0.0	1.000	557105	0.9556		99.7	1554	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.357	-0.007	1.278	2976843	2.31		92.6	3722	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.350	3.350	0.0	1.000	1183120	0.99		99.0	754	
513.00 > 169.00	3.350	3.350	0.0	1.000	208497		5.67(2.36-7.09)		295	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.508	3.507	0.001	1.338	1576436	2.40		95.9	3402	
28 N-methyl perfluorooctane sulfonami										M
570.00 > 419.00	3.508	3.508	0.0	1.000	614551	1.01		101	627	M
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.670	3.670	0.0	1.226	873258	1.02		106	2687	
599.00 > 99.00	3.662	3.670	-0.008	1.223	277681		3.14(1.39-4.16)		1894	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.677	3.675	0.002	1.402	1759135	2.58		103	1650	
D 30 13C2 PFUnA										
565.00 > 520.00	3.685	3.684	0.001	1.406	2465966	2.38		95.4	7428	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.677	3.677	0.0	0.998	986399	0.8900		89.0	751	
563.00 > 169.00	3.685	3.677	0.008	1.000	187011		5.27(2.12-6.36)		722	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.685	3.685	0.0	1.002	550103	0.8766		87.7	1256	
35 MeFOSA										
512.00 > 169.00	3.827	3.827	0.0		519665	NC			588	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.844	3.844	0.0	1.284	3776398	NC			7084	
D 36 13C2 PFDaA										
615.00 > 570.00	3.983	3.981	0.002	1.519	2703128	2.47		98.9	5262	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.983	0.0	1.000	1118205	0.9294		92.9	829	
613.00 > 169.00	3.983	3.983	0.0	1.000	254937		4.39(2.13-6.40)		1270	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.983	3.983	0.0	1.192	364391	NC			2758	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.221	4.221	0.0	1.410	385754	NC			1088	
699.00 > 99.00	4.221	4.221	0.0	1.410	533631		0.72(0.00-0.00)		2075	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.249	4.249	0.0	1.067	1101816	0.9477		94.8	510	
663.00 > 169.00	4.249	4.249	0.0	1.067	363315		3.03(1.25-3.76)		2055	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.491	4.491	0.0	1.713	3517459	2.52		101	5427	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.491	4.491	0.0	1.000	341438	1.00		100	1713	
713.00 > 219.00	4.482	4.491	-0.009	0.998	232788		1.47(0.71-2.13)		2229	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.907	4.907	0.0	1.871	5935620	2.15		85.9	6165	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.907	4.907	0.0	1.000	2180261	NC			310	
813.00 > 169.00	4.907	4.907	0.0	1.000	372819		5.85(2.86-8.58)		2169	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.265	5.265	0.0	1.073	2482681	NC			280	
913.00 > 169.00	5.265	5.265	0.0	1.073	302841		8.20(3.83-11.48)		1735	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL4_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_079.d

Injection Date: 10-Aug-2018 20:04:31

Instrument ID: A8_N

Lims ID: CCV L4

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 13

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

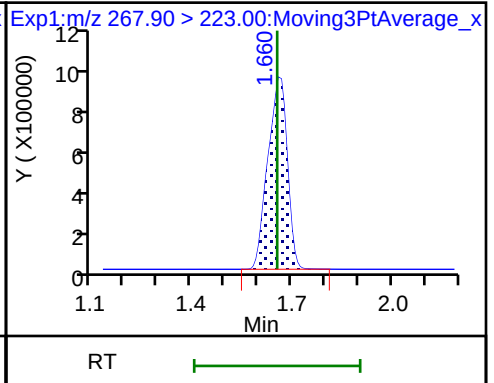
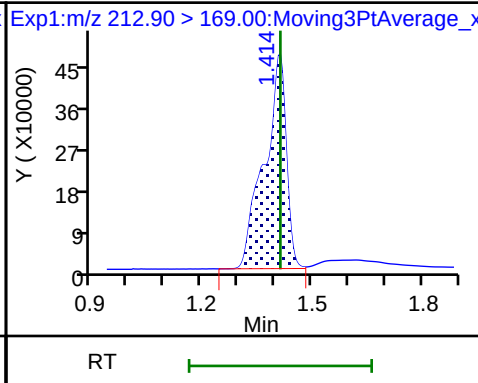
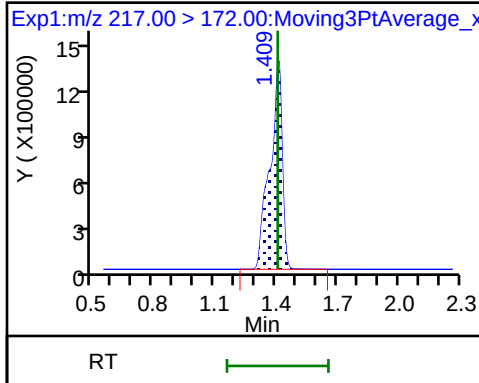
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

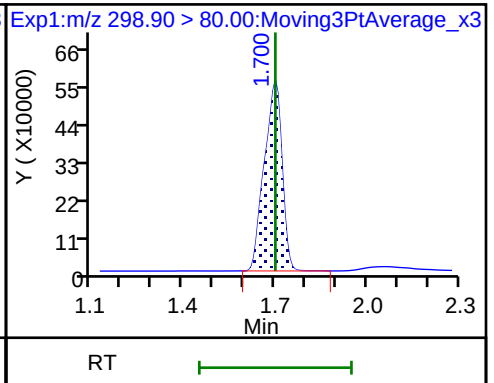
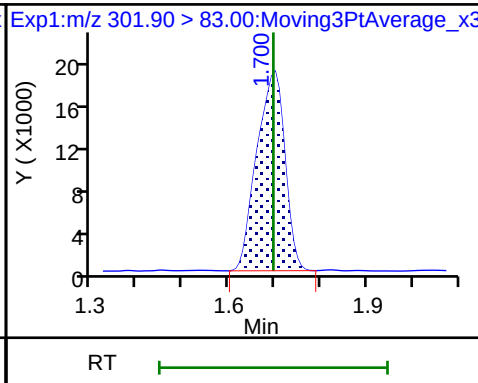
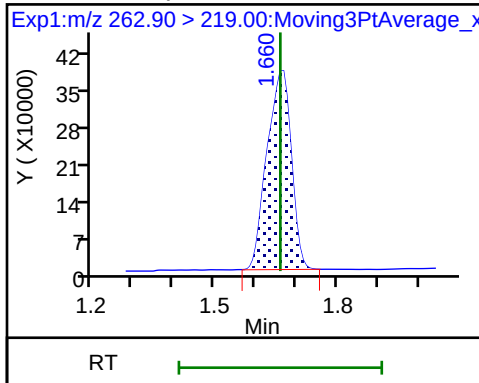
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

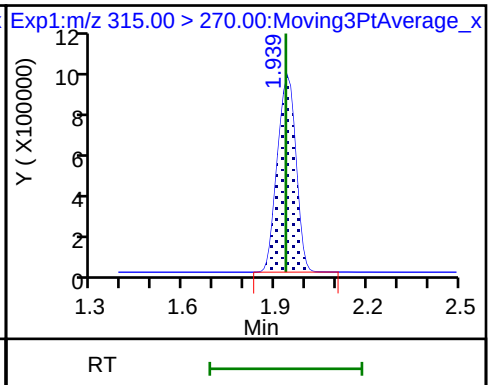
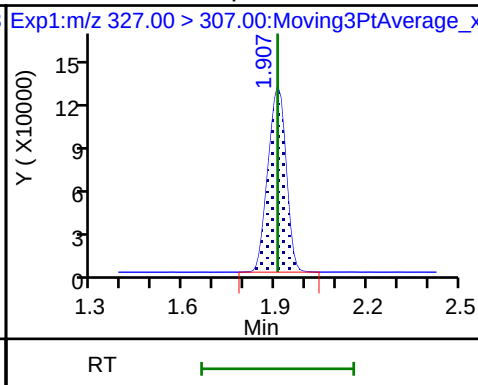
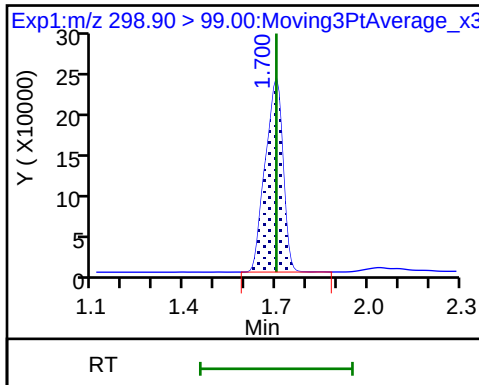
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

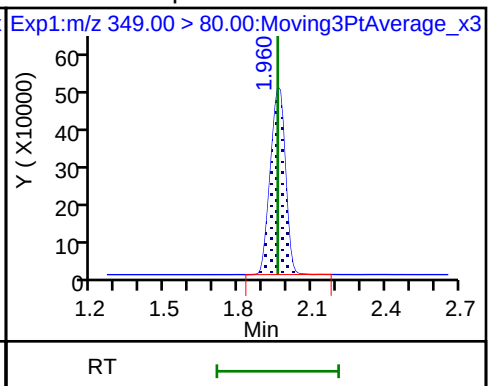
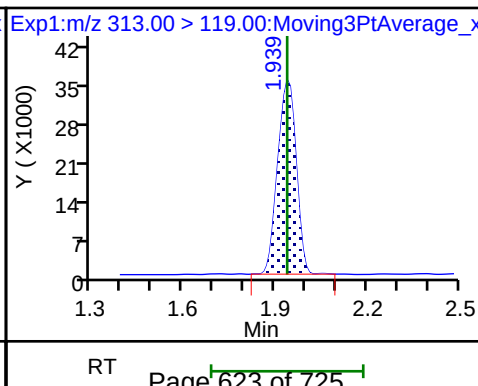
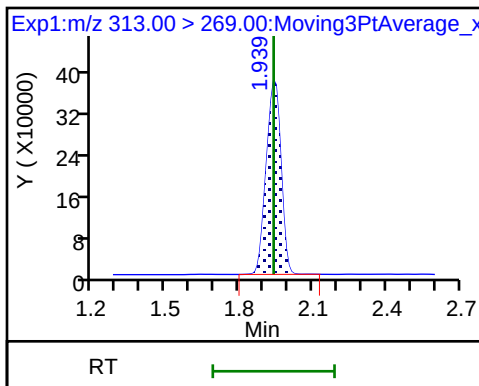
D 7 13C2 PFHxA



6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

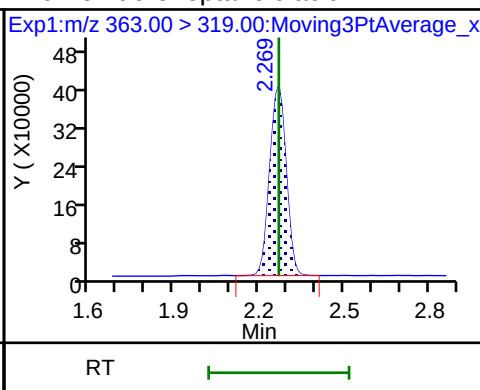
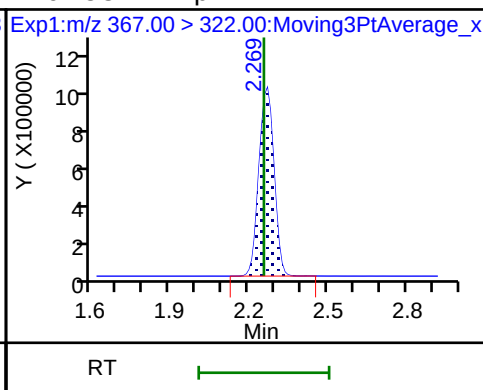
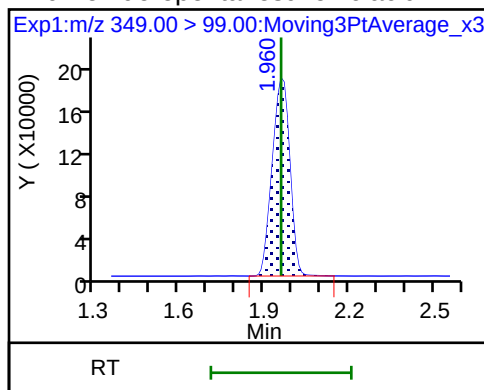
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

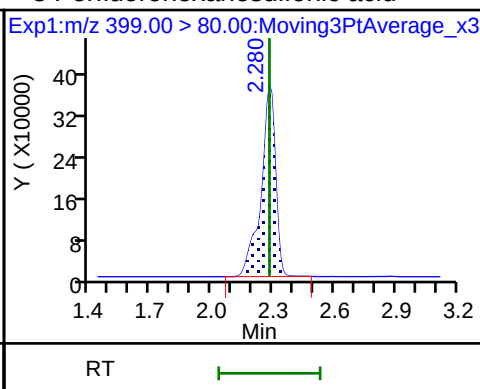
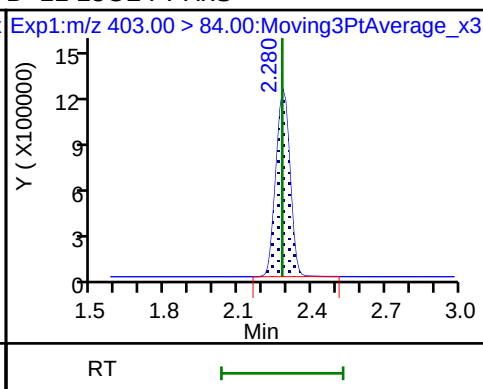
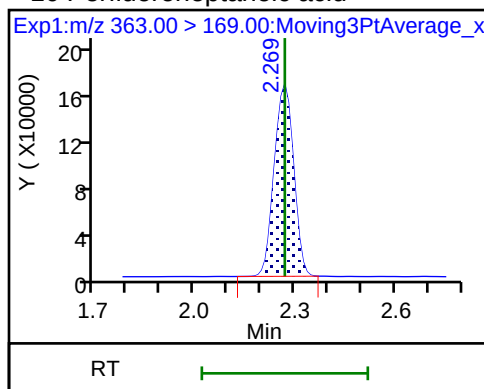
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

D 11 18O2 PFHxS

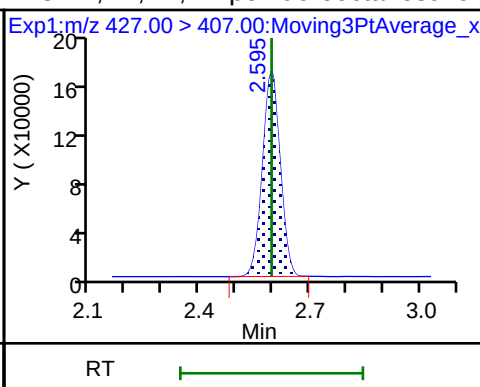
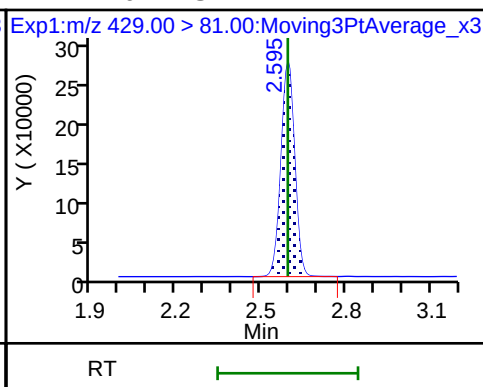
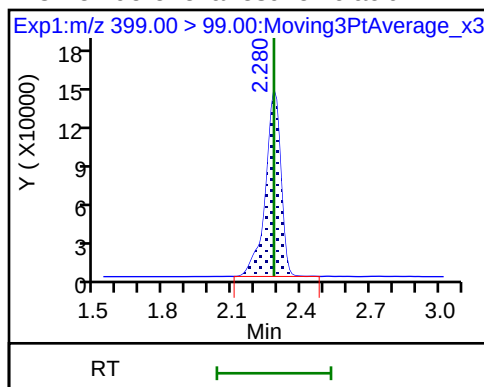
8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

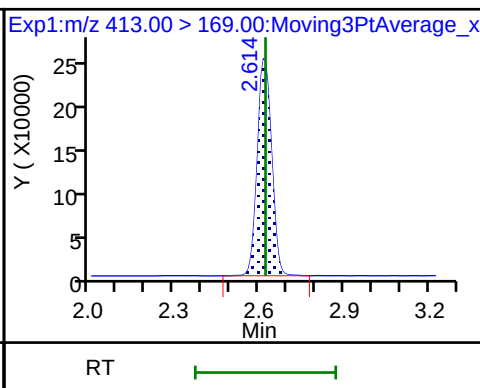
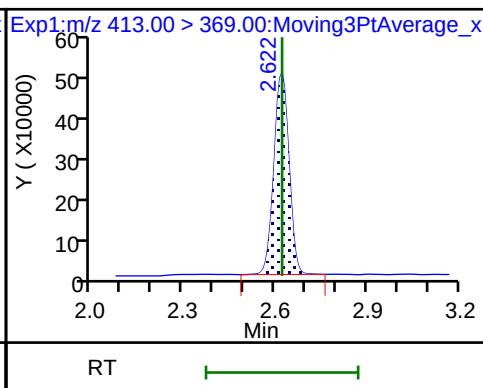
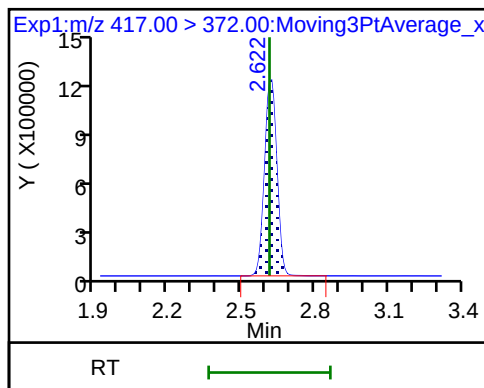
13 1H,1H,2H,2H-perfluorooctanesulfoni



D 14 13C4 PFOA

15 Perfluorooctanoic acid

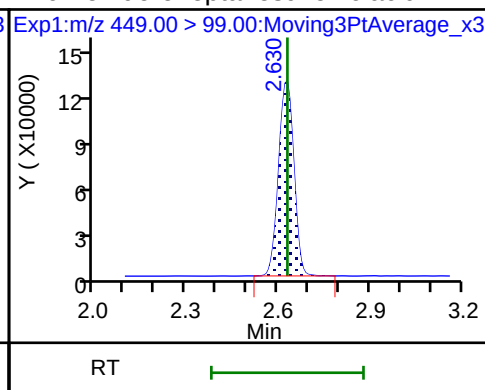
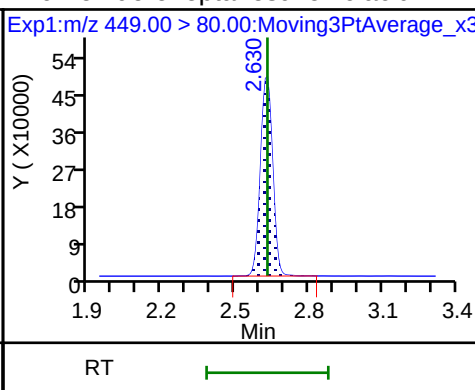
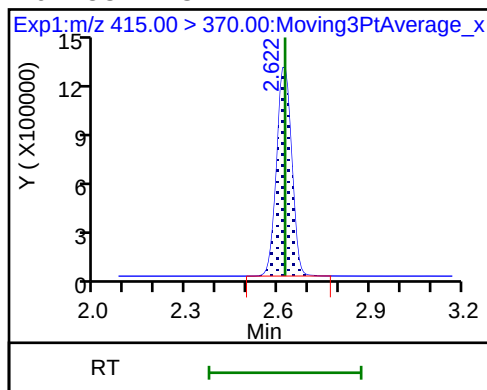
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

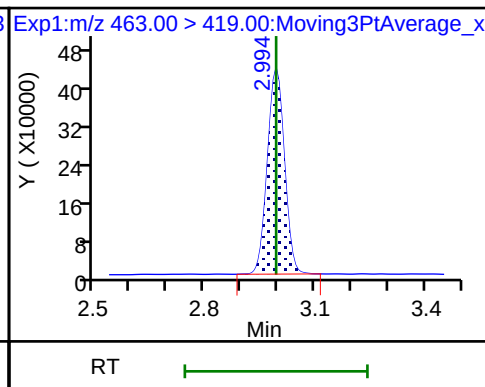
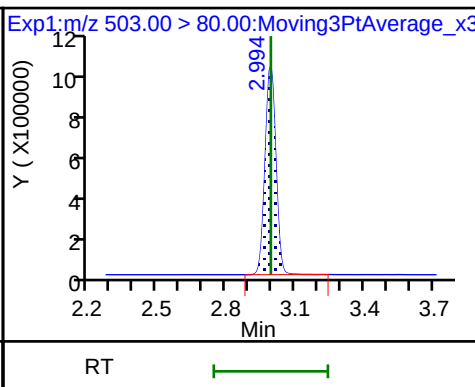
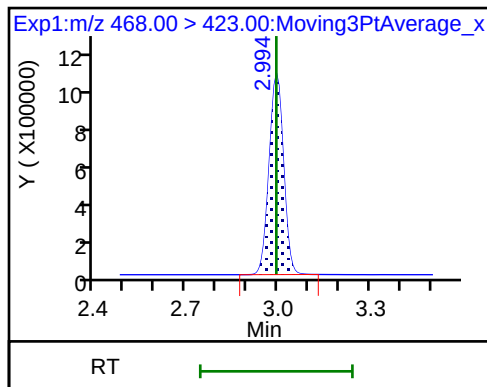
16 Perfluoroheptanesulfonic acid



D 19 13C5 PFNA

D 18 13C4 PFOS

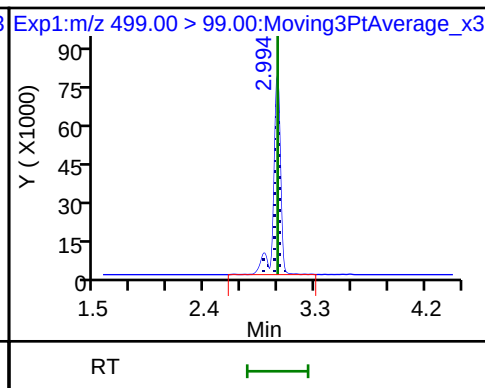
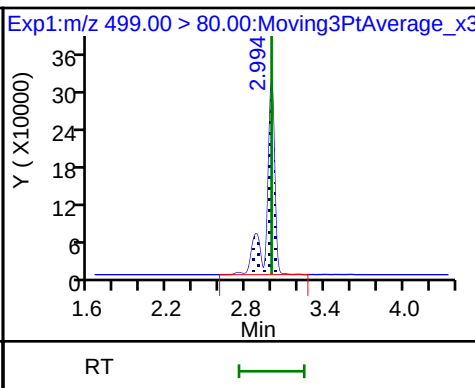
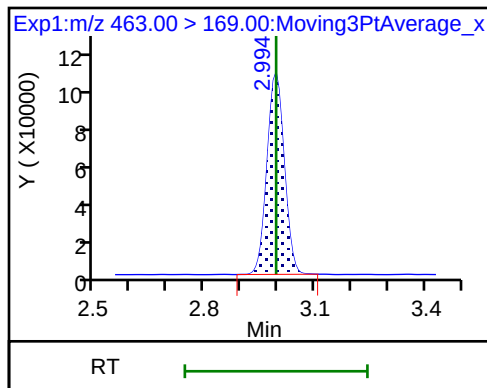
20 Perfluorononanoic acid



20 Perfluorononanoic acid

17 Perfluorooctane sulfonic acid

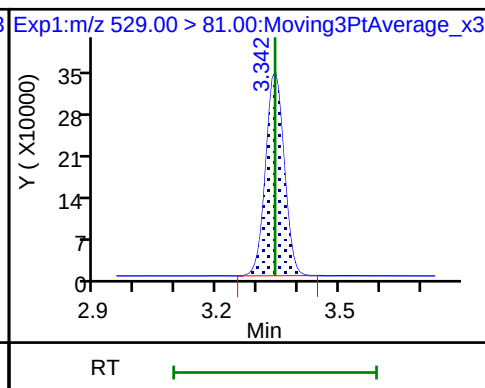
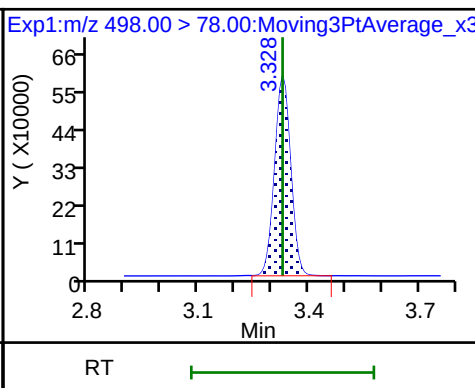
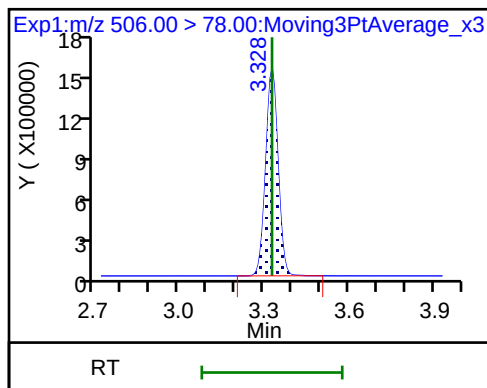
17 Perfluorooctane sulfonic acid

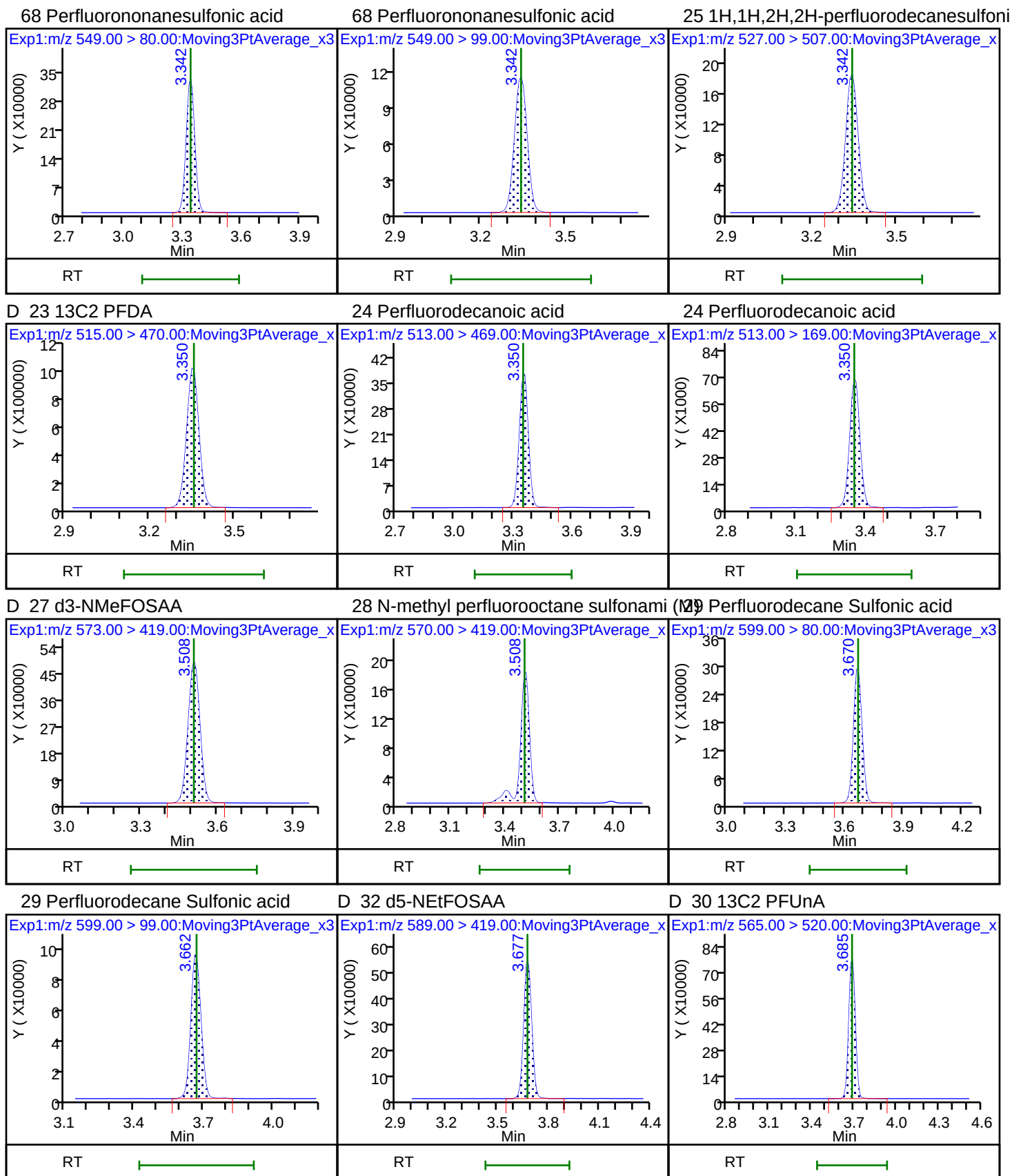


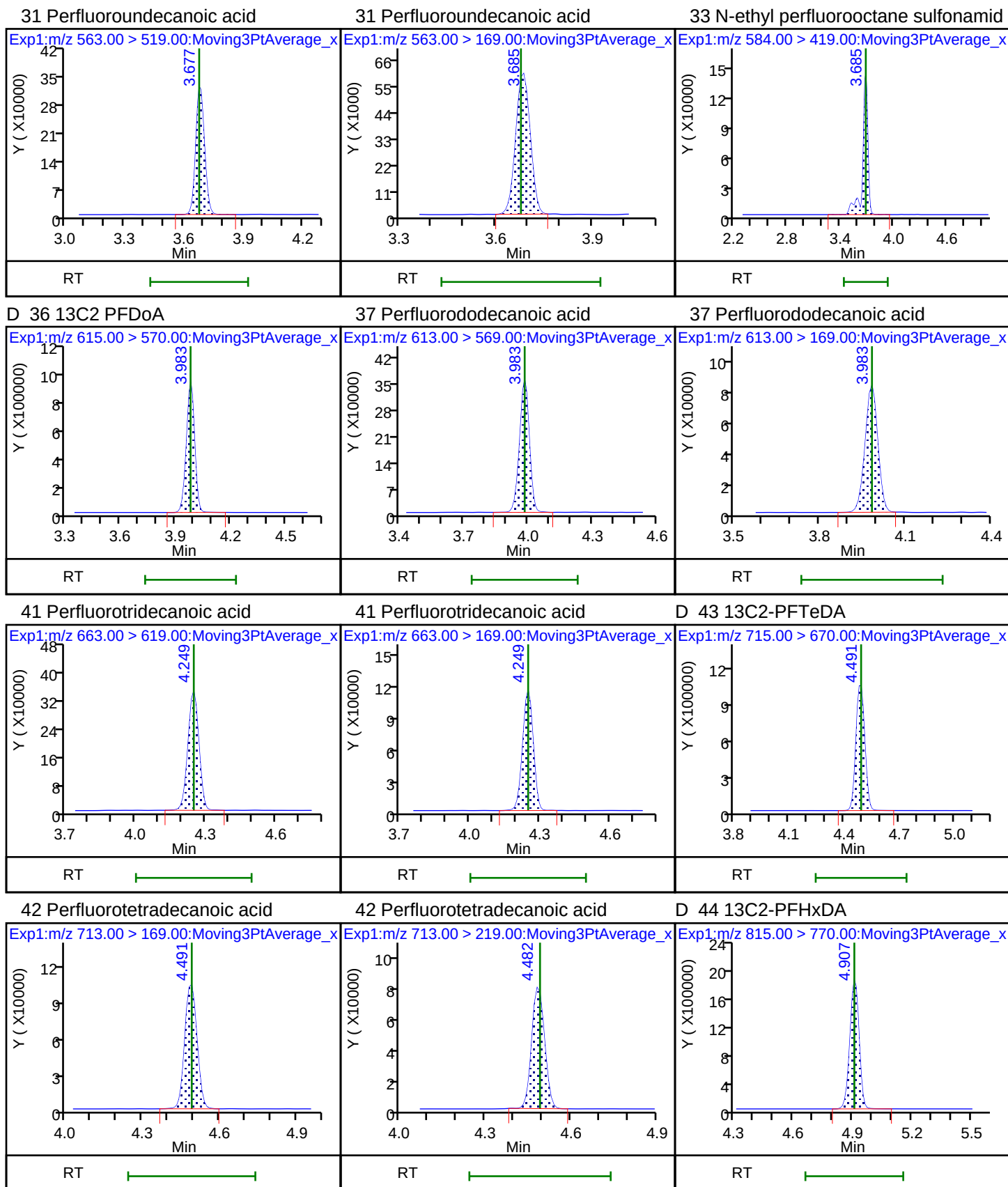
D 21 13C8 FOSA

22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS







TestAmerica Sacramento

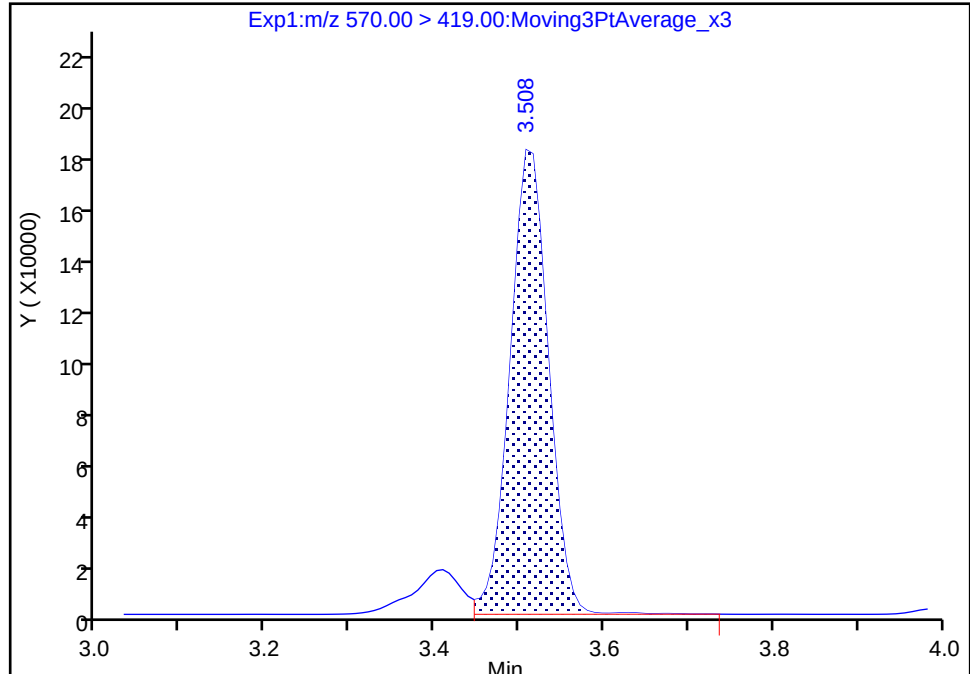
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_079.d
Injection Date: 10-Aug-2018 20:04:31 Instrument ID: A8_N
Lims ID: CCV L4
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 13 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

28 N-methyl perfluorooctane sulfonamidoacetic a, CAS: 2355-31-9

Signal: 1

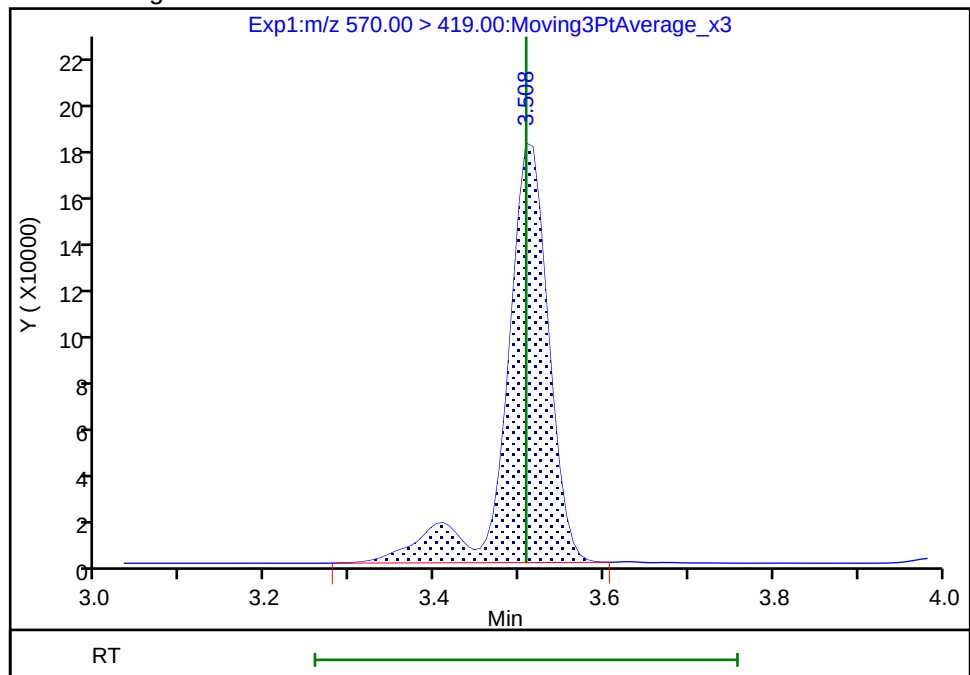
RT: 3.51
Area: 553672
Amount: 0.910272
Amount Units: ng/ml

Processing Integration Results



RT: 3.51
Area: 614551
Amount: 1.010361
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 16-Aug-2018 12:54:01
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 629 of 725

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239343/4 Calibration Date: 08/10/2018 20:27

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLAAAX_082.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9211		2.45	2.50	-1.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.154		2.53	2.50	1.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	78.98		2.30	2.21	4.0	30.0
4:2 FTS	AveID	16.57	16.60		2.34	2.34	0.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.022		2.50	2.50	0.0	30.0
Perfluoropentanesulfonic acid	AveID	68.92	69.54		2.37	2.35	0.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.038		2.44	2.50	-2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.014		2.13	2.28	-6.5	30.0
6:2 FTS	AveID	1.573	1.544		2.33	2.37	-1.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.068		2.36	2.50	-5.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.321		2.54	2.38	6.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.049		2.49	2.50	-0.5	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.099		2.37	2.32	2.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.034		2.66	2.50	6.2	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7967		2.54	2.40	5.9	30.0
8:2 FTS	AveID	1.299	1.231		2.27	2.40	-5.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.034		2.58	2.50	3.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9629		2.50	2.50	-0.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.7067		2.69	2.41	11.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8296		2.33	2.50	-7.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	0.9560		2.13	2.50	-14.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.023		2.30	2.50	-8.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.020		2.37	2.50	-5.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2412		2.49	2.50	-0.3	30.0
13C4 PFBA	Ave	1.385	1.370		2.47	2.50	-1.1	30.0
13C5 PFPeA	Ave	0.9537	0.8781		2.30	2.50	-7.9	30.0
13C3-PFBS	Ave	0.0221	0.0210		2.21	2.33	-5.0	30.0
13C2 PFHxA	Ave	1.082	1.022		2.36	2.50	-5.6	30.0
13C4-PFHpA	Ave	1.065	0.9885		2.32	2.50	-7.2	30.0
18O2 PFHxS	Ave	1.366	1.275		2.21	2.37	-6.7	30.0
M2-6:2FTS	Ave	0.2242	0.2340		2.48	2.38	4.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239343/4 Calibration Date: 08/10/2018 20:27
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLAAAX_082.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9916		2.54	2.50	1.5	30.0
13C4 PFOS	Ave	0.8973	0.8273		2.20	2.39	-7.8	30.0
13C5 PFNA	Ave	0.8770	0.8137		2.32	2.50	-7.2	30.0
13C8 FOSA	Ave	1.188	1.099		2.31	2.50	-7.6	30.0
M2-8:2FTS	Ave	0.2707	0.2781		2.46	2.40	2.7	30.0
13C2 PFDA	Ave	0.7695	0.7151		2.32	2.50	-7.1	30.0
d3-NMeFOSAA	Ave	0.3935	0.3940		2.50	2.50	0.1	30.0
d5-NEtFOSAA	Ave	0.4077	0.4056		2.49	2.50	-0.5	30.0
13C2 PFUnA	Ave	0.6189	0.5722		2.31	2.50	-7.5	30.0
13C2 PFDoA	Ave	0.6541	0.6790		2.60	2.50	3.8	30.0
13C2-PFTeDA	Ave	0.8335	0.8692		2.61	2.50	4.3	30.0
13C2-PFHxDA	Ave	1.653	1.490		2.25	2.50	-9.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_082.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 10-Aug-2018 20:27:58 ALS Bottle#: 14 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Sublist: chrom-A8_N*sub34
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 16-Aug-2018 12:58:12 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d

Column 1 : Det: EXP1

Process Host: XAWRK002

First Level Reviewer: mongkols

Date: 16-Aug-2018 12:57:31

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	1.406	0.005	0.537	5253824	2.47		98.9	8869	
2 Perfluorobutyric acid										
212.90 > 169.00	1.411	1.411	0.0	1.000	4839198	2.45		98.1	464	
D 3 13C5-PFPeA										
267.90 > 223.00	1.662	1.655	0.007	0.633	3368491	2.30		92.1	7723	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.670	1.670	0.0	1.005	3886090	2.53		101	314	
D 47 13C3-PFBS										
301.90 > 83.00	1.702	1.696	0.006	0.648	74773	2.21		95.0	364	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.702	1.702	0.0	1.000	5613385	2.30		104	452	
298.90 > 99.00	1.702	1.702	0.0	1.000	2296285		2.44(1.25-3.74)		454	
D 60 M2-4:2FTS										
329.00 > 81.00	1.912	1.903	0.009	0.728	577557	NC			1349	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.912	1.912	0.0	1.123	1246579	2.34		100	7299	
D 7 13C2 PFHxA										
315.00 > 270.00	1.943	1.934	0.009	0.740	3919469	2.36		94.4	7982	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.943	1.943	0.0	1.000	4004060	2.50		100	1529	
313.00 > 119.00	1.943	1.943	0.0	1.000	351502		11.39(5.03-15.10)		916	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.964	1.964	0.0	1.154	5244467	2.37		101	5151	
349.00 > 99.00	1.964	1.964	0.0	1.154	1946105		2.69(1.36-4.07)		2674	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.037	2.028	0.009	0.775	308278	NC			811	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.037	2.037	0.0	1.000	697088	NC			403	
D 9 13C4-PFHpA										
367.00 > 322.00	2.265	2.256	0.009	0.862	3791979	2.32		92.8	6136	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.277	2.277	0.0	1.005	3934565	2.44		97.7	807	
363.00 > 169.00	2.277	2.277	0.0	1.005	1529152		2.57(1.13-3.40)		1987	
D 11 18O2 PFHxS										
403.00 > 84.00	2.288	2.278	0.010	0.871	4625159	2.21		93.3	6035	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.288	2.288	0.0	1.000	4511082	2.13		93.5	2816	
399.00 > 99.00	2.288	2.288	0.0	1.000	1540785		2.93(1.50-4.49)		1669	
65 ADONA										
377.00 > 251.00	2.310	2.310	0.0	0.770	11255649	NC			7270	
377.00 > 85.00	2.310	2.310	0.0	0.770	6645574		1.69(0.84-2.53)		10653	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.594	0.004	0.989	852640	2.48		104	2488	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.598	2.598	0.0	1.000	1313463	2.33		98.1	3175	
D 73 13C8 PFOA										
421.00 > 376.00	2.619	2.613	0.006	0.997	6683253	NC			9250	
D 14 13C4 PFOA										
417.00 > 372.00	2.627	2.613	0.014	1.000	3804037	2.54		101	9227	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.627	2.627	0.0	1.000	4066620	2.36		94.5	344	
413.00 > 169.00	2.627	2.627	0.0	1.000	2099344		1.94(0.84-2.52)		3168	
* 62 13C2-PFOA										
415.00 > 370.00	2.627	2.627	0.0		3836135	2.50			5254	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.635	2.635	0.0	0.878	3991312	2.54		107	3217	
449.00 > 99.00	2.635	2.635	0.0	0.878	1062983		3.75(1.94-5.82)		1876	
D 72 13C8 PFOS										
507.00 > 99.00	3.000	2.986	0.014	1.142	1556926	NC			3105	
D 19 13C5 PFNA										
468.00 > 423.00	3.000	2.993	0.007	1.142	3121390	2.32		92.8	6691	
D 18 13C4 PFOS										
503.00 > 80.00	3.000	2.993	0.007	1.142	3034010	2.20		92.2	2625	
20 Perfluorononanoic acid										
463.00 > 419.00	3.000	3.000	0.0	1.000	3273031	2.49		99.5	881	
463.00 > 169.00	3.000	3.000	0.0	1.000	771194		4.24(1.90-5.69)		3003	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.000	3.000	0.0	1.000	3236529	2.37		102	2550	
499.00 > 99.00	3.000	3.000	0.0	1.000	712222		4.54(2.31-6.93)		1870	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.219	3.219	0.0	1.073	5504297	NC			7640	
D 21 13C8 FOSA										
506.00 > 78.00	3.334	3.327	0.007	1.269	4214552	2.31		92.4	5812	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.341	3.341	0.0	1.002	4359090	2.66		106	3569	
D 26 M2-8:2FTS										
529.00 > 81.00	3.356	3.342	0.014	1.277	1022043	2.46		103	2866	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.349	3.349	0.0	1.116	2427324	2.54		106	4082	
549.00 > 99.00	3.349	3.349	0.0	1.116	895873		2.71(1.33-3.97)		2449	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.356	3.356	0.0	1.000	1258052	2.27		94.7	2956	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.364	3.364	0.0	1.000	2836586	2.58		103	1683	
513.00 > 169.00	3.364	3.364	0.0	1.000	479720		5.91(2.36-7.09)		422	
D 23 13C2 PFDA										
515.00 > 470.00	3.364	3.357	0.007	1.280	2743170	2.32		92.9	4613	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.515	3.507	0.008	1.338	1511548	2.50		100	3080	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.522	3.522	0.0	1.002	1455471	2.50		99.8	1046	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.674	3.674	0.0	1.225	2161940	2.69		112	5114	
599.00 > 99.00	3.674	3.674	0.0	1.225	709089		3.05(1.39-4.16)		3731	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.683	3.675	0.008	1.402	1555883	2.49		99.5	1539	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.691	3.691	0.0	1.000	2098484	2.13		85.1	1564	
563.00 > 169.00	3.691	3.691	0.0	1.000	446724		4.70(2.12-6.36)		3179	
D 30 13C2 PFUnA										
565.00 > 520.00	3.691	3.684	0.007	1.405	2195005	2.31		92.5	4915	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.691	3.691	0.0	1.002	1290716	2.33		93.0	2213	
35 MeFOSA										
512.00 > 169.00	3.833	3.833	0.0		1299005	NC			610	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.850	3.850	0.0	1.283	8701788	NC			12487	
D 36 13C2 PFDaA										
615.00 > 570.00	3.988	3.981	0.007	1.518	2604683	2.60		104	5187	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.988	3.988	0.0	1.000	2665657	2.30		92.0	1660	
613.00 > 169.00	3.988	3.988	0.0	1.000	633129		4.21(2.13-6.40)		2496	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.996	3.996	0.0	1.191	926062	NC			4902	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.227	4.227	0.0	1.409	906761	NC			1830	
699.00 > 99.00	4.227	4.227	0.0	1.409	1261577		0.72(0.00-0.00)		3336	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.255	4.255	0.0	1.067	2656166	2.37		94.8	1042	
663.00 > 169.00	4.255	4.255	0.0	1.067	848825		3.13(1.25-3.76)		4111	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 43 13C2-PFTeDA										
715.00 > 670.00	4.487	4.491	-0.004	1.708	3334253	2.61		104	5608	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.497	4.497	0.0	1.002	804177	2.49		99.7	3601	
713.00 > 219.00	4.487	4.497	-0.009	1.000	534707		1.50(0.71-2.13)		1454	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.919	4.919	0.0	1.002	5148097	NC			718	
813.00 > 169.00	4.909	4.919	-0.010	1.000	874041		5.89(2.86-8.58)		3283	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.909	4.907	0.002	1.869	5716550	2.25		90.1	6100	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.267	5.267	0.0	1.073	5868914	NC			603	
913.00 > 169.00	5.267	5.267	0.0	1.073	707363		8.30(3.83-11.48)		2673	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00006

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62538.b\2018.08.10LLAAAX_082.d

Injection Date: 10-Aug-2018 20:27:58

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 14

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

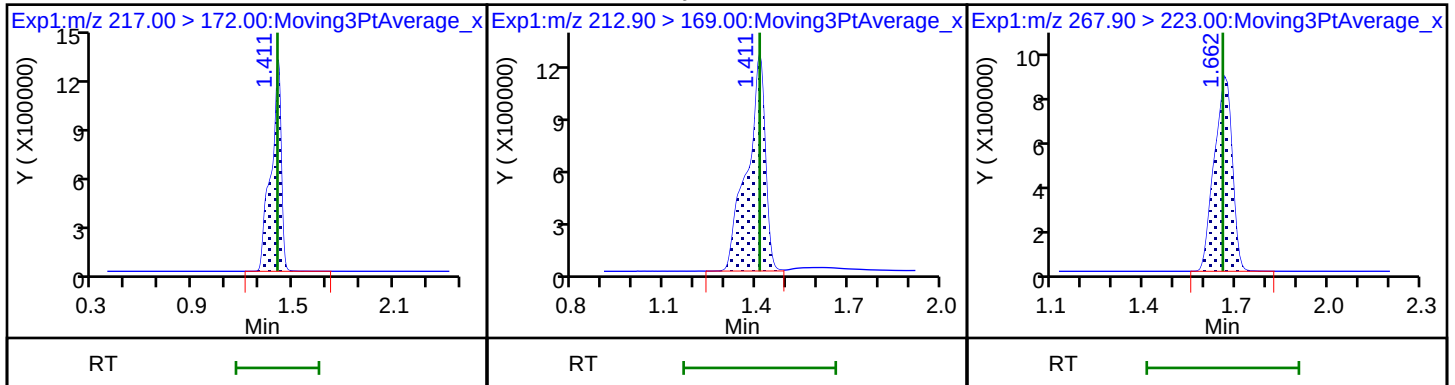
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

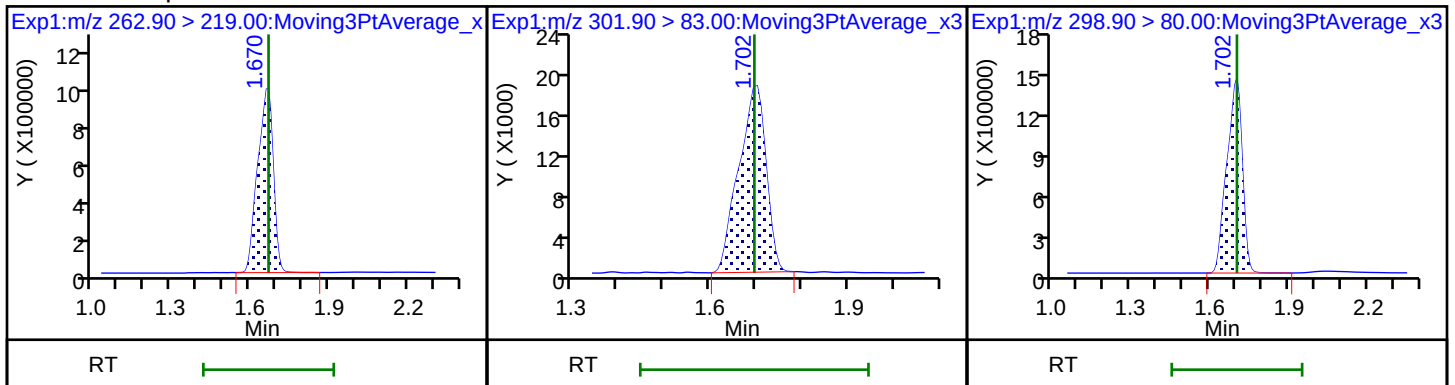
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

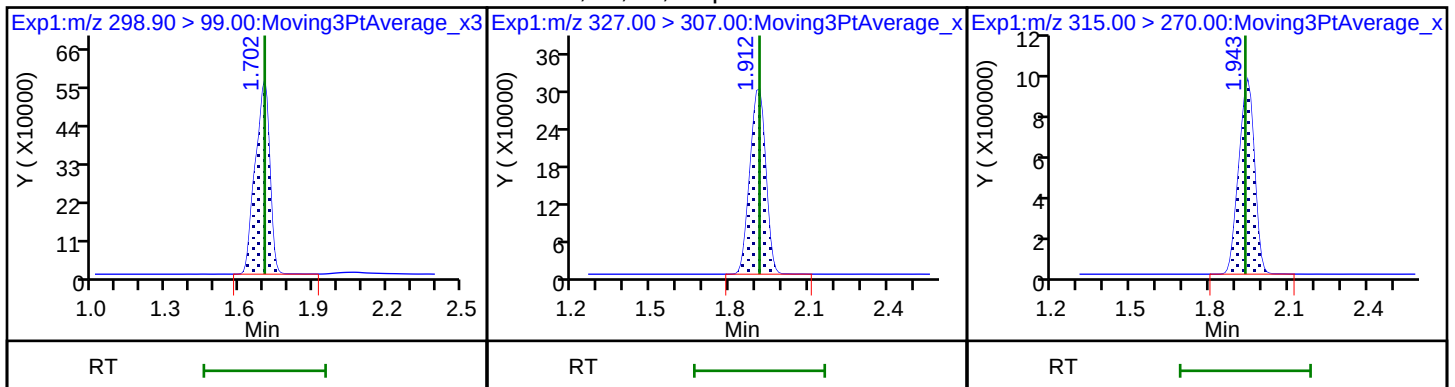
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid

61 1H,1H,2H,2H-perfluorohexanesulfonate

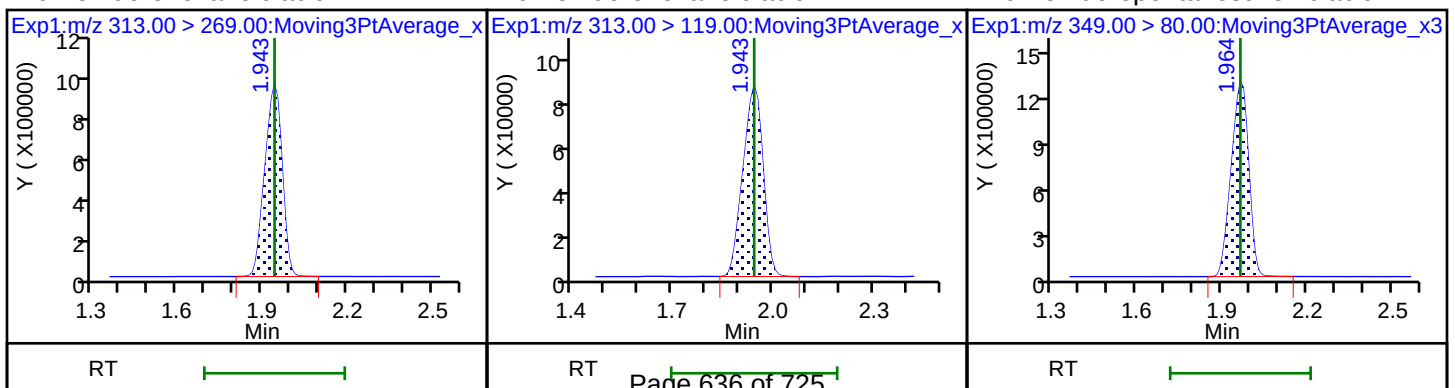
D 7 13C2 PFHxA



6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

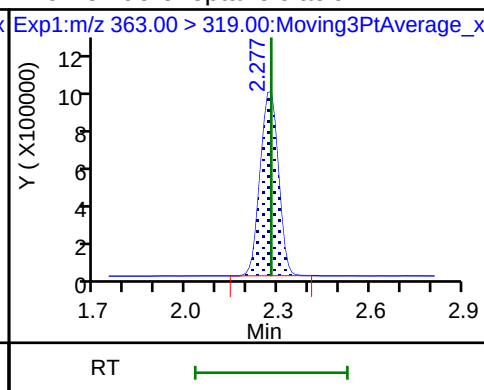
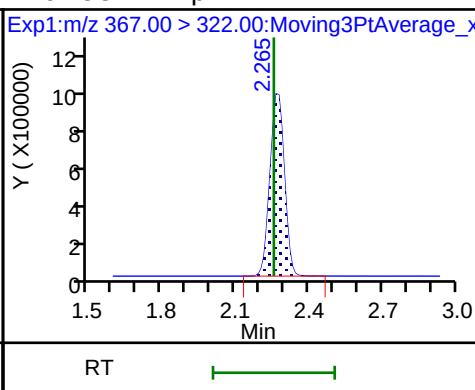
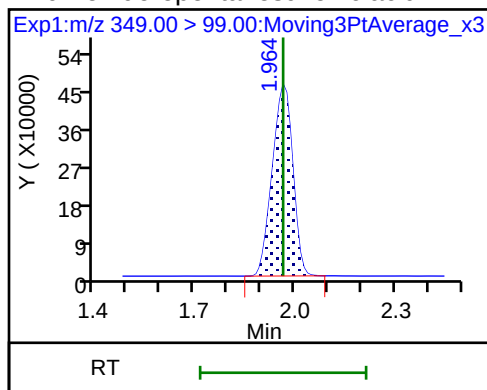
70 Perfluoropentanesulfonic acid



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

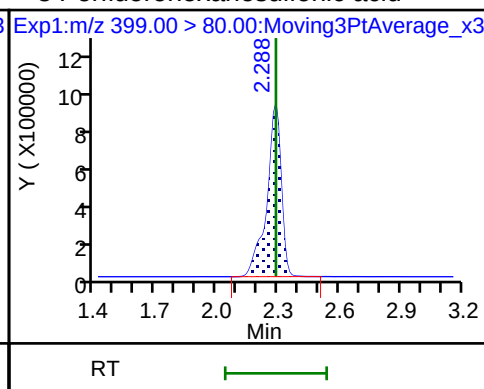
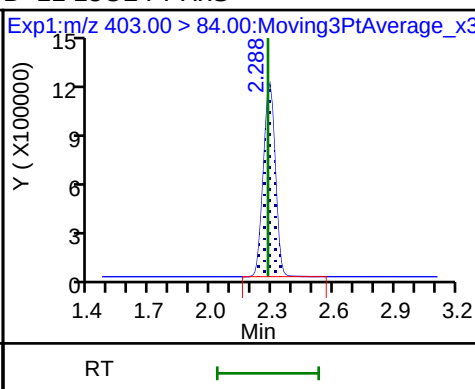
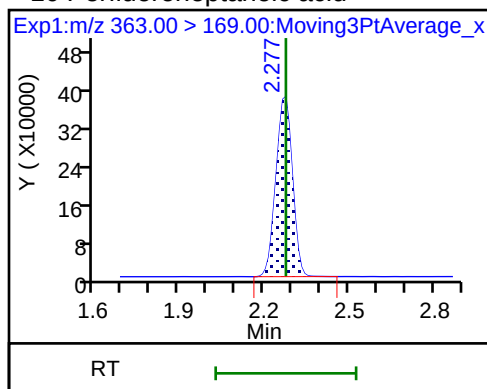
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

D 11 18O2 PFHxS

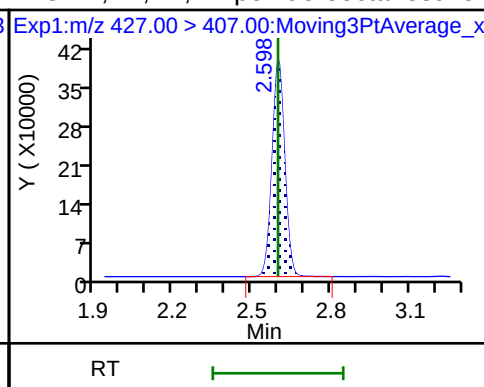
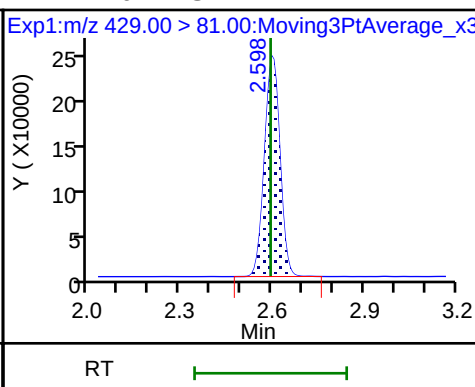
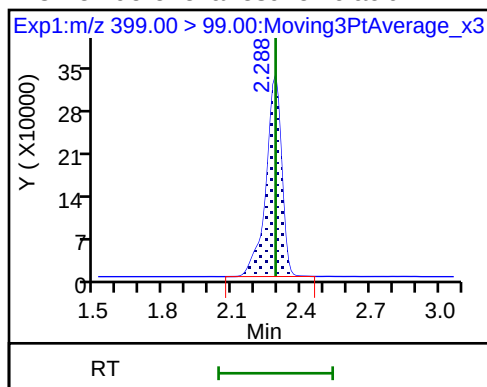
8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

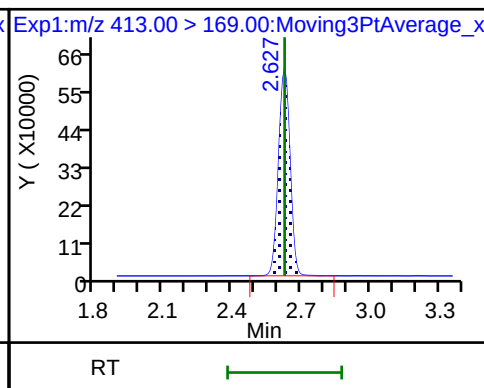
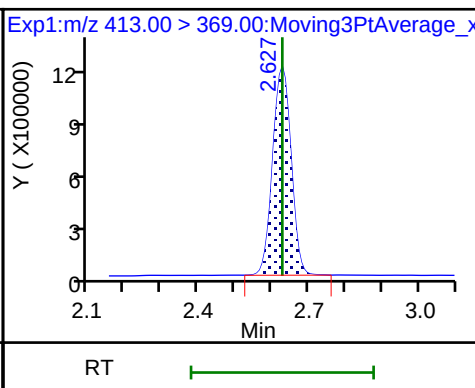
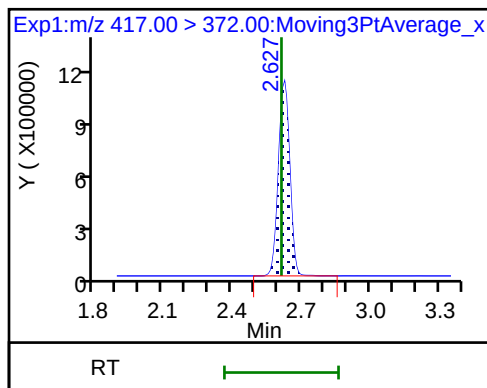
13 1H,1H,2H,2H-perfluorooctanesulfoni



D 14 13C4 PFOA

15 Perfluorooctanoic acid

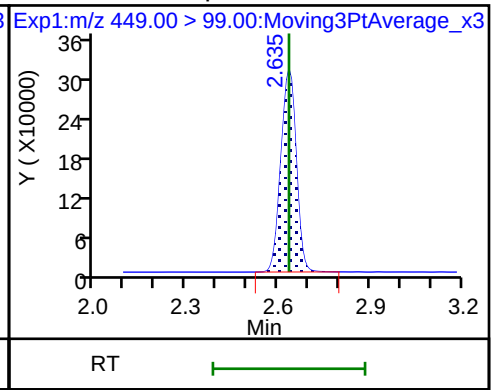
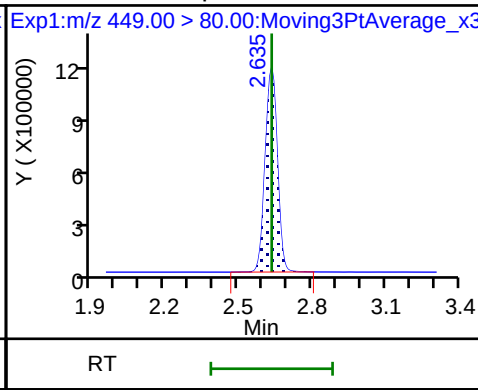
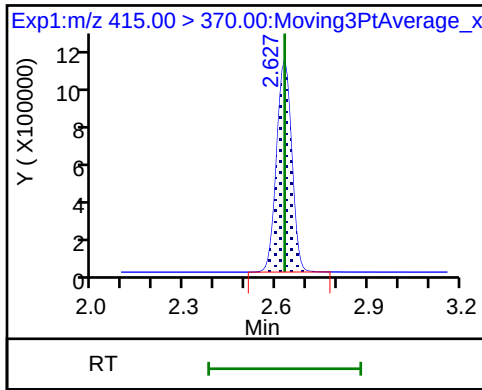
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

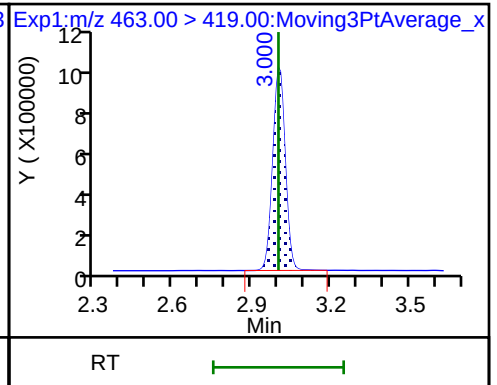
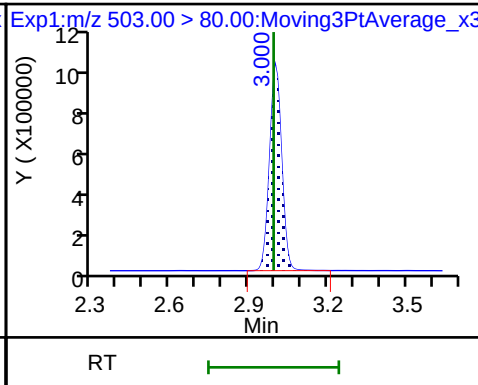
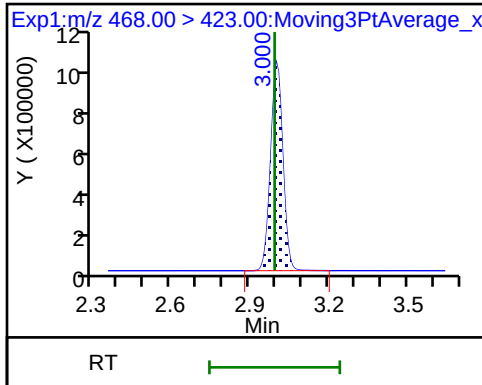
16 Perfluoroheptanesulfonic acid



D 19 13C5 PFNA

D 18 13C4 PFOS

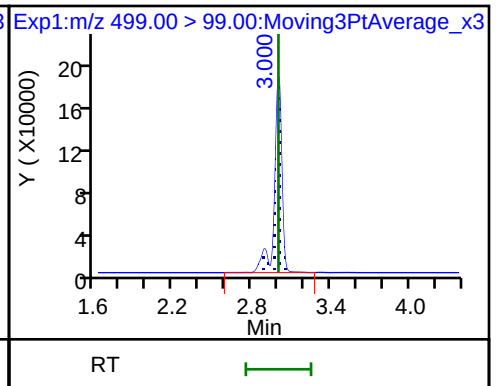
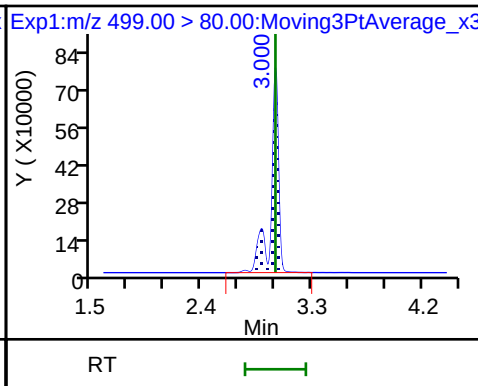
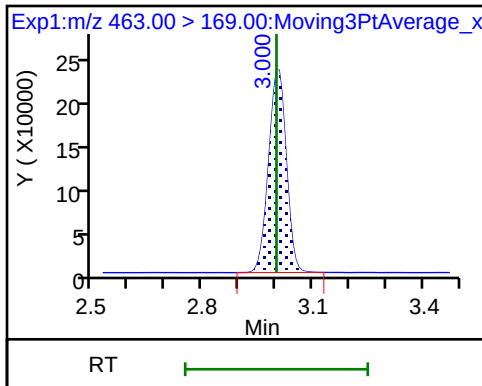
20 Perfluorononanoic acid



20 Perfluorononanoic acid

17 Perfluorooctane sulfonic acid

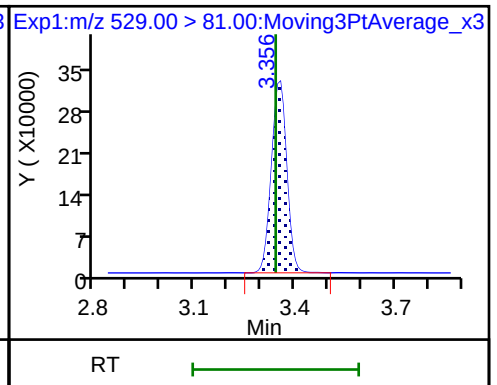
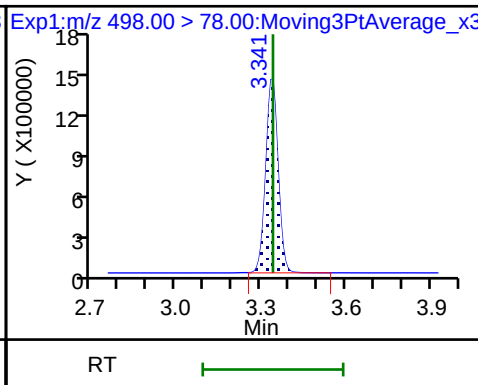
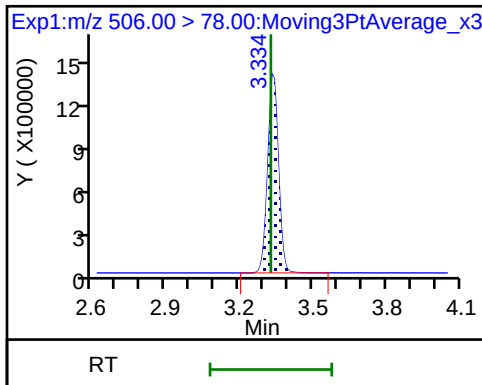
17 Perfluorooctane sulfonic acid

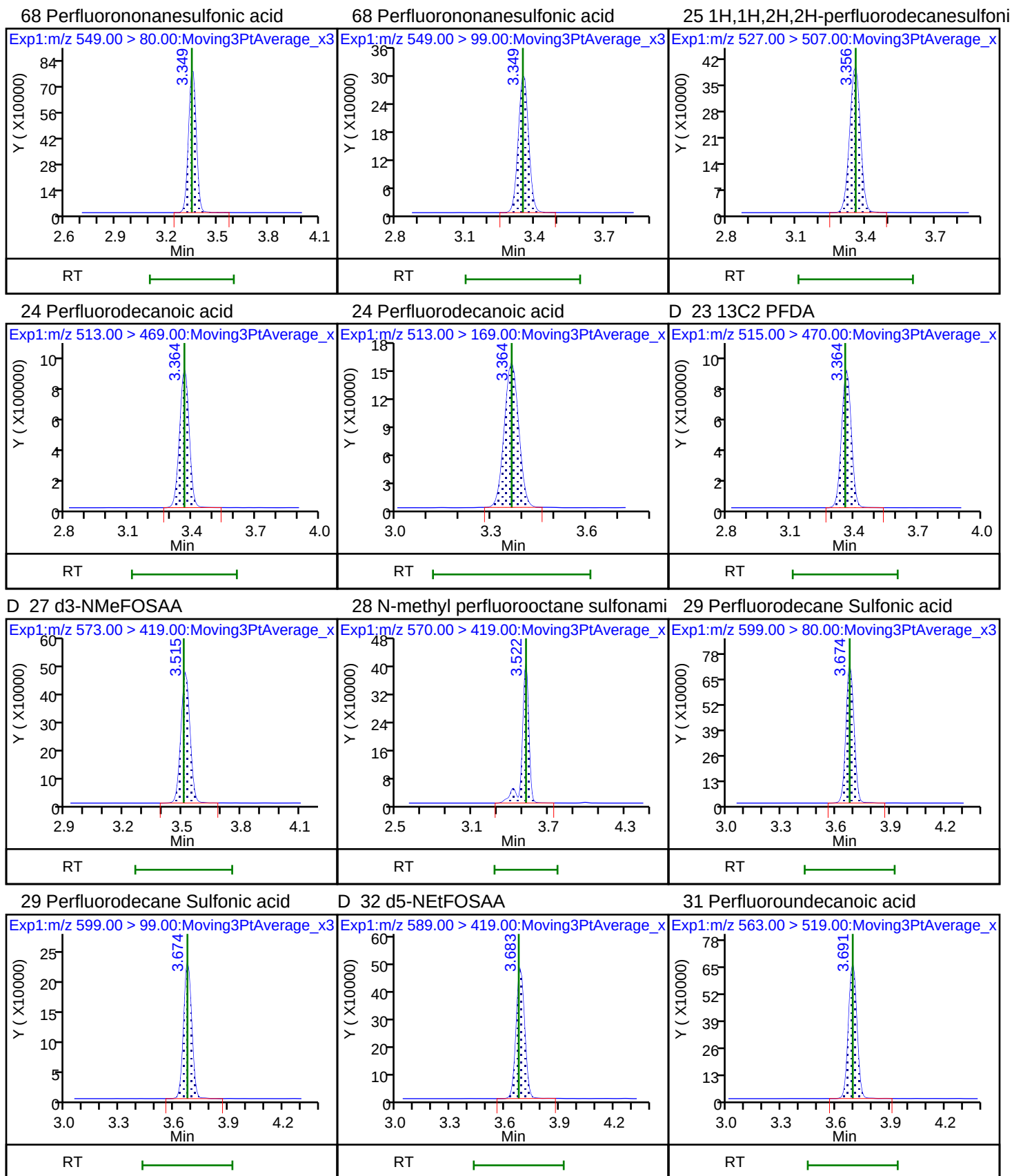


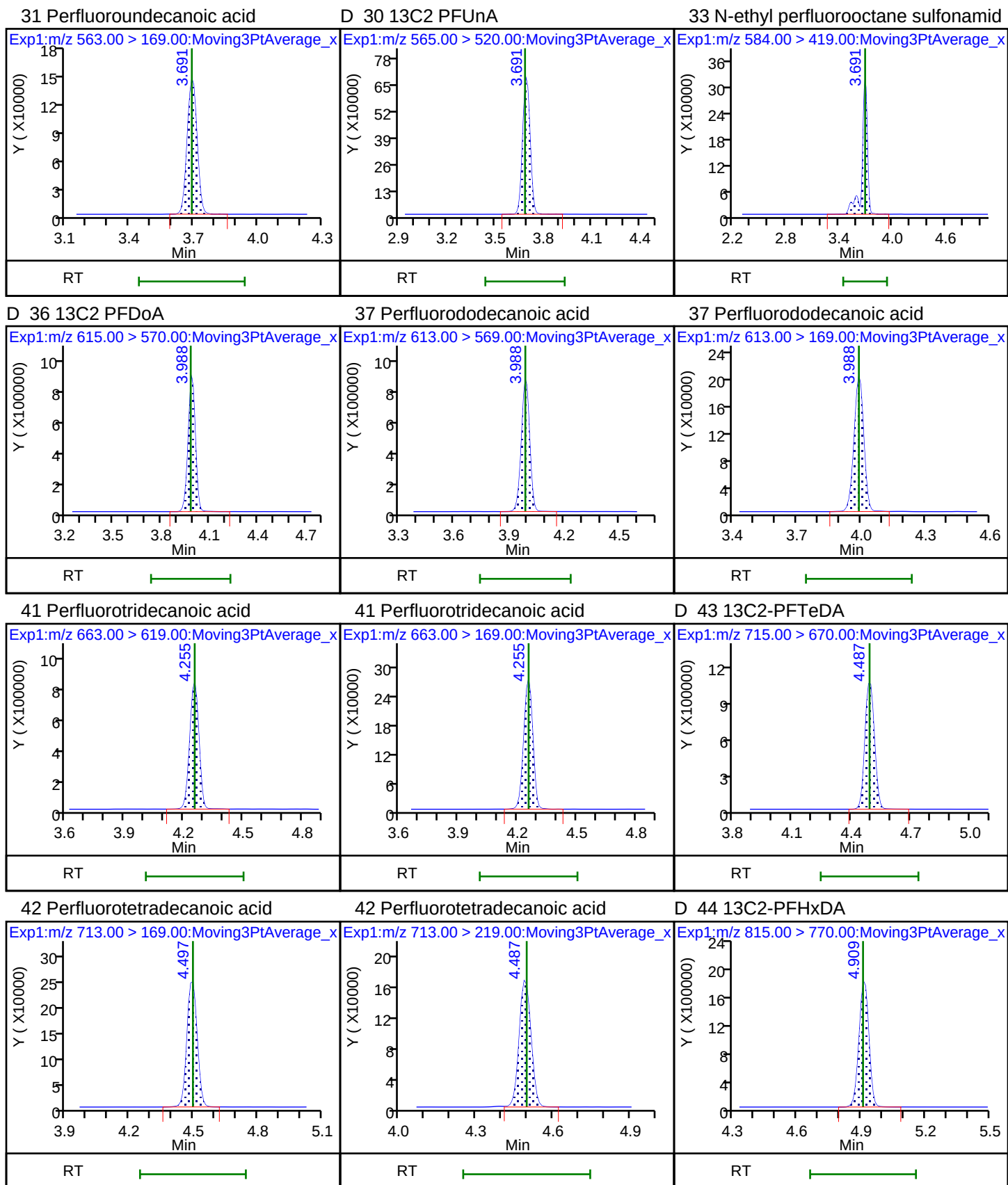
D 21 13C8 FOSA

22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS







FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-238978/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_007.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>08/10/2018 08:23</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.748	J M	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.5	U M	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-238978/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_007.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>08/10/2018 08:23</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	85		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	91		50-150
STL00993	13C2 PFHxA	85		50-150
STL01892	13C4-PFHpA	88		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	89		50-150
STL00997	13C2 PFUnA	89		50-150
STL00998	13C2 PFDoA	86		50-150
STL00994	18O2 PFHxS	85		50-150
STL02116	13C2-PFTeDA	101		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	84		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_007.d
 Lims ID: MB 320-238978/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 10-Aug-2018 08:23:48 ALS Bottle#: 1 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-238978/1-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 14:12:02 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK035

First Level Reviewer: hannigana

Date: 10-Aug-2018 13:57:28

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	1.404	1.411	-0.007	0.536	5975227	2.35		94.0	9901	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.404	1.413	-0.009	1.000	41963	0.0187			3.9	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.652	1.662	-0.010	0.631	3974933	2.27		90.8	14517	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.660	1.668	-0.008	1.005	11749	0.006495			0.7	
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.702	-0.010	0.647	78997	1.95		83.9	520	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.943	-0.004	0.741	4220005	2.12		85.0	10010	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.033	2.037	-0.004	0.777	314697	NC			877	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.033	2.043	-0.010	1.000	1054	NC			0.8	
D 9 13C4-PFHpA										
367.00 > 322.00	2.270	2.265	0.005	0.867	4283050	2.19		87.6	6664	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.258	2.269	-0.011	0.995	6375	0.003504			1.5	
363.00 > 169.00	2.281	2.269	0.012	1.005	2184		2.92(1.13-3.40)		4.5	
D 11 18O2 PFHxS										
403.00 > 84.00	2.281	2.276	0.005	0.872	5032888	2.01		84.9	10324	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.281	2.280	0.001	1.000	17500	0.007586			39.6	
399.00 > 99.00	2.270	2.280	-0.010	0.995	6235		2.81(1.50-4.49)		7.3	
D 12 M2-6:2FTS										
429.00 > 81.00	2.588	2.592	-0.004	0.989	1029330	2.50		105	3037	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 1H,1H,2H,2H-perfluorooctanesulfoni	427.00 > 407.00	2.588	2.601	-0.013	1.000	57319	0.0841		165	
D 73 13C8 PFOA	421.00 > 376.00	2.616	2.612	0.004	1.000	8911	NC		80.2	
D 14 13C4 PFOA	417.00 > 372.00	2.616	2.619	-0.003	1.000	4193356	2.34	93.5	9303	
15 Perfluorooctanoic acid	413.00 > 369.00	2.624	2.622	0.002	1.003	9858	0.005198		1.0	
	413.00 > 169.00	2.616	2.622	-0.006	1.000	7959	1.24(0.84-2.52)		19.7	
* 62 13C2-PFOA	415.00 > 370.00	2.616	2.622	-0.006		4588938	2.50		14171	
D 72 13C8 PFOS	507.00 > 99.00	2.997	2.984	0.013	1.146	2018	NC		24.8	
D 18 13C4 PFOS	503.00 > 80.00	2.990	2.992	-0.002	1.143	3551813	2.16	90.2	3778	
D 19 13C5 PFNA	468.00 > 423.00	2.990	2.992	-0.002	1.143	3689829	2.29	91.7	9290	
69 9-Chlorohexadecafluoro-3-oxanonane	531.00 > 351.00	3.200	3.211	-0.011	1.070	1724	NC		8.5	
D 21 13C8 FOSA	506.00 > 78.00	3.325	3.326	-0.001	1.271	4610248	2.11	84.5	5669	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.325	3.334	-0.009	1.000	2824	0.001573		15.7	
D 26 M2-8:2FTS	529.00 > 81.00	3.347	3.340	0.007	1.279	1154720	2.32	97.0	3871	
25 1H,1H,2H,2H-perfluorodecanesulfoni	527.00 > 507.00	3.340	3.349	-0.009	0.998	1242	0.001983		4.8	
D 23 13C2 PFDA	515.00 > 470.00	3.355	3.355	0.0	1.282	3151878	2.23	89.3	4952	
D 27 d3-NMeFOSAA	573.00 > 419.00	3.505	3.506	-0.001	1.340	1765370	2.44	97.8	4422	
D 32 d5-NEtFOSAA	589.00 > 419.00	3.673	3.674	-0.001	1.404	1851916	2.47	99.0	1621	
D 30 13C2 PFUnA	565.00 > 520.00	3.682	3.682	0.0	1.407	2514543	2.21	88.5	6082	
31 Perfluoroundecanoic acid	563.00 > 519.00	3.673	3.685	-0.012	0.998	15831	0.0140		6.2	RM
	563.00 > 169.00	3.659	3.685	-0.026	0.994	2266	6.99(2.12-6.36)		11.8	RM M
66 11-Chloroeicosafuoro-3-oxaundecan	631.00 > 451.00	3.840	3.852	-0.012	1.284	2000	NC		12.2	
D 36 13C2 PFDoA	615.00 > 570.00	3.982	3.987	-0.005	1.522	2582959	2.15	86.0	3959	
D 43 13C2-PFTeDA	715.00 > 670.00	4.488	4.493	-0.005	1.715	3849453	2.52	101	6987	
D 44 13C2-PFHxDA	815.00 > 770.00	4.910	4.917	-0.007	1.877	5783215	1.91	76.2	7243	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.910	4.919	-0.009	1.000	55178	NC			9.8	
813.00 > 169.00	4.910	4.919	-0.009	1.000	9469		5.83(2.86-8.58)		72.2	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_007.d

Injection Date: 10-Aug-2018 08:23:48

Instrument ID: A8_N

Lims ID: MB 320-238978/1-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 1

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

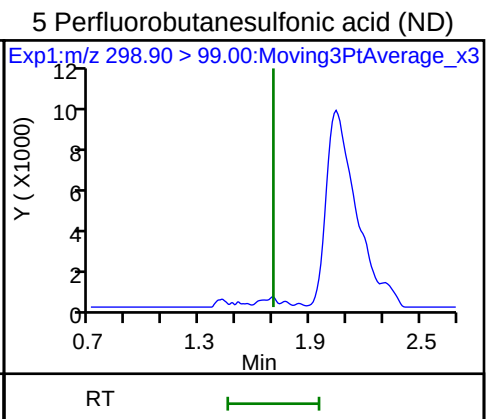
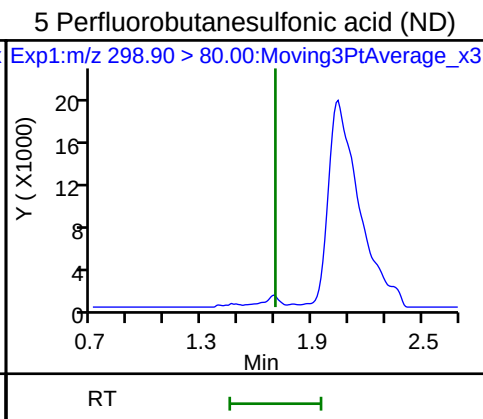
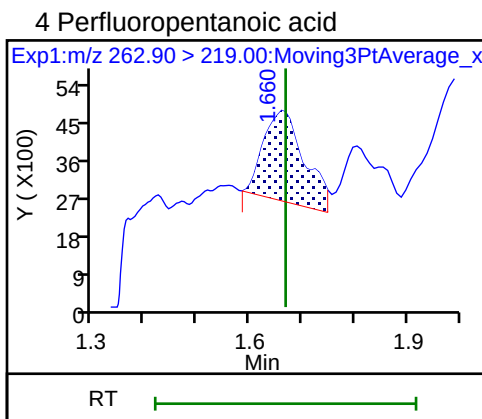
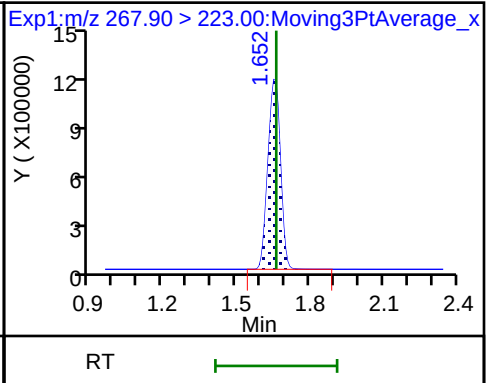
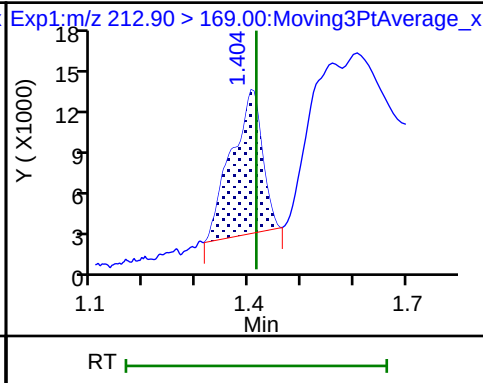
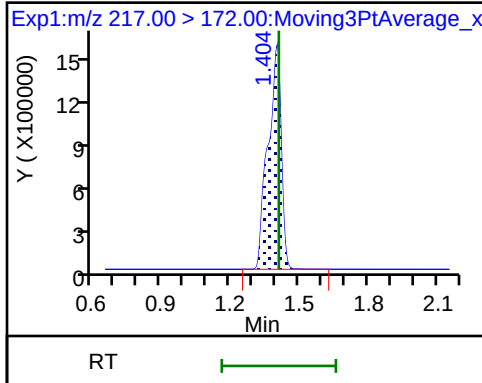
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

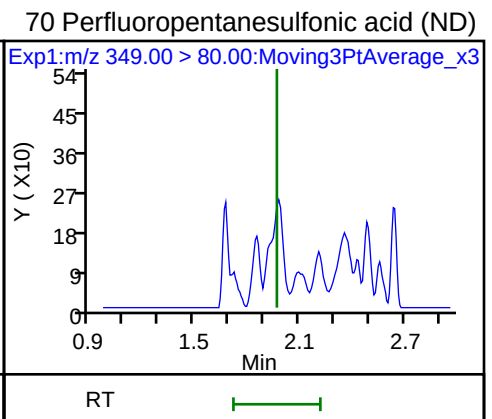
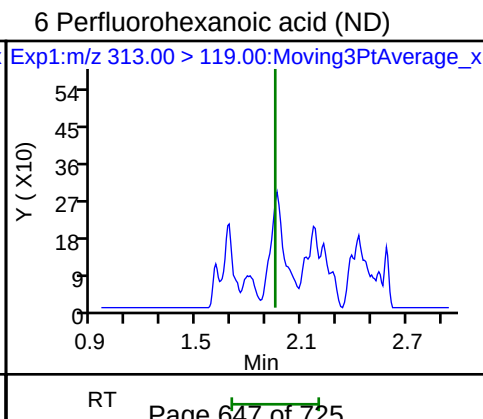
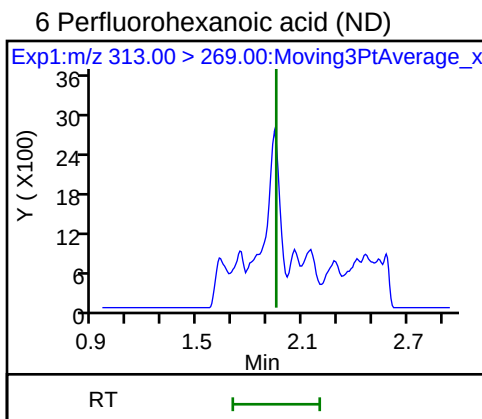
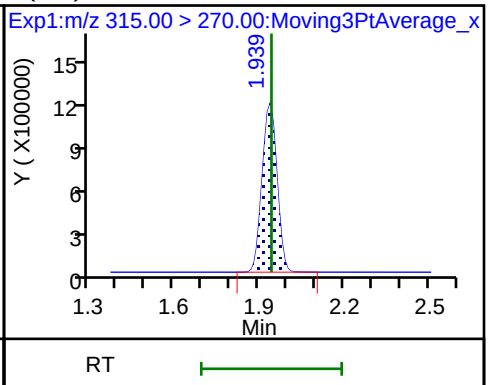
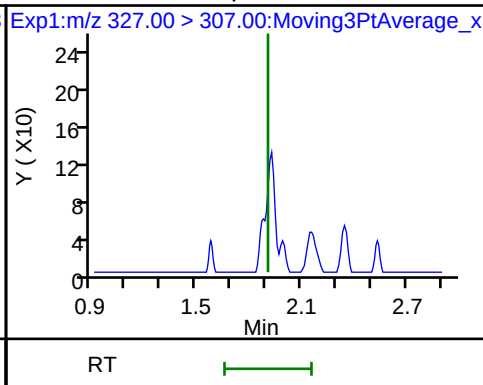
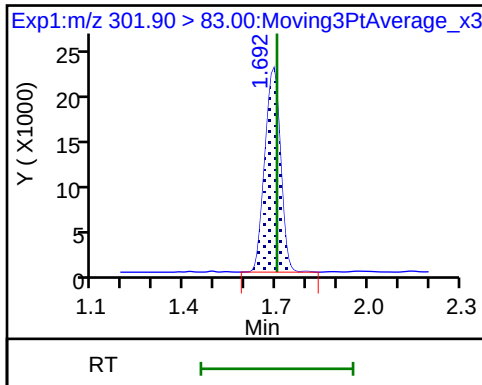
D 3 13C5-PFPeA



D 47 13C3-PFBS

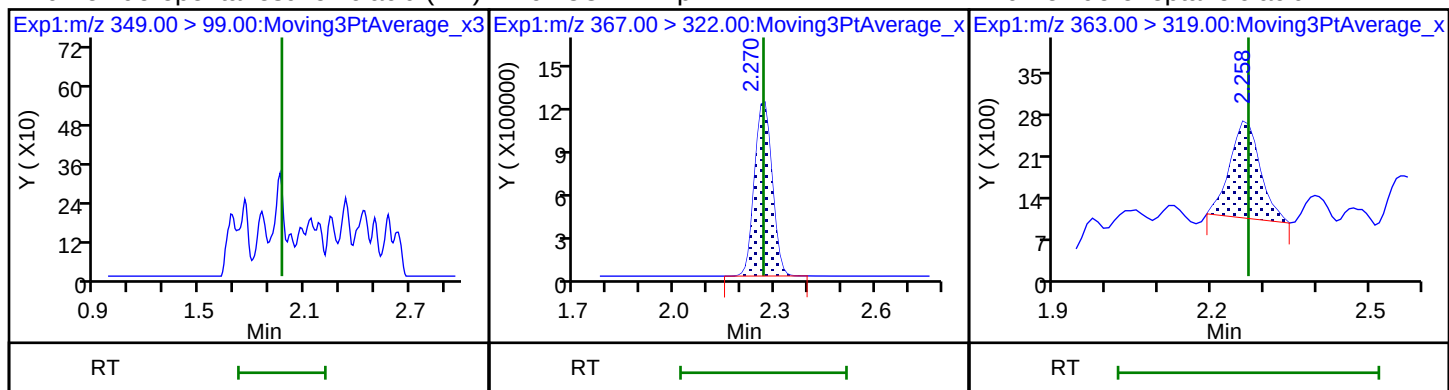
61 1H,1H,2H,2H-perfluorohexanesulfonate (ND)

D 13C2 PFHxA



70 Perfluoropentanesulfonic acid (ND) D 9 13C4-PFHpA

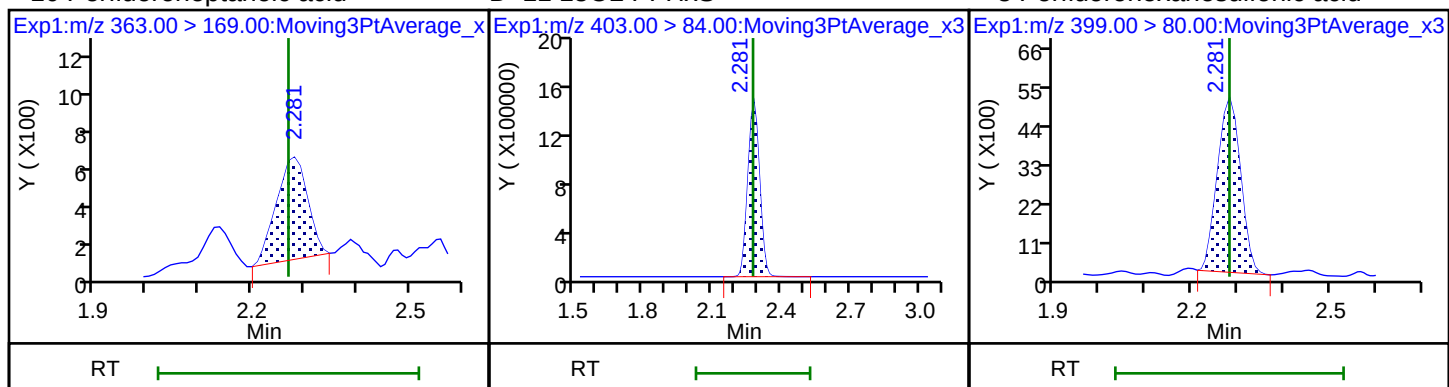
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

D 11 18O2 PFHxS

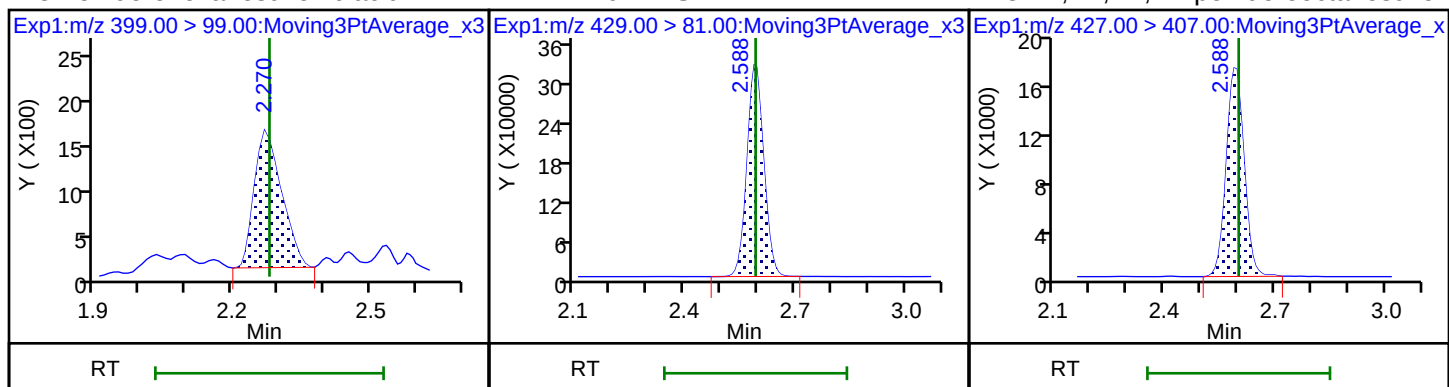
8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

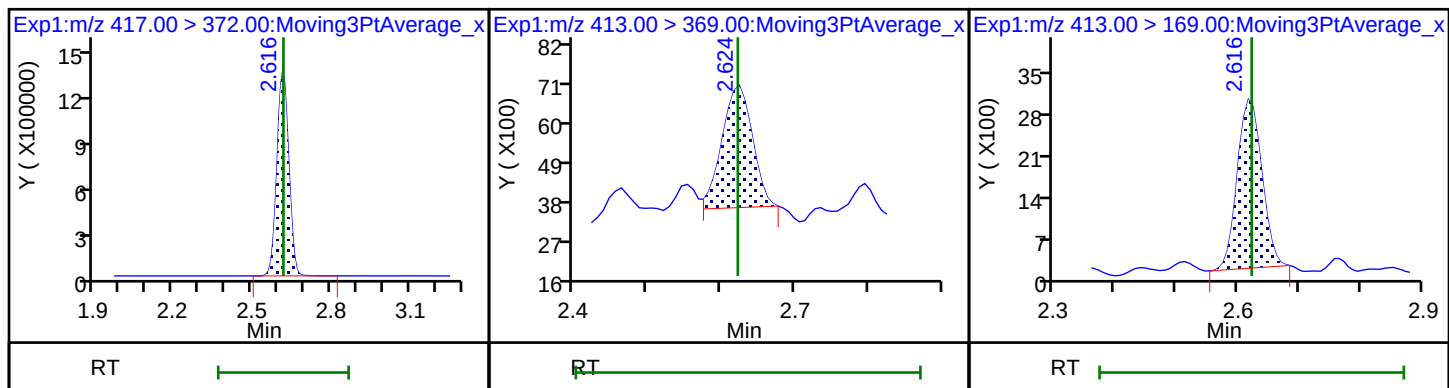
13 1H,1H,2H,2H-perfluorooctanesulfoni



D 14 13C4 PFOA

15 Perfluorooctanoic acid

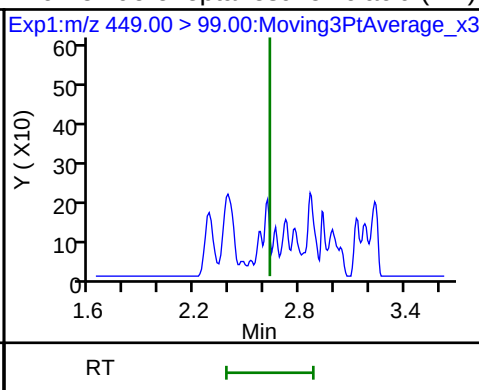
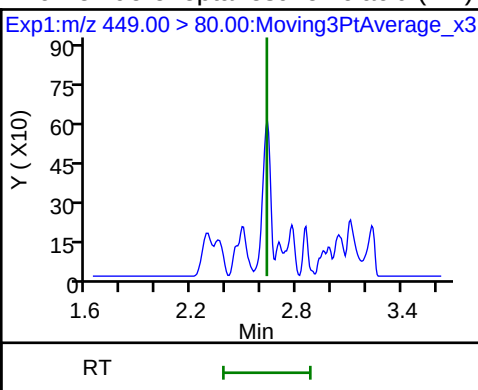
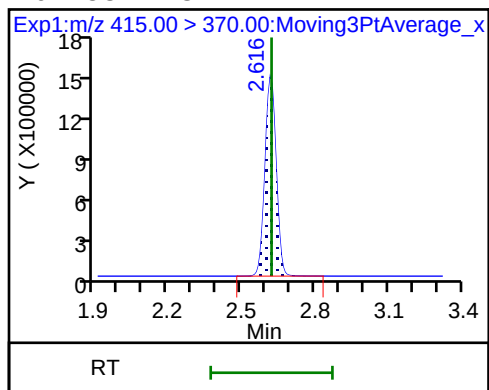
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid (ND)

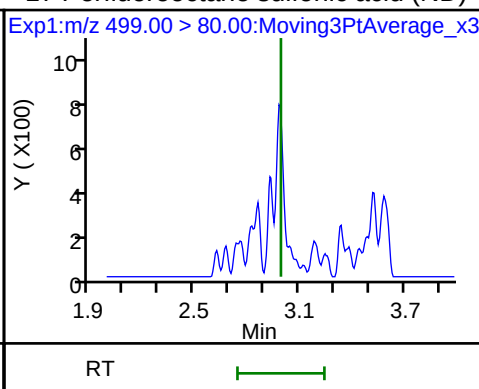
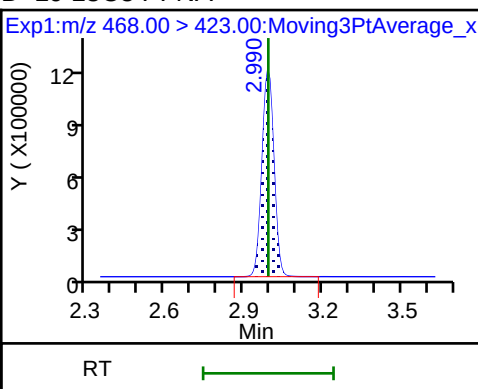
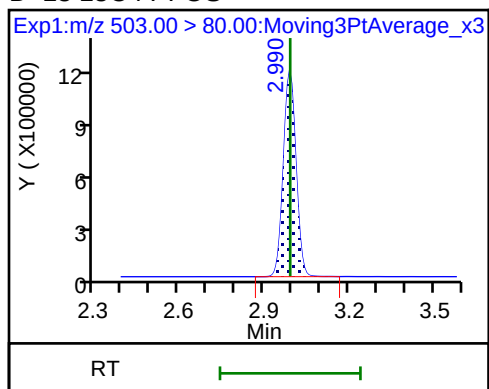
16 Perfluoroheptanesulfonic acid (ND)



D 18 13C4 PFOS

D 19 13C5 PFNA

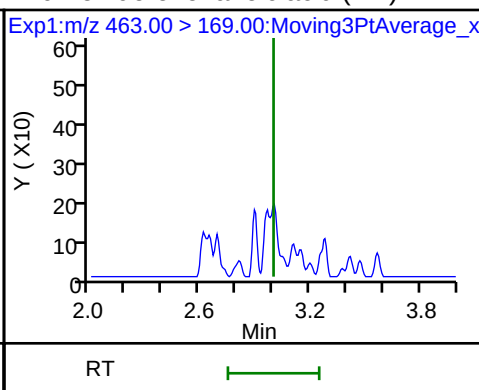
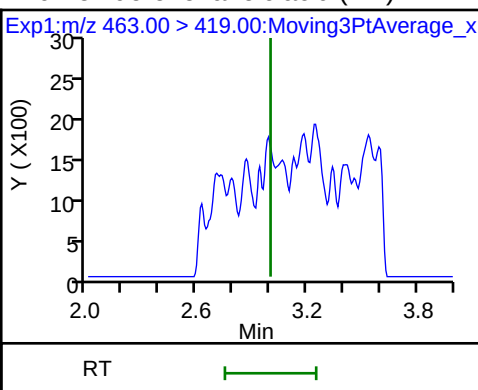
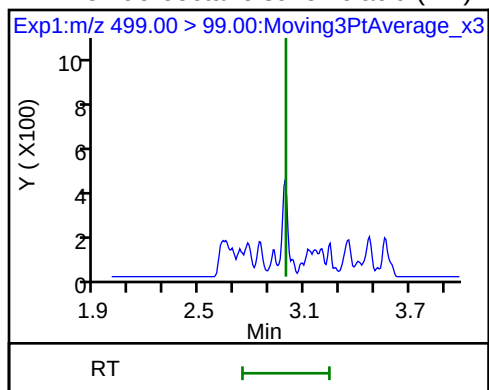
17 Perfluorooctane sulfonic acid (ND)



17 Perfluorooctane sulfonic acid (ND)

20 Perfluorononanoic acid (ND)

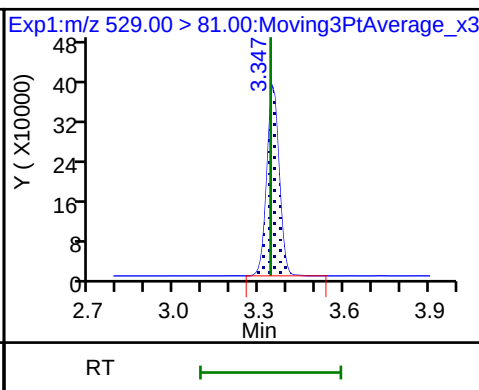
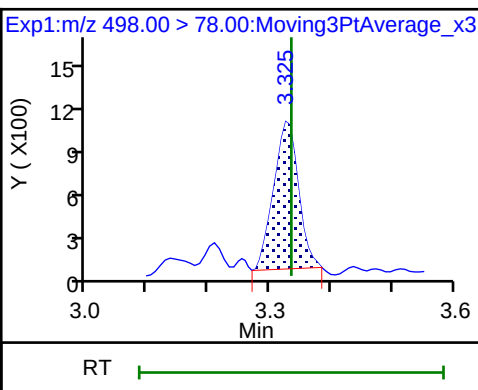
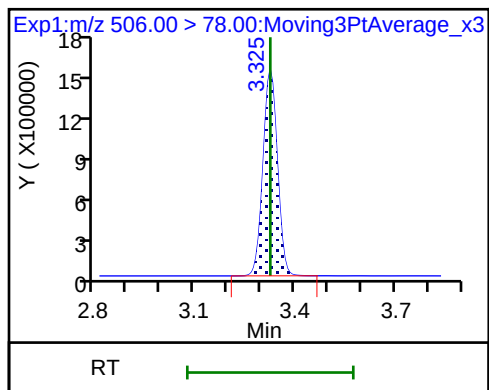
20 Perfluorononanoic acid (ND)



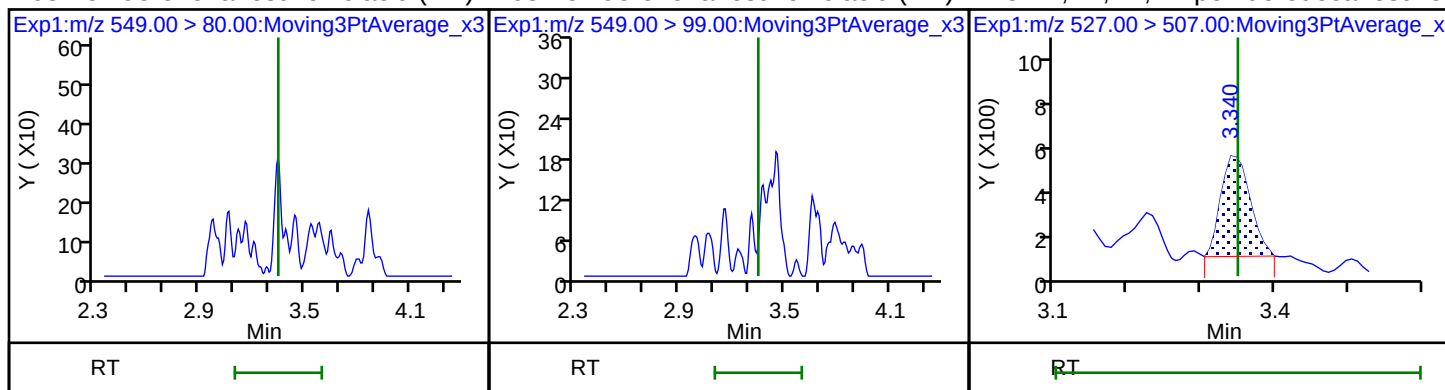
D 21 13C8 FOSA

22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS



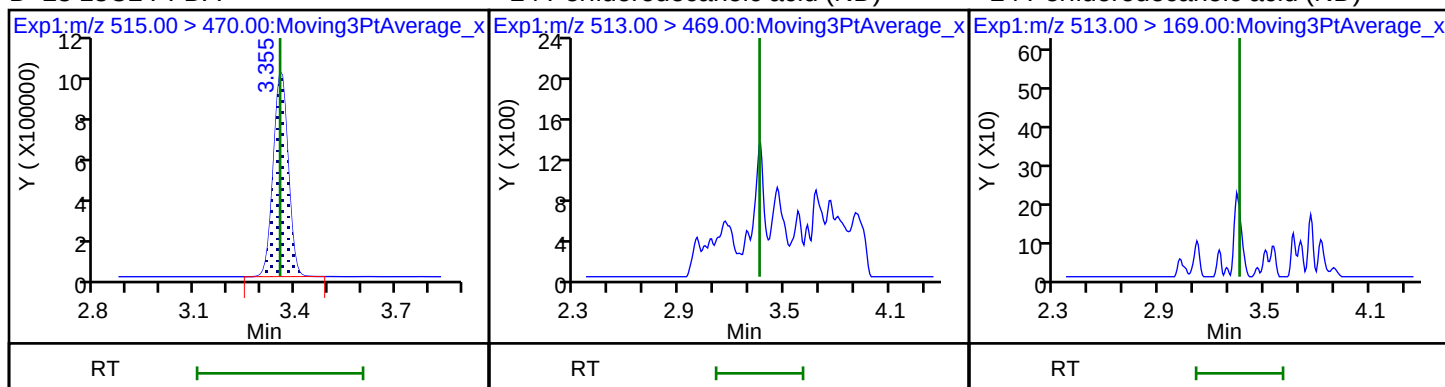
68 Perfluorononanesulfonic acid (ND) 68 Perfluorononanesulfonic acid (ND) 25 1H,1H,2H,2H-perfluorodecanesulfoni



D 23 13C2 PFDA

24 Perfluorodecanoic acid (ND)

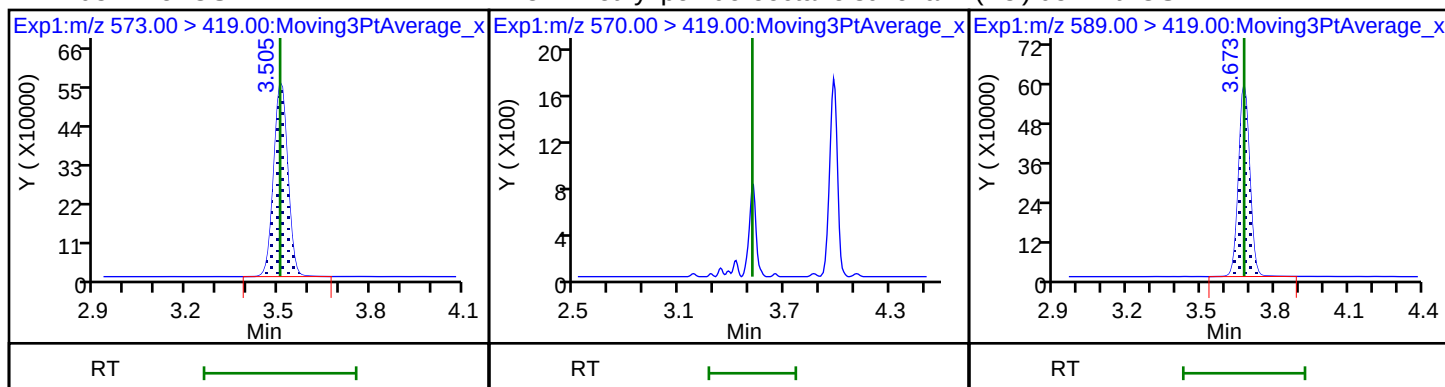
24 Perfluorodecanoic acid (ND)



D 27 d3-NMeFOSAA

28 N-methyl perfluorooctane sulfonamide (ND)

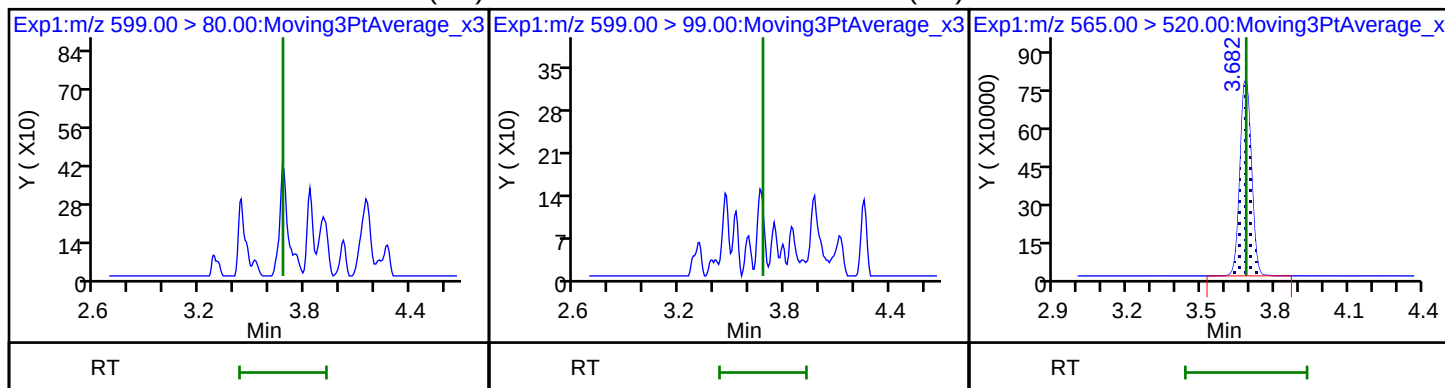
D 27 d5-NEtFOSAA

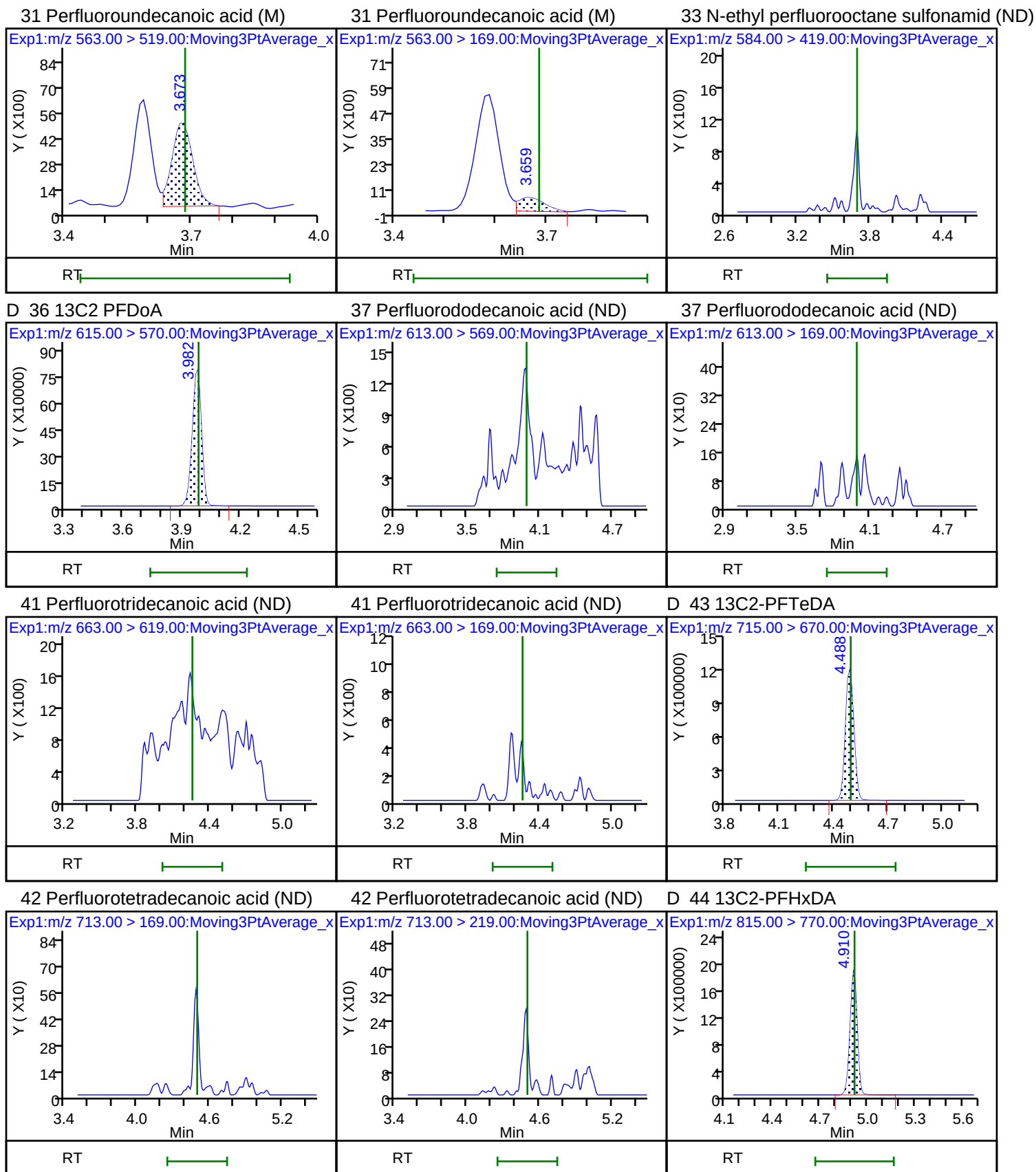


29 Perfluorodecane Sulfonic acid (ND)

29 Perfluorodecane Sulfonic acid (ND)

D 30 13C2 PFUnA





TestAmerica Sacramento

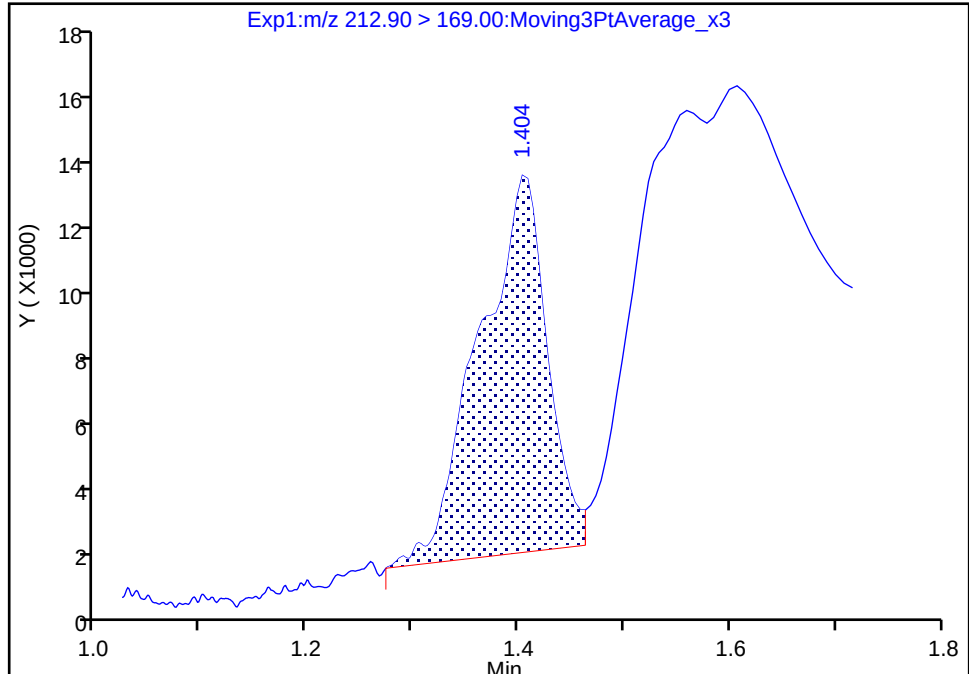
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_007.d
Injection Date: 10-Aug-2018 08:23:48 Instrument ID: A8_N
Lims ID: MB 320-238978/1-A
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

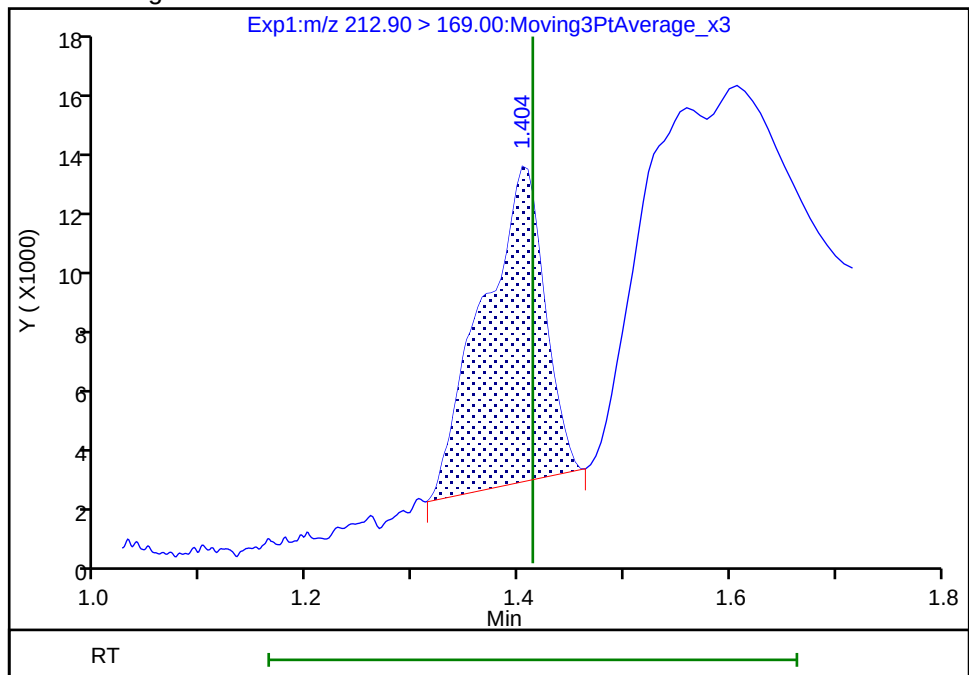
RT: 1.40
Area: 49652
Amount: 0.022127
Amount Units: ng/ml

Processing Integration Results



RT: 1.40
Area: 41963
Amount: 0.018700
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:56:28

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

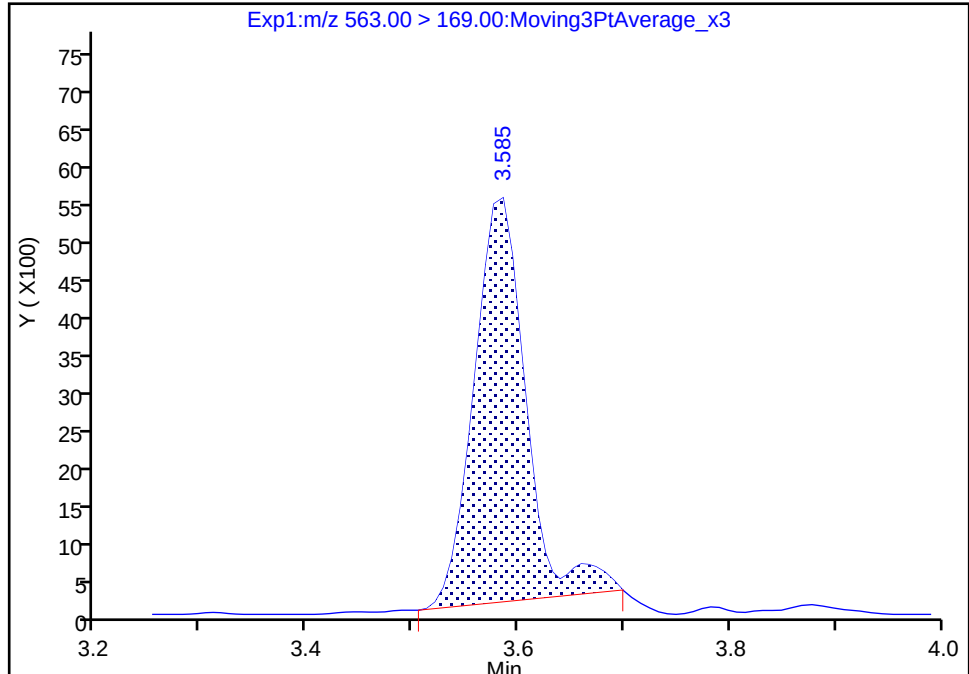
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_007.d
Injection Date: 10-Aug-2018 08:23:48 Instrument ID: A8_N
Lims ID: MB 320-238978/1-A
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 2

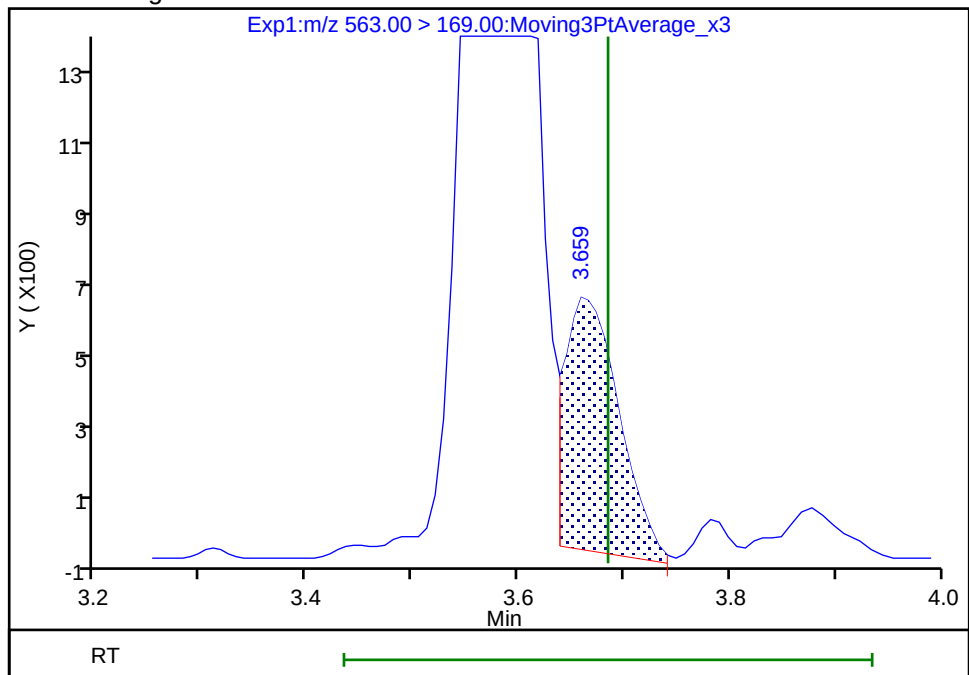
RT: 3.59
Area: 18229
Amount: 0.015195
Amount Units: ng/ml

Processing Integration Results



RT: 3.66
Area: 2266
Amount: 0.014007
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:57:04
Audit Action: Manually Integrated

Audit Reason: Wrong peak
Page 654 of 725

TestAmerica Sacramento

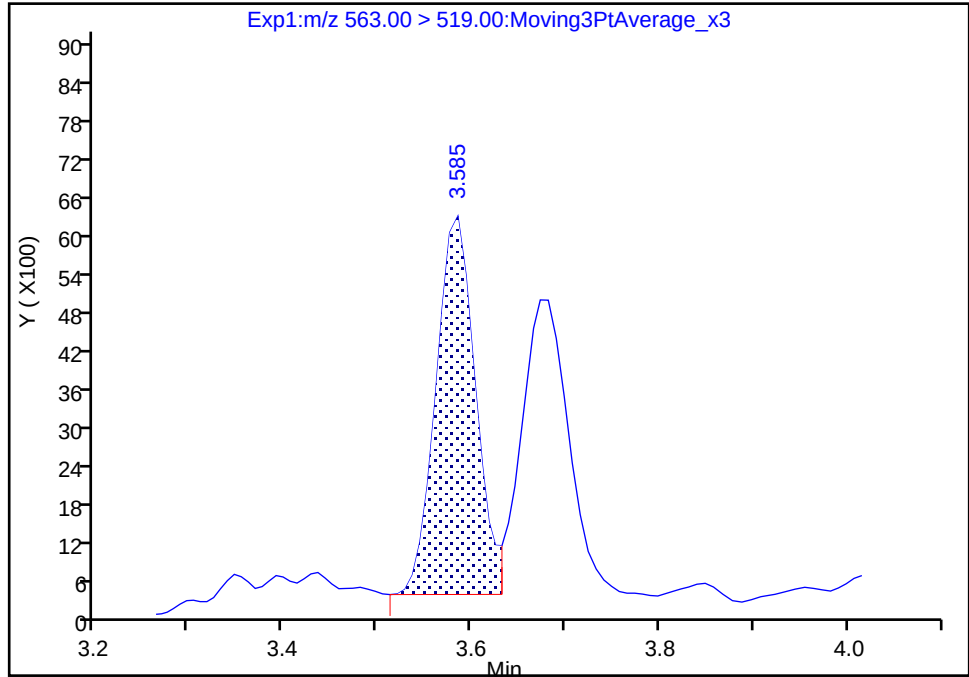
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_007.d
Injection Date: 10-Aug-2018 08:23:48 Instrument ID: A8_N
Lims ID: MB 320-238978/1-A
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

31 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

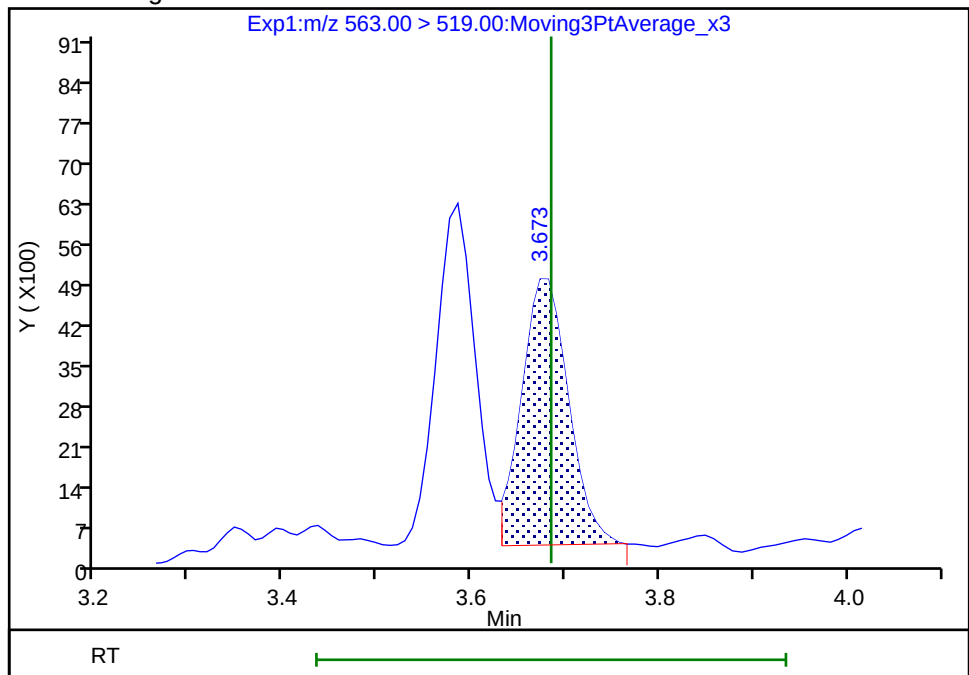
RT: 3.59
Area: 17173
Amount: 0.015195
Amount Units: ng/ml

Processing Integration Results



RT: 3.67
Area: 15831
Amount: 0.014007
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:57:21

Audit Action: Manually Integrated

Audit Reason: Wrong peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 320-239237/1
 Matrix: Water Lab File ID: 2018.08.10LLA_004.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 08/10/2018 08:00
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 239237 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00729	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 320-239237/1
 Matrix: Water Lab File ID: 2018.08.10LLA_004.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 08/10/2018 08:00
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 239237 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	97		50-150
STL00992	13C4 PFBA	95		50-150
STL01893	13C5 PFPeA	89		50-150
STL00993	13C2 PFHxA	89		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	101		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	91		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	99		50-150
STL00994	18O2 PFHxS	88		50-150
STL02116	13C2-PFTeDA	104		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	87		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_004.d
 Lims ID: CCB
 Client ID:
 Sample Type: CCB
 Inject. Date: 10-Aug-2018 08:00:21 ALS Bottle#: 20 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCB
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 13:55:05 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK035

First Level Reviewer: roycea

Date: 10-Aug-2018 12:40:29

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	1.406	1.411	-0.005	0.537	5620559	2.37		95.0	9733	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.631	1.655	-0.023	0.986	6011	0.003631			0.5	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.662	-0.008	0.631	3637229	2.23		89.3	8677	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.702	-0.008	0.647	76615	2.03		87.4	348	
D 60 M2-4:2FTS										
329.00 > 81.00	1.902	1.912	-0.010	0.726	604948	NC			1243	
D 7 13C2 PFHxA										
315.00 > 270.00	1.933	1.943	-0.010	0.738	4129888	2.23		89.3	11119	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.038	2.037	0.001	0.778	333680	NC			890	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.265	0.001	0.865	4132197	2.27		90.8	7141	
10 Perfluoroheptanoic acid										R
363.00 > 319.00	2.266	2.266	0.0	1.000	5163	0.002942			1.2	R
363.00 > 169.00	2.266	2.266	0.0	1.000	1446		3.57(1.13-3.40)		3.5	
D 11 18O2 PFHxS										
403.00 > 84.00	2.277	2.276	0.001	0.869	4872259	2.09		88.3	4555	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.277	2.277	0.0	1.000	16278	0.007289			32.1	
399.00 > 99.00	2.266	2.277	-0.011	0.995	6485		2.51(1.50-4.49)		12.8	
D 12 M2-6:2FTS										
429.00 > 81.00	2.593	2.592	0.001	0.990	978884	2.56		108	3506	
D 73 13C8 PFOA										
421.00 > 376.00	2.612	2.612	0.0	0.997	7508843	NC			13672	

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	2.620	2.619	0.001	1.000	4229004	2.53		101	8943	
* 62 13C2-PFOA										
415.00 > 370.00	2.620	2.620	0.0		4272227	2.50			8175	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.620	2.620	0.0	1.000	8682	0.004539			0.9	
413.00 > 169.00	2.620	2.620	0.0	1.000	7972		1.09(0.84-2.52)		17.1	
D 72 13C8 PFOS										
507.00 > 99.00	2.985	2.984	0.001	1.139	1688718	NC			3643	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.142	3295050	2.15		89.9	3807	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.142	3429459	2.29		91.5	6108	
D 21 13C8 FOSA										
506.00 > 78.00	3.327	3.326	0.001	1.270	4933538	2.43		97.2	5632	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.319	3.327	-0.008	0.998	527	0.000274			6.1	
D 26 M2-8:2FTS										
529.00 > 81.00	3.341	3.340	0.001	1.275	1063416	2.30		96.0	3504	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.319	3.342	-0.023	0.993	428	0.000742			2.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.356	3.355	0.001	1.281	2999860	2.28		91.3	5107	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.507	3.506	0.001	1.339	1644874	2.45		97.8	4183	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.674	3.674	0.0	1.402	1789034	2.57		103	1870	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.691	3.675	0.016	1.002	5955	0.005168			4.4	
563.00 > 169.00	3.691	3.675	0.016	1.002	1116		5.34(2.12-6.36)		9.1	
D 30 13C2 PFUnA										
565.00 > 520.00	3.683	3.682	0.001	1.406	2563742	2.42		97.0	4240	
D 36 13C2 PFDoA										
615.00 > 570.00	3.987	3.987	0.0	1.522	2760247	2.47		98.8	4851	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.495	4.493	0.002	1.716	3704940	2.60		104	5620	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.917	4.908	0.009	1.000	52674	NC			8.0	
813.00 > 169.00	4.917	4.908	0.009	1.000	9571		5.50(2.86-8.58)		84.0	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.917	4.917	0.0	1.877	6166719	2.18		87.3	7341	

[QC Flag Legend](#)

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

[Reagents:](#)

LCPFC_LL0_00008

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_004.d

Injection Date: 10-Aug-2018 08:00:21

Instrument ID: A8_N

Lims ID: CCB

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 20

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

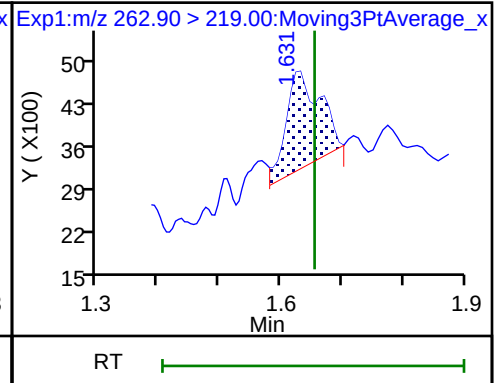
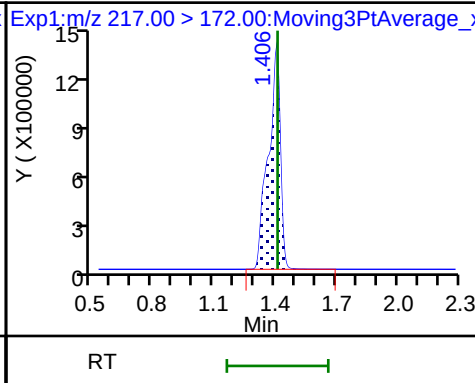
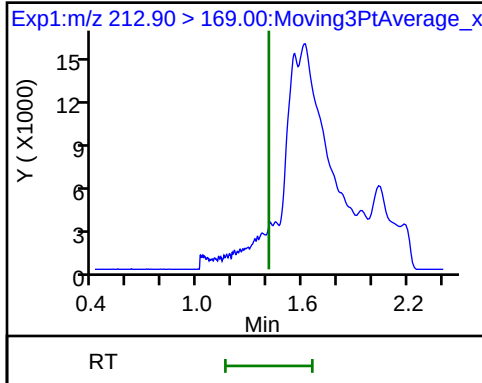
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

2 Perfluorobutyric acid (ND)

D 1 13C4 PFBA

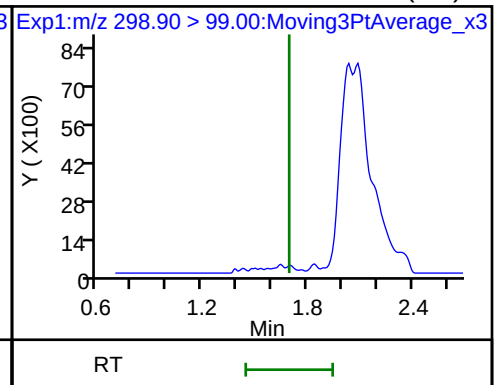
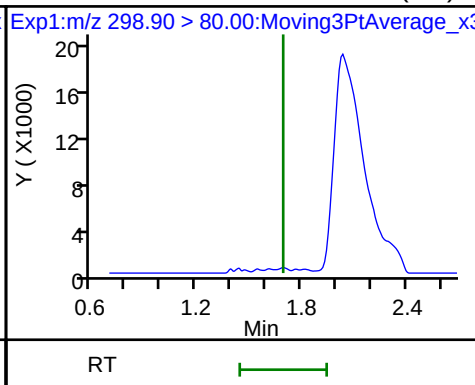
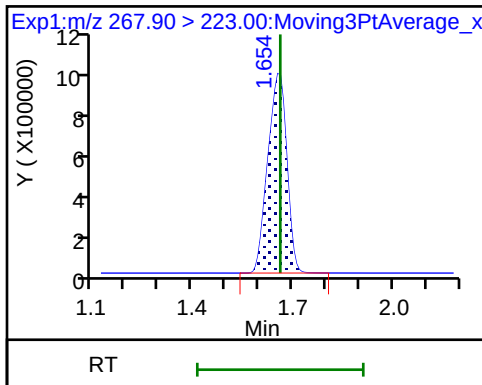
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid (ND)

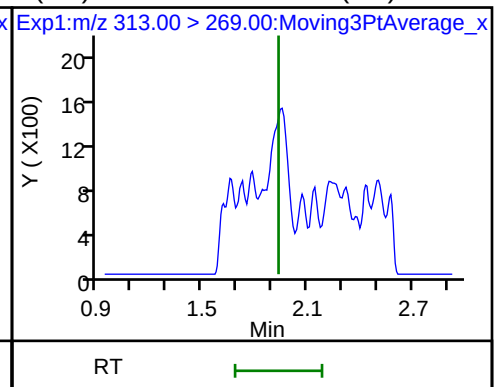
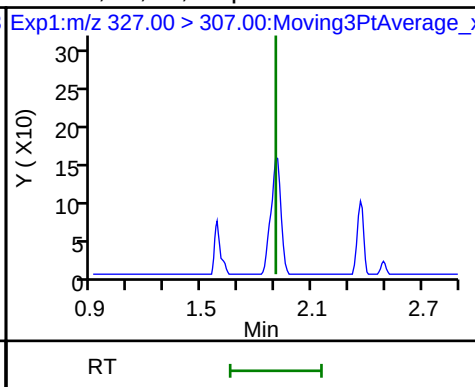
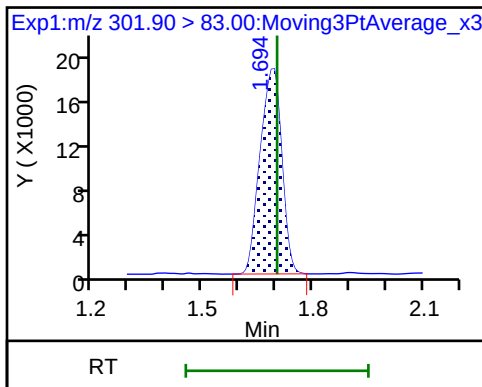
5 Perfluorobutanesulfonic acid (ND)



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfoni (ND)

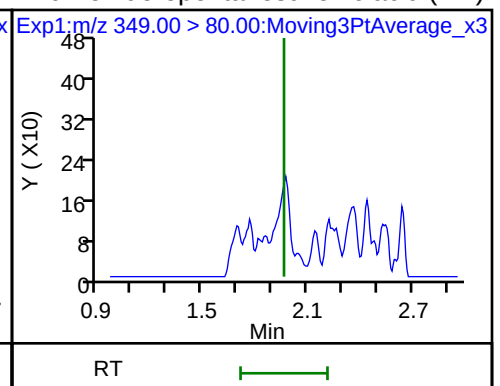
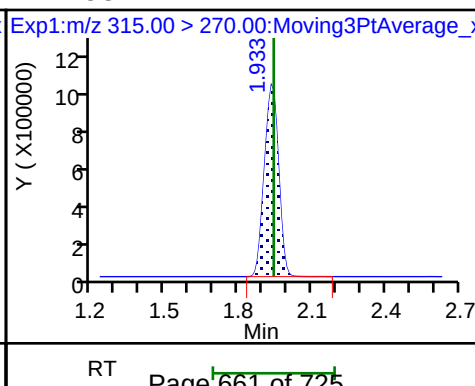
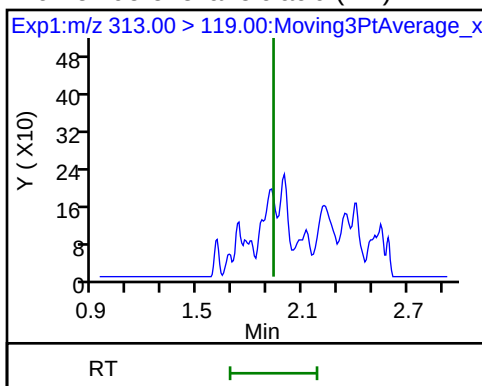
6 Perfluorohexanoic acid (ND)



6 Perfluorohexanoic acid (ND)

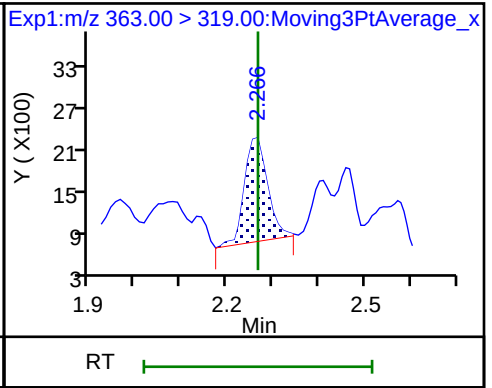
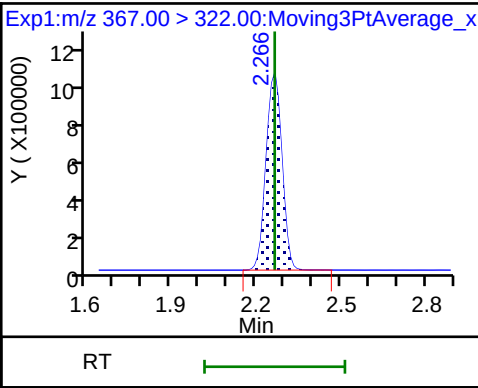
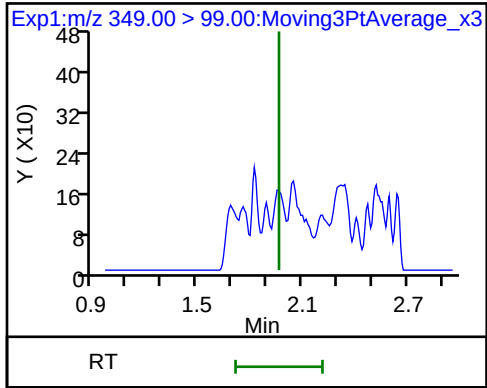
D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid (ND)



70 Perfluoropentanesulfonic acid (ND) D 9 13C4-PFHpA

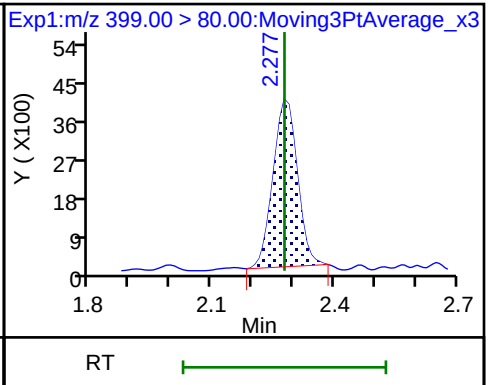
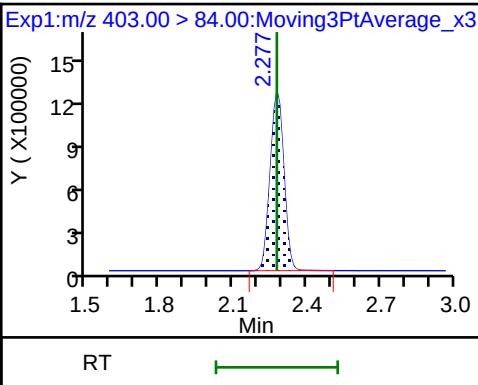
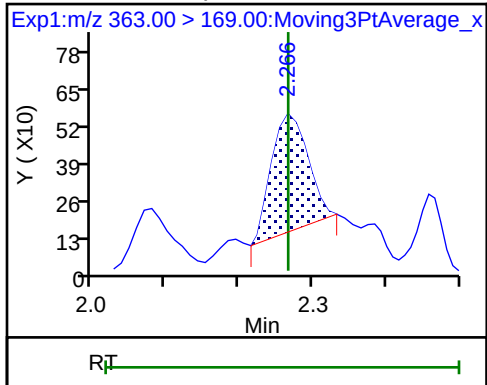
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

D 11 18O2 PFHxS

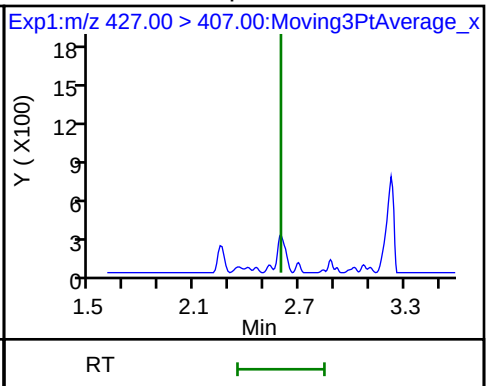
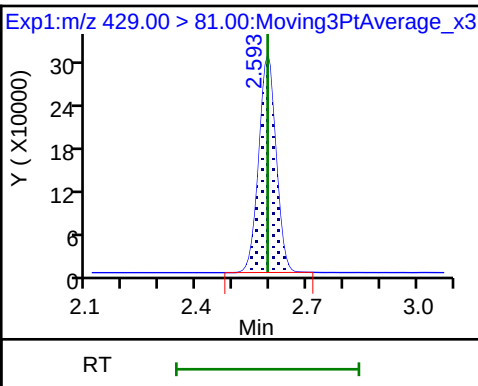
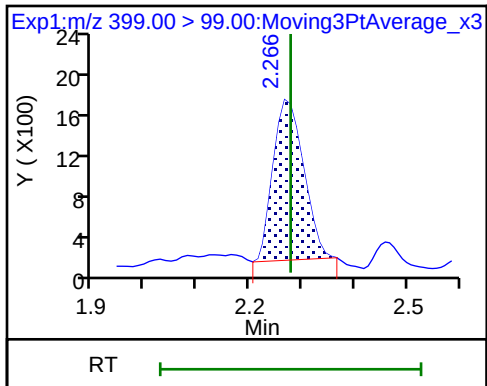
8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

D 12 M2-6:2FTS

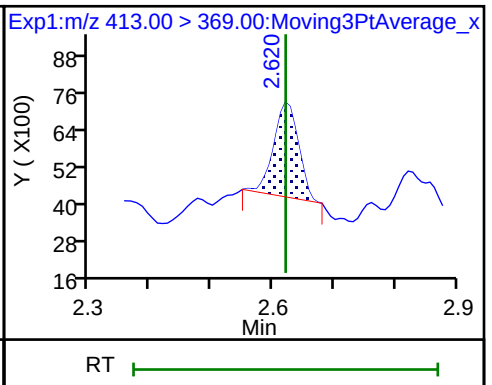
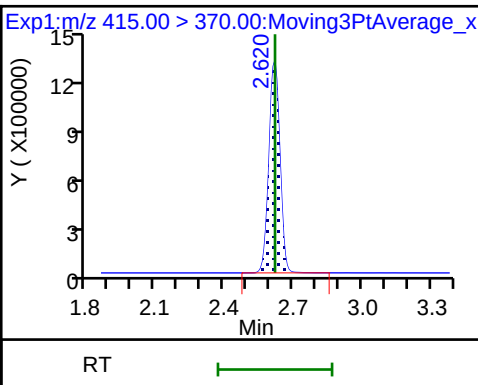
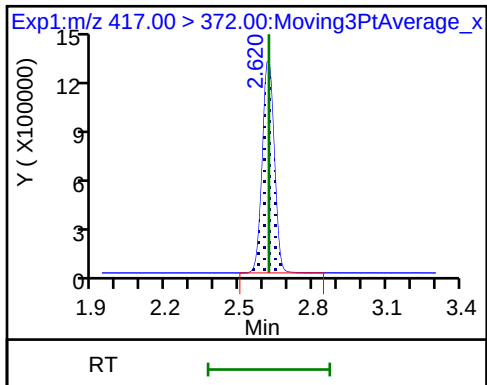
13 1H,1H,2H,2H-perfluorooctanesulfoni (ND)



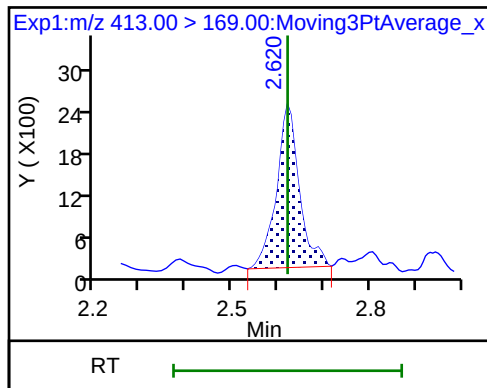
D 14 13C4 PFOA

* 62 13C2-PFOA

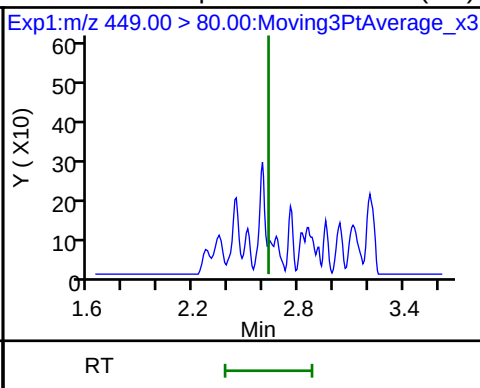
15 Perfluorooctanoic acid



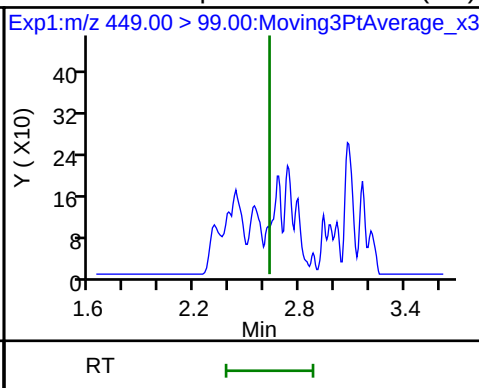
15 Perfluorooctanoic acid



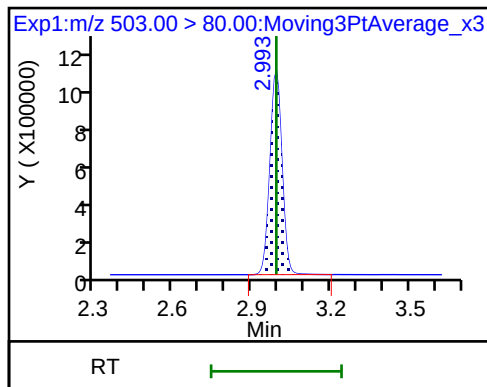
16 Perfluoroheptanesulfonic acid (ND)



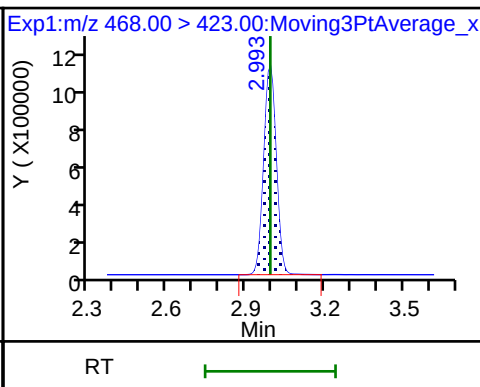
16 Perfluoroheptanesulfonic acid (ND)



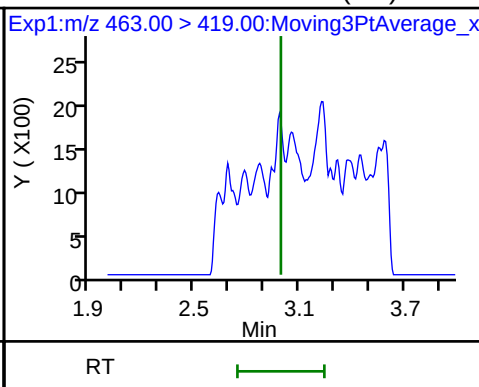
D 18 13C4 PFOS



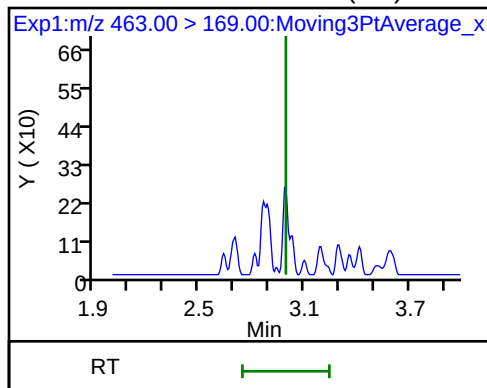
D 19 13C5 PFNA



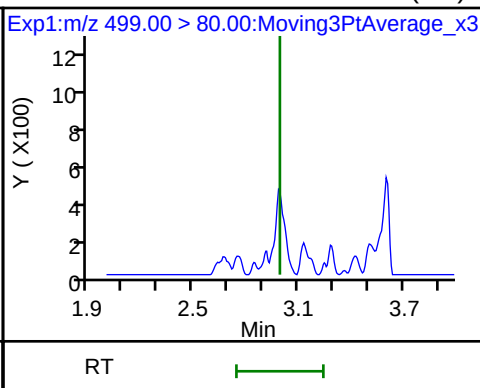
20 Perfluorononanoic acid (ND)



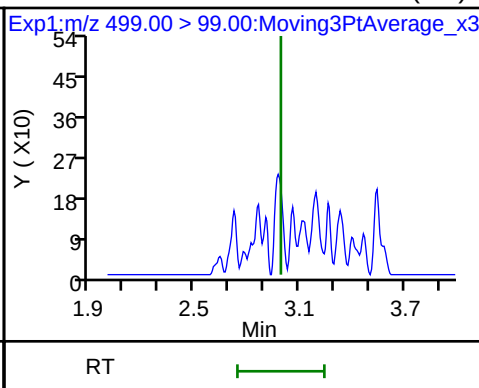
20 Perfluorononanoic acid (ND)



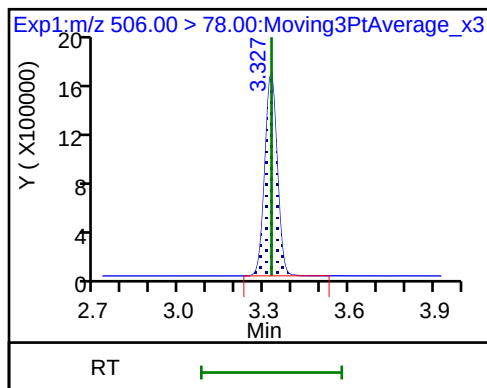
17 Perfluorooctane sulfonic acid (ND)



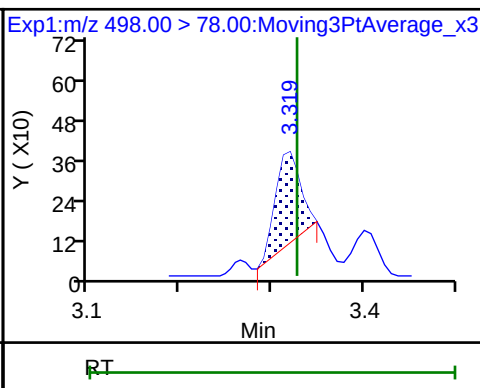
17 Perfluorooctane sulfonic acid (ND)



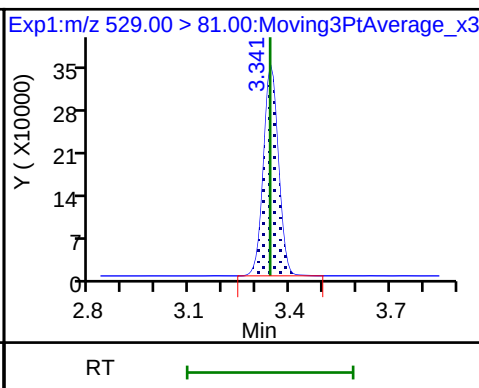
D 21 13C8 FOSA



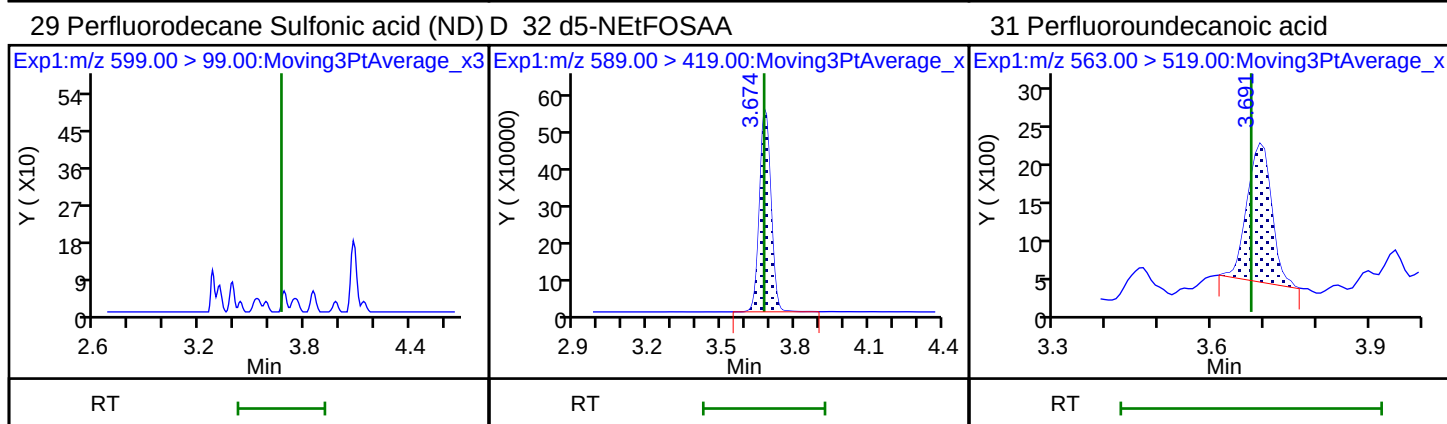
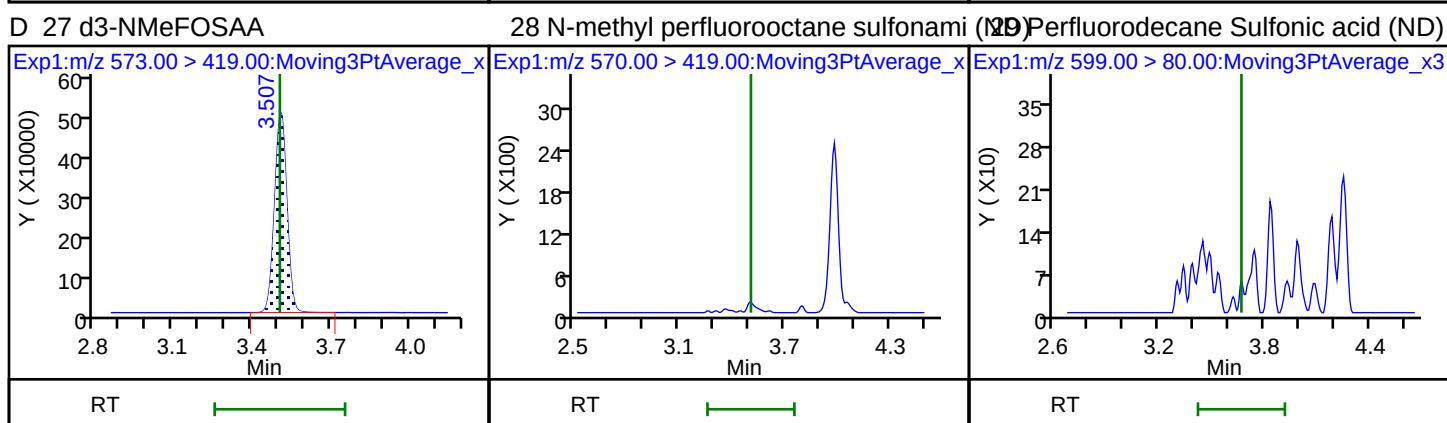
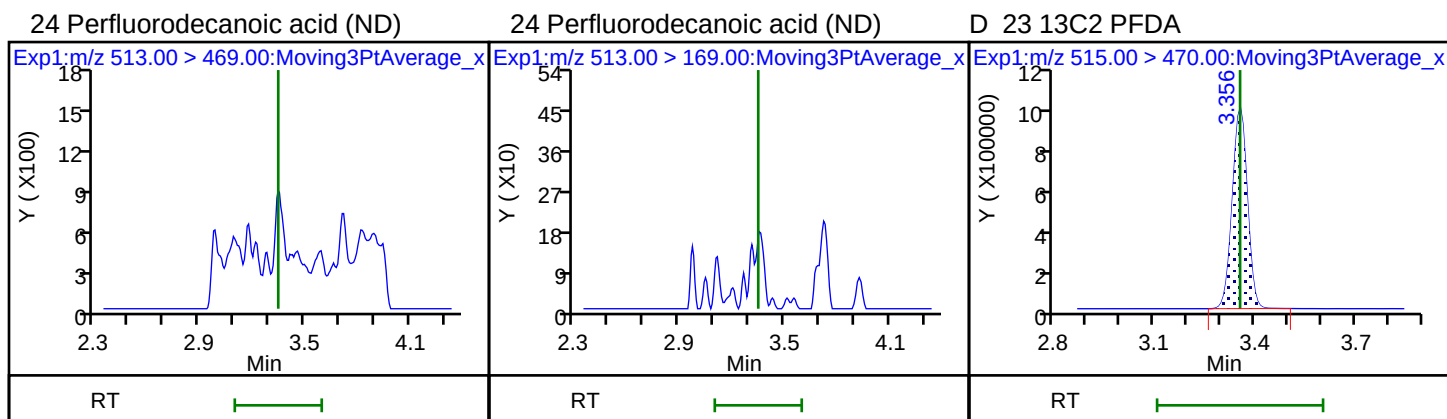
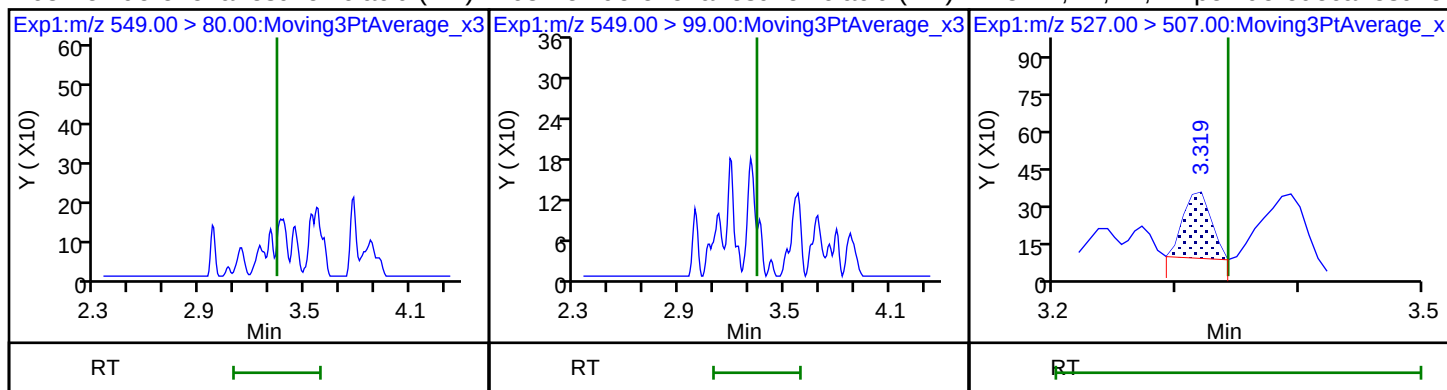
22 Perfluorooctane Sulfonamide

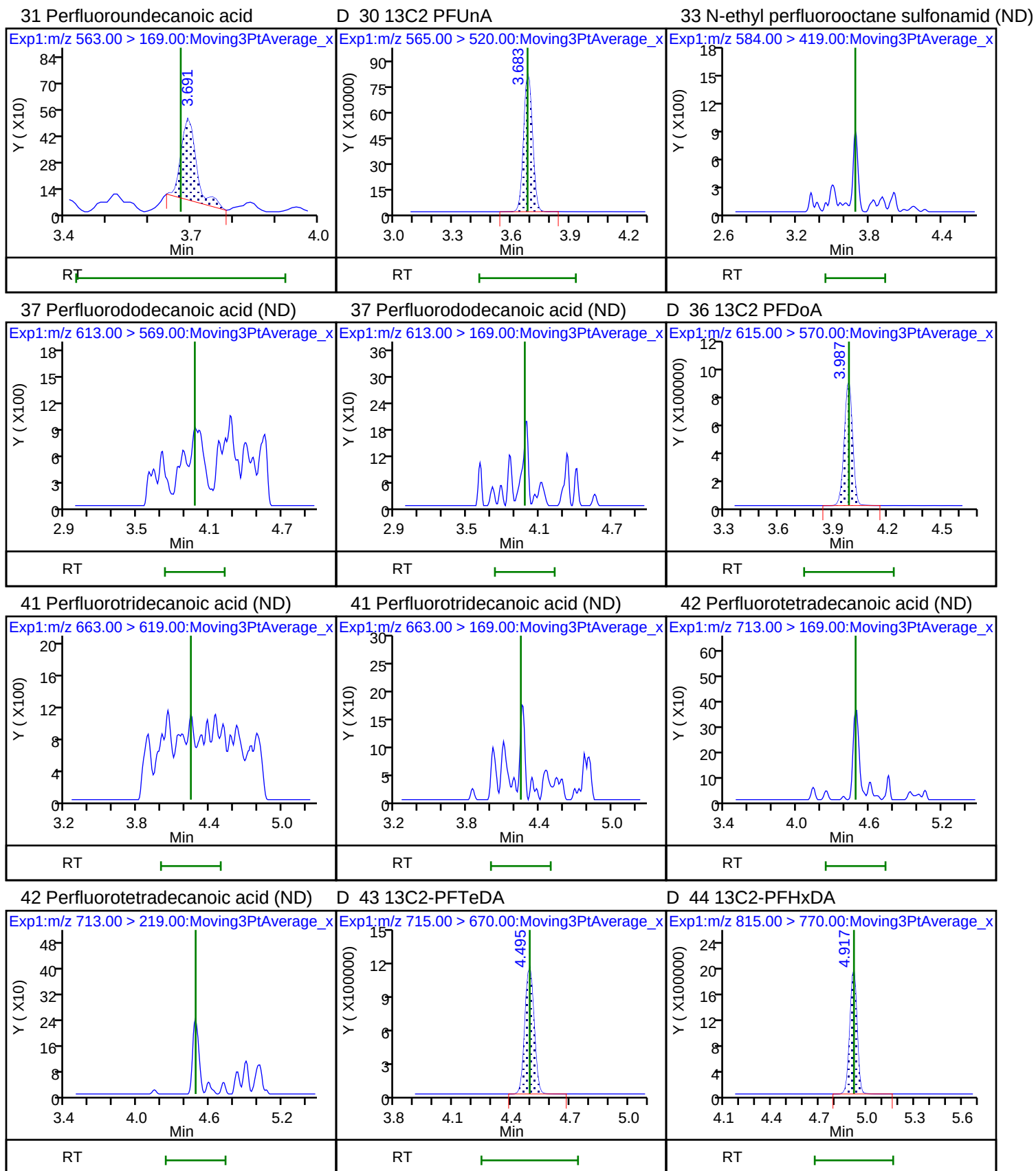


D 26 M2-8:2FTS



68 Perfluorononanesulfonic acid (ND) 68 Perfluorononanesulfonic acid (ND) 25 1H,1H,2H,2H-perfluorodecanesulfoni





FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 320-239308/1
 Matrix: Water Lab File ID: 2018.08.10LLAAAX_004.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 08/10/2018 16:33
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 239308 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00720	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>CCB 320-239308/1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLAAAX_004.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: _____	Date Extracted: _____
Sample wt/vol: <u>1(mL)</u>	Date Analyzed: <u>08/10/2018 16:33</u>
Con. Extract Vol.: _____	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239308</u>	Units: <u>ng/mL</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	94		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	91		50-150
STL00993	13C2 PFHxA	93		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	102		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	99		50-150
STL00998	13C2 PFDoA	93		50-150
STL00994	18O2 PFHxS	89		50-150
STL02116	13C2-PFTeDA	99		50-150
STL00991	13C4 PFOS	91		50-150
STL02337	13C3-PFBS	93		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_004.d
 Lims ID: CCB
 Client ID:
 Sample Type: CCB
 Inject. Date: 10-Aug-2018 16:33:22 ALS Bottle#: 20 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCB
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 13-Aug-2018 08:54:54 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK026

First Level Reviewer: roycea

Date: 12-Aug-2018 12:19:07

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	1.403	1.411	-0.008	0.537	5523311	2.35		94.1	7495	
D 3 13C5-PFPeA										
267.90 > 223.00	1.659	1.662	-0.003	0.635	3690249	2.28		91.3	7642	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.651	1.662	-0.011	0.995	6151	0.003662			0.4	
D 47 13C3-PFBS										
301.90 > 83.00	1.692	1.702	-0.010	0.647	81179	2.17		93.4	304	
D 60 M2-4:2FTS										
329.00 > 81.00	1.898	1.912	-0.014	0.726	578238	NC			768	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.943	-0.005	0.742	4270274	2.33		93.1	9581	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.012	2.038	-0.026	0.990	532	NC			0.4	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.033	2.048	-0.015	0.778	350149	NC			1217	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.277	-0.019	0.864	4101614	2.27		90.9	7520	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.288	-0.008	0.872	4878020	2.11		89.1	4926	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.288	-0.008	1.000	16106	0.007203			38.1	
399.00 > 99.00	2.280	2.288	-0.008	1.000	4643		3.47(1.50-4.49)		5.0	
D 12 M2-6:2FTS										
429.00 > 81.00	2.588	2.599	-0.010	0.990	900645	2.37		99.8	1911	
D 73 13C8 PFOA										
421.00 > 376.00	2.606	2.620	-0.014	0.997	7537637	NC			11024	
* 62 13C2-PFOA										
415.00 > 370.00	2.614	2.620	-0.006		4237844	2.50			6383	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.622	2.620	0.002	1.003	13037	0.006836			1.3	
413.00 > 169.00	2.614	2.620	-0.006	1.000	6432		2.03(0.84-2.52)		9.3	
D 14 13C4 PFOA										
417.00 > 372.00	2.614	2.627	-0.013	1.000	4216827	2.55		102	6154	
D 18 13C4 PFOS										
503.00 > 80.00	2.978	3.000	-0.022	1.139	3311797	2.18		91.1	3595	
D 19 13C5 PFNA										
468.00 > 423.00	2.978	3.000	-0.022	1.139	3420532	2.30		92.0	5918	
D 72 13C8 PFOS										
507.00 > 99.00	2.978	3.000	-0.022	1.139	1679459	NC			3390	
D 21 13C8 FOSA										
506.00 > 78.00	3.320	3.333	-0.013	1.270	4709468	2.34		93.5	5317	
D 26 M2-8:2FTS										
529.00 > 81.00	3.328	3.355	-0.027	1.273	1049072	2.29		95.5	2377	
D 23 13C2 PFDA										
515.00 > 470.00	3.335	3.363	-0.028	1.276	3182539	2.44		97.6	4817	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.492	3.522	-0.030	1.336	1536343	2.30		92.1	3552	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.669	3.675	-0.006	1.000	6768	0.005773			4.1	
563.00 > 169.00	3.662	3.675	-0.013	0.998	1225		5.52(2.12-6.36)		8.7	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.662	3.682	-0.020	1.401	1706344	2.47		98.8	1746	
D 30 13C2 PFUnA										
565.00 > 520.00	3.669	3.691	-0.022	1.404	2608355	2.49		99.5	6161	
D 36 13C2 PFDoA										
615.00 > 570.00	3.965	3.987	-0.022	1.517	2585382	2.33		93.3	5880	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.470	4.494	-0.024	1.710	3505076	2.48		99.2	7002	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.891	4.910	-0.019	1.000	51848	NC			14.7	
813.00 > 169.00	4.891	4.910	-0.019	1.000	9082		5.71(2.86-8.58)		78.2	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.891	4.917	-0.026	1.871	5707355	2.04		81.4	7335	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL0_00008

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62527.b\2018.08.10LLAAAX_004.d

Injection Date: 10-Aug-2018 16:33:22

Instrument ID: A8_N

Lims ID: CCB

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 20

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

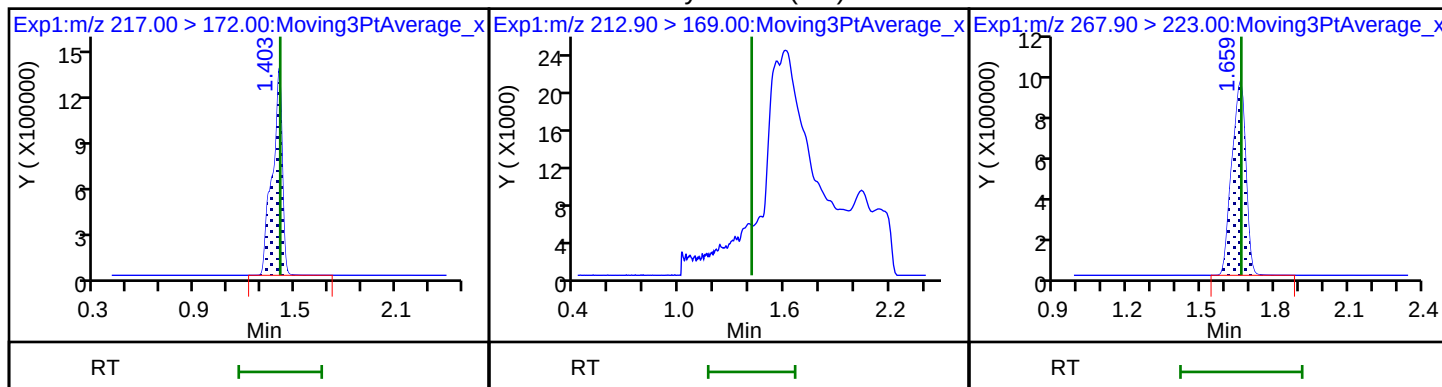
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (ND)

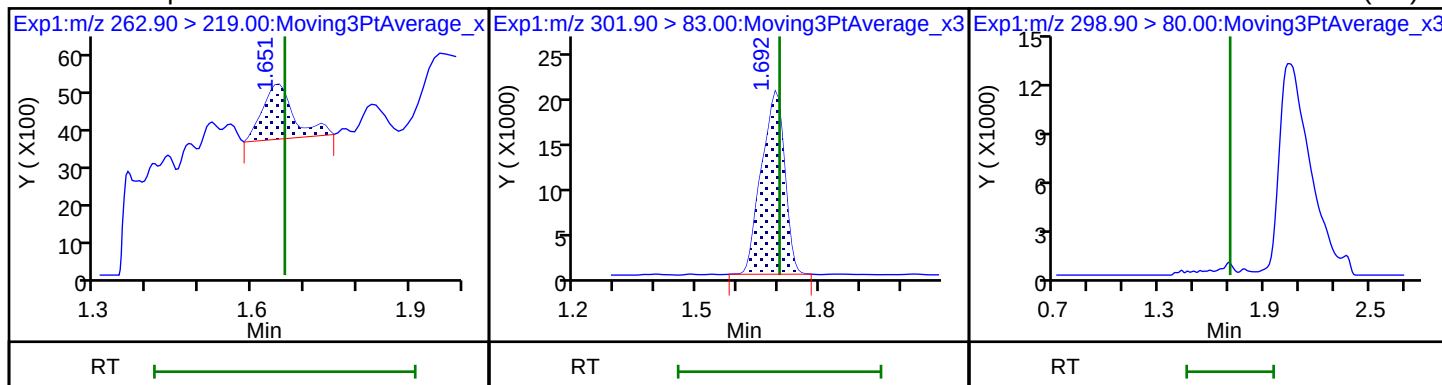
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

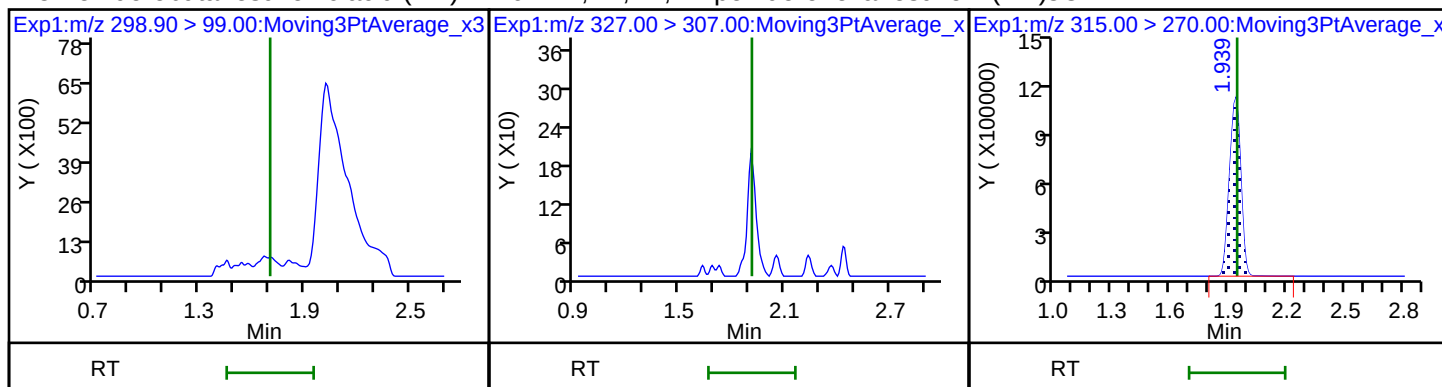
5 Perfluorobutanesulfonic acid (ND)



5 Perfluorobutanesulfonic acid (ND)

61 1H,1H,2H,2H-perfluorohexanesulfonate (ND)

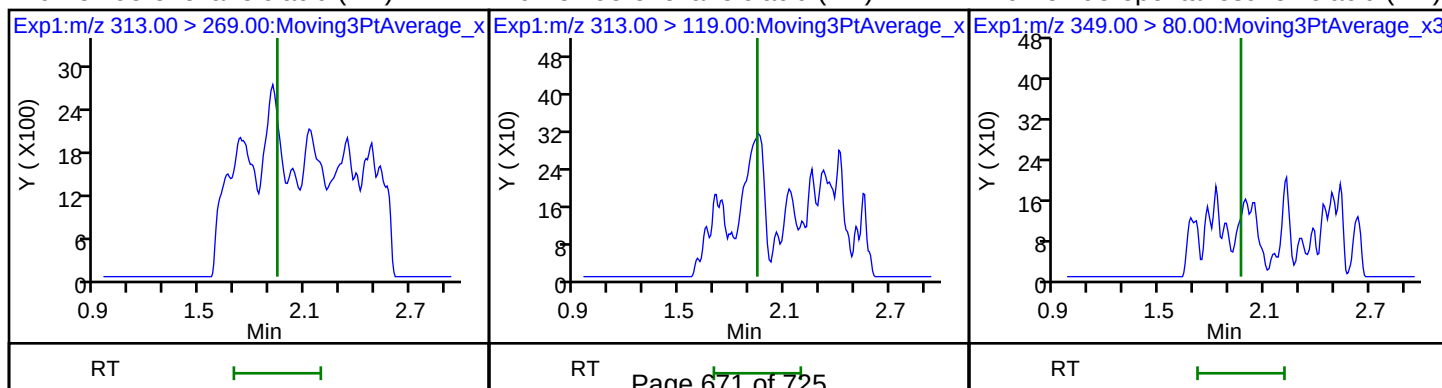
D 13C2 PFHxA



6 Perfluorohexanoic acid (ND)

6 Perfluorohexanoic acid (ND)

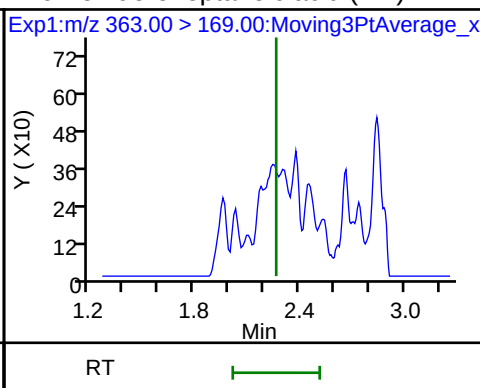
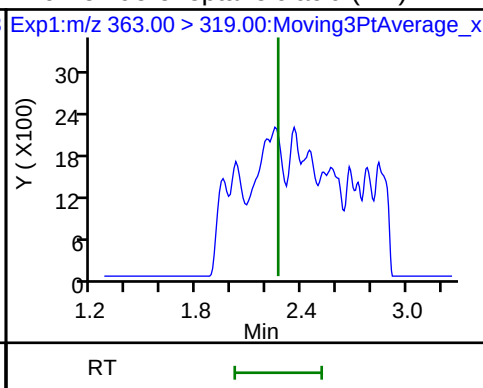
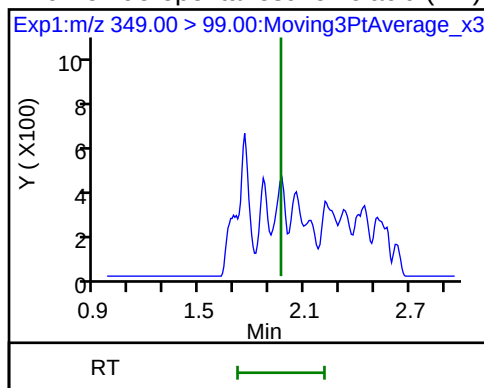
70 Perfluoropentanesulfonic acid (ND)



70 Perfluoropentanesulfonic acid (ND)

10 Perfluoroheptanoic acid (ND)

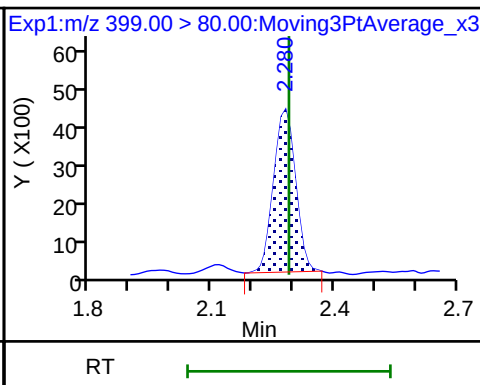
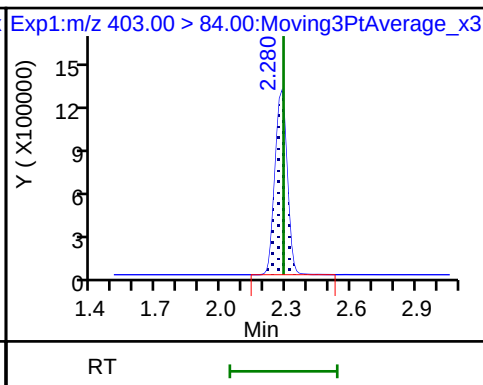
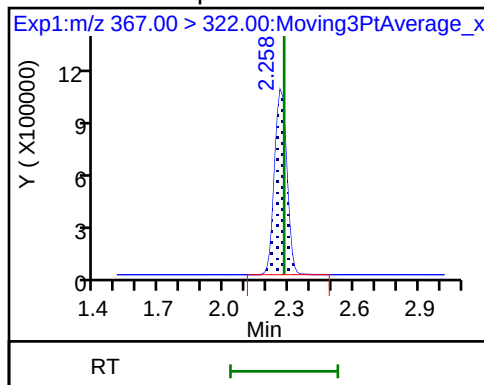
10 Perfluoroheptanoic acid (ND)



D 9 13C4-PFHpA

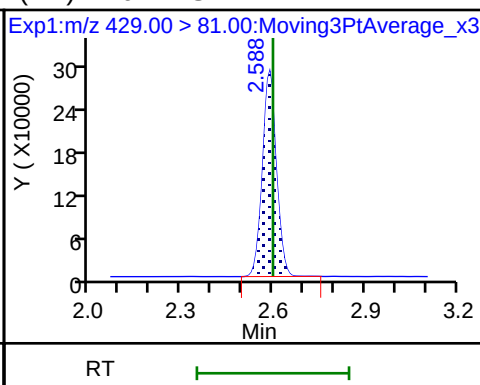
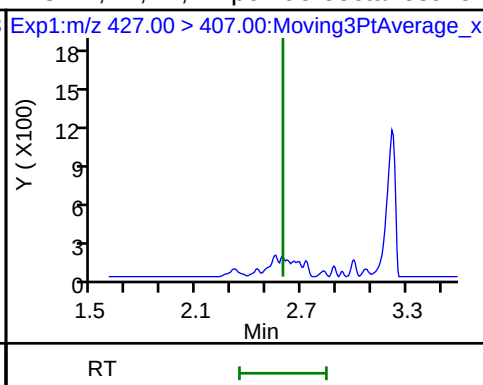
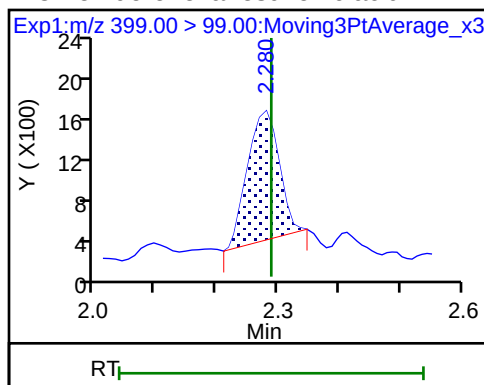
D 11 18O2 PFHxS

8 Perfluorohexanesulfonic acid



8 Perfluorohexanesulfonic acid

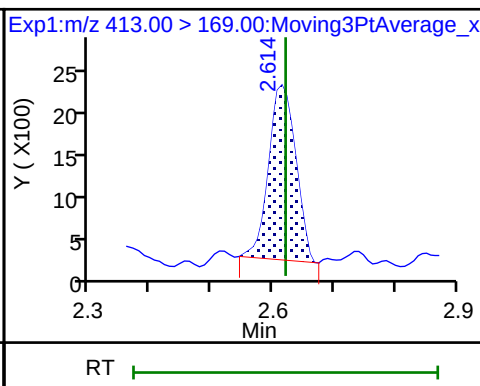
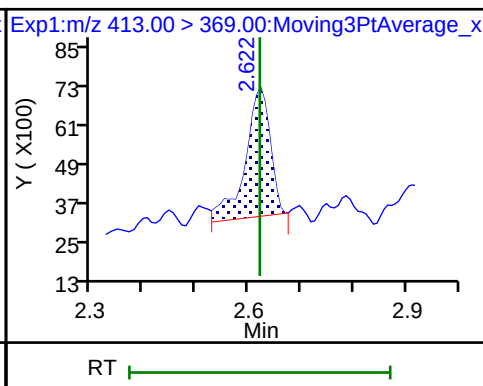
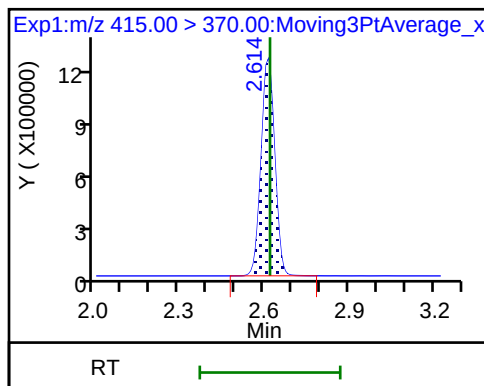
13 1H,1H,2H,2H-perfluorooctanesulfonate (M2)-6:2FTS



* 62 13C2-PFOA

15 Perfluorooctanoic acid

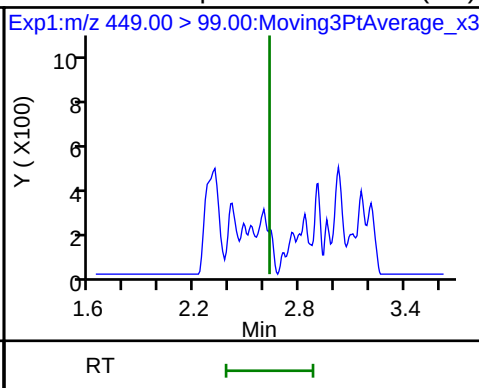
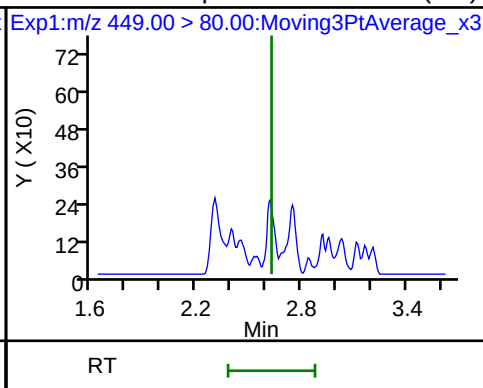
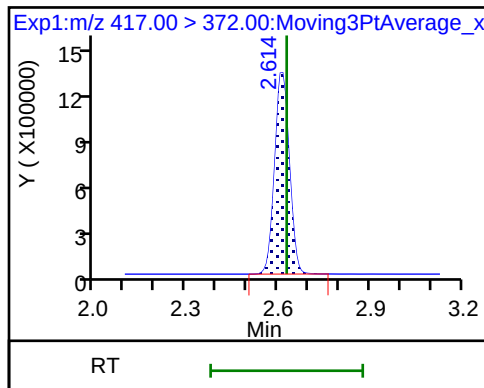
15 Perfluorooctanoic acid



D 14 13C4 PFOA

16 Perfluoroheptanesulfonic acid (ND)

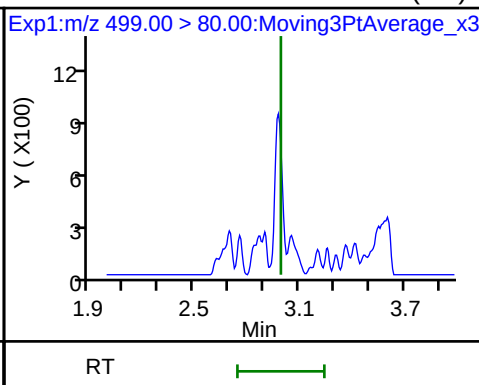
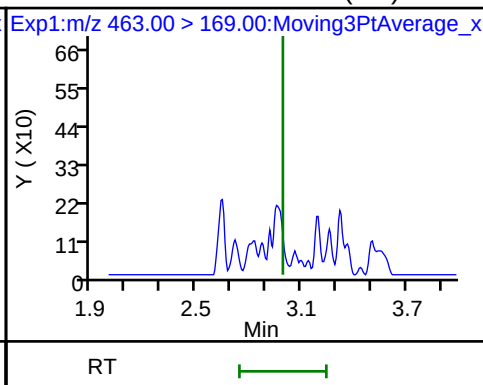
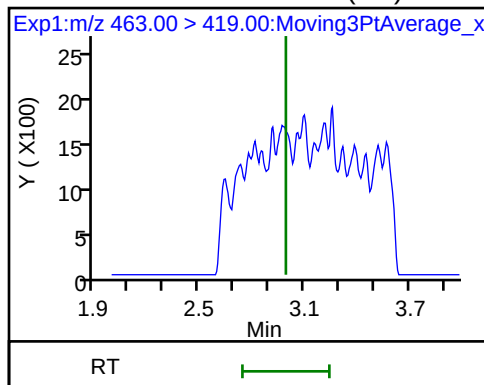
16 Perfluoroheptanesulfonic acid (ND)



20 Perfluorononanoic acid (ND)

20 Perfluorononanoic acid (ND)

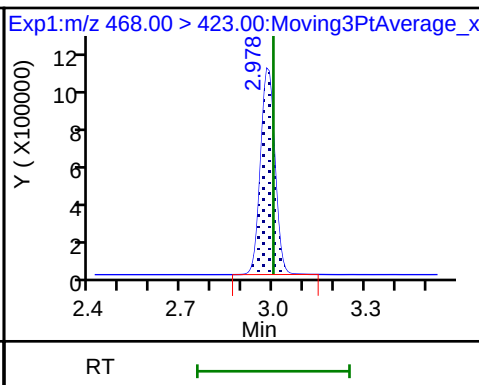
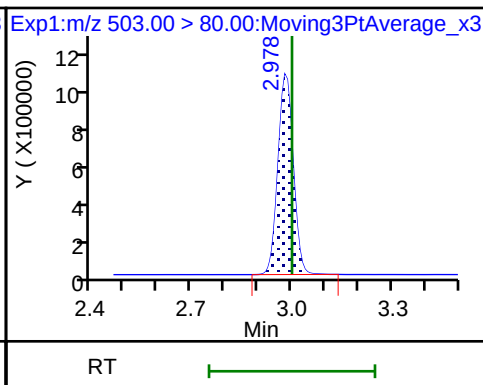
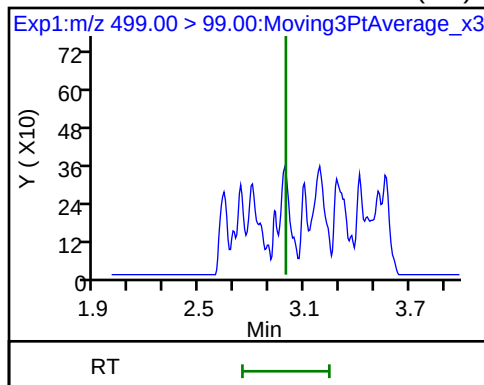
17 Perfluorooctane sulfonic acid (ND)



17 Perfluorooctane sulfonic acid (ND)

D 18 13C4 PFOS

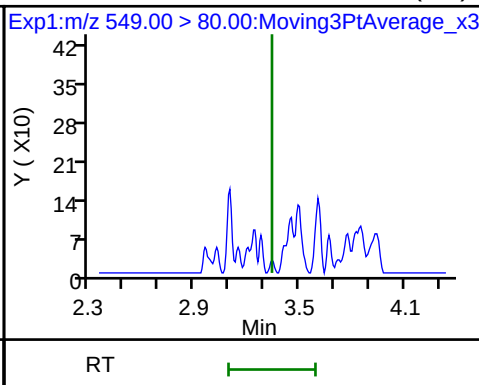
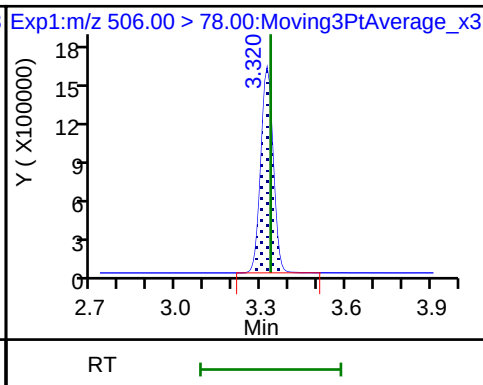
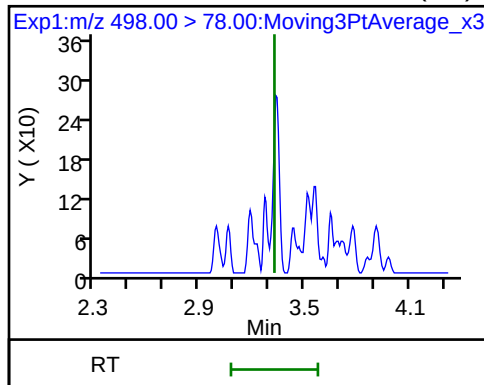
D 19 13C5 PFNA



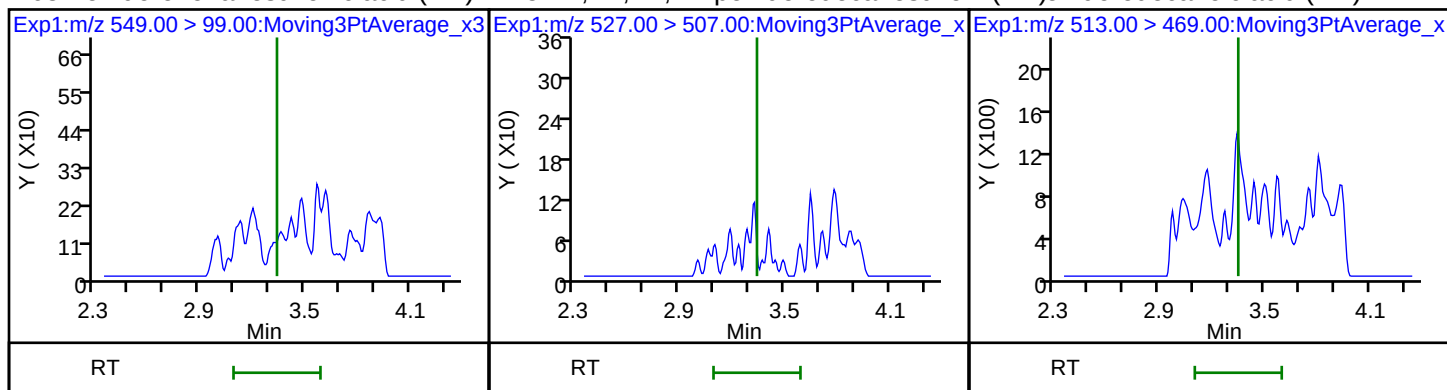
22 Perfluorooctane Sulfonamide (ND)

D 21 13C8 FOSA

68 Perfluorononanesulfonic acid (ND)



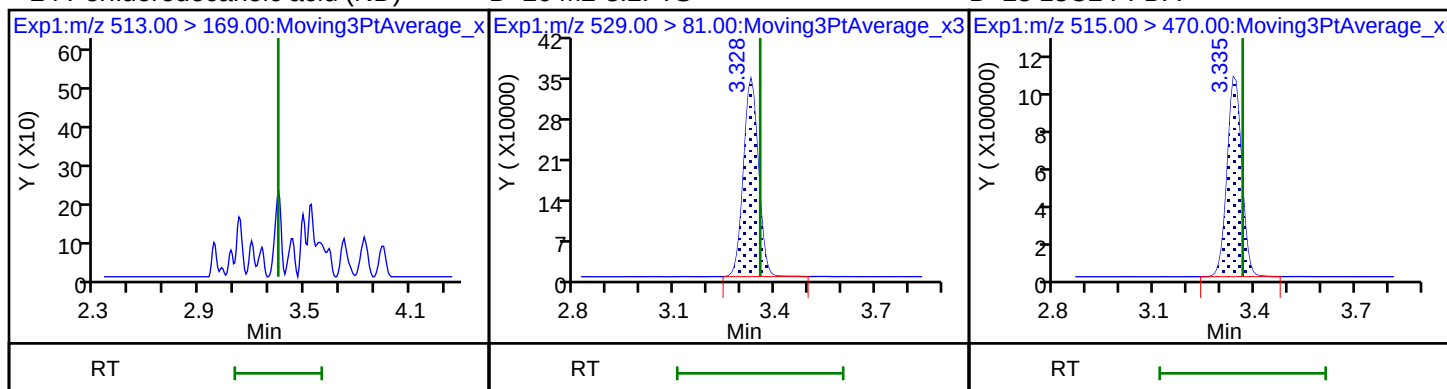
68 Perfluorononanesulfonic acid (ND) 25 1H,1H,2H,2H-perfluorodecanesulfonic acid (ND) 24 Perfluorodecanoic acid (ND)



24 Perfluorodecanoic acid (ND)

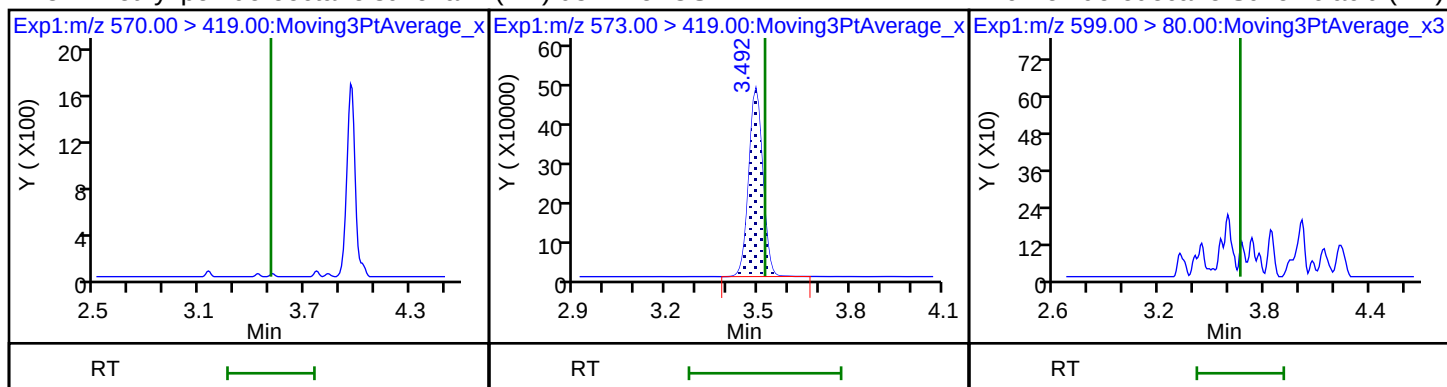
D 26 M2-8:2FTS

D 23 13C2 PFDA



28 N-methyl perfluorooctane sulfonamide (ND) d3-NMeFOSAA

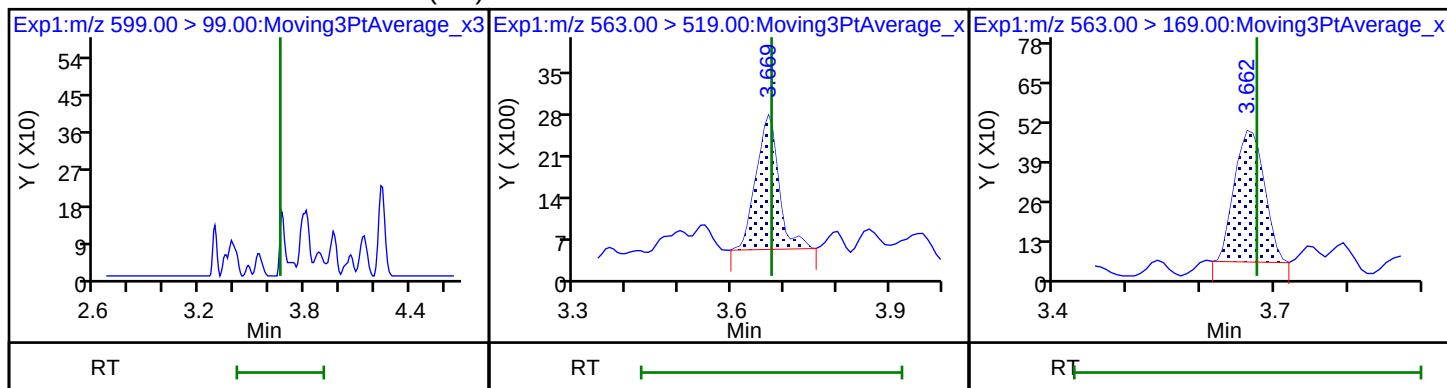
29 Perfluorodecane Sulfonic acid (ND)



29 Perfluorodecane Sulfonic acid (ND)

31 Perfluoroundecanoic acid

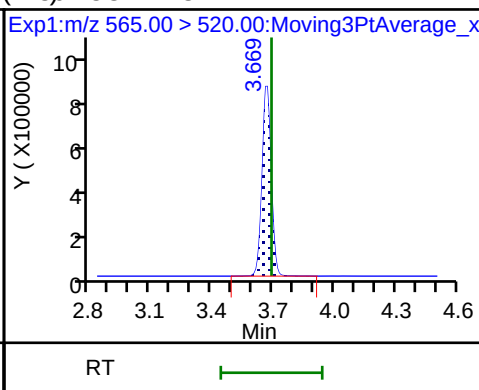
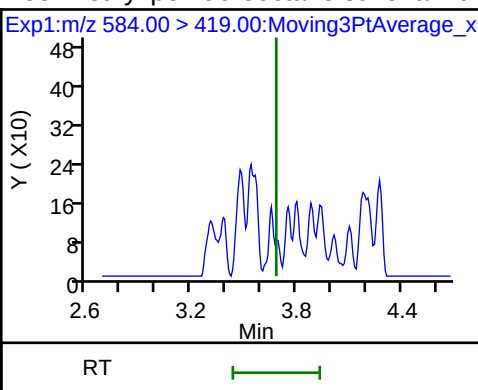
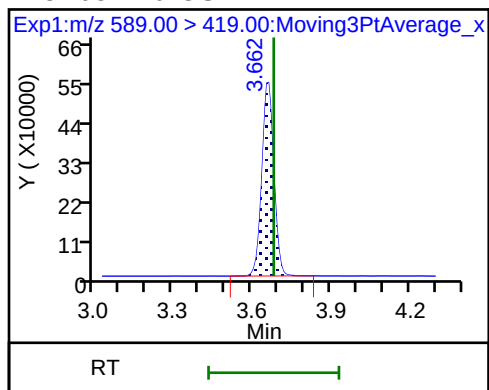
31 Perfluoroundecanoic acid



D 32 d5-NEtFOSAA

33 N-ethyl perfluorooctane sulfonamid (ND)

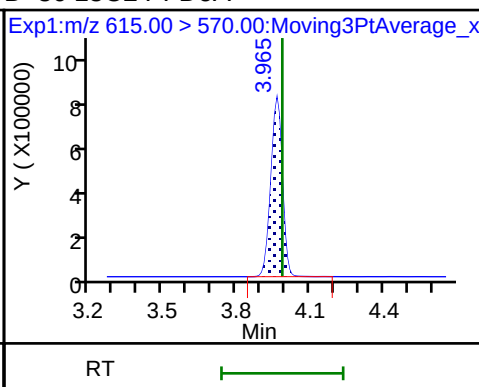
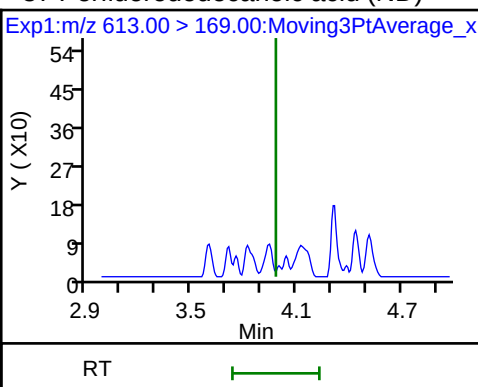
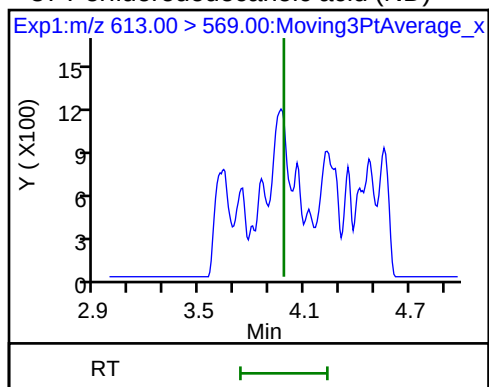
D 33 13C2 PFUnA



37 Perfluorododecanoic acid (ND)

37 Perfluorododecanoic acid (ND)

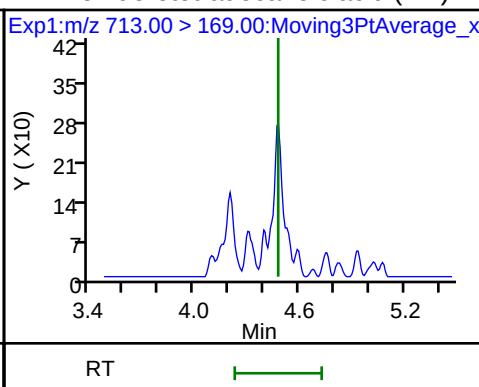
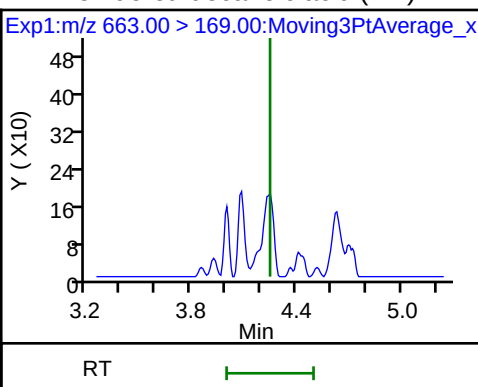
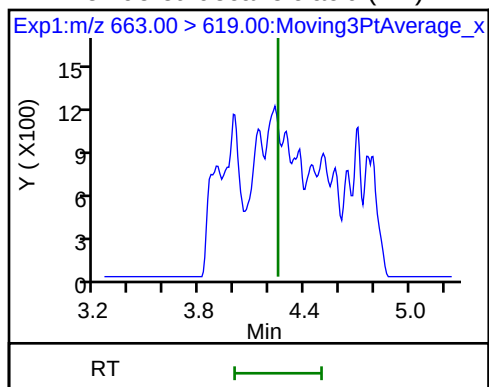
D 36 13C2 PFDaA



41 Perfluorotridecanoic acid (ND)

41 Perfluorotridecanoic acid (ND)

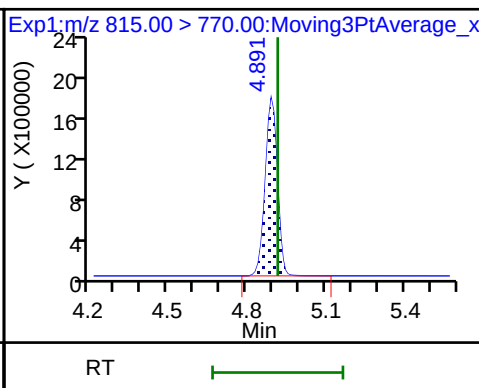
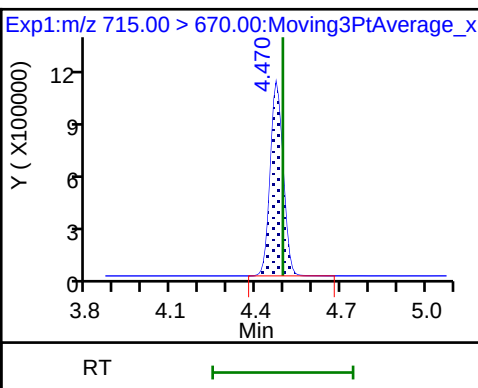
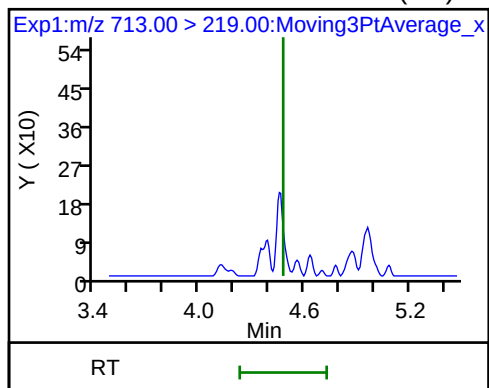
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)

D 43 13C2-PFTeDA

D 44 13C2-PFHxDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>ICB 320-238193/9</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.06LLICAL_009.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: _____	Date Extracted: _____
Sample wt/vol: <u>1(mL)</u>	Date Analyzed: <u>08/06/2018 12:04</u>
Con. Extract Vol.: _____	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>238193</u>	Units: <u>ng/mL</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00768	J	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00720	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-238193/9
 Matrix: Water Lab File ID: 2018.08.06LLICAL_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 08/06/2018 12:04
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238193 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	96		50-150
STL00992	13C4 PFBA	96		50-150
STL01893	13C5 PFPeA	94		50-150
STL00993	13C2 PFHxA	97		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	100		50-150
STL00996	13C2 PFDA	100		50-150
STL00997	13C2 PFUnA	104		50-150
STL00998	13C2 PFDoA	98		50-150
STL00994	18O2 PFHxS	98		50-150
STL02116	13C2-PFTeDA	98		50-150
STL00991	13C4 PFOS	96		50-150
STL02337	13C3-PFBS	92		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_009.d
 Lims ID: ICB
 Client ID:
 Sample Type: ICB
 Inject. Date: 06-Aug-2018 12:04:46 ALS Bottle#: 20 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICB
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 07-Aug-2018 08:17:27 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK002

First Level Reviewer: mongkols

Date: 07-Aug-2018 14:31:52

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	1.394	1.395	-0.001	0.543	5417952	2.39		95.6	8558	
2 Perfluorobutyric acid										M
212.90 > 169.00	1.399	1.397	0.002	1.004	4375	0.002150			0.7	M
D 3 13C5-PFPeA										
267.90 > 223.00	1.636	1.639	-0.003	0.637	3664067	2.35		93.9	8446	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.644	1.643	0.001	1.005	7287	0.004370			0.6	
D 47 13C3-PFBS										
301.90 > 83.00	1.676	1.675	0.001	0.653	77508	2.15		92.3	251	
D 60 M2-4:2FTS										
329.00 > 81.00	1.872	1.875	-0.003	0.729	594337	NC			1009	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.880	1.875	0.005	1.122	1226	0.002219			22.4	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.907	1.908	-0.001	1.000	8935	0.005115			2.3	
313.00 > 119.00	1.918	1.908	0.010	1.005	754		11.85(5.03-15.10)		2.9	
D 7 13C2 PFHxA										
315.00 > 270.00	1.907	1.908	-0.001	0.743	4278761	2.42		96.6	11236	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.939	1.930	0.009	1.157	2405	0.001047			9.0	
349.00 > 99.00	1.928	1.930	-0.002	1.151	1707		1.41(1.36-4.07)		2.3	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.001	2.003	-0.002	0.779	336161	NC			1074	
D 9 13C4-PFHpA										
367.00 > 322.00	2.219	2.227	-0.008	0.864	4303531	2.47		98.7	8059	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.227	2.228	-0.001	1.004	5830	0.003189			1.2	
363.00 > 169.00	2.236	2.228	0.008	1.008	1857		3.14(1.13-3.40)		4.7	
D 11 18O2 PFHxS										
403.00 > 84.00	2.236	2.239	-0.003	0.871	5187045	2.32		98.1	5085	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.236	2.239	-0.003	1.000	17118	0.007200			39.7	
399.00 > 99.00	2.236	2.239	-0.003	1.000	5835		2.93(1.50-4.49)		6.2	
65 ADONA										
377.00 > 251.00	2.269	2.271	-0.002	0.774	3586	NC			11.7	R
377.00 > 85.00	2.269	2.271	-0.002	0.774	4359		0.82(0.84-2.53)		6.3	R
D 12 M2-6:2FTS										
429.00 > 81.00	2.545	2.549	-0.004	0.991	905625	2.47		104	2373	
D 73 13C8 PFOA										
421.00 > 376.00	2.568	2.571	-0.003	1.000	7776992	NC			13090	
D 14 13C4 PFOA										
417.00 > 372.00	2.568	2.573	-0.005	1.000	3949383	2.47		98.7	6011	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.575	2.574	0.001	1.003	12278	0.006874			1.2	
413.00 > 169.00	2.561	2.574	-0.013	0.997	8571		1.43(0.84-2.52)		15.8	
* 62 13C2-PFOA										
415.00 > 370.00	2.568	2.575	-0.007		4092642	2.50			6084	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.582	2.583	-0.001	0.881	3026	0.001728			10.5	
449.00 > 99.00	2.582	2.583	-0.001	0.881	799		3.79(1.94-5.82)		2.8	
D 72 13C8 PFOS										
507.00 > 99.00	2.930	2.938	-0.008	1.141	1660661	NC			4227	
D 19 13C5 PFNA										
468.00 > 423.00	2.935	2.939	-0.004	1.143	3584430	2.50		99.9	9580	
D 18 13C4 PFOS										
503.00 > 80.00	2.930	2.939	-0.009	1.141	3377510	2.30		96.2	4110	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.143	3.150	-0.007	1.073	5715	NC			16.0	
D 26 M2-8:2FTS										
529.00 > 81.00	3.276	3.284	-0.008	1.276	1051210	2.37		99.0	2817	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.258	3.286	-0.028	0.995	553	0.000970			3.5	
D 23 13C2 PFDA										
515.00 > 470.00	3.289	3.294	-0.005	1.281	3163657	2.51		100	7320	
D 21 13C8 FOSA										
506.00 > 78.00	3.311	3.317	-0.006	1.289	4681486	2.41		96.2	5650	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.311	3.319	-0.008	1.000	7466	0.004095			20.4	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.444	3.448	-0.004	1.341	1549730	2.41		96.2	2197	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.444	3.453	-0.009	1.000	13486	0.0226			15.1	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.612	3.616	-0.004	1.406	1661269	2.49		99.6	1282	
D 30 13C2 PFUnA										
565.00 > 520.00	3.612	3.620	-0.008	1.406	2637070	2.60		104	6068	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.612	3.622	-0.010	1.000	14276	0.0120			8.5	R
563.00 > 169.00	3.612	3.622	-0.010	1.000	580		24.61(2.12-6.36)		4.8	R
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.619	3.623	-0.004	1.002	15358	0.0259			41.1	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.774	3.781	-0.007	1.288	10677	NC			30.5	
D 36 13C2 PFDaA										
615.00 > 570.00	3.908	3.913	-0.005	1.522	2631041	2.46		98.3	4515	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.898	3.913	-0.015	1.190	1968	NC			20.4	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.908	3.913	-0.005	1.000	7155	0.006110			3.0	
613.00 > 169.00	3.908	3.913	-0.005	1.000	1333		5.37(2.13-6.40)		8.4	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.167	4.173	-0.006	1.066	7296	0.006447			2.9	R
663.00 > 169.00	4.167	4.173	-0.006	1.066	1107		6.59(1.25-3.76)		8.7	R
D 43 13C2-PFTeDA										
715.00 > 670.00	4.398	4.399	-0.001	1.713	3356196	2.46		98.4	8014	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.398	4.400	-0.002	1.000	2496	0.007682			40.5	
713.00 > 219.00	4.390	4.400	-0.010	0.998	1232		2.03(0.71-2.13)		18.3	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.796	4.799	-0.003	1.868	6682185	2.47		98.7	8637	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.796	4.801	-0.005	1.000	74538	NC			30.0	
813.00 > 169.00	4.796	4.801	-0.005	1.000	11842		6.29(2.86-8.58)		90.2	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.132	5.136	-0.004	1.070	22386	NC			6.6	
913.00 > 169.00	5.132	5.136	-0.004	1.070	2634		8.50(3.83-11.48)		23.8	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL0_00008

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_009.d

Injection Date: 06-Aug-2018 12:04:46

Instrument ID: A8_N

Lims ID: ICB

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 20

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

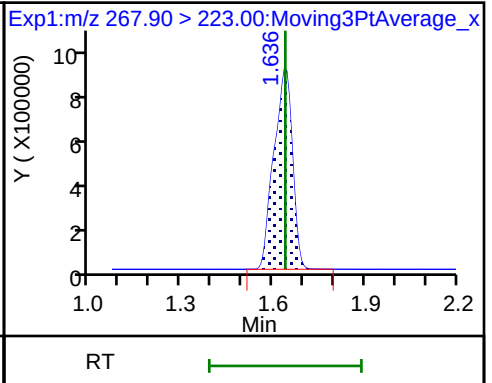
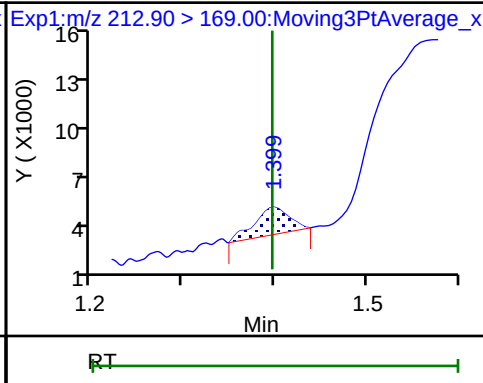
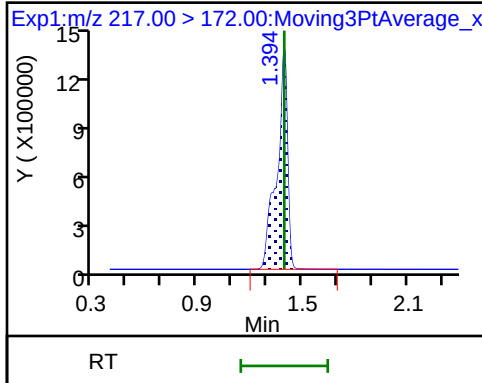
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (M)

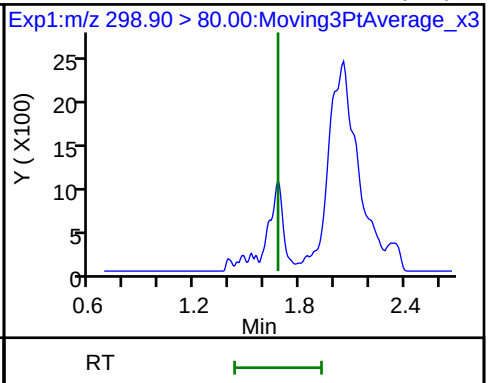
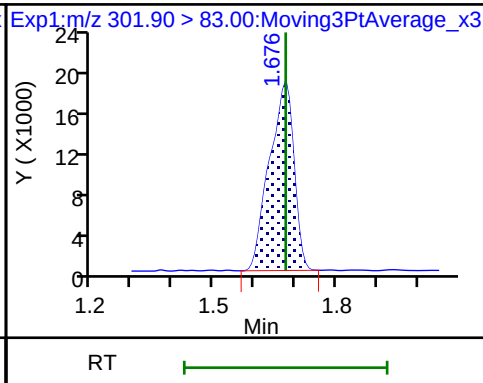
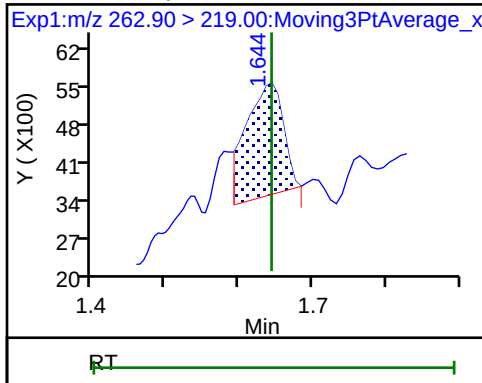
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

D 47 13C3-PFBS

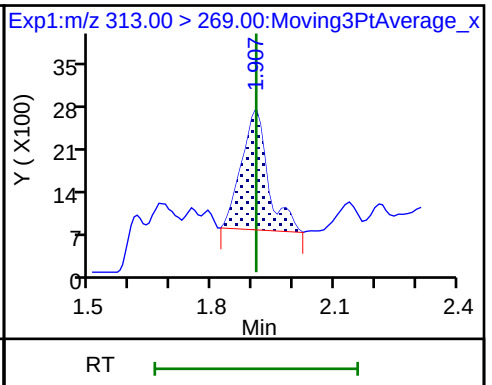
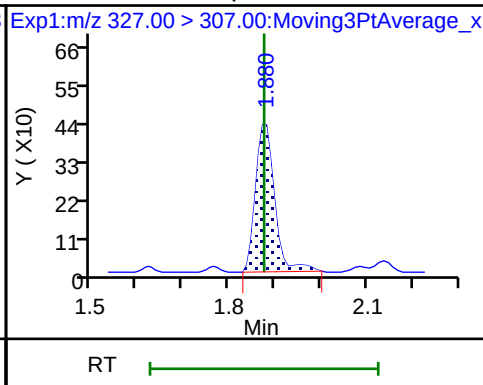
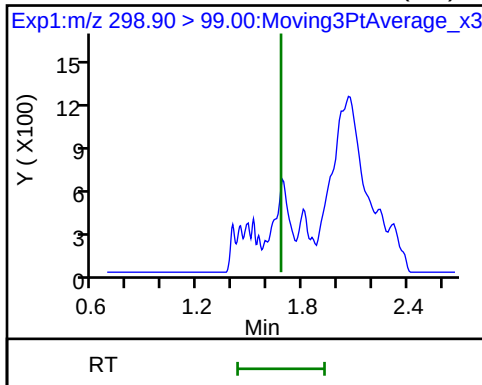
5 Perfluorobutanesulfonic acid (ND)



5 Perfluorobutanesulfonic acid (ND)

61 1H,1H,2H,2H-perfluorohexanesulfoni

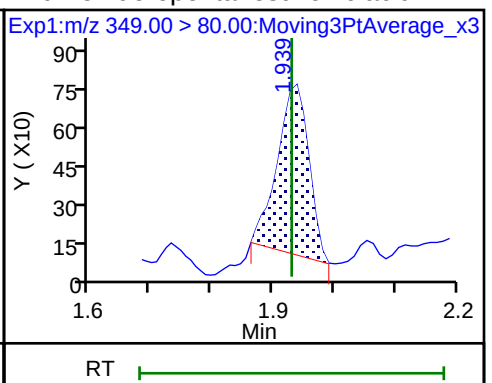
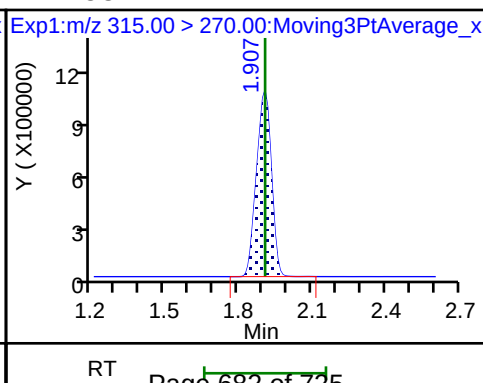
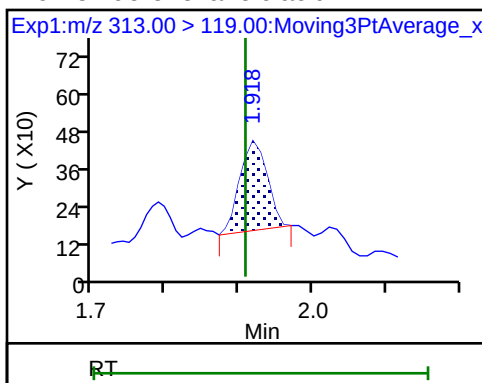
6 Perfluorohexanoic acid

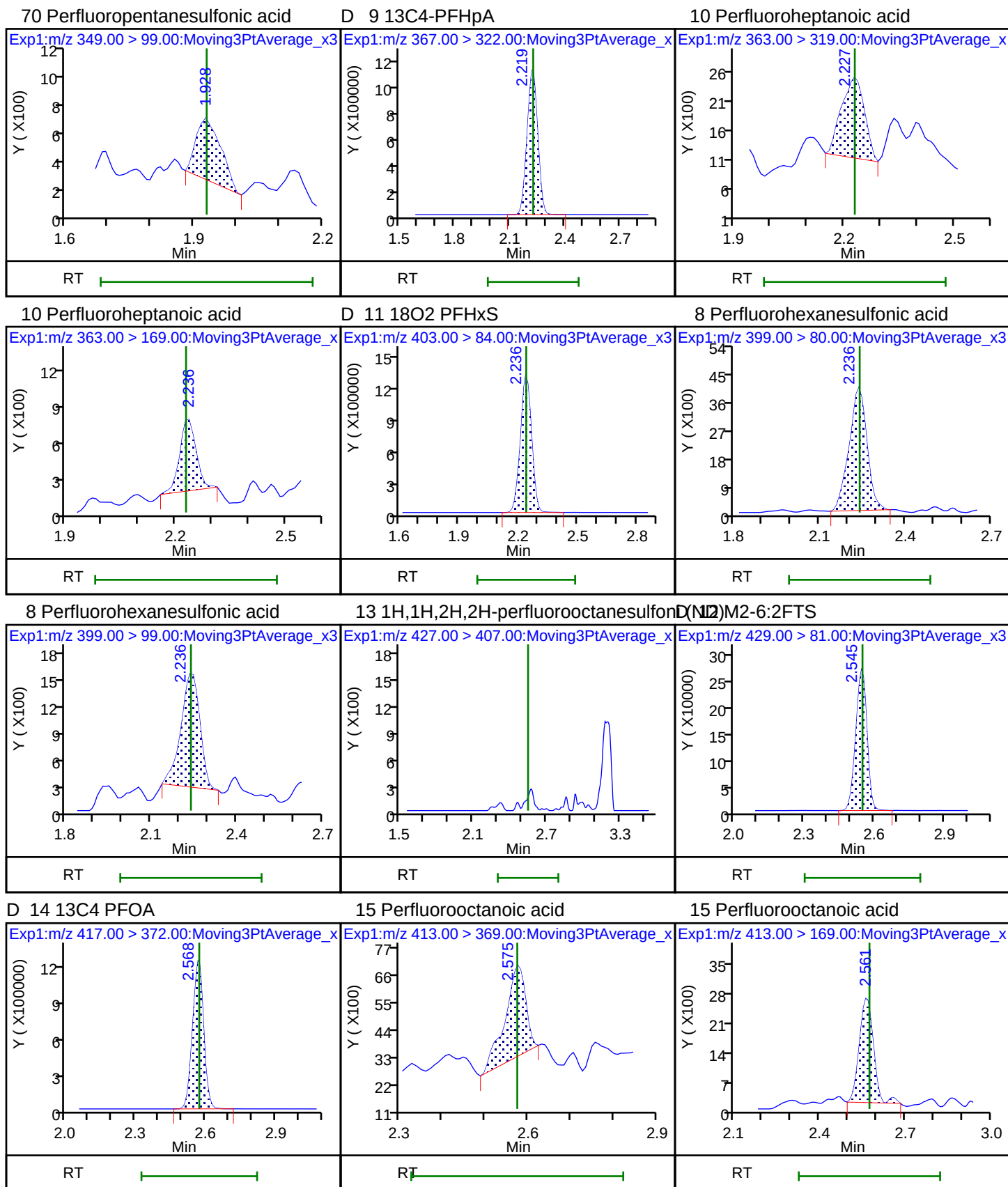


6 Perfluorohexanoic acid

D 7 13C2 PFHxA

70 Perfluoropentanesulfonic acid

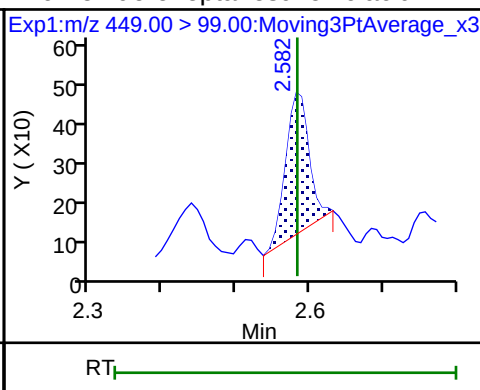
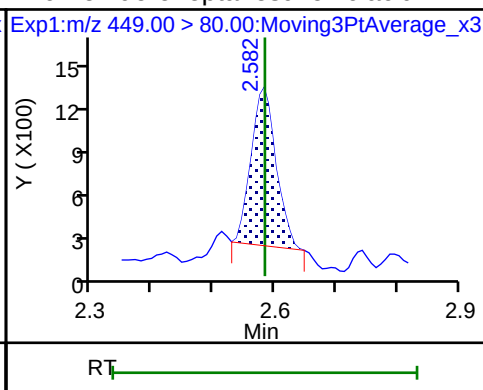
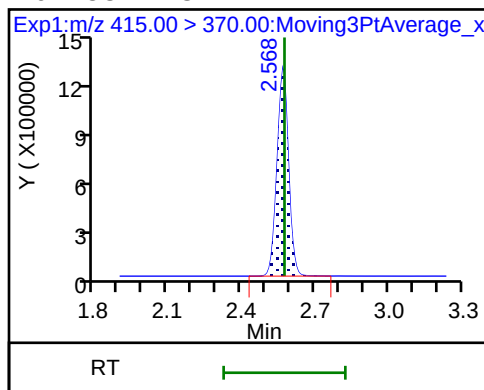




* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

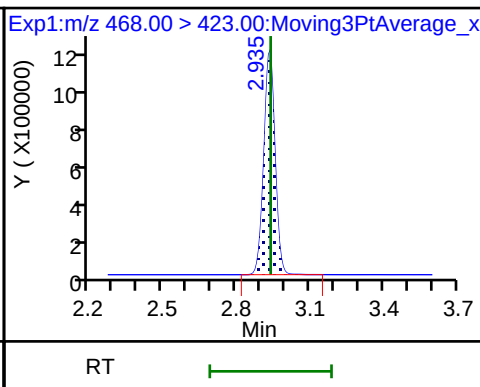
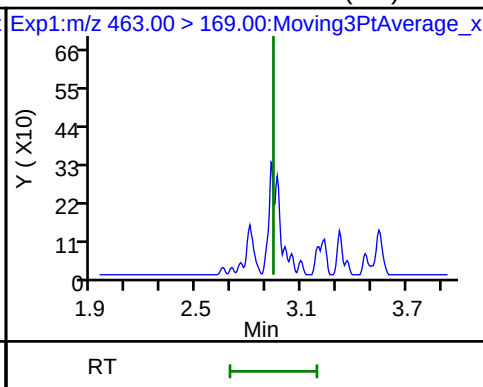
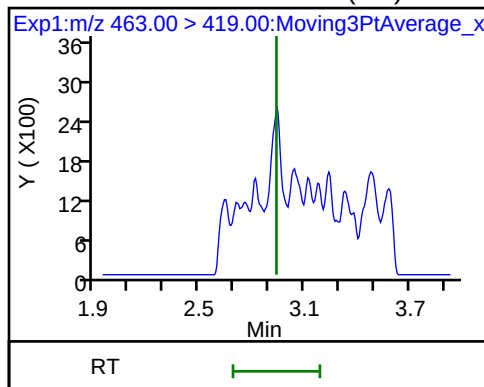
16 Perfluoroheptanesulfonic acid



20 Perfluorononanoic acid (ND)

20 Perfluorononanoic acid (ND)

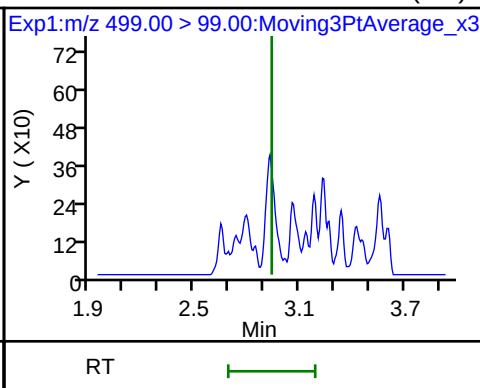
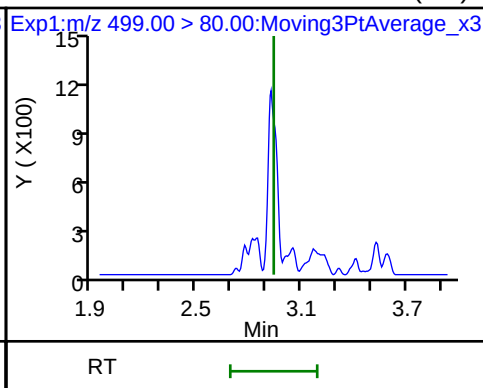
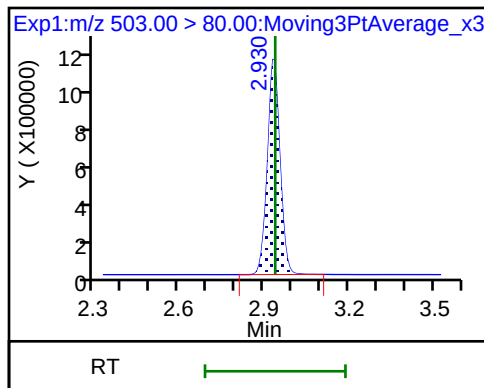
D 19 13C5 PFNA



D 18 13C4 PFOS

17 Perfluorooctane sulfonic acid (ND)

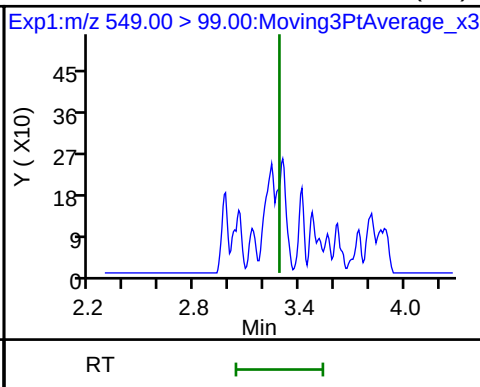
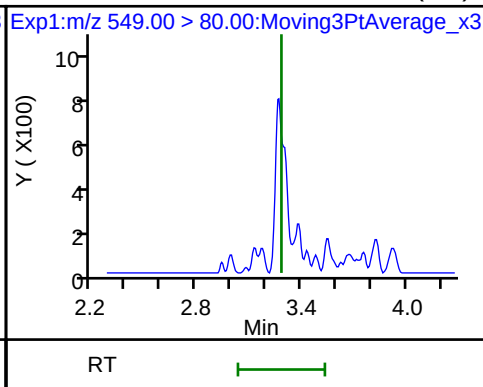
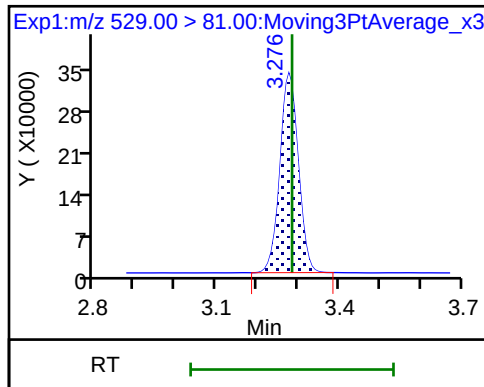
17 Perfluorooctane sulfonic acid (ND)



D 26 M2-8:2FTS

68 Perfluorononanesulfonic acid (ND)

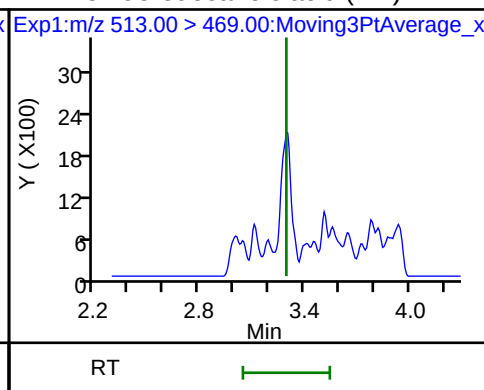
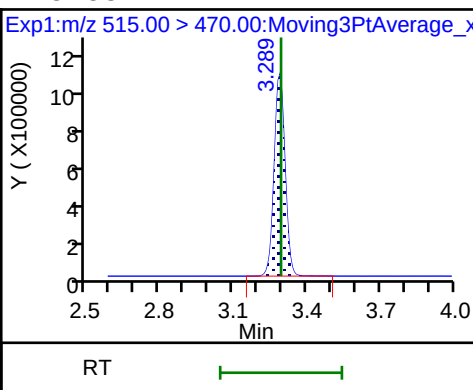
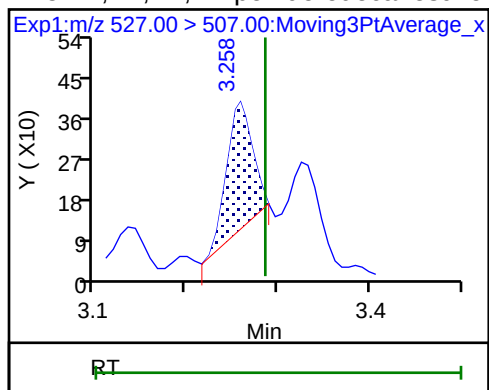
68 Perfluorononanesulfonic acid (ND)



25 1H,1H,2H,2H-perfluorodecanesulfonate

D 23 13C2 PFDA

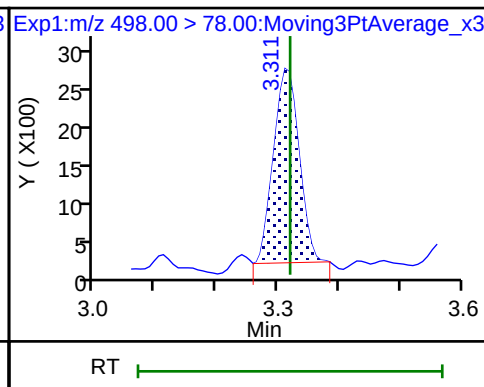
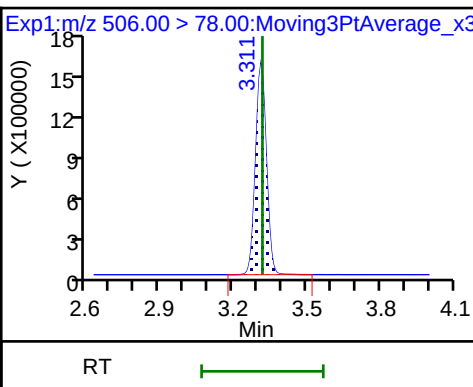
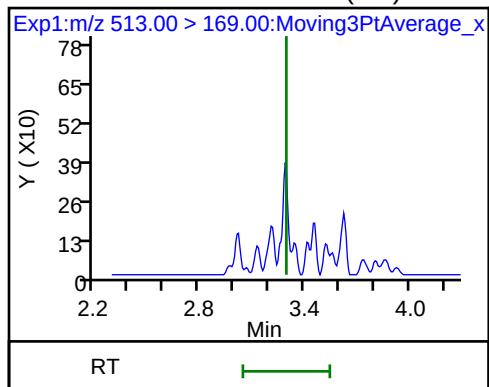
24 Perfluorodecanoic acid (ND)



24 Perfluorodecanoic acid (ND)

D 21 13C8 FOSA

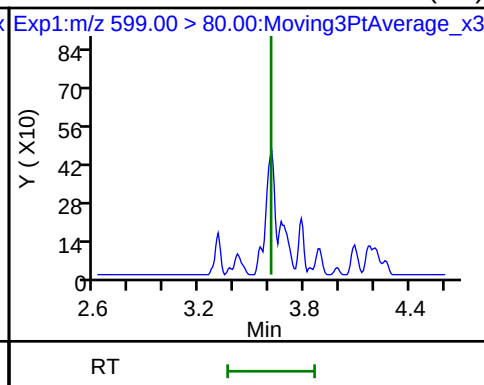
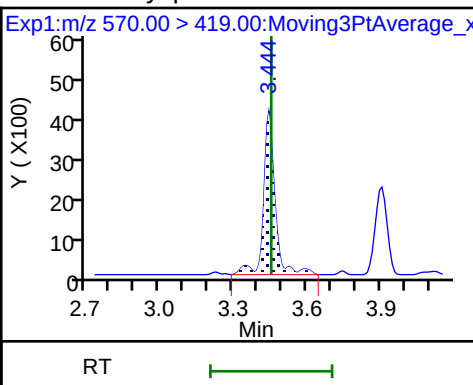
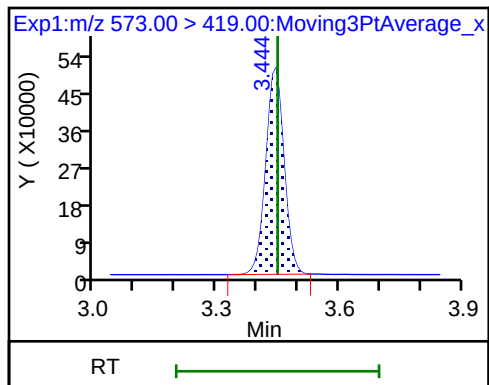
22 Perfluorooctane Sulfonamide



D 27 d3-NMeFOSAA

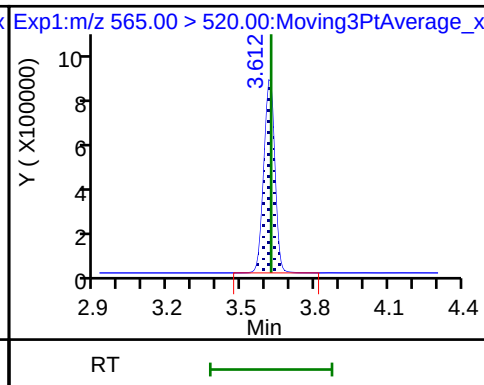
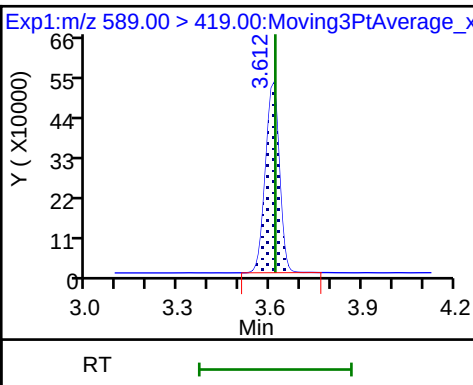
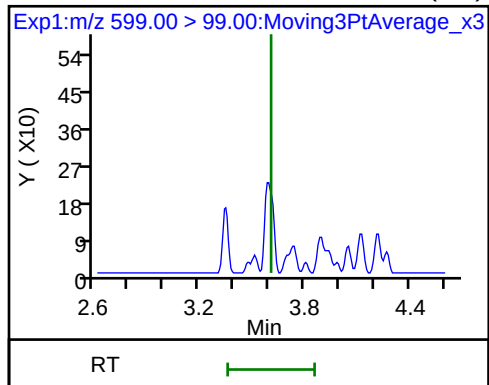
28 N-methyl perfluorooctane sulfonami

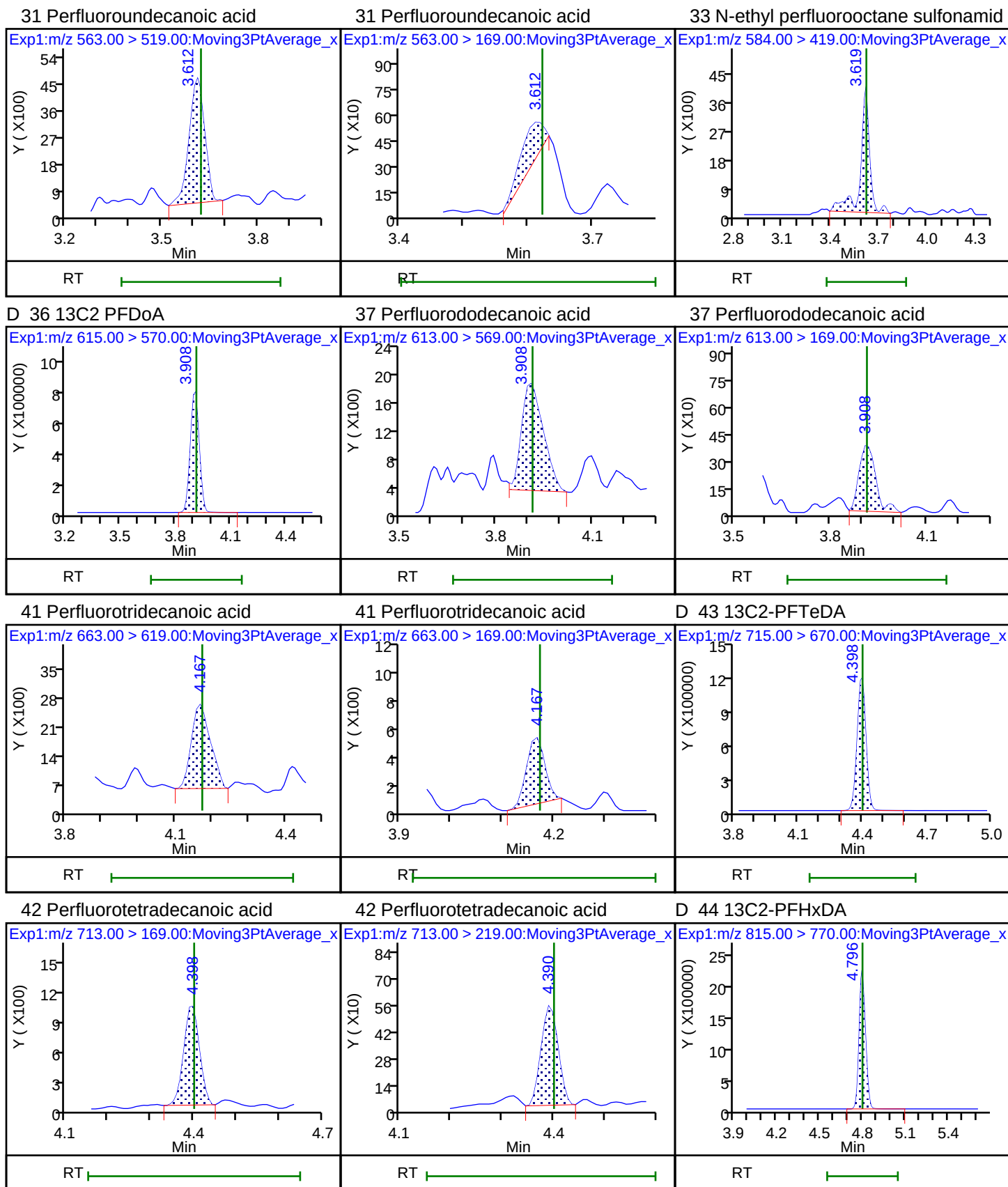
29 Perfluorodecane Sulfonic acid (ND)



29 Perfluorodecane Sulfonic acid (ND) D 32 d5-NEtFOSAA

D 30 13C2 PFUnA





TestAmerica Sacramento

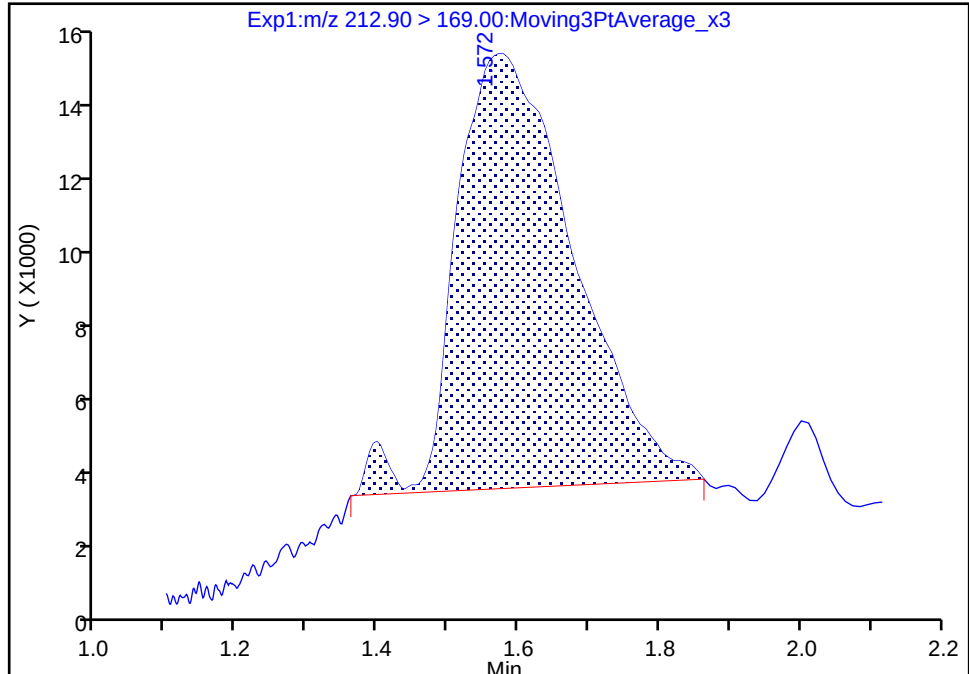
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_009.d
Injection Date: 06-Aug-2018 12:04:46 Instrument ID: A8_N
Lims ID: ICB
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 20 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

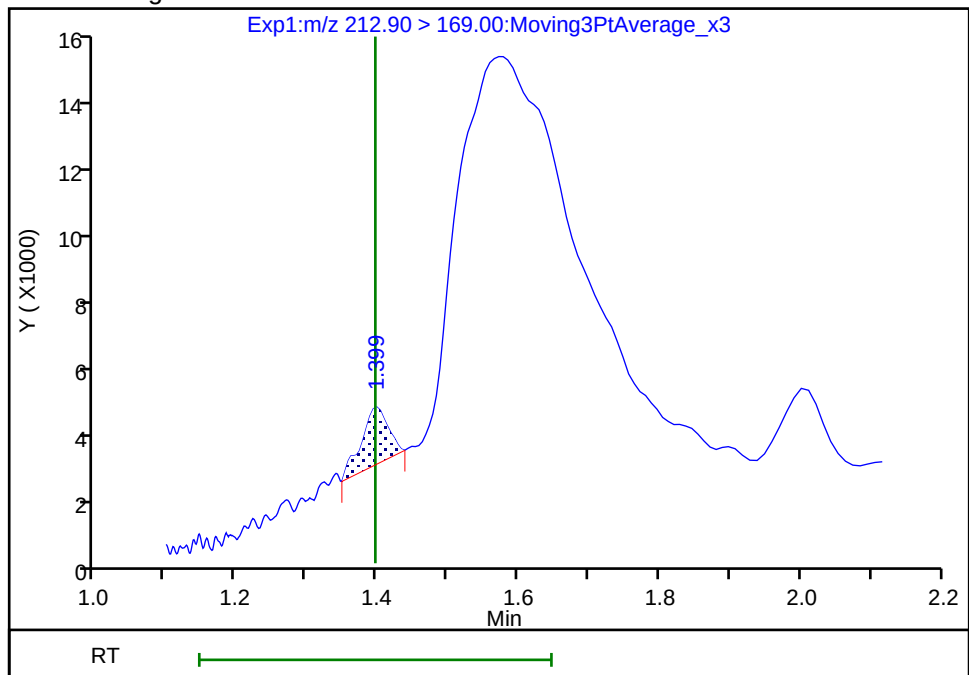
RT: 1.57
Area: 131164
Amount: 0.064463
Amount Units: ng/ml

Processing Integration Results



RT: 1.40
Area: 4375
Amount: 0.002150
Amount Units: ng/ml

Manual Integration Results



Reviewer: mongkols, 07-Aug-2018 14:31:47

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCS 320-238978/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_008.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>08/10/2018 08:31</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	38.9		2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	38.6		2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	38.7		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	39.7		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	39.4		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	40.9		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	40.4		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	32.3		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	39.0		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	39.5		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	38.9		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37.2		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	33.7	M	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	38.9		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	36.6		4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	39.1		2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	39.0		4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCS 320-238978/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_008.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>08/10/2018 08:31</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	81		50-150
STL00992	13C4 PFBA	91		50-150
STL01893	13C5 PFPeA	86		50-150
STL00993	13C2 PFHxA	83		50-150
STL01892	13C4-PFHpA	83		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	83		50-150
STL00996	13C2 PFDA	83		50-150
STL00997	13C2 PFUnA	90		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	87		50-150
STL00991	13C4 PFOS	86		50-150
STL02337	13C3-PFBS	81		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_008.d
 Lims ID: LCS 320-238978/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 10-Aug-2018 08:31:41 ALS Bottle#: 2 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-238978
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 14:12:02 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK035

First Level Reviewer: hannigana

Date: 10-Aug-2018 13:58:54

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	1.401	1.411	-0.010	0.535	5734623	2.27		90.7	9764	
2 Perfluorobutyric acid										
212.90 > 169.00	1.406	1.413	-0.007	1.004	2096941	0.9737		97.4	199	
D 3 13C5-PFPeA										
267.90 > 223.00	1.655	1.662	-0.007	0.632	3728646	2.14		85.7	10759	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.655	1.668	-0.013	1.000	1638663	0.9657		96.6	137	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.696	1.700	-0.004	1.005	2299394	0.9311		105	172	
298.90 > 99.00	1.688	1.700	-0.012	1.000	969085		2.37(1.25-3.74)		171	
D 47 13C3-PFBS										
301.90 > 83.00	1.688	1.702	-0.014	0.644	75589	1.88		80.7	448	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.903	1.907	-0.004	1.128	552776	1.03		110	5467	
D 7 13C2 PFHxA										
315.00 > 270.00	1.934	1.943	-0.009	0.738	4098451	2.07		83.0	7717	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.934	1.949	-0.015	1.000	1620615	0.9686		96.9	650	
313.00 > 119.00	1.934	1.949	-0.015	1.000	141953		11.42(5.03-15.10)		437	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.955	1.970	-0.015	1.159	2159212	0.9636		103	5969	
349.00 > 99.00	1.955	1.970	-0.015	1.159	824093		2.62(1.36-4.07)		1426	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.039	2.037	0.002	0.778	358787	NC			1116	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.039	2.043	-0.004	1.000	295142	NC			176	
D 9 13C4-PFHpA										
367.00 > 322.00	2.267	2.265	0.002	0.865	4023740	2.07		82.8	11337	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.267	2.269	-0.002	1.000	1696143	0.99		99.2	365	
363.00 > 169.00	2.267	2.269	-0.002	1.000	654220		2.59(1.13-3.40)		1364	
D 11 18O2 PFHxS										
403.00 > 84.00	2.278	2.276	0.002	0.869	4876956	1.96		82.7	6431	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.278	2.280	-0.002	1.000	1881425	0.8416		92.5	2209	M
399.00 > 99.00	2.278	2.280	-0.002	1.000	654623		2.87(1.50-4.49)		1057	M
65 ADONA										
377.00 > 251.00	2.311	2.314	-0.003	0.772	4828941	NC			11468	
377.00 > 85.00	2.311	2.314	-0.003	0.772	2923793		1.65(0.84-2.53)		7937	
D 12 M2-6:2FTS										
429.00 > 81.00	2.594	2.592	0.002	0.990	928132	2.27		95.5	3552	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.594	2.601	-0.007	1.000	632603	1.03		109	2576	
D 14 13C4 PFOA										
417.00 > 372.00	2.621	2.619	0.002	1.000	3941134	2.21		88.4	10304	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.621	2.622	-0.001	1.000	1754479	0.9843		98.3	155	
413.00 > 169.00	2.621	2.622	-0.001	1.000	947121		1.85(0.84-2.52)		2039	
* 62 13C2-PFOA										
415.00 > 370.00	2.621	2.622	-0.001		4563448	2.50			8773	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.629	2.629	0.0	0.878	1690348	0.9736		102	4613	
449.00 > 99.00	2.629	2.629	0.0	0.878	482944		3.50(1.94-5.82)		1544	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.142	3348806	2.04		85.5	4401	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.142	3325443	2.08		83.1	11187	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.993	0.0	1.000	1375456	0.9142		98.5	1768	
499.00 > 99.00	2.993	2.993	0.0	1.000	310372		4.43(2.31-6.93)		697	
20 Perfluorononanoic acid										
463.00 > 419.00	2.993	3.001	-0.008	1.000	1431722	1.02		102	384	
463.00 > 169.00	2.993	3.001	-0.008	1.000	339027		4.22(1.90-5.69)		1826	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.203	3.211	-0.008	1.070	2232194	NC			5316	
D 21 13C8 FOSA										
506.00 > 78.00	3.327	3.326	0.001	1.270	4402473	2.03		81.2	5979	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.327	3.334	-0.007	1.000	1672258	0.9753		97.5	3598	
D 26 M2-8:2FTS										
529.00 > 81.00	3.349	3.340	0.009	1.278	1061471	2.15		89.7	2852	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.342	3.349	-0.007	1.117	1026461	0.9740		101	2547	
549.00 > 99.00	3.342	3.349	-0.007	1.117	366319		2.80(1.33-3.97)		1580	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.349	3.349	0.0	1.000	505846	0.8785		91.7	1277	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.357	3.355	0.002	1.281	2902999	2.07		82.7	5639	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.357	3.357	0.0	1.000	1176515	1.01		101	812	
513.00 > 169.00	3.357	3.357	0.0	1.000	214478		5.49(2.36-7.09)		418	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.507	3.506	0.001	1.338	1545365	2.15		86.1	3214	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.515	3.515	0.0	1.002	590555	0.99		99.0	630	M
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.675	3.674	0.001	1.402	1618154	2.17		87.0	1338	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.668	3.676	-0.008	1.226	866087	0.9781		101	3050	
599.00 > 99.00	3.668	3.676	-0.008	1.226	307504		2.82(1.39-4.16)		1774	
D 30 13C2 PFUnA										
565.00 > 520.00	3.684	3.682	0.002	1.406	2547047	2.25		90.2	10420	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.684	3.685	-0.001	1.000	924066	0.8072		80.7	582	
563.00 > 169.00	3.684	3.685	-0.001	1.000	182442		5.06(2.12-6.36)		291	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.684	3.693	-0.009	1.002	548928	0.9510		95.1	1403	
35 MeFOSA										
512.00 > 169.00	3.825	3.826	-0.001		339543	NC			520	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.842	3.852	-0.010	1.284	3632368	NC			8413	
D 36 13C2 PFDaA										
615.00 > 570.00	3.981	3.987	-0.006	1.519	2526078	2.12		84.6	3861	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.990	3.991	-0.001	1.191	391697	NC			2038	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.981	3.991	-0.010	1.000	1097567	0.9762		97.6	714	
613.00 > 169.00	3.981	3.991	-0.010	1.000	259899		4.22(2.13-6.40)		1040	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.219	4.228	-0.009	1.410	345909	NC			769	
699.00 > 99.00	4.219	4.228	-0.009	1.410	486762		0.71(0.00-0.00)		2288	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.248	4.257	-0.009	1.067	1072099	0.9868		98.7	467	
663.00 > 169.00	4.248	4.257	-0.009	1.067	347350		3.09(1.25-3.76)		1836	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.488	4.493	-0.005	1.712	3324842	2.19		87.4	6823	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.488	4.497	-0.009	1.000	313336	0.9734		97.3	2105	
713.00 > 219.00	4.488	4.497	-0.009	1.000	206699		1.52(0.71-2.13)		1370	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.910	4.917	-0.007	1.873	4112275	1.36		54.5	5636	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.910	4.919	-0.009	1.000	1435573	NC			231	
813.00 > 169.00	4.910	4.919	-0.009	1.000	255061		5.63(2.86-8.58)		1670	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.273	5.281	-0.008	1.074	934385	NC			132	
913.00 > 169.00	5.273	5.281	-0.008	1.074	115056		8.12(3.83-11.48)		873	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_008.d

Injection Date: 10-Aug-2018 08:31:41

Instrument ID: A8_N

Lims ID: LCS 320-238978/2-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

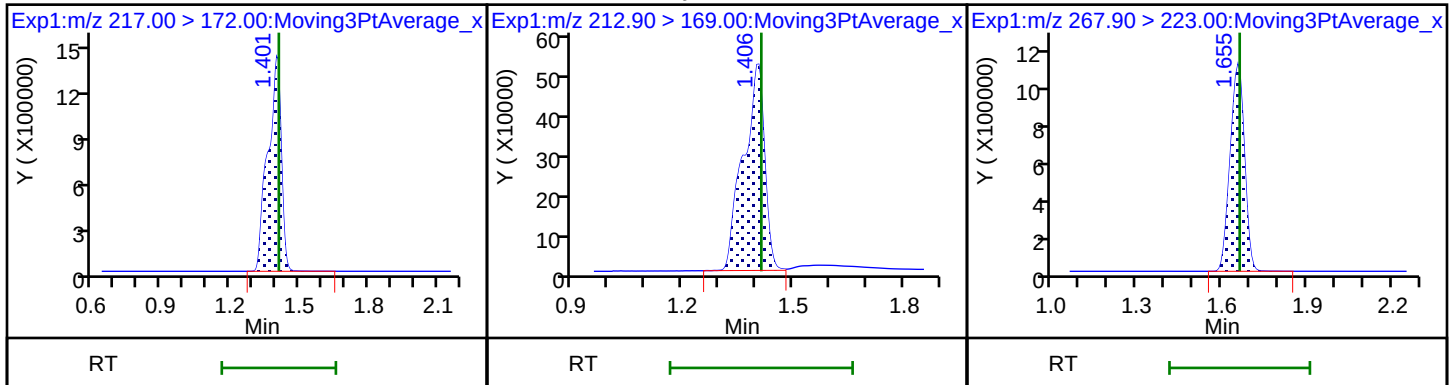
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

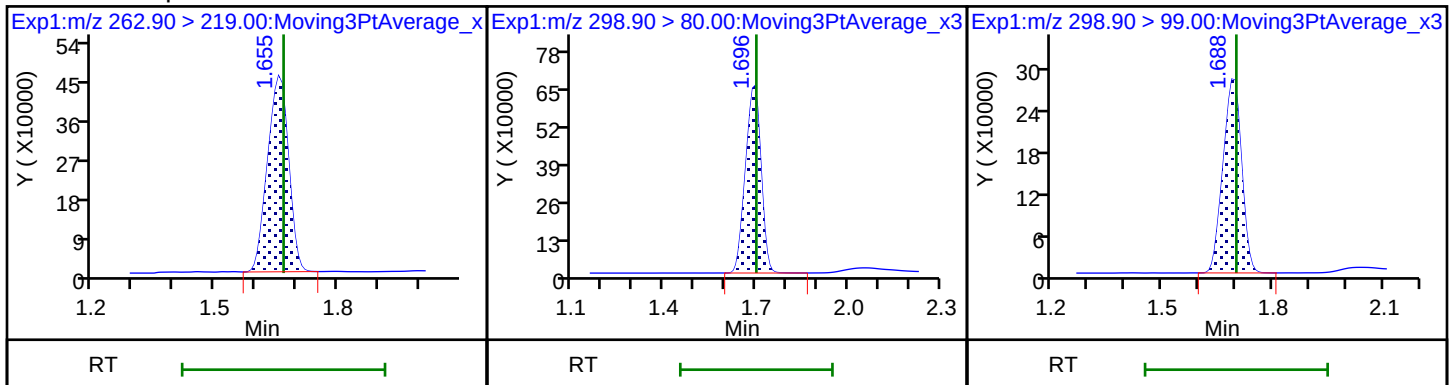
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

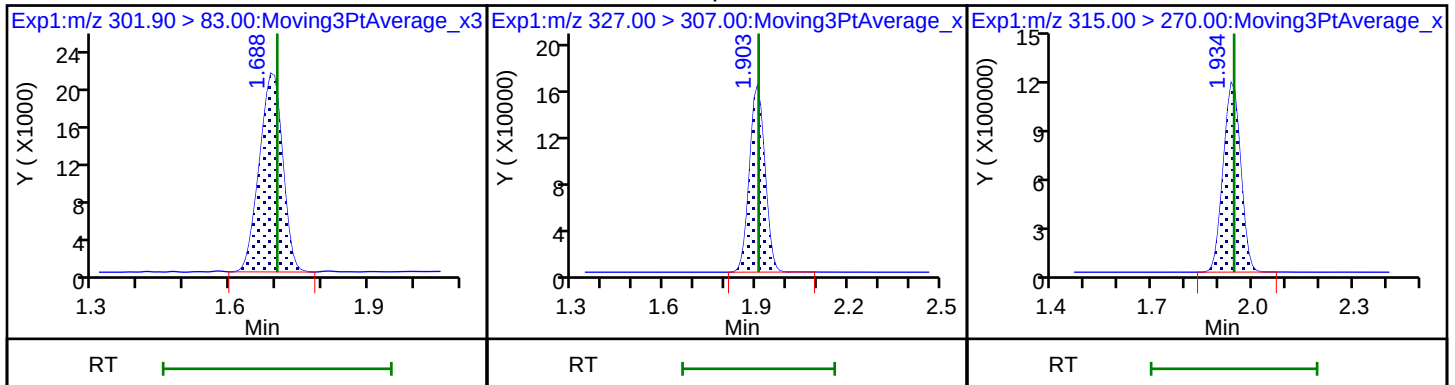
5 Perfluorobutanesulfonic acid



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfonate

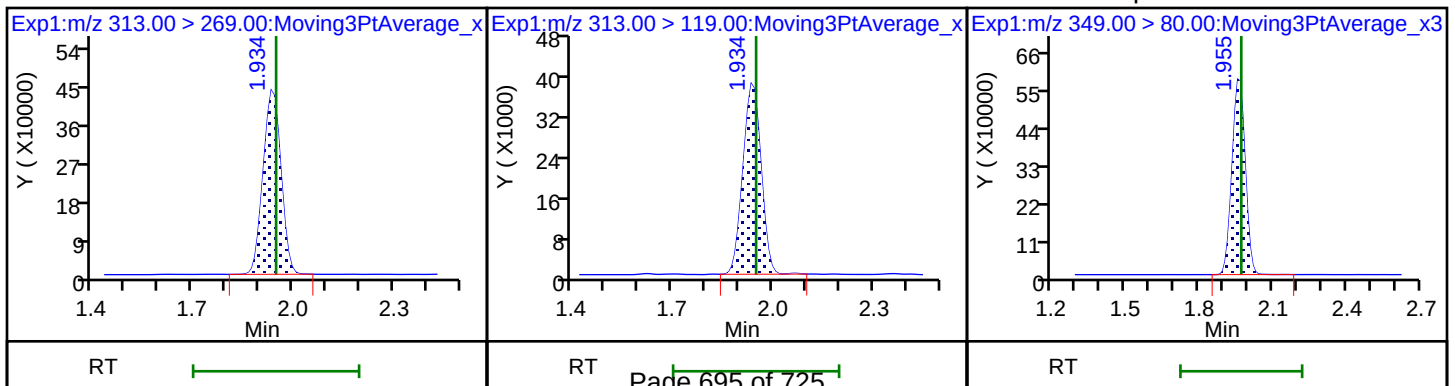
D 7 13C2 PFHxA

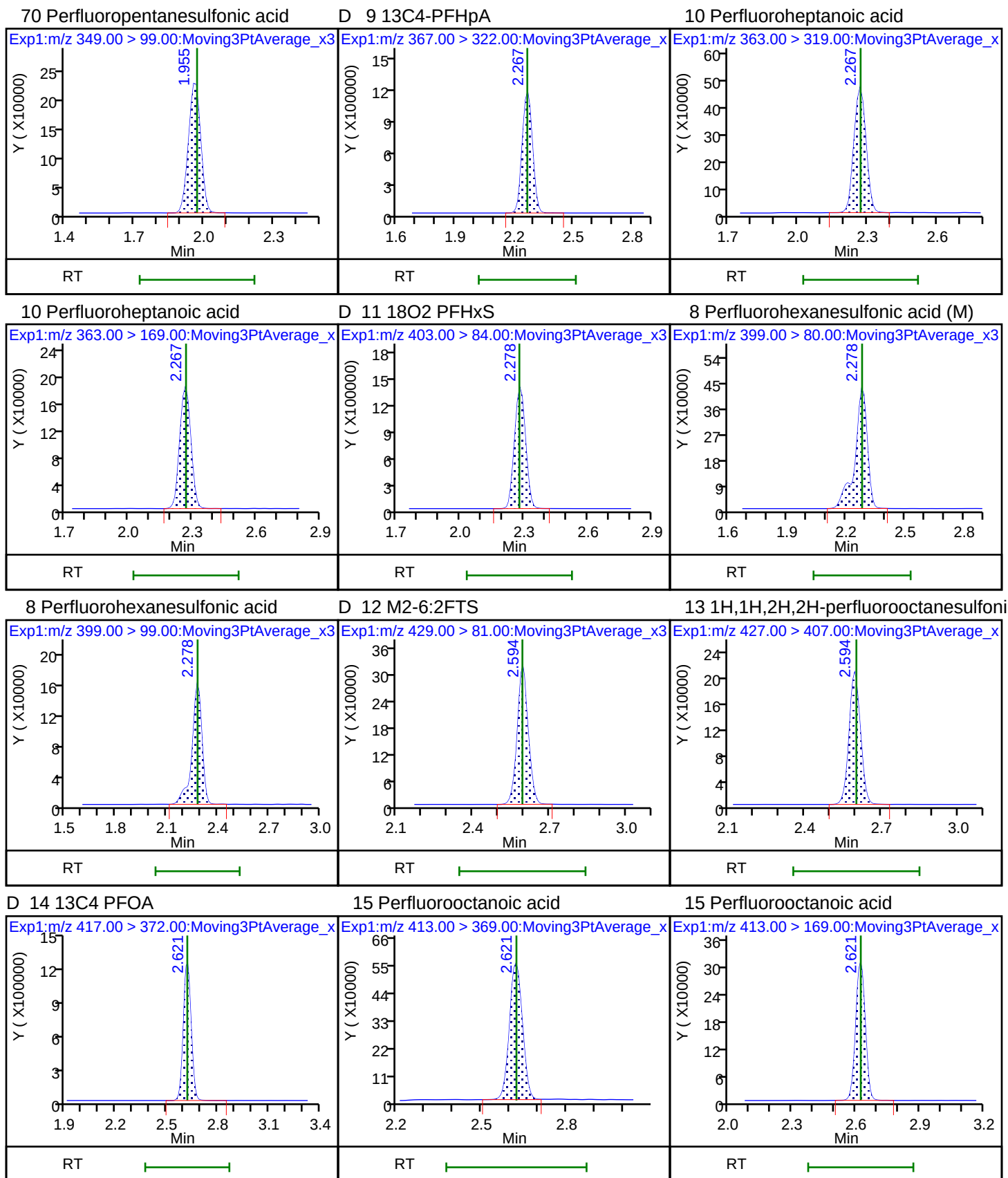


6 Perfluorohexanoic acid

6 Perfluorohexanoic acid

70 Perfluoropentanesulfonic acid

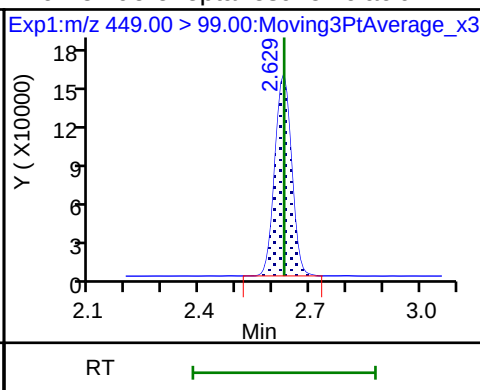
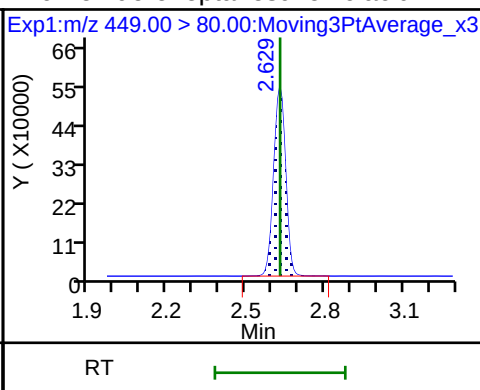
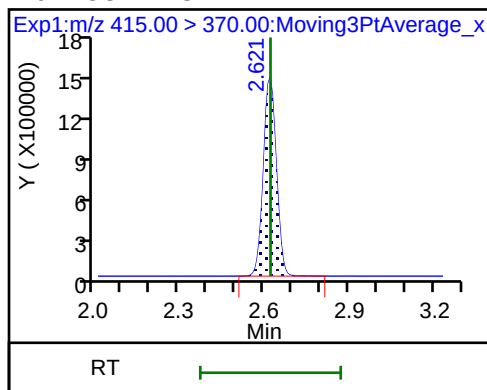




* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

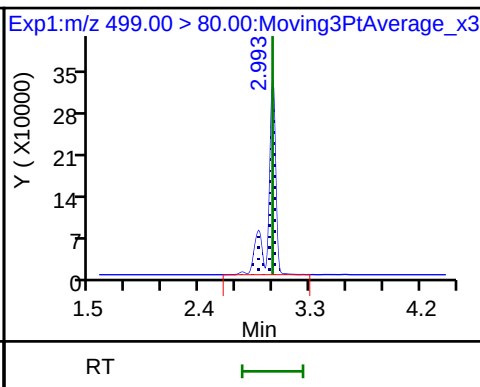
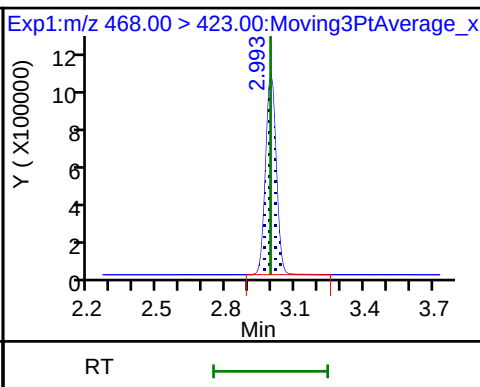
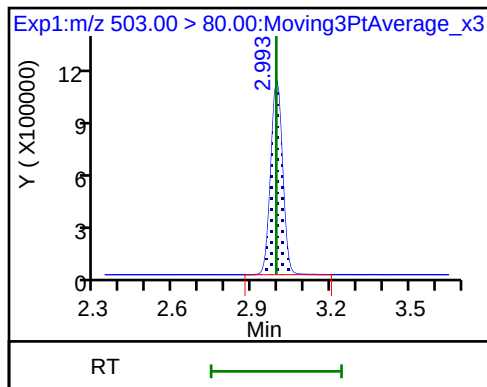
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

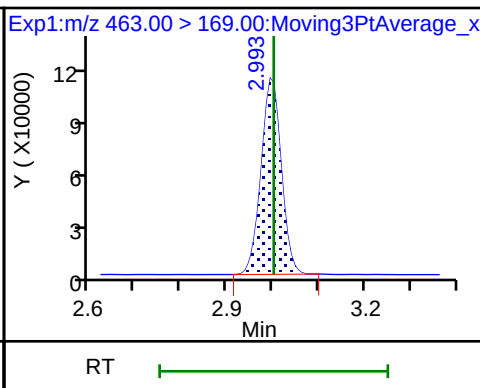
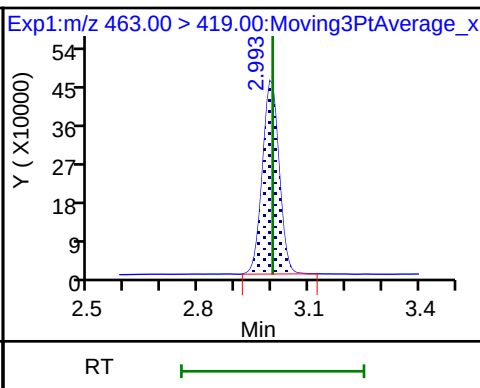
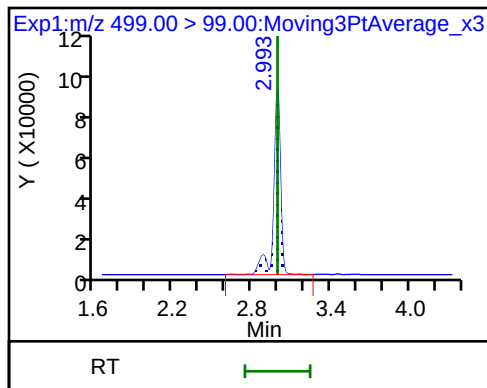
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid

20 Perfluorononanoic acid

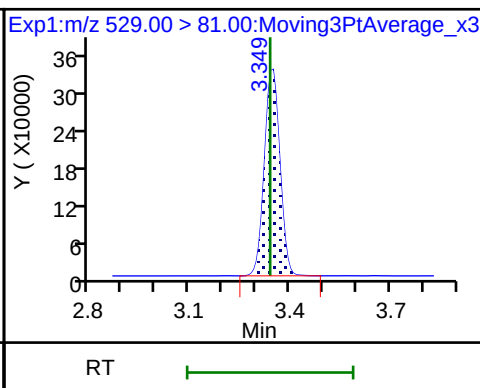
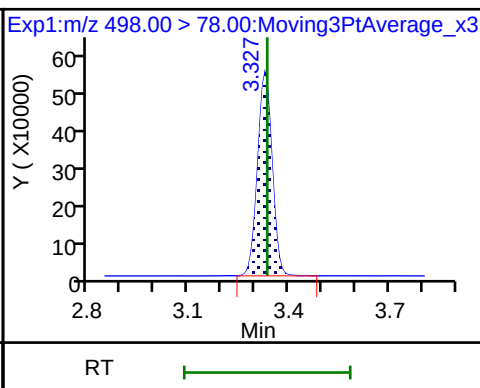
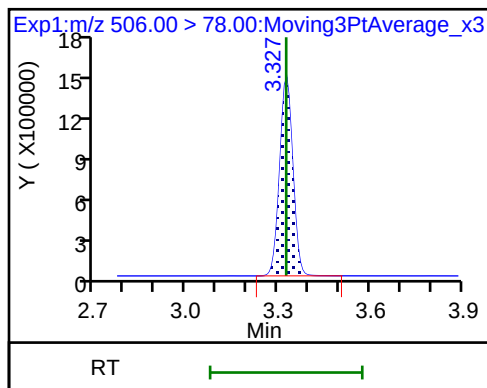
20 Perfluorononanoic acid

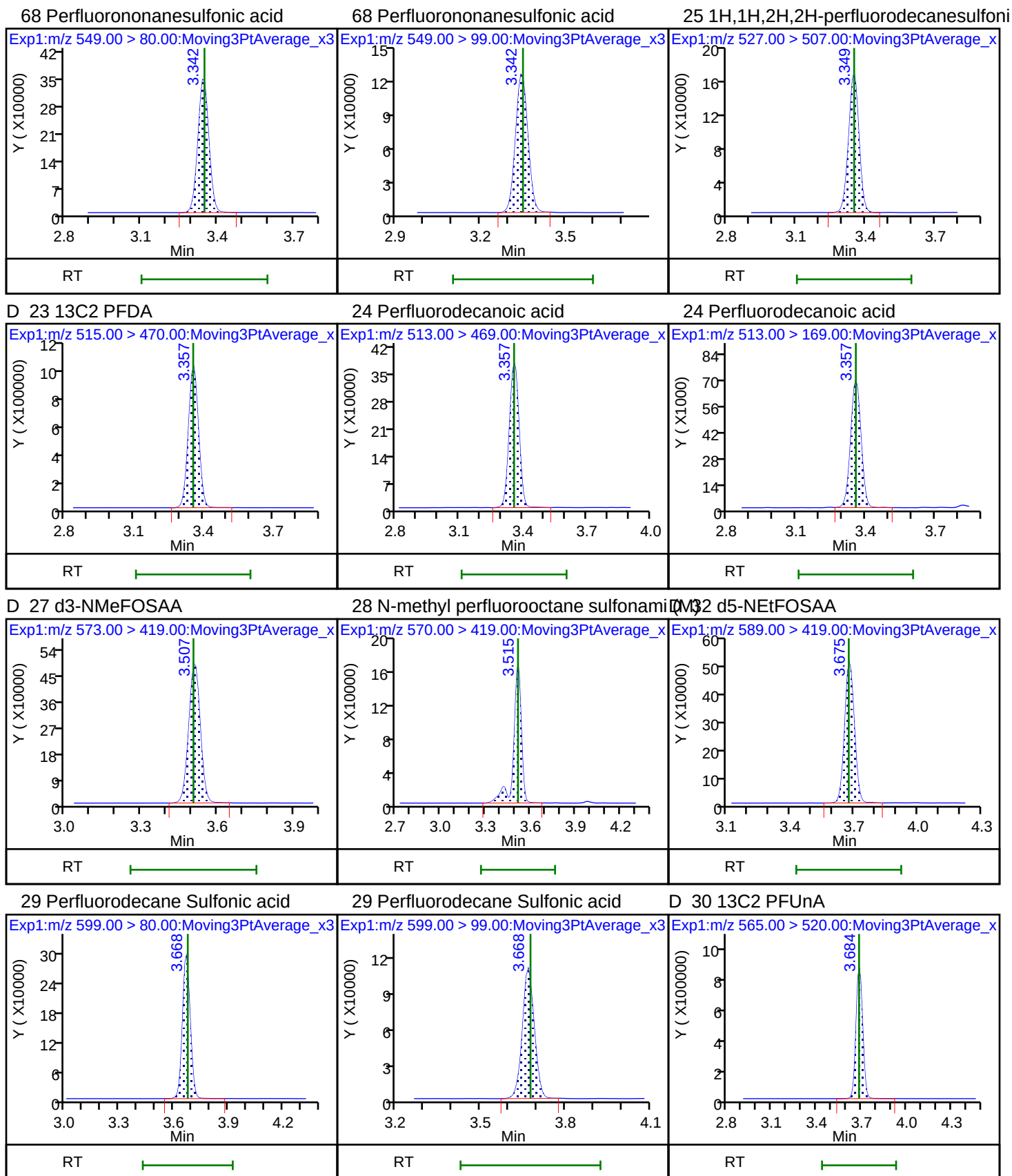


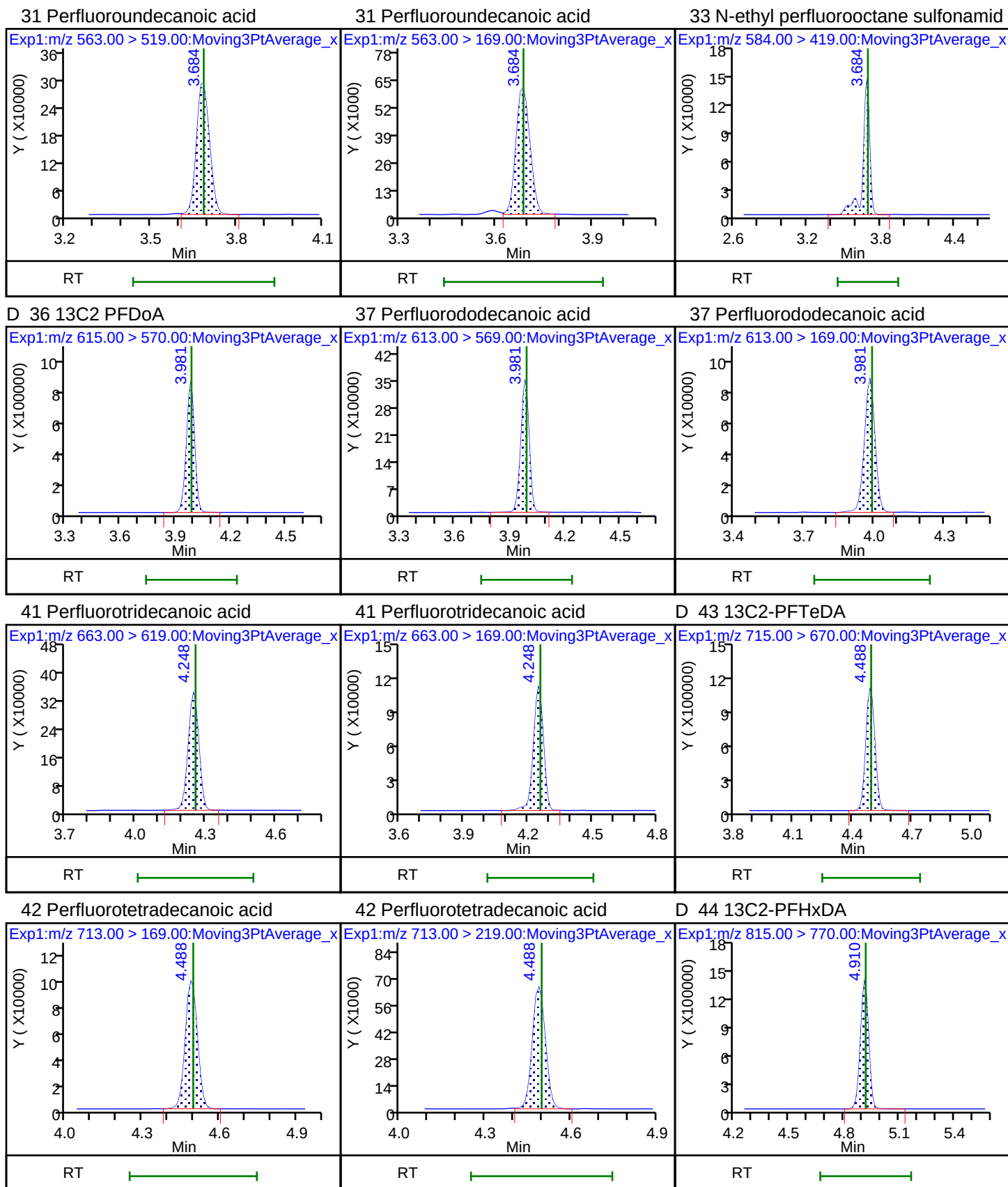
D 21 13C8 FOSA

22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS







TestAmerica Sacramento

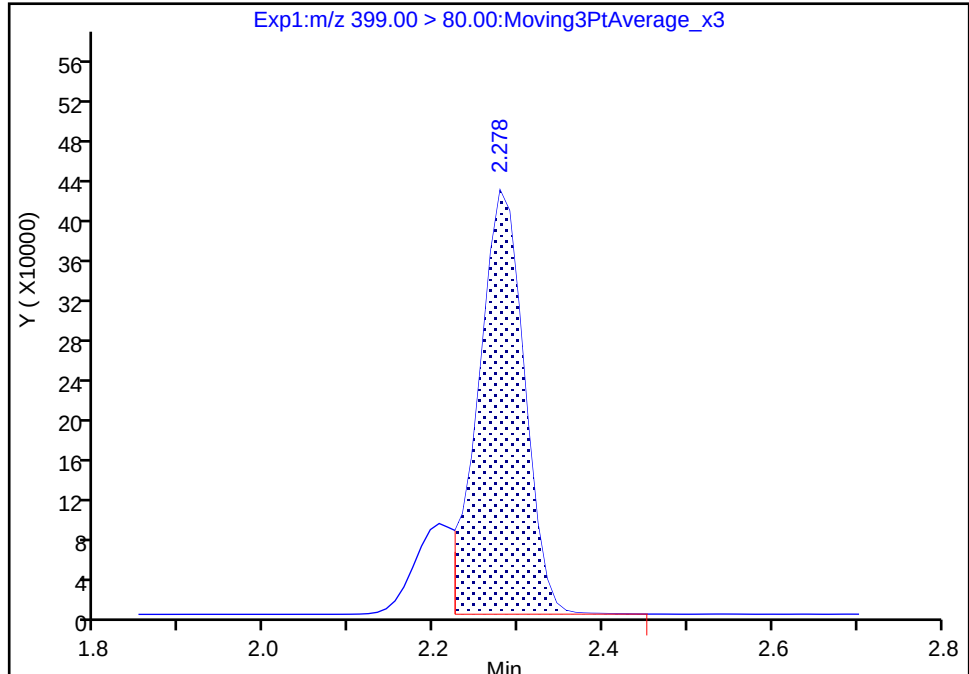
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_008.d
Injection Date: 10-Aug-2018 08:31:41 Instrument ID: A8_N
Lims ID: LCS 320-238978/2-A
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

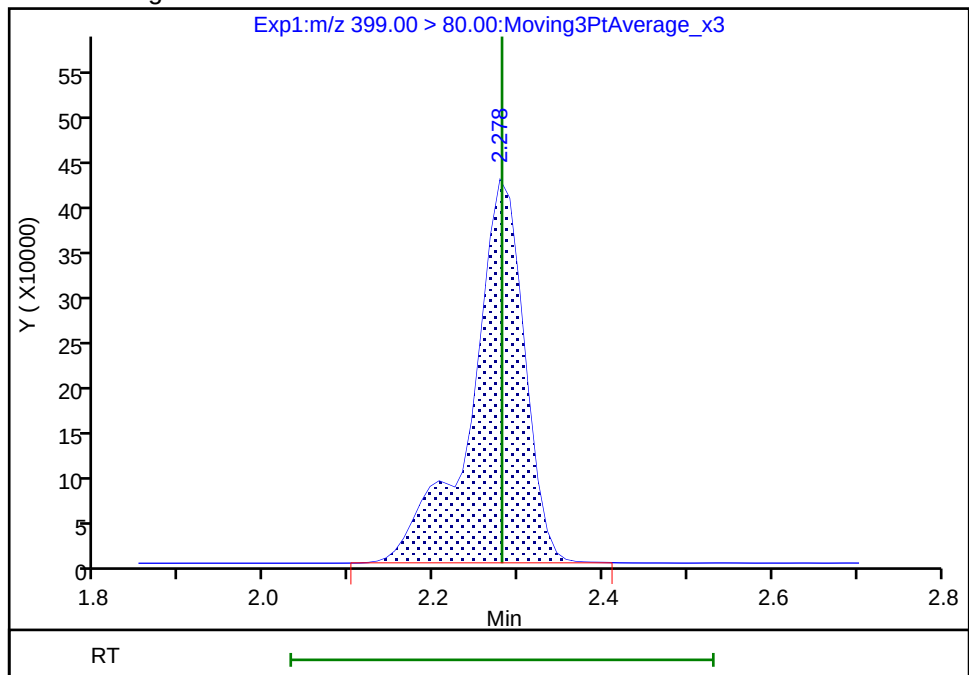
RT: 2.28
Area: 1599976
Amount: 0.715722
Amount Units: ng/ml

Processing Integration Results



RT: 2.28
Area: 1881425
Amount: 0.841623
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:58:17
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 701 of 725

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCSD 320-238978/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_009.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>08/10/2018 08:39</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	38.6		2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	38.4		2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	38.8		2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	39.3		2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	39.0		2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	40.5		2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	39.9		2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	31.3		2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	38.0		2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	38.8		4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	39.5		4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.3		2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	33.8	M	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	40.0		2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38.2		4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	39.8		2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	40.2		4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>LCSD 320-238978/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_009.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>08/10/2018 08:39</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	81		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	87		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	82		50-150
STL00990	13C4 PFOA	88		50-150
STL00995	13C5 PFNA	83		50-150
STL00996	13C2 PFDA	85		50-150
STL00997	13C2 PFUnA	87		50-150
STL00998	13C2 PFDoA	90		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	87		50-150
STL00991	13C4 PFOS	83		50-150
STL02337	13C3-PFBS	86		50-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_009.d
 Lims ID: LCSD 320-238978/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 10-Aug-2018 08:39:32 ALS Bottle#: 3 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-238978/3-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 10-Aug-2018 14:12:02 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK035

First Level Reviewer: hannigana

Date: 10-Aug-2018 13:59:42

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	1.406	1.411	-0.005	0.535	5994607	2.34		93.6	11212	
2 Perfluorobutyric acid										
212.90 > 169.00	1.406	1.413	-0.007	1.000	2172318	0.9649		96.5	199	
D 3 13C5-PFPeA										
267.90 > 223.00	1.664	1.662	0.002	0.633	3847748	2.18		87.2	8188	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.664	1.668	-0.004	1.000	1680443	0.9596		96.0	150	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.696	1.700	-0.004	1.000	2300707	0.8583		97.1	174	
298.90 > 99.00	1.696	1.700	-0.004	1.000	957646		2.40(1.25-3.74)		194	
D 47 13C3-PFBS										
301.90 > 83.00	1.696	1.702	-0.006	0.645	82052	2.01		86.5	510	
61 1H,1H,2H,2H-perfluorohexanesulfoni										
327.00 > 307.00	1.914	1.907	0.007	1.128	598198	1.02		110	5400	
D 7 13C2 PFHxA										
315.00 > 270.00	1.945	1.943	0.002	0.740	4286610	2.14		85.6	9783	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.945	1.949	-0.004	1.000	1697607	0.9701		97.0	667	
313.00 > 119.00	1.945	1.949	-0.004	1.000	153985		11.02(5.03-15.10)		417	
70 Perfluoropentanesulfonic acid										
349.00 > 80.00	1.966	1.970	-0.004	1.159	2310079	0.9497		101	4902	
349.00 > 99.00	1.966	1.970	-0.004	1.159	823858		2.80(1.36-4.07)		1755	
D 64 13C3 HFPO-DA										
332.10 > 287.00	2.039	2.037	0.002	0.776	334288	NC			959	
67 Perfluoro(2-propoxypropanoic) acid										
329.10 > 285.00	2.039	2.043	-0.004	1.000	323886	NC			202	
D 9 13C4-PFHpA										
367.00 > 322.00	2.278	2.265	0.013	0.867	4052431	2.06		82.2	10995	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.278	2.269	0.009	1.000	1693017	0.9836		98.4	425	
363.00 > 169.00	2.278	2.269	0.009	1.000	664233		2.55(1.13-3.40)		1380	
D 11 18O2 PFHxS										
403.00 > 84.00	2.289	2.276	0.013	0.871	4934197	1.95		82.6	8686	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.289	2.280	0.009	1.000	1908333	0.8438		92.7	1711	M
399.00 > 99.00	2.289	2.280	0.009	1.000	689490		2.77(1.50-4.49)		1044	M
65 ADONA										
377.00 > 251.00	2.312	2.314	-0.002	0.770	5017838	NC			11490	
377.00 > 85.00	2.312	2.314	-0.002	0.770	2954663		1.70(0.84-2.53)		6308	
D 12 M2-6:2FTS										
429.00 > 81.00	2.600	2.592	0.008	0.989	1009787	2.43		103	3121	
13 1H,1H,2H,2H-perfluorooctanesulfoni										
427.00 > 407.00	2.600	2.601	-0.001	1.000	660624	0.9875		104	2413	
D 14 13C4 PFOA										
417.00 > 372.00	2.629	2.619	0.010	1.000	3995263	2.21		88.4	10315	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.629	2.622	0.007	1.000	1762123	0.9752		97.4	158	
413.00 > 169.00	2.629	2.622	0.007	1.000	922055		1.91(0.84-2.52)		1822	
* 62 13C2-PFOA										
415.00 > 370.00	2.629	2.622	0.007		4625875	2.50			8852	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.636	2.629	0.007	0.878	1706744	1.00		105	3257	
449.00 > 99.00	2.636	2.629	0.007	0.878	467283		3.65(1.94-5.82)		1118	
D 18 13C4 PFOS										
503.00 > 80.00	3.003	2.992	0.011	1.142	3292102	1.98		83.0	3450	
D 19 13C5 PFNA										
468.00 > 423.00	3.003	2.992	0.011	1.142	3353064	2.07		82.6	5158	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.003	2.993	0.010	1.000	1411657	0.9544		103	1431	
499.00 > 99.00	3.003	2.993	0.010	1.000	321311		4.39(2.31-6.93)		1034	
20 Perfluorononanoic acid										
463.00 > 419.00	3.003	3.001	0.002	1.000	1430513	1.01		101	371	
463.00 > 169.00	3.003	3.001	0.002	1.000	347579		4.12(1.90-5.69)		1532	
69 9-Chlorohexadecafluoro-3-oxanonane										
531.00 > 351.00	3.213	3.211	0.002	1.070	2329148	NC			3767	
D 21 13C8 FOSA										
506.00 > 78.00	3.329	3.326	0.003	1.266	4468304	2.03		81.3	5588	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.336	3.334	0.002	1.002	1749520	1.01		101	3375	
D 26 M2-8:2FTS										
529.00 > 81.00	3.351	3.340	0.011	1.275	1104433	2.20		92.1	3648	
68 Perfluorononanesulfonic acid										
549.00 > 80.00	3.351	3.349	0.002	1.116	1047546	1.01		105	2513	
549.00 > 99.00	3.351	3.349	0.002	1.116	389711		2.69(1.33-3.97)		1769	
25 1H,1H,2H,2H-perfluorodecanesulfoni										
527.00 > 507.00	3.351	3.349	0.002	1.000	521279	0.8701		90.8	1529	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C2 PFDA										
515.00 > 470.00	3.366	3.355	0.011	1.280	3018764	2.12		84.8	4948	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.366	3.357	0.009	1.000	1208642	1.00		99.8	892	
513.00 > 169.00	3.359	3.357	0.002	0.998	209602		5.77(2.36-7.09)		635	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.517	3.506	0.011	1.338	1644024	2.26		90.3	4028	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.517	3.515	0.002	1.000	618587	0.9752		97.5	563	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.680	3.674	0.006	1.400	1632770	2.16		86.6	1401	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.671	3.676	-0.005	1.223	865464	0.99		103	2547	
599.00 > 99.00	3.671	3.676	-0.005	1.223	293913		2.94(1.39-4.16)		1778	
D 30 13C2 PFUnA										
565.00 > 520.00	3.688	3.682	0.006	1.403	2499282	2.18		87.3	6804	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.688	3.685	0.003	1.000	879114	0.7826		78.3	655	
563.00 > 169.00	3.688	3.685	0.003	1.000	182608		4.81(2.12-6.36)		1187	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.688	3.693	-0.005	1.002	545283	0.9362		93.6	1318	
35 MeFOSA										
512.00 > 169.00	3.829	3.826	0.003		313793	NC			455	
66 11-Chloroeicosafuoro-3-oxaundecan										
631.00 > 451.00	3.846	3.852	-0.006	1.281	3779646	NC			6448	
D 36 13C2 PFDaA										
615.00 > 570.00	3.985	3.987	-0.002	1.516	2715191	2.24		89.7	5517	
74 1H,1H,2H,2H-perfluorododecanesulfo										
627.00 > 607.00	3.994	3.991	0.003	1.192	393398	NC			2691	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.985	3.991	-0.006	1.000	1147057	0.9492		94.9	642	
613.00 > 169.00	3.985	3.991	-0.006	1.000	274459		4.18(2.13-6.40)		1781	
75 Perfluorododecanesulfonic acid (PF										
699.00 > 80.00	4.233	4.228	0.005	1.410	356840	NC			802	
699.00 > 99.00	4.223	4.228	-0.005	1.406	502180		0.71(0.00-0.00)		3711	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.252	4.257	-0.005	1.067	1131654	0.9690		96.9	472	
663.00 > 169.00	4.252	4.257	-0.005	1.067	355763		3.18(1.25-3.76)		2656	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.494	4.493	0.001	1.709	3361115	2.18		87.2	6587	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.494	4.497	-0.003	1.000	321232	0.9872		98.7	2371	
713.00 > 219.00	4.494	4.497	-0.003	1.000	222743		1.44(0.71-2.13)		1110	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.917	4.917	0.0	1.870	4582975	1.50		59.9	6023	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.917	4.919	-0.002	1.000	1679581	NC			243	
813.00 > 169.00	4.917	4.919	-0.002	1.000	289689		5.80(2.86-8.58)		1809	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.280	5.281	-0.001	1.074	1165104	NC			149	
913.00 > 169.00	5.273	5.281	-0.008	1.072	145134		8.03(3.83-11.48)		974	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_009.d

Injection Date: 10-Aug-2018 08:39:32

Instrument ID: A8_N

Lims ID: LCSD 320-238978/3-A

Client ID:

Operator ID: \SACINSTLCMS01@tai.com

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

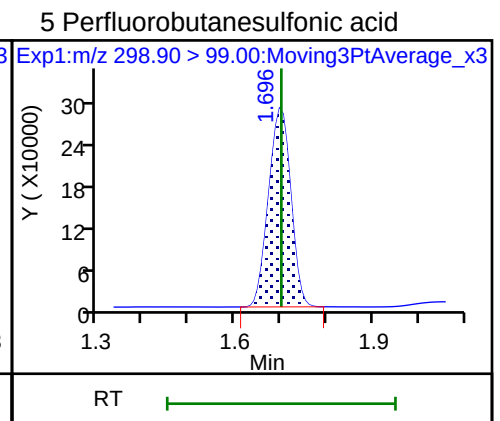
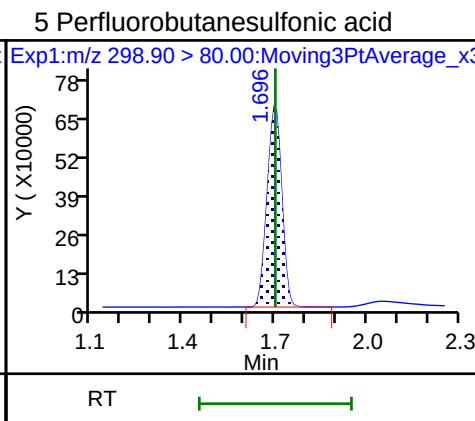
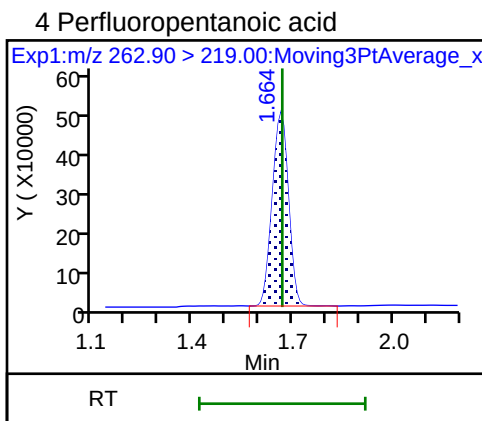
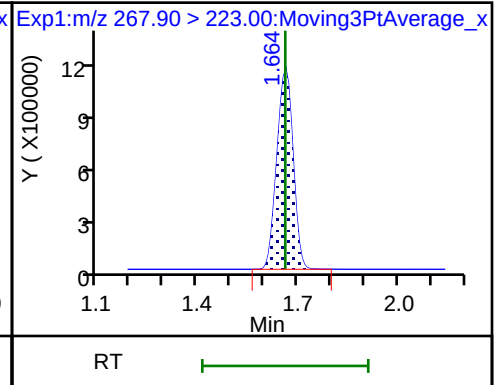
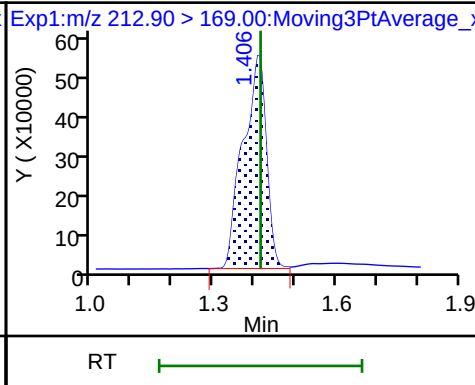
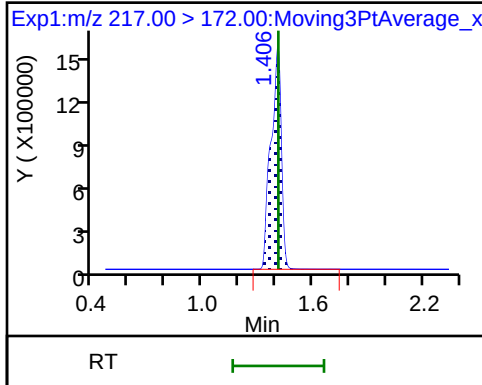
Method: A8_N

Limit Group: LC PFC_QSM5-1 ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

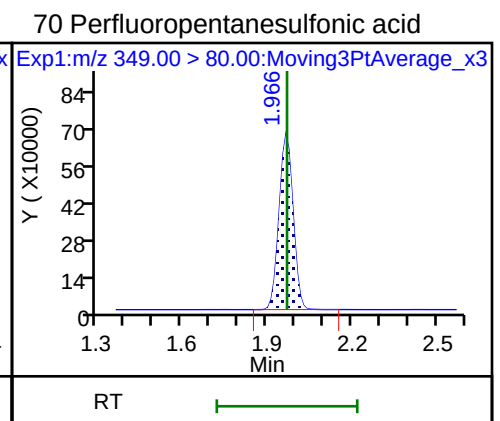
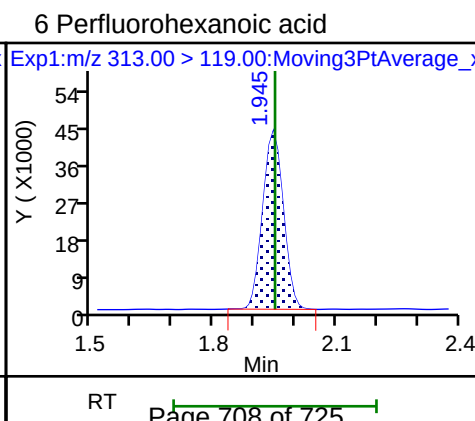
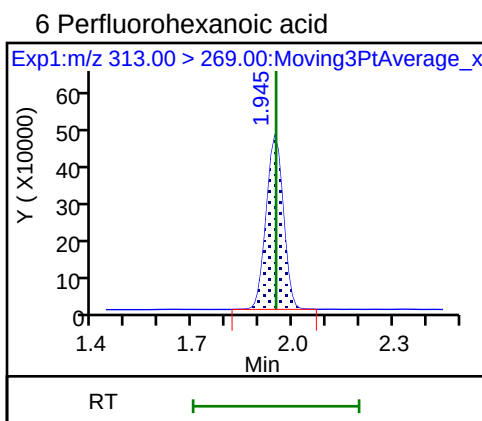
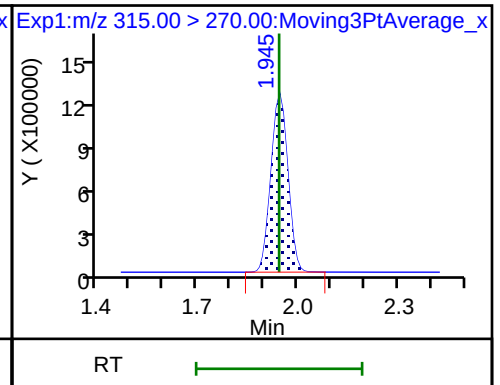
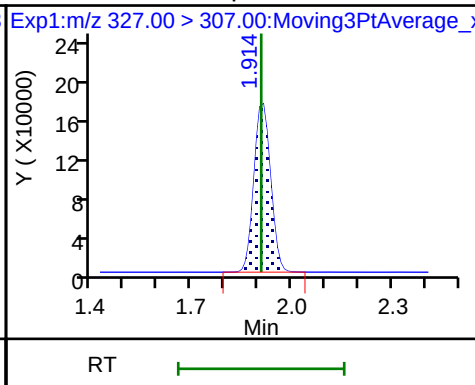
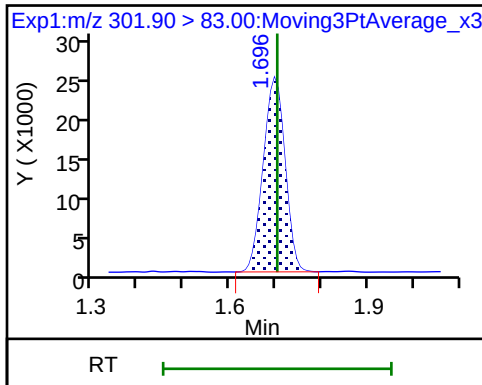
D 3 13C5-PFPeA



D 47 13C3-PFBS

61 1H,1H,2H,2H-perfluorohexanesulfonate

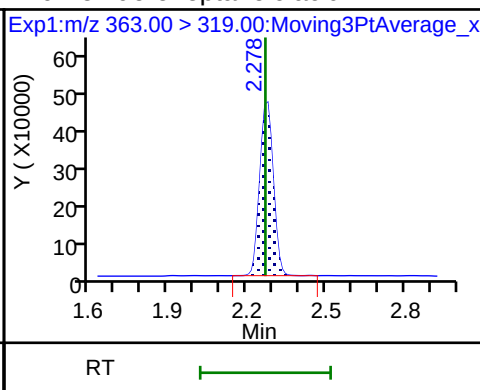
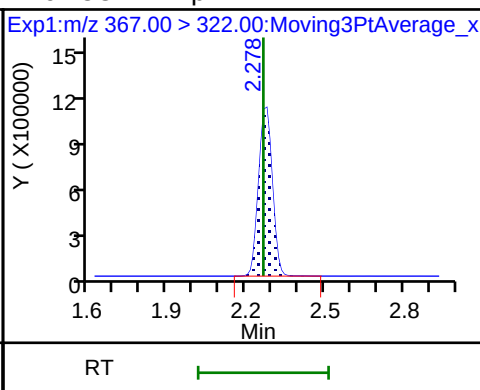
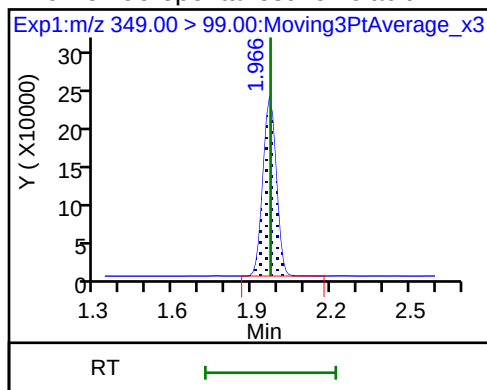
D 7 13C2 PFHxA



70 Perfluoropentanesulfonic acid

D 9 13C4-PFHpA

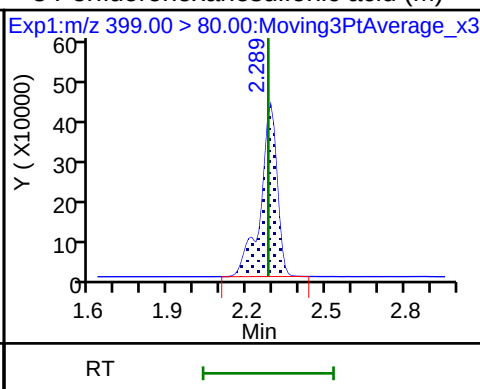
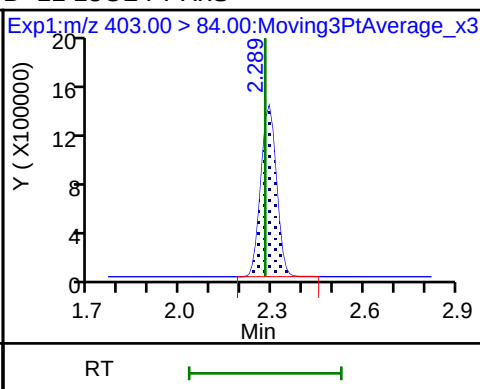
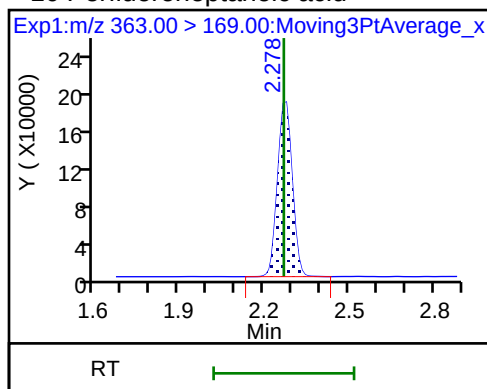
10 Perfluoroheptanoic acid



10 Perfluoroheptanoic acid

D 11 18O2 PFHxS

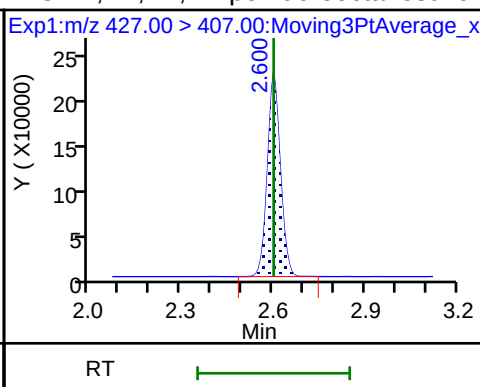
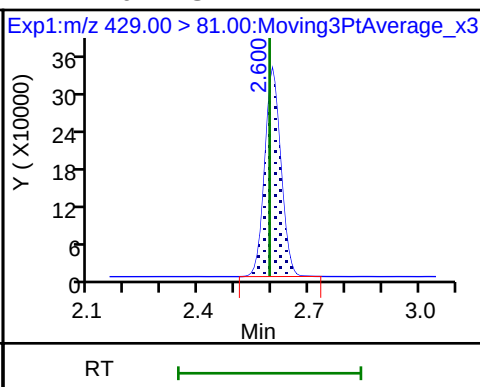
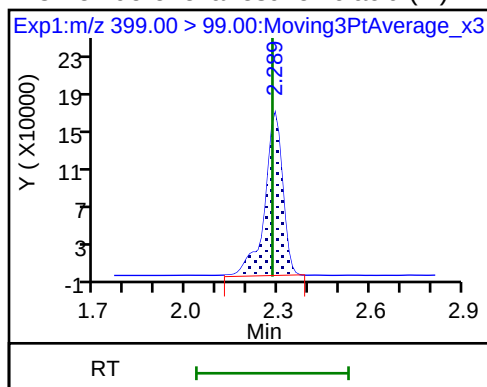
8 Perfluorohexanesulfonic acid (M)



8 Perfluorohexanesulfonic acid (M)

D 12 M2-6:2FTS

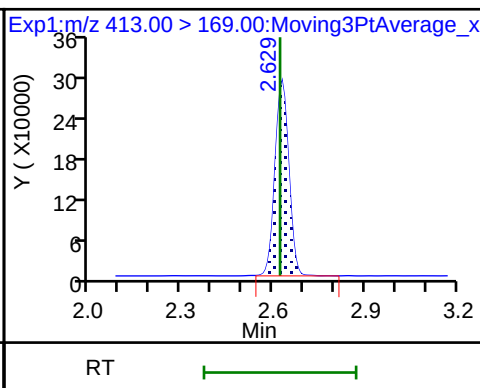
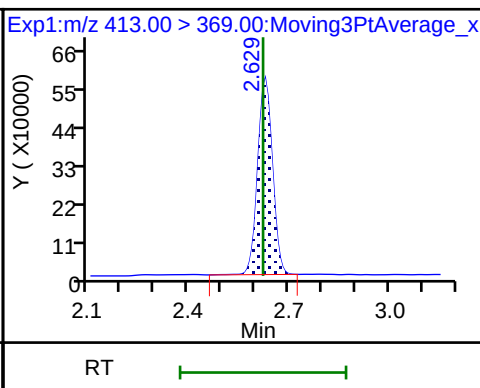
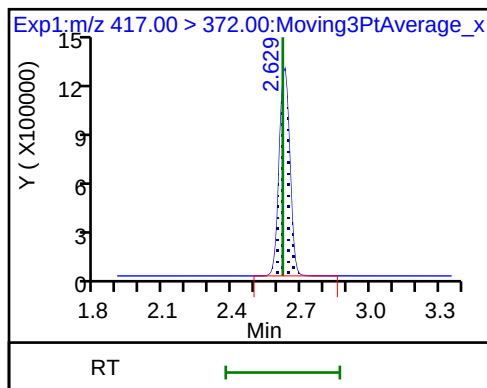
13 1H,1H,2H,2H-perfluorooctanesulfoni



D 14 13C4 PFOA

15 Perfluorooctanoic acid

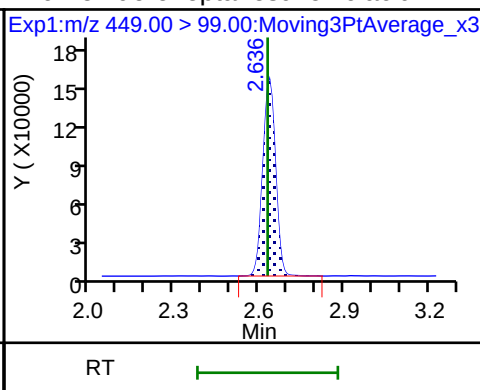
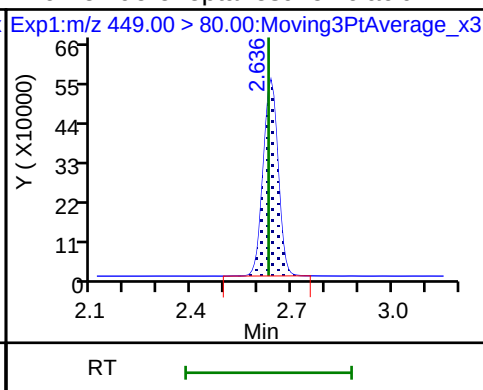
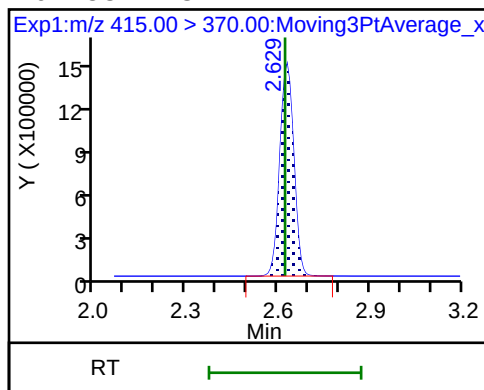
15 Perfluorooctanoic acid



* 62 13C2-PFOA

16 Perfluoroheptanesulfonic acid

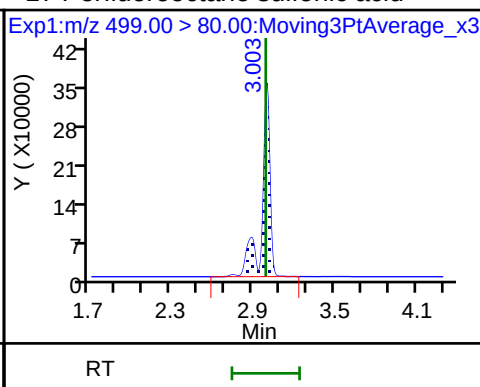
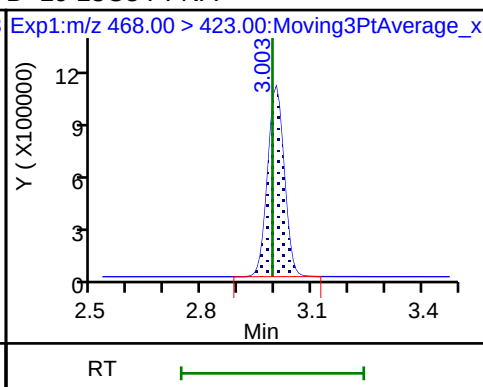
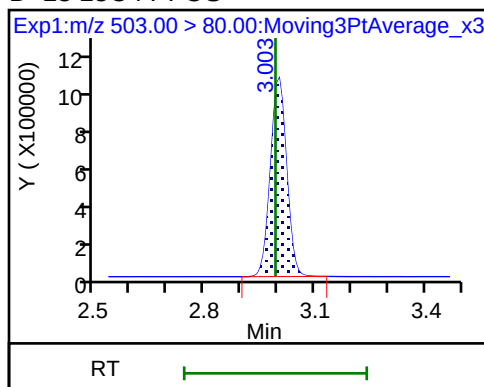
16 Perfluoroheptanesulfonic acid



D 18 13C4 PFOS

D 19 13C5 PFNA

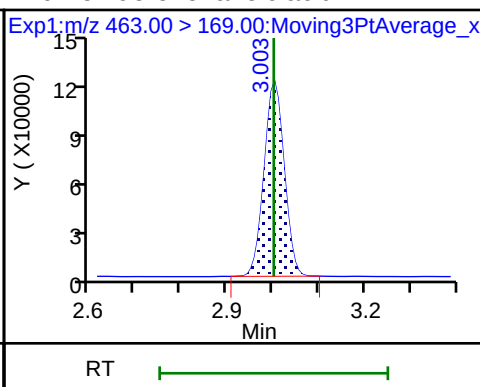
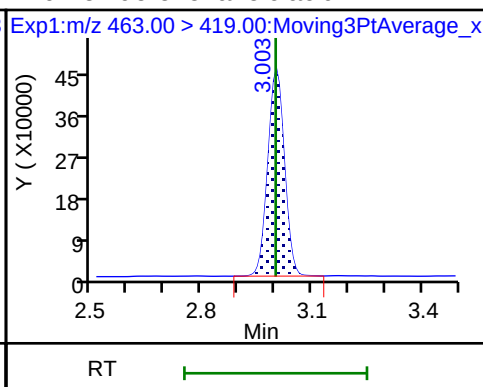
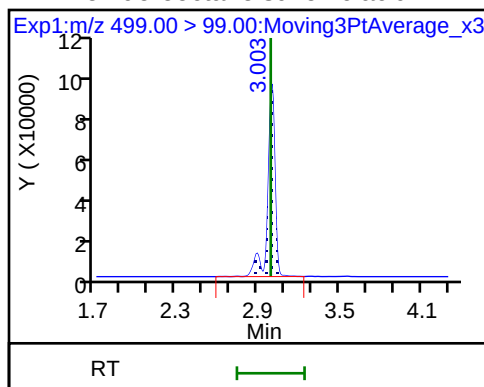
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid

20 Perfluorononanoic acid

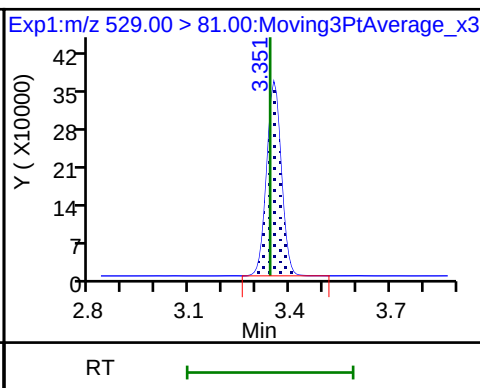
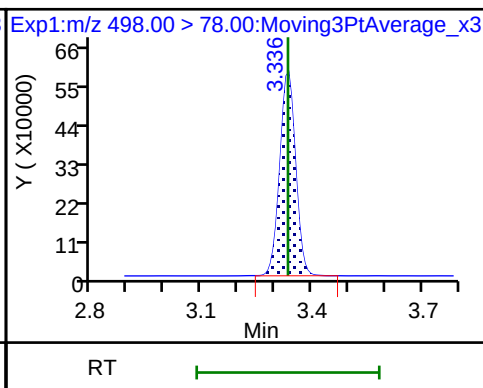
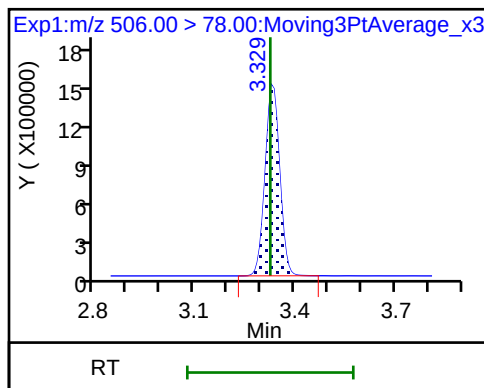
20 Perfluorononanoic acid



D 21 13C8 FOSA

22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS



68 Perfluorononanesulfonic acid

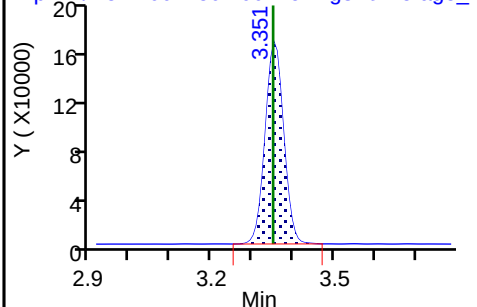
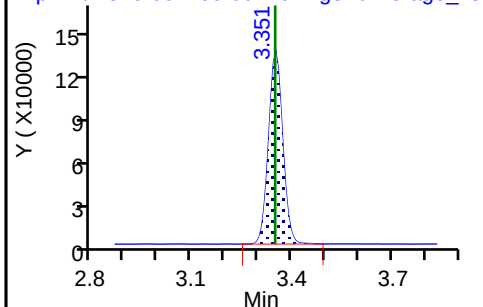
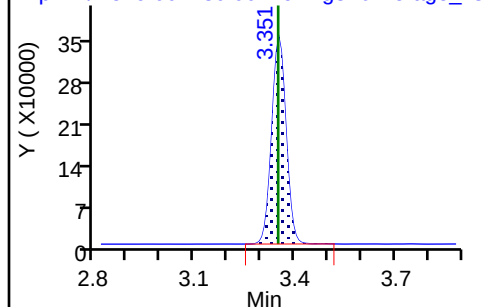
68 Perfluorononanesulfonic acid

25 1H,1H,2H,2H-perfluorodecanesulfoni

Exp1:m/z 549.00 > 80.00:Moving3PtAverage_x3

Exp1:m/z 549.00 > 99.00:Moving3PtAverage_x3

Exp1:m/z 527.00 > 507.00:Moving3PtAverage_x



RT

RT

RT

D 23 13C2 PFDA

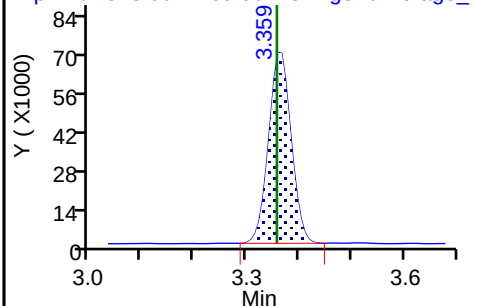
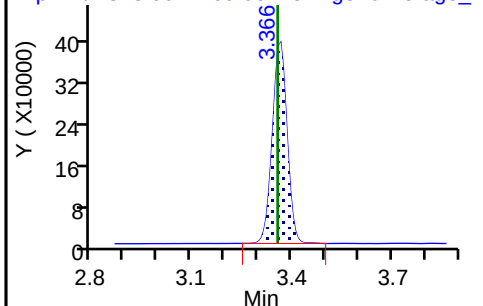
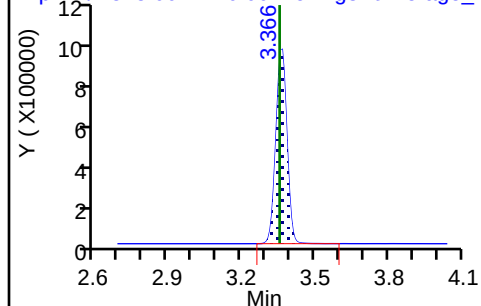
24 Perfluorodecanoic acid

24 Perfluorodecanoic acid

Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x

Exp1:m/z 513.00 > 469.00:Moving3PtAverage_x

Exp1:m/z 513.00 > 169.00:Moving3PtAverage_x



RT

RT

RT

D 27 d3-NMeFOSAA

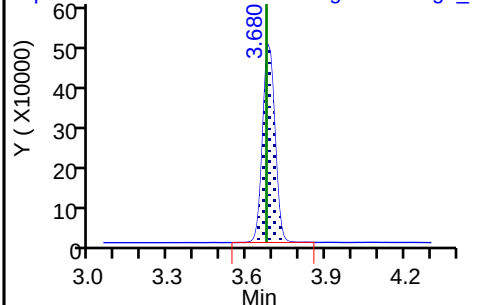
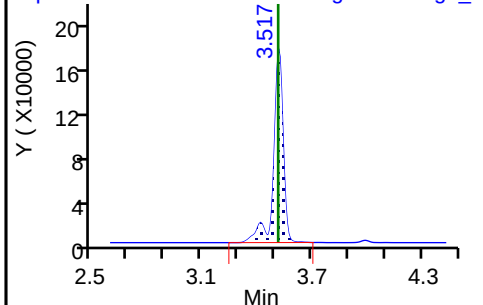
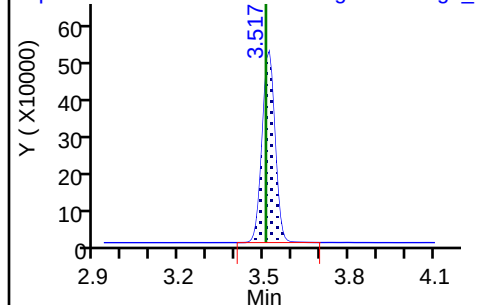
28 N-methyl perfluorooctane sulfonamid

32 d5-NEtFOSAA

Exp1:m/z 573.00 > 419.00:Moving3PtAverage_x

Exp1:m/z 570.00 > 419.00:Moving3PtAverage_x

Exp1:m/z 589.00 > 419.00:Moving3PtAverage_x



RT

RT

RT

29 Perfluorodecane Sulfonic acid

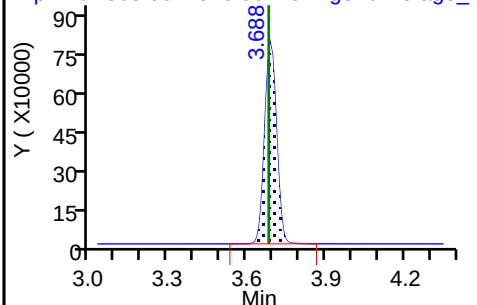
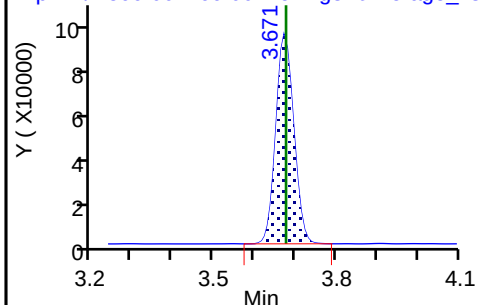
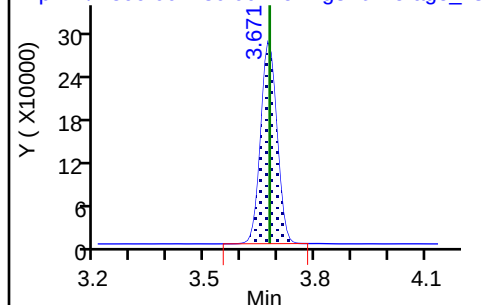
29 Perfluorodecane Sulfonic acid

D 30 13C2 PFUnA

Exp1:m/z 599.00 > 80.00:Moving3PtAverage_x3

Exp1:m/z 599.00 > 99.00:Moving3PtAverage_x3

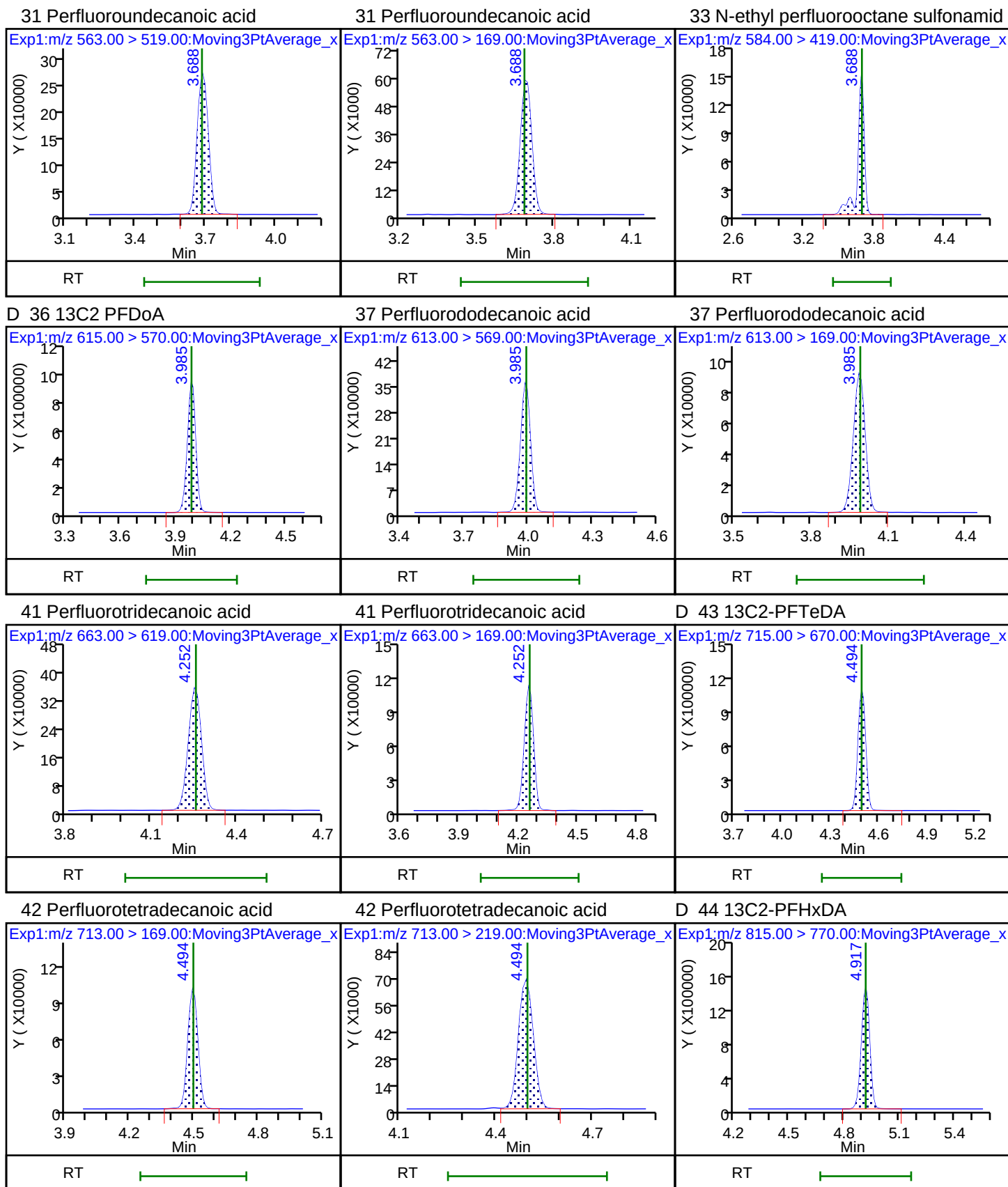
Exp1:m/z 565.00 > 520.00:Moving3PtAverage_x



RT

RT

RT



TestAmerica Sacramento

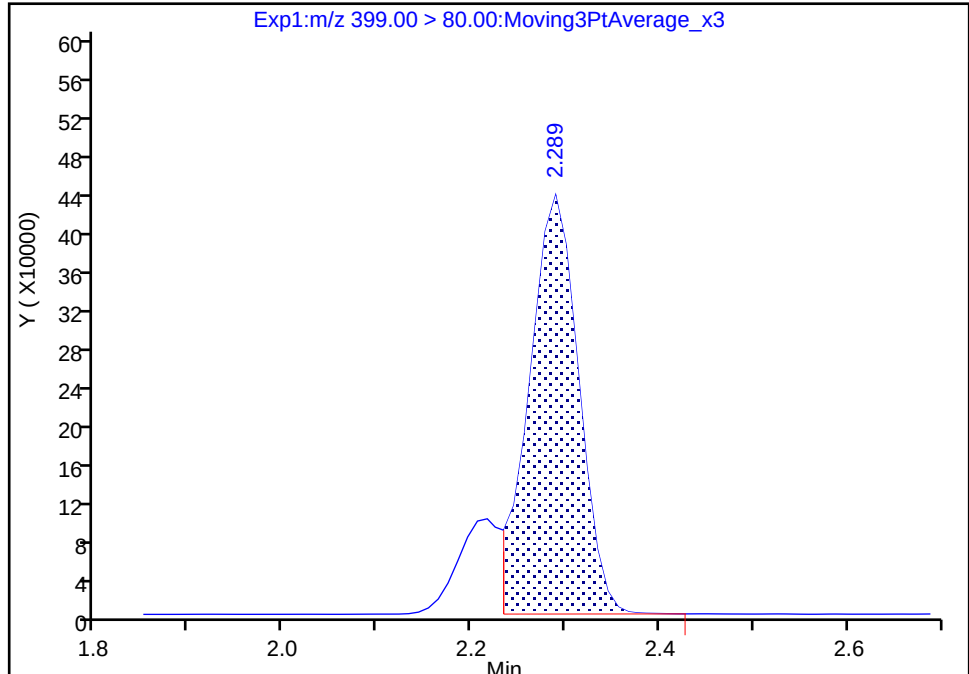
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_009.d
Injection Date: 10-Aug-2018 08:39:32 Instrument ID: A8_N
Lims ID: LCSD 320-238978/3-A
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

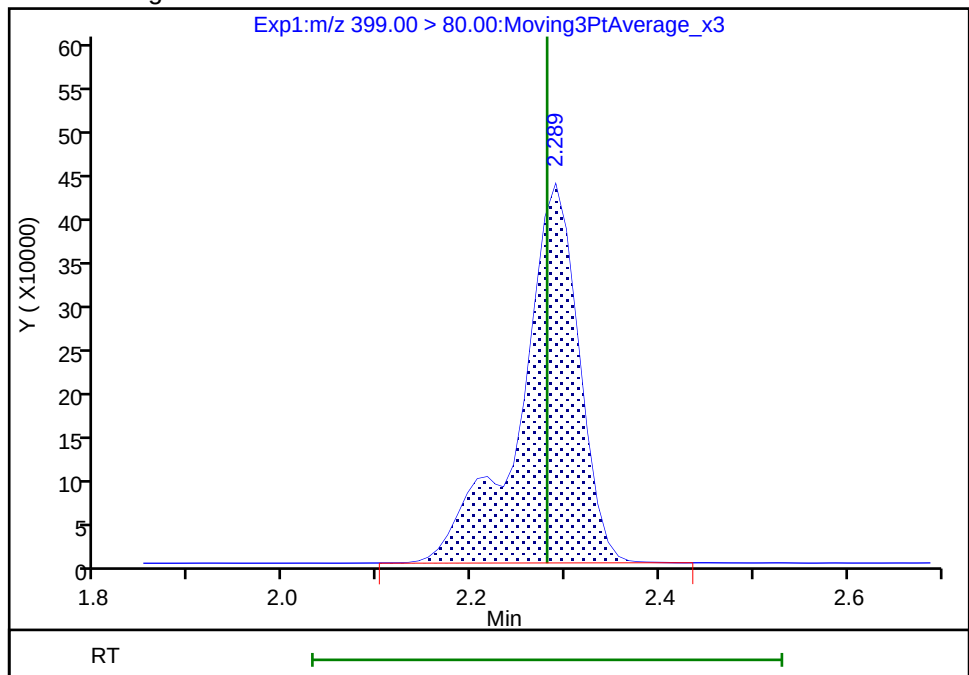
RT: 2.29
Area: 1594978
Amount: 0.705209
Amount Units: ng/ml

Processing Integration Results



RT: 2.29
Area: 1908333
Amount: 0.843757
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:59:19
Audit Action: Manually Integrated

Audit Reason: Isomers
Page 714 of 725

TestAmerica Sacramento

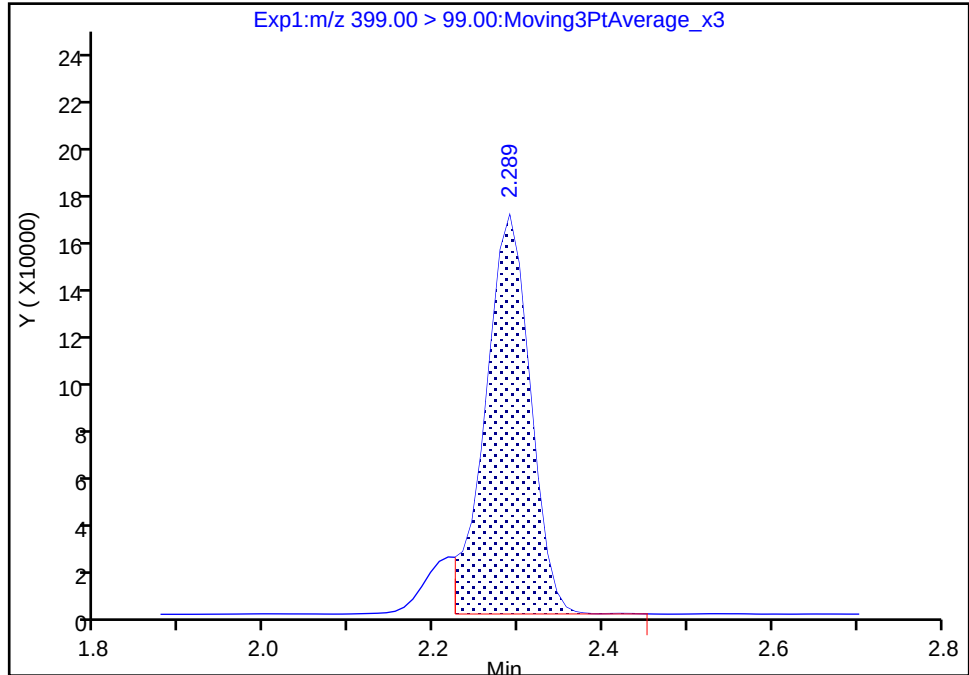
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_009.d
Injection Date: 10-Aug-2018 08:39:32 Instrument ID: A8_N
Lims ID: LCSD 320-238978/3-A
Client ID:
Operator ID: \SACINSTLCMS01@tai.com ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_QSM5-1 ICAL
Column: Detector EXP1

8 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 2

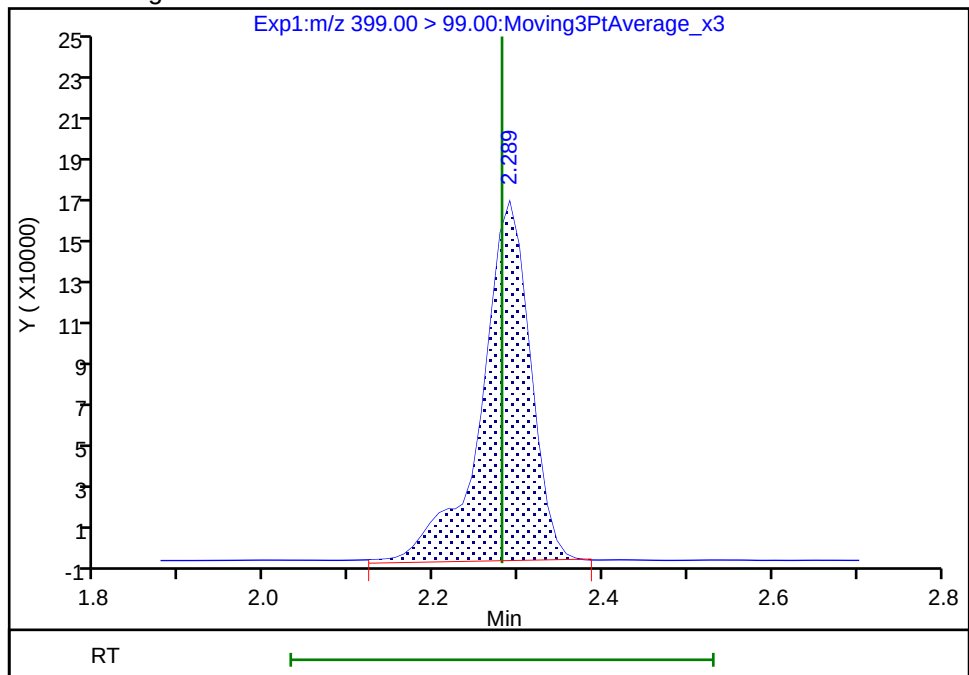
RT: 2.29
Area: 623756
Amount: 0.705209
Amount Units: ng/ml

Processing Integration Results



RT: 2.29
Area: 689490
Amount: 0.843757
Amount Units: ng/ml

Manual Integration Results



Reviewer: hannigana, 10-Aug-2018 13:59:25

Audit Action: Manually Integrated

Audit Reason: Isomers

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/06/2018 11:10Analysis Batch Number: 238193 End Date: 08/06/2018 12:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-238193/2		08/06/2018 11:10	1	2018.08.06LLICA L 002.d	GeminiC18 3x100 3(mm)
IC 320-238193/3		08/06/2018 11:17	1	2018.08.06LLICA L 003.d	GeminiC18 3x100 3(mm)
IC 320-238193/4		08/06/2018 11:25	1	2018.08.06LLICA L 004.d	GeminiC18 3x100 3(mm)
IC 320-238193/5 ICIS		08/06/2018 11:33	1	2018.08.06LLICA L 005.d	GeminiC18 3x100 3(mm)
IC 320-238193/6		08/06/2018 11:41	1	2018.08.06LLICA L 006.d	GeminiC18 3x100 3(mm)
IC 320-238193/7		08/06/2018 11:49	1	2018.08.06LLICA L 007.d	GeminiC18 3x100 3(mm)
IC 320-238193/8		08/06/2018 11:56	1	2018.08.06LLICA L 008.d	GeminiC18 3x100 3(mm)
ICB 320-238193/9		08/06/2018 12:04	1	2018.08.06LLICA L 009.d	GeminiC18 3x100 3(mm)
ICV 320-238193/10		08/06/2018 12:12	1	2018.08.06LLICA L 010.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/10/2018 08:00Analysis Batch Number: 239237End Date: 08/10/2018 09:57

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-239237/1		08/10/2018 08:00	1	2018.08.10LLA_0 04.d	GeminiC18 3x100 3(mm)
CCVL 320-239237/2		08/10/2018 08:08	1	2018.08.10LLA_0 05.d	GeminiC18 3x100 3(mm)
CCV 320-239237/3 CCVIS		08/10/2018 08:15	1	2018.08.10LLA_0 06.d	GeminiC18 3x100 3(mm)
MB 320-238978/1-A		08/10/2018 08:23	1	2018.08.10LLA_0 07.d	GeminiC18 3x100 3(mm)
LCS 320-238978/2-A		08/10/2018 08:31	1	2018.08.10LLA_0 08.d	GeminiC18 3x100 3(mm)
LCSD 320-238978/3-A		08/10/2018 08:39	1	2018.08.10LLA_0 09.d	GeminiC18 3x100 3(mm)
320-41704-1		08/10/2018 08:47	1	2018.08.10LLA_0 10.d	GeminiC18 3x100 3(mm)
320-41704-2		08/10/2018 08:55	1	2018.08.10LLA_0 11.d	GeminiC18 3x100 3(mm)
320-41704-3		08/10/2018 09:03	1	2018.08.10LLA_0 12.d	GeminiC18 3x100 3(mm)
320-41704-4		08/10/2018 09:10	1	2018.08.10LLA_0 13.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 09:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 09:26	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 09:34	1		GeminiC18 3x100 3(mm)
CCV 320-239237/14		08/10/2018 09:42	1	2018.08.10LLA_0 17.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 09:49	1		GeminiC18 3x100 3(mm)
CCV 320-239237/16		08/10/2018 09:57	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/10/2018 16:33Analysis Batch Number: 239308 End Date: 08/10/2018 18:07

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-239308/1		08/10/2018 16:33	1	2018.08.10LLAAAX 004.d	GeminiC18 3x100 3(mm)
CCVL 320-239308/2		08/10/2018 16:41	1	2018.08.10LLAAAX 005.d	GeminiC18 3x100 3(mm)
CCV 320-239308/3 CCVIS		08/10/2018 16:48	1	2018.08.10LLAAAX 045.d	GeminiC18 3x100 3(mm)
CCV 320-239308/13		08/10/2018 18:07	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/10/2018 20:04Analysis Batch Number: 239343 End Date: 08/10/2018 20:27

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-239343/1		08/10/2018 20:04	1	2018.08.10LLAAAX 079.d	GeminiC18 3x100 3(mm)
320-41704-1 DL		08/10/2018 20:12	20	2018.08.10LLAAAX 080.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 20:20	1		GeminiC18 3x100 3(mm)
CCV 320-239343/4		08/10/2018 20:27	1	2018.08.10LLAAAX 082.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Batch Number: 238978 Batch Start Date: 08/09/18 10:23 Batch Analyst: Kolstad, Kate MBatch Method: 3535 Batch End Date: 08/09/18 18:13

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00092	LCPFC-IS 00073
MB 320-238978/1		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCS 320-238978/2		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCSD 320-238978/3		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
320-41704-C-1	TP-PFC-032-TPI	3535, EPA 537 (Mod)	T	318.48 g	28.60 g	289.9 mL	10.00 mL	500 uL	500 uL
320-41704-A-2	TP-PFC-032-MID CARBON	3535, EPA 537 (Mod)	T	317.68 g	27.84 g	289.8 mL	10.00 mL	500 uL	500 uL
320-41704-B-3	TP-PFC-032-TPE	3535, EPA 537 (Mod)	T	308.82 g	27.52 g	281.3 mL	10.00 mL	500 uL	500 uL
320-41704-A-4	TP-PFC-032-TPE-D	3535, EPA 537 (Mod)	T	310.84 g	27.58 g	283.3 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00163					
MB 320-238978/1		3535, EPA 537 (Mod)							
LCS 320-238978/2		3535, EPA 537 (Mod)		500 uL					
LCSD 320-238978/3		3535, EPA 537 (Mod)		500 uL					
320-41704-C-1	TP-PFC-032-TPI	3535, EPA 537 (Mod)	T						
320-41704-A-2	TP-PFC-032-MID CARBON	3535, EPA 537 (Mod)	T						
320-41704-B-3	TP-PFC-032-TPE	3535, EPA 537 (Mod)	T						
320-41704-A-4	TP-PFC-032-TPE-D	3535, EPA 537 (Mod)	T						

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.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

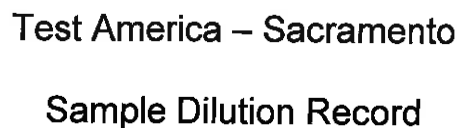
SDG No.: _____

Batch Number: 238978 Batch Start Date: 08/09/18 10:23 Batch Analyst: Kolstad, Kate MBatch Method: 3535 Batch End Date: 08/09/18 18:13

Batch Notes	
Analyst ID - Aliquot Step	KMK
Balance ID	QA-078
Batch Comment	Client labels match TA label, KMK. Envi-Carb: 103369.
Analyst ID - Final Volume Step	KMK
H2O ID	8-7-18
Hexane ID	1313826
Internal Standard ID#	1314760
Manifold ID	N
Methanol ID	1313683
Sodium Hydroxide ID	1325869
Pipette ID	I46345G
Analyst ID - Reagent Drop	KMK
Analyst ID - IS Reagent Drop	KMK
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	TWL
Solvent Lot #	1320119
Solvent Name	0.3% NH4OH/MEOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003237137A

Basis	Basis Description
T	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.



Date 8/10/18

<u>Job #</u>	<u>Sample #</u>	<u>Original F.V.</u> (uL)	<u>Aliquot (uL)</u>	<u>Dilution F.V.</u> (uL)	<u>Dilution Factor</u>
320-41704	1	10,00	15	300	20
ABH 8/10/18					

Comments:

Shipping and Receiving Documents

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:[illegible]

+ Relinquish Date wrong as well as in year listed.

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-41704-1

Login Number: 41704

List Number: 1

Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	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	Refer to Job Narrative for details.
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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","320","ng/L","D","19","DL","","","TRG","","","69","LOQ","YES","-99","","","289.9","10.00","52",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","26","ng/L","U","12","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","26",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","200","ng/L","D","7.4","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","17",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","330","ng/L","D","8.1","DL","","","TRG","","","34","LOQ","YES","-99","","","289.9","10.00","17",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","26","ng/L","U","9.0","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","26",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1800","ng/L","D M","9.3","DL","","","TRG","","","34","LOQ","YES","-99","","","289.9","10.00","26",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","17","ng/L","U","8.3","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","17",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","26","ng/L","U","9.7","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","26",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","390","ng/L","D M","6.6","DL","","","TRG","","","34","LOQ","YES","-99","","","289.9","10.00","17",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","69","ng/L","D M","10","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","26",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","54","ng/L","D","7.9","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","17",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","67","ng/L","D M","11","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","26",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","9.2","ng/L","J D","6.4","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","17",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","26","ng/L","U","9.0","DL","","","TRG","","","34","LOQ","NO","-99","","","289.9","10.00","26",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","52","ng/L","U","14","DL","","","TRG","","","69","LOQ","NO","-99","","","289.9","10.00","52",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","52","ng/L","U","13","DL","","","TRG","","","69","LOQ","NO","-99","","","289.9","10.00","52",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","52","ng/L","U","22","DL","","","TRG","","","69","LOQ","NO","-99","","","289.9","10.00","52",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00990","13C4 PFOA","75","ng/L","","","-99","DL","","","TRG","87","","","-99","LOQ","YES","86.2","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00991","13C4 PFOS","66","ng/L","","","-99","DL","","","TRG","80","","","-99","LOQ","YES","82.4","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00992","13C4 PFBA","73","ng/L","","","-99","DL","","","TRG","85","","","-99","LOQ","YES","86.2","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00993","13C2 PFHxA","74","ng/L","","","-99","DL","","","TRG","85","","","-99","LOQ","YES","86.2","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00994","18O2 PFHxS","64","ng/L","","","-99","DL","","","TRG","78","","","-99","LOQ","YES","81.6","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00995","13C5 PFNA","72","ng/L","","","-99","DL","","","TRG","83","","","-99","LOQ","YES","86.2","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00996","13C2 PFDA","71","ng/L","","","-99","DL","","","TRG","82","","","-99","LOQ","YES","86.2","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00997","13C2 PFUnA","76","ng/L","","","-99","DL","","","TRG","89","","","-99","LOQ","YES","86.2","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL00998","13C2 PFDoA","71","ng/L","","","-99","DL","","","TRG","82","","","-99","LOQ","YES","86.2","","","289.9","10.00","1700",""

"TP-PFC-032-TPI","EPA 537 (Mod)","DL","320-41704-1","TALSAC","STL01056","13C8

FOSA", "68", "ng/L", "", "-99", "DL", "", "TRG", "79", "", "-99", "LOQ", "YES", "86.2", "", "289.9", "10.00", "1700", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "DL", "320-41704-1", "TALSAC", "STL01892", "13C4-
PFHpA", "70", "ng/L", "", "-99", "DL", "", "TRG", "81", "", "-99", "LOQ", "YES", "86.2", "", "289.9", "10.00", "1700", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "DL", "320-41704-1", "TALSAC", "STL01893", "13C5
PFPeA", "71", "ng/L", "", "-99", "DL", "", "TRG", "83", "", "-99", "LOQ", "YES", "86.2", "", "289.9", "10.00", "1700", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "DL", "320-41704-1", "TALSAC", "STL02116", "13C2-
PFTeDA", "73", "ng/L", "", "-99", "DL", "", "TRG", "85", "", "-99", "LOQ", "YES", "86.2", "", "289.9", "10.00", "1700", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "DL", "320-41704-1", "TALSAC", "STL02337", "13C3-
PFBS", "61", "ng/L", "", "-99", "DL", "", "TRG", "77", "", "-99", "LOQ", "YES", "80.2", "", "289.9", "10.00", "1700", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid
(PFOS)", "330", "ng/L", "E", "0.95", "DL", "", "TRG", "", "", "3.4", "LOQ", "NO", "-99", "", "289.9", "10.00", "2.6", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "2058-94-8", "Perfluoroundecanoic acid
(PFUnA)", "1.3", "ng/L", "U", "0.62", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "1.3", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "2706-90-3", "Perfluoropentanoic acid
(PFPeA)", "200", "ng/L", "", "0.37", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "0.86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "307-24-4", "Perfluorohexanoic acid
(PFHxA)", "350", "ng/L", "E", "0.41", "DL", "", "TRG", "", "", "1.7", "LOQ", "NO", "-99", "", "289.9", "10.00", "0.86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "307-55-1", "Perfluorododecanoic acid
(PFDoA)", "1.3", "ng/L", "U", "0.45", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "1.3", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "1300", "ng/L", "E M", "0.47", "DL", "", "TRG", "", "", "1.7", "LOQ", "NO", "-99", "", "289.9", "10.00", "1.3", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "335-76-2", "Perfluorodecanoic acid
(PFDA)", "0.78", "ng/L", "J", "0.41", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "0.86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid
(PFDS)", "1.3", "ng/L", "U", "0.48", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "1.3", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid
(PFHxS)", "370", "ng/L", "E M", "0.33", "DL", "", "TRG", "", "", "1.7", "LOQ", "NO", "-99", "", "289.9", "10.00", "0.86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "375-22-4", "Perfluorobutanoic acid
(PFBA)", "68", "ng/L", "M", "0.51", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "1.3", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "50", "ng/L", "", "0.40", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "0.86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid
(PFHpA)", "62", "ng/L", "M", "0.53", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "1.3", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid
(PFHpS)", "7.2", "ng/L", "", "0.32", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "0.86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "375-95-1", "Perfluorononanoic acid
(PFNA)", "2.4", "ng/L", "", "0.45", "DL", "", "TRG", "", "", "1.7", "LOQ", "YES", "-99", "", "289.9", "10.00", "1.3", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid
(PFTeA)", "2.6", "ng/L", "U", "0.72", "DL", "", "TRG", "", "", "3.4", "LOQ", "YES", "-99", "", "289.9", "10.00", "2.6", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid
(PFTriA)", "2.6", "ng/L", "U", "0.66", "DL", "", "TRG", "", "", "3.4", "LOQ", "YES", "-99", "", "289.9", "10.00", "2.6", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide
(FOSA)", "2.6", "ng/L", "U", "1.1", "DL", "", "TRG", "", "", "3.4", "LOQ", "YES", "-99", "", "289.9", "10.00", "2.6", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "STL00990", "13C4
PFOA", "77", "ng/L", "", "-99", "DL", "", "TRG", "90", "", "-99", "LOQ", "YES", "86.2", "", "289.9", "10.00", "86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "STL00991", "13C4
PFOS", "81", "ng/L", "", "-99", "DL", "", "TRG", "98", "", "-99", "LOQ", "YES", "82.4", "", "289.9", "10.00", "86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "STL00992", "13C4
PFBA", "90", "ng/L", "", "-99", "DL", "", "TRG", "104", "", "-99", "LOQ", "YES", "86.2", "", "289.9", "10.00", "86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "STL00993", "13C2
PFHxA", "85", "ng/L", "", "-99", "DL", "", "TRG", "98", "", "-99", "LOQ", "YES", "86.2", "", "289.9", "10.00", "86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "STL00994", "18O2
PFHxS", "76", "ng/L", "", "-99", "DL", "", "TRG", "93", "", "-99", "LOQ", "YES", "81.6", "", "289.9", "10.00", "86", ""
"TP-PFC-032-TPI", "EPA 537 (Mod)", "RES", "320-41704-1", "TALSAC", "STL00995", "13C5

PFNA","86","ng/L","",-99","DL","","TRG","99","","-99","LOQ","YES","86.2","","289.9","10.00","86",""
"TP-PFC-032-TPI","EPA 537 (Mod)","RES","320-41704-1","TALSAC","STL00996","13C2
PFDA","89","ng/L","",-99","DL","","TRG","103","","-99","LOQ","YES","86.2","","289.9","10.00","86",""
"TP-PFC-032-TPI","EPA 537 (Mod)","RES","320-41704-1","TALSAC","STL00997","13C2
PFUnA","96","ng/L","",-99","DL","","TRG","111","","-99","LOQ","YES","86.2","","289.9","10.00","86",""
"TP-PFC-032-TPI","EPA 537 (Mod)","RES","320-41704-1","TALSAC","STL00998","13C2
PFDaA","97","ng/L","",-99","DL","","TRG","112","","-99","LOQ","YES","86.2","","289.9","10.00","86",""
"TP-PFC-032-TPI","EPA 537 (Mod)","RES","320-41704-1","TALSAC","STL01056","13C8
FOSA","88","ng/L","",-99","DL","","TRG","102","","-99","LOQ","YES","86.2","","289.9","10.00","86",""
"TP-PFC-032-TPI","EPA 537 (Mod)","RES","320-41704-1","TALSAC","STL01892","13C4-
PFHpA","88","ng/L","",-99","DL","","TRG","102","","-99","LOQ","YES","86.2","","289.9","10.00","86",""
"TP-PFC-032-TPI","EPA 537 (Mod)","RES","320-41704-1","TALSAC","STL01893","13C5
PFPeA","90","ng/L","",-99","DL","","TRG","104","","-99","LOQ","YES","86.2","","289.9","10.00","86",""
"TP-PFC-032-TPI","EPA 537 (Mod)","RES","320-41704-1","TALSAC","STL02116","13C2-
PFTeDA","97","ng/L","",-99","DL","","TRG","113","","-99","LOQ","YES","86.2","","289.9","10.00","86",""
"TP-PFC-032-TPI","EPA 537 (Mod)","RES","320-41704-1","TALSAC","STL02337","13C3-
PFBS","82","ng/L","",-99","DL","","TRG","102","","-99","LOQ","YES","80.2","","289.9","10.00","86",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","2.6","ng/L","U","0.95","DL","","TRG","","","3.5","LOQ","YES","-99","","289.8","10.00","2.6",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","2058-94-
8","Perfluoroundecanoic acid
(PFUnA)","1.3","ng/L","U","0.62","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","1.3",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","280","ng/L","","0.37","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","0.86",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","230","ng/L","","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","0.86",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDaA)","1.3","ng/L","U","0.45","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","1.3",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","38","ng/L","M","0.47","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","1.3",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","0.86","ng/L","U","0.41","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","0.86",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","1.3","ng/L","U","0.48","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","1.3",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","2.7","ng/L","M","0.33","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","0.86",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","110","ng/L","","0.51","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","1.3",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","9.3","ng/L","","0.40","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","0.86",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","5.6","ng/L","","0.53","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","1.3",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.86","ng/L","U","0.32","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","0.86",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","1.3","ng/L","U","0.45","DL","","TRG","","","1.7","LOQ","YES","-99","","289.8","10.00","1.3",""
"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","2.6","ng/L","U","0.72","DL","","TRG","","","3.5","LOQ","YES","-99","","289.8","10.00","2.6",""

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.6","ng/L","U","0.66","DL","","TRG","","","3.5","LOQ","YES","-99","","289.8","10.00","2.6","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.6","ng/L","U","1.1","DL","","TRG","","","3.5","LOQ","YES","-99","","289.8","10.00","2.6","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00990","13C4 PFOA","80","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00991","13C4 PFOS","70","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","82.5","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00992","13C4 PFBA","81","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00993","13C2 PFHxA","74","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00994","18O2 PFHxS","68","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","81.6","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00995","13C5 PFNA","72","ng/L","","-99","DL","","TRG","83","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00996","13C2 PFDA","74","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00997","13C2 PFUnA","76","ng/L","","-99","DL","","TRG","88","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL00998","13C2 PFDoA","74","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL01056","13C8 FOA","73","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL01892","13C4-PFHpA","75","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL01893","13C5 PFPeA","74","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL02116","13C2-PFTeDA","74","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","86.3","","289.8","10.00","86","","

"TP-PFC-032-MID CARBON","EPA 537 (Mod)","RES","320-41704-2","TALSAC","STL02337","13C3-PFBS","67","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","80.2","","289.8","10.00","86","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.7","ng/L","U","0.98","DL","","TRG","","","3.6","LOQ","YES","-99","","281.3","10.00","2.7","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.3","ng/L","U","0.64","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","1.3","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","240","ng/L","","0.38","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","0.89","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","130","ng/L","","0.42","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","0.89","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","1.3","ng/L","U","0.46","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","1.3","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","5.6","ng/L","M","0.48","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","1.3","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","0.89","ng/L","U","0.43","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","0.89","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.3","ng/L","U","0.50","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","1.3","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","0.58","ng/L","J M","0.34","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","0.89","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","120","ng/L","","0.52","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","1.3","","

"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","3.3","ng/L","","0.41","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","0.89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.2","ng/L","J","0.54","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","1.3",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","0.89","ng/L","U","0.33","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","0.89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.3","ng/L","U","0.46","DL","","TRG","","","1.8","LOQ","YES","-99","","281.3","10.00","1.3",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","2.7","ng/L","U","0.74","DL","","TRG","","","3.6","LOQ","YES","-99","","281.3","10.00","2.7",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.7","ng/L","U","0.68","DL","","TRG","","","3.6","LOQ","YES","-99","","281.3","10.00","2.7",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.7","ng/L","U","1.2","DL","","TRG","","","3.6","LOQ","YES","-99","","281.3","10.00","2.7",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00990","13C4 PFOA","83","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00991","13C4 PFOS","74","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","85.0","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00992","13C4 PFBA","83","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00993","13C2 PFHxA","76","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00994","18O2 PFHxS","71","ng/L","","-99","DL","","TRG","84","","-99","LOQ","YES","84.1","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00995","13C5 PFNA","75","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00996","13C2 PFDA","77","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00997","13C2 PFUnA","84","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL00998","13C2 PFDaA","76","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL01056","13C8 FOSA","77","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL01892","13C4-PFHpA","75","ng/L","","-99","DL","","TRG","85","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL01893","13C5 PFPeA","76","ng/L","","-99","DL","","TRG","86","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL02116","13C2-PFTeDA","85","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","88.9","","281.3","10.00","89",""
"TP-PFC-032-TPE","EPA 537 (Mod)","RES","320-41704-3","TALSAC","STL02337","13C3-PFBS","67","ng/L","","-99","DL","","TRG","81","","-99","LOQ","YES","82.7","","281.3","10.00","89",""
"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.6","ng/L","U","0.97","DL","","TRG","","","3.5","LOQ","YES","-99","","283.3","10.00","2.6",""
"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.3","ng/L","U","0.64","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","1.3",""
"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","250","ng/L","","0.38","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","0.88",""
"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","140","ng/L","","0.41","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","0.88",""
"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","307-55-1","Perfluorododecanoic acid (PFDaA)","1.3","ng/L","U","0.46","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","1.3",""
"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","5.8","ng/L","M","0.48","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","1.3",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","0.88","ng/L","U","0.42","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","0.88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.3","ng/L","U","0.49","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","1.3",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","0.59","ng/L","J M","0.34","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","0.88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","120","ng/L","","","0.52","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","1.3",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","3.1","ng/L","","","0.41","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","0.88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.4","ng/L","J","0.54","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","1.3",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","0.88","ng/L","U","0.33","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","0.88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.3","ng/L","U","0.46","DL","","TRG","","","1.8","LOQ","YES","-99","","283.3","10.00","1.3",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","2.6","ng/L","U","0.73","DL","","TRG","","","3.5","LOQ","YES","-99","","283.3","10.00","2.6",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","2.6","ng/L","U","0.67","DL","","TRG","","","3.5","LOQ","YES","-99","","283.3","10.00","2.6",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","2.6","ng/L","U","1.1","DL","","TRG","","","3.5","LOQ","YES","-99","","283.3","10.00","2.6",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00990","13C4 PFOA","79","ng/L","","","-99","DL","","TRG","89","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00991","13C4 PFOS","69","ng/L","","","-99","DL","","TRG","81","","","-99","LOQ","YES","84.4","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00992","13C4 PFBA","80","ng/L","","","-99","DL","","TRG","90","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00993","13C2 PFHxA","71","ng/L","","","-99","DL","","TRG","81","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00994","18O2 PFHxS","66","ng/L","","","-99","DL","","TRG","80","","","-99","LOQ","YES","83.5","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00995","13C5 PFNA","71","ng/L","","","-99","DL","","TRG","80","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00996","13C2 PFDA","74","ng/L","","","-99","DL","","TRG","84","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00997","13C2 PFUnA","75","ng/L","","","-99","DL","","TRG","85","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL00998","13C2 PFDaA","78","ng/L","","","-99","DL","","TRG","88","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL01056","13C8 FOSA","73","ng/L","","","-99","DL","","TRG","83","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL01892","13C4-PFHpA","72","ng/L","","","-99","DL","","TRG","82","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL01893","13C5 PFPeA","72","ng/L","","","-99","DL","","TRG","81","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL02116","13C2-PFTeDA","76","ng/L","","","-99","DL","","TRG","87","","","-99","LOQ","YES","88.2","","283.3","10.00","88",""

"TP-PFC-032-TPE-D","EPA 537 (Mod)","RES","320-41704-4","TALSAC","STL02337","13C3-PFBS","68","ng/L","","","-99","DL","","TRG","83","","","-99","LOQ","YES","82.1","","283.3","10.00","88",""

"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","36.6","ng/L","","","1.1","DL","","SPK","99","","","4.0","LOQ","YES","37.1","","250","10.00","3.0",""

"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","2058-94-

8", "Perfluoroundecanoic acid (PFUnA)", "32.3", "ng/L", "", "0.72", "DL", "", "SPK", "81", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.5", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "2706-90-3", "Perfluoropentanoic acid (PFPeA)", "38.6", "ng/L", "", "0.43", "DL", "", "SPK", "97", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "307-24-4", "Perfluorohexanoic acid (PFHxA)", "38.7", "ng/L", "", "0.47", "DL", "", "SPK", "97", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "307-55-1", "Perfluorododecanoic acid (PFDoA)", "39.0", "ng/L", "", "0.52", "DL", "", "SPK", "98", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.5", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "39.4", "ng/L", "", "0.54", "DL", "", "SPK", "98", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.5", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "335-76-2", "Perfluorodecanoic acid (PFDA)", "40.4", "ng/L", "", "0.48", "DL", "", "SPK", "101", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "335-77-3", "Perfluorodecanesulfonic acid (PFDS)", "39.1", "ng/L", "", "0.56", "DL", "", "SPK", "101", "", "2.0", "LOQ", "YES", "38.6", "", "250", "10.00", "1.5", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "33.7", "ng/L", "M", "0.38", "DL", "", "SPK", "92", "", "2.0", "LOQ", "YES", "36.4", "", "250", "10.00", "1.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "375-22-4", "Perfluorobutanoic acid (PFBA)", "38.9", "ng/L", "", "0.59", "DL", "", "SPK", "97", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.5", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "37.2", "ng/L", "", "0.46", "DL", "", "SPK", "105", "", "2.0", "LOQ", "YES", "35.4", "", "250", "10.00", "1.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "39.7", "ng/L", "", "0.61", "DL", "", "SPK", "99", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.5", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "375-92-8", "Perfluoroheptanesulfonic Acid (PFHpS)", "38.9", "ng/L", "", "0.37", "DL", "", "SPK", "102", "", "2.0", "LOQ", "YES", "38.1", "", "250", "10.00", "1.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "40.9", "ng/L", "", "0.52", "DL", "", "SPK", "102", "", "2.0", "LOQ", "YES", "40.0", "", "250", "10.00", "1.5", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "376-06-7", "Perfluorotetradecanoic acid (PFTeA)", "38.9", "ng/L", "", "0.83", "DL", "", "SPK", "97", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10.00", "3.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "72629-94-8", "Perfluorotridecanoic Acid (PFTriA)", "39.5", "ng/L", "", "0.76", "DL", "", "SPK", "99", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10.00", "3.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "754-91-6", "Perfluorooctane Sulfonamide (FOSA)", "39.0", "ng/L", "", "1.3", "DL", "", "SPK", "98", "", "4.0", "LOQ", "YES", "40.0", "", "250", "10.00", "3.0", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "STL00990", "13C4 PFOA", "88.4", "ng/L", "", "-99", "DL", "", "SPK", "88", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "100", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "STL00991", "13C4 PFOS", "81.8", "ng/L", "", "-99", "DL", "", "SPK", "86", "", "-99", "LOQ", "YES", "95.6", "", "250", "10.00", "100", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "STL00992", "13C4 PFBA", "90.7", "ng/L", "", "-99", "DL", "", "SPK", "91", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "100", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "STL00993", "13C2 PFHxA", "83.0", "ng/L", "", "-99", "DL", "", "SPK", "83", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "100", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "STL00994", "18O2 PFHxS", "78.3", "ng/L", "", "-99", "DL", "", "SPK", "83", "", "-99", "LOQ", "YES", "94.6", "", "250", "10.00", "100", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "STL00995", "13C5 PFNA", "83.1", "ng/L", "", "-99", "DL", "", "SPK", "83", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "100", ""
 "LCS 320-238978/2-A", "EPA 537 (Mod)", "RES", "LCS 320-238978/2-A", "TALSAC", "STL00996", "13C2 PFDA", "82.7", "ng/L", "", "-99", "DL", "", "SPK", "83", "", "-99", "LOQ", "YES", "100", "", "250", "10.00", "100", ""

"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","STL00997","13C2
PFUnA","90.2","ng/L","",-99","DL","","SPK","90","",-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","STL00998","13C2
PFDaA","84.6","ng/L","",-99","DL","","SPK","85","",-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","STL01056","13C8
FOSA","81.2","ng/L","",-99","DL","","SPK","81","",-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","STL01892","13C4-
PFHpA","82.8","ng/L","",-99","DL","","SPK","83","",-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","STL01893","13C5
PFPeA","85.7","ng/L","",-99","DL","","SPK","86","",-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","STL02116","13C2-
PFTeDA","87.4","ng/L","",-99","DL","","SPK","87","",-99","LOQ","YES","100","","250","10.00","100",""
"LCS 320-238978/2-A","EPA 537 (Mod)","RES","LCS 320-238978/2-A","TALSAC","STL02337","13C3-
PFBS","75.1","ng/L","",-99","DL","","SPK","81","",-99","LOQ","YES","93.0","","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","38.2","ng/L","","1.1","DL","","SPK","103","4","4.0","LOQ","YES","37.1","LCS 320-238978/2-
A","250","10.00","3.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","2058-94-
8","Perfluoroundecanoic acid
(PFUnA)","31.3","ng/L","","0.72","DL","","SPK","78","3","2.0","LOQ","YES","40.0","LCS 320-238978/2-
A","250","10.00","1.5",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","2706-90-
3","Perfluoropentanoic acid
(PFPeA)","38.4","ng/L","","0.43","DL","","SPK","96","1","2.0","LOQ","YES","40.0","LCS 320-238978/2-
A","250","10.00","1.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","307-24-
4","Perfluorohexanoic acid
(PFHxA)","38.8","ng/L","","0.47","DL","","SPK","97","0","2.0","LOQ","YES","40.0","LCS 320-238978/2-
A","250","10.00","1.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","307-55-
1","Perfluorododecanoic acid
(PFDaA)","38.0","ng/L","","0.52","DL","","SPK","95","3","2.0","LOQ","YES","40.0","LCS 320-238978/2-
A","250","10.00","1.5",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","335-67-
1","Perfluorooctanoic acid (PFOA)","39.0","ng/L","","0.54","DL","","SPK","97","1","2.0","LOQ","YES","40.0","LCS
320-238978/2-A","250","10.00","1.5",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","335-76-
2","Perfluorodecanoic acid
(PFDA)","39.9","ng/L","","0.48","DL","","SPK","100","1","2.0","LOQ","YES","40.0","LCS 320-238978/2-
A","250","10.00","1.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","39.8","ng/L","","0.56","DL","","SPK","103","2","2.0","LOQ","YES","38.6","LCS 320-238978/2-
A","250","10.00","1.5",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","33.8","ng/L","M","0.38","DL","","SPK","93","0","2.0","LOQ","YES","36.4","LCS 320-238978/2-
A","250","10.00","1.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","375-22-
4","Perfluorobutanoic acid (PFBA)","38.6","ng/L","","0.59","DL","","SPK","96","1","2.0","LOQ","YES","40.0","LCS
320-238978/2-A","250","10.00","1.5",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","375-73-
5","Perfluorobutanesulfonic acid

(PFBS)","34.3","ng/L","","0.46","DL","","SPK","97","8","2.0","LOQ","YES","35.4","LCS 320-238978/2-A","250","10.00","1.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","39.3","ng/L","","0.61","DL","","SPK","98","1","2.0","LOQ","YES","40.0","LCS 320-238978/2-A","250","10.00","1.5",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","40.0","ng/L","","0.37","DL","","SPK","105","3","2.0","LOQ","YES","38.1","LCS 320-238978/2-A","250","10.00","1.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","40.5","ng/L","","0.52","DL","","SPK","101","1","2.0","LOQ","YES","40.0","LCS 320-238978/2-A","250","10.00","1.5",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","39.5","ng/L","","0.83","DL","","SPK","99","1","4.0","LOQ","YES","40.0","LCS 320-238978/2-A","250","10.00","3.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","38.8","ng/L","","0.76","DL","","SPK","97","2","4.0","LOQ","YES","40.0","LCS 320-238978/2-A","250","10.00","3.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","40.2","ng/L","","1.3","DL","","SPK","101","3","4.0","LOQ","YES","40.0","LCS 320-238978/2-A","250","10.00","3.0",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00990","13C4 PFOA","88.4","ng/L","","-99","DL","","SPK","88","","-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00991","13C4 PFOS","79.3","ng/L","","-99","DL","","SPK","83","","-99","LOQ","YES","95.6","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00992","13C4 PFBA","93.6","ng/L","","-99","DL","","SPK","94","","-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00993","13C2 PFHxA","85.6","ng/L","","-99","DL","","SPK","86","","-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00994","18O2 PFHxS","78.1","ng/L","","-99","DL","","SPK","83","","-99","LOQ","YES","94.6","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00995","13C5 PFNA","82.6","ng/L","","-99","DL","","SPK","83","","-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00996","13C2 PFDA","84.8","ng/L","","-99","DL","","SPK","85","","-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00997","13C2 PFUnA","87.3","ng/L","","-99","DL","","SPK","87","","-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL00998","13C2 PFDaA","89.7","ng/L","","-99","DL","","SPK","90","","-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL01056","13C8 FOSA","81.3","ng/L","","-99","DL","","SPK","81","","-99","LOQ","YES","100","LCS 320-238978/2-

A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL01892","13C4-PFHpA","82.2","ng/L","",-99","DL","","SPK","82","",-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL01893","13C5-PFPeA","87.2","ng/L","",-99","DL","","SPK","87","",-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL02116","13C2-PFTeDA","87.2","ng/L","",-99","DL","","SPK","87","",-99","LOQ","YES","100","LCS 320-238978/2-A","250","10.00","100",""
"LCSD 320-238978/3-A","EPA 537 (Mod)","RES","LCSD 320-238978/3-A","TALSAC","STL02337","13C3-PFBS","80.4","ng/L","",-99","DL","","SPK","86","",-99","LOQ","YES","93.0","LCS 320-238978/2-A","250","10.00","100",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","3.0","ng/L","U","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.00","3.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","1.5","ng/L","U M","0.72","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","1.0","ng/L","U","0.43","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","1.0","ng/L","U","0.47","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","1.5","ng/L","U","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1.5","ng/L","U","0.54","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","1.0","ng/L","U","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.5","ng/L","U","0.56","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","1.0","ng/L","U","0.38","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","0.748","ng/L","J M","0.59","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","1.0","ng/L","U","0.46","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.5","ng/L","U","0.61","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","1.0","ng/L","U","0.37","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.5","ng/L","U","0.52","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.00","1.5",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","3.0","ng/L","U","0.83","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.00","3.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","3.0","ng/L","U","0.76","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.00","3.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","754-91-6","Perfluorooctane

Sulfonamide (FOSA),"3.0","ng/L","U","1.3","DL","","","TRG","","","4.0","LOQ","YES",-99","","250","10.00","3.0",""
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00990","13C4
PFOA","93.5","ng/L","","-99","DL","","","TRG","94","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00991","13C4
PFOS","86.3","ng/L","","-99","DL","","","TRG","90","","-99","LOQ","YES","95.6","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00992","13C4
PFBA","94.0","ng/L","","-99","DL","","","TRG","94","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00993","13C2
PFHxA","85.0","ng/L","","-99","DL","","","TRG","85","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00994","18O2
PFHxS","80.3","ng/L","","-99","DL","","","TRG","85","","-99","LOQ","YES","94.6","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00995","13C5
PFNA","91.7","ng/L","","-99","DL","","","TRG","92","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00996","13C2
PFDA","89.3","ng/L","","-99","DL","","","TRG","89","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00997","13C2
PFUnA","88.5","ng/L","","-99","DL","","","TRG","89","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL00998","13C2
PFDaA","86.0","ng/L","","-99","DL","","","TRG","86","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL01056","13C8
FOSA","84.5","ng/L","","-99","DL","","","TRG","85","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL01892","13C4-
PFHpA","87.6","ng/L","","-99","DL","","","TRG","88","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL01893","13C5
PFPeA","90.8","ng/L","","-99","DL","","","TRG","91","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL02116","13C2-
PFTeDA","101","ng/L","","-99","DL","","","TRG","101","","-99","LOQ","YES","100","","250","10.00","100","","
"MB 320-238978/1-A","EPA 537 (Mod)","RES","MB 320-238978/1-A","TALSAC","STL02337","13C3-
PFBS","78.0","ng/L","","-99","DL","","","TRG","84","","-99","LOQ","YES","93.0","","250","10.00","100","","
"Unknown","Unknown","TP-PFC-032-TPI","08/01/2018 10:05","WASTE","320-41704-1","NM","","","3.20","EPA 537
(Mod)","3535","RES","08/09/2018 10:23","08/10/2018
08:47","TALSAC","COA","WET","NA","1","NA","NA","","-99","320-238978","320-238978","NA","320-
239237","320-41704-1","08/02/2018 09:45","08/02/2018 15:40","","
"Unknown","Unknown","TP-PFC-032-TPI","08/01/2018 10:05","WASTE","320-41704-1","NM","","","3.20","EPA 537
(Mod)","3535","DL","08/09/2018 10:23","08/10/2018
20:12","TALSAC","COA","WET","NA","20","NA","NA","","-99","320-238978","320-238978","NA","320-
239343","320-41704-1","08/02/2018 09:45","08/02/2018 15:40","","
"Unknown","Unknown","TP-PFC-032-MID CARBON","08/01/2018 10:10","WASTE","320-41704-
2","NM","","","3.20","EPA 537 (Mod)","3535","RES","08/09/2018 10:23","08/10/2018
08:55","TALSAC","COA","WET","NA","1","NA","NA","","-99","320-238978","320-238978","NA","320-
239237","320-41704-1","08/02/2018 09:45","08/02/2018 15:40","","
"Unknown","Unknown","TP-PFC-032-TPE","08/01/2018 10:15","WASTE","320-41704-3","NM","","","3.20","EPA 537
(Mod)","3535","RES","08/09/2018 10:23","08/10/2018
09:03","TALSAC","COA","WET","NA","1","NA","NA","","-99","320-238978","320-238978","NA","320-
239237","320-41704-1","08/02/2018 09:45","08/02/2018 15:40","","
"Unknown","Unknown","TP-PFC-032-TPE-D","08/01/2018 00:00","WASTE","320-41704-4","NM","","","3.20","EPA
537 (Mod)","3535","RES","08/09/2018 10:23","08/10/2018
09:10","TALSAC","COA","WET","NA","1","NA","NA","","-99","320-238978","320-238978","NA","320-
239237","320-41704-1","08/02/2018 09:45","08/02/2018 15:40","","
"Unknown","Unknown","LCS 320-238978/2-A","","AQ","LCS 320-238978/2-A","LCS","","-99","EPA 537
(Mod)","3535","RES","08/09/2018 10:23","08/10/2018
08:31","TALSAC","COA","WET","NA","1","NA","NA","","100","320-238978","320-238978","NA","320-
239237","320-41704-1","08/09/2018 10:23","08/02/2018 15:40","","
"Unknown","Unknown","LCSD 320-238978/3-A","","AQ","LCSD 320-238978/3-A","LCSD","","-99","EPA 537

(Mod)","3535","RES","08/09/2018 10:23","08/10/2018
08:39","TALSAC","COA","WET","NA","1","NA","NA","","100","320-238978","320-238978","NA","320-
239237","320-41704-1","08/09/2018 10:23","08/02/2018 15:40",""
"Unknown","Unknown","MB 320-238978/1-A","","AQ","MB 320-238978/1-A","MB","","-99","EPA 537
(Mod)","3535","RES","08/09/2018 10:23","08/10/2018
08:23","TALSAC","COA","WET","NA","1","NA","NA","","100","320-238978","320-238978","NA","320-
239237","320-41704-1","08/09/2018 10:23","08/02/2018 15:40",""



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 these SDGs. The text of this report has been formulated to address only those areas affecting data quality.

PFAS

The following compounds were detected in the laboratory method and/or Initial/Continuing Calibration Blanks (ICB/CCBs) at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level Limit of Quantitation (LOQ) > or <</u>
Perfluorobutanoic acid (PFBA) ⁽¹⁾	0.748 ng/L	< LOQ
Perfluorotetradecanoic acid (PFTeA) ⁽²⁾	0.00768 ng/ml	< LOQ
Perfluorohexanesulfonic acid (PFHxS) ⁽²⁾	0.00729 ng/ml	< LOQ

⁽¹⁾ – Maximum concentration detected in the laboratory method blank, MB 320-238978/1-A, affecting all samples.

⁽²⁾ – Maximum concentration detected in the ICB and/or CCBs affecting all samples.

The detected results reported for PFHxS reported below the Limit of Detection (LOD) were raised to LOD and qualified as non-detected, (U).

NOTES

The injected internal standard compound, 13C2-perfluorooctanoic acid (13C2-PFOA), had an area below the 50% quality control limit in the diluted analysis of sample TP-PFC-032-TPI. No action was taken because the sample was diluted twenty times and the internal standard area response varied because of the dilution.

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentrations of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)), PFHxS, perfluorohexanoic acid (PFHxA), and perfluorooctanesulfonic acid (PFOS) exceeded the instrument calibration range in sample TP-PFC-032-TPI. The sample was reanalyzed at a 20X dilution. The results for these compounds from the dilution were used in the data validation.

Detected results reported below the LOQ but above the Detection Limit (DL) were qualified as estimated, (J). Non-detected results are reported to LOD.

EXECUTIVE SUMMARY

Laboratory Performance: Contaminants were detected in the laboratory method blank, ICB, and CCBs. The injected internal standard area was low in the diluted sample.

Other Factors Affecting Data Quality: One sample was further diluted. Detected results below the LOQ were estimated.

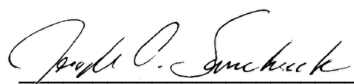
TO: J. ORIENT
SDGs: 320-41704-1

PAGE 3

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.
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

APPENDIX A

QUALIFIED ANALYTICAL 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 ($< 2 \times \text{IDL}$ for inorganics and $< \text{CRQL}$ 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 SDG: 320-41704-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	TP-PFC-032-MID CARBON			TP-PFC-032-TPE			TP-PFC-032-TPE-D			TP-PFC-032-TPI		
	LAB_ID	320-41704-2			320-41704-3			320-41704-4			320-41704-1		
	SAMP_DATE	8/1/2018			8/1/2018			8/1/2018			8/1/2018		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							TP-PFC-032-TPE					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADEC AFLUOROOCTANOIC ACID (PFOA)		38			38			5.8					
PERFLUOROBUTANESULFONIC ACID (PFBS)		9.3			9.3			3.1			50		
PERFLUOROBUTANOIC ACID (PFBA)		110			110			120			68		
PERFLUORODECANESULFONIC ACID (PFDS)		1.3	U		1.3	U		1.3	U		1.3	U	
PERFLUORODECANOIC ACID (PFDA)		0.86	U		0.86	U		0.88	U		0.78	J	P
PERFLUORODODECANOIC ACID (PFDOA)		1.3	U		1.3	U		1.3	U		1.3	U	
PERFLUOROHEPTANESULFONIC ACID		0.86	U		0.86	U		0.88	U		7.2		
PERFLUOROHEPTANOIC ACID (PFHPA)		5.6			5.6			1.4	J	P	62		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		2.7			2.7			0.88	U	A			
PERFLUOROHEXANOIC ACID (PFHXA)		230			230			140					
PERFLUORONONANOIC ACID (PFNA)		1.3	U		1.3	U		1.3	U		2.4		
PERFLUOROOCTANE SULFONAMIDE (FOSA)		2.6	U		2.6	U		2.6	U		2.6	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		2.6	U		2.6	U		2.6	U				
PERFLUOROPENTANOIC ACID (PFPEA)		280			280			250			200		
PERFLUOROTETRADECANOIC ACID (PFTEA)		2.6	U		2.6	U		2.6	U		2.6	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		2.6	U		2.6	U		2.6	U		2.6	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		1.3	U		1.3	U		1.3	U		1.3	U	

PROJ_NO: 08005-WE21 SDG: 320-41704-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	TP-PFC-032-TPI-DL		
	LAB_ID	320-41704-1		
	SAMP_DATE	8/1/2018		
	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID (PFOA)		1800		
PERFLUOROBUTANESULFONIC ACID (PFBS)				
PERFLUOROBUTANOIC ACID (PFBA)				
PERFLUORODECANESULFONIC ACID (PFDS)				
PERFLUORODECANOIC ACID (PFDA)				
PERFLUORODODECANOIC ACID (PFDOA)				
PERFLUOROHEPTANESULFONIC ACID				
PERFLUOROHEPTANOIC ACID (PFHPA)				
PERFLUOROHEXANESULFONIC ACID (PFHXS)		390		
PERFLUOROHEXANOIC ACID (PFHXA)		330		
PERFLUORONONANOIC ACID (PFNA)				
PERFLUOROOCTANE SULFONAMIDE (FOSA)				
PERFLUOROOCTANESULFONIC ACID (PFOS)		320		
PERFLUOROPENTANOIC ACID (PFPEA)				
PERFLUOROTETRADECANOIC ACID (PFTEA)				
PERFLUOROTRIDECANOIC ACID (PFTRIA)				
PERFLUOROUNDECANOIC ACID (PFUNA)				

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPI</u>	Lab Sample ID: <u>320-41704-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_010.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.9 (mL)</u>	Date Analyzed: <u>08/10/2018 08:47</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	68	M	1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	200		1.7	0.86	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	350	E	1.7	0.86	0.41
375-85-9	Perfluoroheptanoic acid (PFHpA)	62	M	1.7	1.3	0.53
335-67-1	Perfluorooctanoic acid (PFOA)	1300	E M	1.7	1.3	0.47
375-95-1	Perfluorononanoic acid (PFNA)	2.4		1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.78	J	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.4	2.6	0.66
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.4	2.6	0.72
375-73-5	Perfluorobutanesulfonic acid (PFBS)	50		1.7	0.86	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	370	E M	1.7	0.86	0.33
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.2		1.7	0.86	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	330	E	3.4	2.6	0.95
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.4	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPI</u>	Lab Sample ID: <u>320-41704-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_010.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.9(mL)</u>	Date Analyzed: <u>08/10/2018 08:47</u>
Con. Extract Vol.: <u>10.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	102		50-150
STL00992	13C4 PFBA	104		50-150
STL01893	13C5 PFPeA	104		50-150
STL00993	13C2 PFHxA	98		50-150
STL01892	13C4-PFHpA	102		50-150
STL00990	13C4 PFOA	90		50-150
STL00995	13C5 PFNA	99		50-150
STL00996	13C2 PFDA	103		50-150
STL00997	13C2 PFUnA	111		50-150
STL00998	13C2 PFDoA	112		50-150
STL00994	18O2 PFHxS	93		50-150
STL02116	13C2-PFTeDA	113		50-150
STL00991	13C4 PFOS	98		50-150
STL02337	13C3-PFBS	102		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPI DL</u>	Lab Sample ID: <u>320-41704-1 DL</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLAAAX_080.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.9 (mL)</u>	Date Analyzed: <u>08/10/2018 20:12</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>20</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239343</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	69	D M	34	26	10
2706-90-3	Perfluoropentanoic acid (PFPeA)	200	D	34	17	7.4
307-24-4	Perfluorohexanoic acid (PFHxA)	330	D	34	17	8.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	67	D M	34	26	11
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D M	34	26	9.3
375-95-1	Perfluorononanoic acid (PFNA)	26	U	34	26	9.0
335-76-2	Perfluorodecanoic acid (PFDA)	17	U	34	17	8.3
2058-94-8	Perfluoroundecanoic acid (PFUnA)	26	U	34	26	12
307-55-1	Perfluorododecanoic acid (PFDoA)	26	U	34	26	9.0
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	52	U	69	52	13
376-06-7	Perfluorotetradecanoic acid (PFTeA)	52	U	69	52	14
375-73-5	Perfluorobutanesulfonic acid (PFBS)	54	D	34	17	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	390	D M	34	17	6.6
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	9.2	J D	34	17	6.4
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	320	D	69	52	19
335-77-3	Perfluorodecanesulfonic acid (PFDS)	26	U	34	26	9.7
754-91-6	Perfluorooctane Sulfonamide (FOSA)	52	U	69	52	22

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPI DL</u>	Lab Sample ID: <u>320-41704-1 DL</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLAAAX_080.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.9(mL)</u>	Date Analyzed: <u>08/10/2018 20:12</u>
Con. Extract Vol.: <u>10.00(mL)</u>	Dilution Factor: <u>20</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239343</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	79		50-150
STL00992	13C4 PFBA	85		50-150
STL01893	13C5 PFPeA	83		50-150
STL00993	13C2 PFHxA	85		50-150
STL01892	13C4-PFHpA	81		50-150
STL00990	13C4 PFOA	87		50-150
STL00995	13C5 PFNA	83		50-150
STL00996	13C2 PFDA	82		50-150
STL00997	13C2 PFUnA	89		50-150
STL00998	13C2 PFDoA	82		50-150
STL00994	18O2 PFHxS	78		50-150
STL02116	13C2-PFTeDA	85		50-150
STL00991	13C4 PFOS	80		50-150
STL02337	13C3-PFBS	77		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-MID CARBON</u>	Lab Sample ID: <u>320-41704-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_011.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:10</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.8 (mL)</u>	Date Analyzed: <u>08/10/2018 08:55</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	110		1.7	1.3	0.51
2706-90-3	Perfluoropentanoic acid (PFPeA)	280		1.7	0.86	0.37
307-24-4	Perfluorohexanoic acid (PFHxA)	230		1.7	0.86	0.41
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.6		1.7	1.3	0.53
335-67-1	Perfluorooctanoic acid (PFOA)	38	M	1.7	1.3	0.47
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.7	1.3	0.45
335-76-2	Perfluorodecanoic acid (PFDA)	0.86	U	1.7	0.86	0.41
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.7	1.3	0.62
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.7	1.3	0.45
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	2.6	0.66
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	2.6	0.72
375-73-5	Perfluorobutanesulfonic acid (PFBS)	9.3		1.7	0.86	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.7	M	1.7	0.86	0.33
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.86	U	1.7	0.86	0.32
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	0.95
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.7	1.3	0.48
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-MID CARBON</u>	Lab Sample ID: <u>320-41704-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_011.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:10</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>289.8 (mL)</u>	Date Analyzed: <u>08/10/2018 08:55</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	84		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	86		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	87		50-150
STL00990	13C4 PFOA	93		50-150
STL00995	13C5 PFNA	83		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	88		50-150
STL00998	13C2 PFDoA	86		50-150
STL00994	18O2 PFHxS	83		50-150
STL02116	13C2-PFTeDA	86		50-150
STL00991	13C4 PFOS	85		50-150
STL02337	13C3-PFBS	84		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPE</u>	Lab Sample ID: <u>320-41704-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_012.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:15</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>281.3 (mL)</u>	Date Analyzed: <u>08/10/2018 09:03</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		1.8	1.3	0.52
2706-90-3	Perfluoropentanoic acid (PFPeA)	240		1.8	0.89	0.38
307-24-4	Perfluorohexanoic acid (PFHxA)	130		1.8	0.89	0.42
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.2	J	1.8	1.3	0.54
335-67-1	Perfluorooctanoic acid (PFOA)	5.6	M	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.8	1.3	0.46
335-76-2	Perfluorodecanoic acid (PFDA)	0.89	U	1.8	0.89	0.43
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	1.3	0.64
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	1.3	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.7	U	3.6	2.7	0.68
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.7	U	3.6	2.7	0.74
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.3		1.8	0.89	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.58	J M	1.8	0.89	0.34
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.89	U	1.8	0.89	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.7	U	3.6	2.7	0.98
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	1.3	0.50
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.7	U	3.6	2.7	1.2

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPE</u>	Lab Sample ID: <u>320-41704-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_012.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 10:15</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>281.3 (mL)</u>	Date Analyzed: <u>08/10/2018 09:03</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	86		50-150
STL00992	13C4 PFBA	93		50-150
STL01893	13C5 PFPeA	86		50-150
STL00993	13C2 PFHxA	86		50-150
STL01892	13C4-PFHpA	85		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	85		50-150
STL00996	13C2 PFDA	86		50-150
STL00997	13C2 PFUnA	94		50-150
STL00998	13C2 PFDoA	85		50-150
STL00994	18O2 PFHxS	84		50-150
STL02116	13C2-PFTeDA	96		50-150
STL00991	13C4 PFOS	87		50-150
STL02337	13C3-PFBS	81		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPE-D</u>	Lab Sample ID: <u>320-41704-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_013.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 00:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>283.3 (mL)</u>	Date Analyzed: <u>08/10/2018 09:10</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	120		1.8	1.3	0.52
2706-90-3	Perfluoropentanoic acid (PFPeA)	250		1.8	0.88	0.38
307-24-4	Perfluorohexanoic acid (PFHxA)	140		1.8	0.88	0.41
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.4	J	1.8	1.3	0.54
335-67-1	Perfluorooctanoic acid (PFOA)	5.8	M	1.8	1.3	0.48
375-95-1	Perfluorononanoic acid (PFNA)	1.3	U	1.8	1.3	0.46
335-76-2	Perfluorodecanoic acid (PFDA)	0.88	U	1.8	0.88	0.42
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.3	U	1.8	1.3	0.64
307-55-1	Perfluorododecanoic acid (PFDoA)	1.3	U	1.8	1.3	0.46
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.6	U	3.5	2.6	0.67
376-06-7	Perfluorotetradecanoic acid (PFTeA)	2.6	U	3.5	2.6	0.73
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.1		1.8	0.88	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.59	J M	1.8	0.88	0.34
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.88	U	1.8	0.88	0.33
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.6	U	3.5	2.6	0.97
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.3	U	1.8	1.3	0.49
754-91-6	Perfluorooctane Sulfonamide (FOSA)	2.6	U	3.5	2.6	1.1

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: <u>TP-PFC-032-TPE-D</u>	Lab Sample ID: <u>320-41704-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_013.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: <u>08/01/2018 00:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>283.3 (mL)</u>	Date Analyzed: <u>08/10/2018 09:10</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	83		50-150
STL00992	13C4 PFBA	90		50-150
STL01893	13C5 PFPeA	81		50-150
STL00993	13C2 PFHxA	81		50-150
STL01892	13C4-PFHpA	82		50-150
STL00990	13C4 PFOA	89		50-150
STL00995	13C5 PFNA	80		50-150
STL00996	13C2 PFDA	84		50-150
STL00997	13C2 PFUnA	85		50-150
STL00998	13C2 PFDoA	88		50-150
STL00994	18O2 PFHxS	80		50-150
STL02116	13C2-PFTeDA	87		50-150
STL00991	13C4 PFOS	81		50-150
STL02337	13C3-PFBS	83		50-150

APPENDIX C

SUPPORT DOCUMENTATION

NAS BRUNSWICK
SDG 320-41704-1

SAMPLE IDENTIFICATION

TP-PFC-0321-MIDCARBON

COMPOUND

PENTADECAFLUOROOCTANOIC ACID (PFOA)

COMPOUND AREA	2097843
INTERNAL STANDARD AMOUNT (ng/ml)	2.5
DILUTION FACTOR	1
INTERNAL STANDARD AREA	4223430
AVERAGE RRF	1.1307
SAMPLE VOLUME (ml)	289.8
VOLUME EXTRACT (ml)	10
ml to L	1000
CONCENTRATION =	37.90 ng/L

$2097843 \times 2.5\text{ng/ml} \times 1000\text{ml} \times 10\text{ml} \times 1/(4223430 \times 1.1307 \times 289.8\text{ml} \times 1\text{L})$

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\2018.08.10LLA_011.d
 Lims ID: 320-41704-A-2-A
 Client ID: TP-PFC-032-MID CARBON
 Sample Type: Client
 Inject. Date: 10-Aug-2018 08:55:14 ALS Bottle#: 5 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-41704-a-2-a
 Misc. Info.: Plate: 1 Rack: 4
 Operator ID: \SACINSTLCMS01@tai.com Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20180810-62502.b\A8_N.m
 Limit Group: LC PFC_QSM5-1 ICAL
 Last Update: 13-Aug-2018 08:26:34 Calib Date: 06-Aug-2018 11:56:59
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180806-62198.b\2018.08.06LLICAL_008.d
 Column 1 : Det: EXP1
 Process Host: XAWRK048

First Level Reviewer: hannigana

Date: 13-Aug-2018 08:26:34

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	1.406	1.411	-0.005	0.537	6056810	2.36		94.4	10248	
2 Perfluorobutyric acid										
212.90 > 169.00	1.406	1.413	-0.007	1.000	7461083	3.28			686	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.662	-0.008	0.631	3786861	2.14		85.7	8334	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.662	1.668	-0.006	1.005	14017838	8.13			1127	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.700	-0.006	1.000	699039	0.2685			49.3	
298.90 > 99.00	1.694	1.700	-0.006	1.000	314707		2.22(1.25-3.74)		55.1	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.702	-0.008	0.647	79682	1.95		83.8	512	
D 7 13C2 PFHxA										
315.00 > 270.00	1.944	1.943	0.001	0.742	4291427	2.14		85.6	14438	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.933	1.949	-0.016	0.995	11475611	6.55			3098	R
313.00 > 119.00	1.944	1.949	-0.005	1.000	727865		15.77(5.03-15.10)		1958	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.265	0.001	0.865	4289876	2.17		86.9	12824	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.269	-0.003	1.000	293635	0.1612			21.2	
363.00 > 169.00	2.266	2.269	-0.003	1.000	103330		2.84(1.13-3.40)		30.1	
D 11 18O2 PFHxS										
403.00 > 84.00	2.277	2.276	0.001	0.869	4960834	1.96		82.8	9600	
8 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.277	2.280	-0.003	1.000	180825	0.0795			191	M
399.00 > 99.00	2.277	2.280	-0.003	1.000	58462		3.09(1.50-4.49)		55.3	M

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	2.620	2.619	0.001	1.000	4223430	2.33		93.2	8567	
* 62 13C2-PFOA										
415.00 > 370.00	2.620	2.622	-0.002		4635340	2.50			9862	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.620	2.622	-0.002	1.000	2097843	1.10			116	M
413.00 > 169.00	2.524	2.622	-0.098	0.964	1466598		1.43(0.84-2.52)		1164	M
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.142	3374062	2.03		84.9	4243	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.142	3384914	2.08		83.3	11242	
D 21 13C8 FOSA										
506.00 > 78.00	3.327	3.326	0.001	1.270	4637981	2.10		84.2	8361	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.334	3.334	0.0	1.002	1853	0.001026			16.8	
D 23 13C2 PFDA										
515.00 > 470.00	3.356	3.355	0.001	1.281	3054306	2.14		85.6	7178	
D 30 13C2 PFUnA										
565.00 > 520.00	3.683	3.682	0.001	1.406	2524553	2.20		88.0	6295	
D 36 13C2 PFDaA										
615.00 > 570.00	3.978	3.987	-0.009	1.519	2615558	2.16		86.3	4907	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.493	4.493	0.0	1.715	3303775	2.14		85.5	5292	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

ANALYTE	ORIGINAL	DUPLICATE	RL	RPD	RPD > 30%
PENTADEC AFLUOROOCTANOIC ACID (PFOA)	5.6	5.8	1.8	3.51	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	3.3	3.1	1.8	6.25	FALSE
PERFLUOROBUTANOIC ACID (PFBA)	120	120	1.8	0.00	FALSE
PERFLUOROHEPTANOIC ACID (PFHPA)	1.2	1.4	1.8	15.38	FALSE
PERFLUOROHEXANOIC ACID (PFHXA)	130	140	1.8	7.41	FALSE
PERFLUOROPENTANOIC ACID (PFPEA)	240	250	1.8	4.08	FALSE

SDG 320-41704-1
TP-PFC-032-TPE/TP-PFC-032-TPE-D

ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2xRL
TRUE	TRUE	FALSE
FALSE	FALSE	FALSE
TRUE	TRUE	FALSE
FALSE	FALSE	FALSE
TRUE	TRUE	TRUE
TRUE	TRUE	TRUE

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:[illegible]

* Relinquish Date wrong as well as in year later.

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-41704-1

Login Number: 41704

List Number: 1

Creator: Her, David A

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	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	Refer to Job Narrative for details.
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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Narrative
320-41704-1

Receipt

The samples were received on 8/2/2018 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2° C.

LCMS

Method(s) EPA 537 (Mod), EPA 537(Mod): 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) EPA 537 (Mod): The concentration of several analytes associated with the following sample exceeded the instrument calibration range: TP-PFC-032-TPI (320-41704-1). These analytes have been qualified; however, the peaks did not saturate the instrument detector. This sample has been diluted to bring these analytes within instrument calibration range and both sets of data have been reported.

Method(s) EPA 537 (Mod): Results for sample TP-PFC-032-TPI (320-41704-1) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

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 320-238978.

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.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Qualifiers

LCMS

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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

TestAmerica Job ID: 320-41704-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-41704-1	TP-PFC-032-TPI	Water	08/01/18 10:05	08/02/18 09:45
320-41704-2	TP-PFC-032-MID CARBON	Water	08/01/18 10:10	08/02/18 09:45
320-41704-3	TP-PFC-032-TPE	Water	08/01/18 10:15	08/02/18 09:45
320-41704-4	TP-PFC-032-TPE-D	Water	08/01/18 00:00	08/02/18 09:45

Method Summary

Client: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-41704-1

Method	Method Description	Protocol	Laboratory
EPA 537 (Mod)	PFAS for QSM 5.1, Table B-15	DOD 5.1	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

DOD 5.1 = Department of Defense Quality Systems Manual V5.1

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

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.: 320-41704-1
 SDG No.: _____
 Matrix: Water Level: Low
 GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-032-TPI	320-41704-1	104	104	102	98	102	93	90	99
TP-PFC-032-TPI DL	320-41704-1 DL	85	83	77	85	81	78	87	83
TP-PFC-032-MID CARBON	320-41704-2	94	86	84	86	87	83	93	83
TP-PFC-032-TPE	320-41704-3	93	86	81	86	85	84	94	85
TP-PFC-032-TPE-D	320-41704-4	90	81	83	81	82	80	89	80
	MB 320-238978/1-A	94	91	84	85	88	85	94	92
	LCS 320-238978/2-A	91	86	81	83	83	83	88	83
	LCSD 320-238978/3-A	94	87	86	86	82	83	88	83

	<u>QC LIMITS</u>
PFBA = 13C4 PFBA	50-150
PFPeA = 13C5 PFPeA	50-150
PFBS = 13C3-PFBS	50-150
PFHxA = 13C2 PFHxA	50-150
PFHpA = 13C4-PFHpA	50-150
PFHxS = 18O2 PFHxS	50-150
PFOA = 13C4 PFOA	50-150
PFNA = 13C5 PFNA	50-150

Column to be used to flag recovery values

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

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-032-TPI	320-41704-1	98	102	103	111	112	113
TP-PFC-032-TPI DL	320-41704-1 DL	80	79	82	89	82	85
TP-PFC-032-MID CARBON	320-41704-2	85	84	86	88	86	86
TP-PFC-032-TPE	320-41704-3	87	86	86	94	85	96
TP-PFC-032-TPE-D	320-41704-4	81	83	84	85	88	87
	MB 320-238978/1-A	90	85	89	89	86	101
	LCS 320-238978/2-A	86	81	83	90	85	87
	LCSD 320-238978/3-A	83	81	85	87	90	87

	<u>QC LIMITS</u>
PFOS = 13C4 PFOS	50-150
PFOSA = 13C8 FOSA	50-150
PFDA = 13C2 PFDA	50-150
PFUnA = 13C2 PFUnA	50-150
PFDoA = 13C2 PFDoA	50-150
PFTDA = 13C2-PFTeDA	50-150

Column to be used to flag recovery values

FORM II EPA 537 (Mod)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Sample No.: IC 320-238193/5 Date Analyzed: 08/06/2018 11:33
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.06LLICAL_00 Heated Purge: (Y/N) N
 Calibration ID: 40493

	13PFOA					
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT	3997336	2.57				
UPPER LIMIT	5996004	2.77				
LOWER LIMIT	1998668	2.37				
LAB SAMPLE ID	CLIENT SAMPLE ID					
ICB 320-238193/9		4092642	2.57			
ICV 320-238193/10		3797956	2.57			
CCV 320-239237/3 CCVIS		4246064	2.62			
CCV 320-239308/3 CCVIS		3907854	2.62			

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Sample No.: CCV 320-239237/3 Date Analyzed: 08/10/2018 08:15
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.10LLA_006.d Heated Purge: (Y/N) N
 Calibration ID: 40493

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		4246064	2.62				
UPPER LIMIT		6369096	2.82				
LOWER LIMIT		2123032	2.42				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-239237/1		4272227	2.62				
CCVL 320-239237/2		4051626	2.61				
MB 320-238978/1-A		4588938	2.62				
LCS 320-238978/2-A		4563448	2.62				
LCSD 320-238978/3-A		4625875	2.63				
320-41704-1	TP-PFC-032-TPI	3821614	2.62				
320-41704-2	TP-PFC-032-MID CARBON	4635340	2.62				
320-41704-3	TP-PFC-032-TPE	4804596	2.62				
320-41704-4	TP-PFC-032-TPE-D	4916577	2.63				
CCV 320-239237/14		4039296	2.61				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Sample No.: CCV 320-239308/3 Date Analyzed: 08/10/2018 16:48
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2018.08.10LLAAX_04 Heated Purge: (Y/N) N
 Calibration ID: 40493

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		3907854	2.62				
UPPER LIMIT		5861781	2.82				
LOWER LIMIT		1953927	2.42				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 320-239308/1		4237844	2.61				
CCVL 320-239308/2		4312113	2.61				
CCV 320-239343/1		4178906	2.62				
320-41704-1 DL	TP-PFC-032-TPI DL	241238Q	2.62				
CCV 320-239343/4		3836135	2.63				

13PFOA = 13C2-PFOA

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab File ID: 2018.08.10LLA_007.d Lab Sample ID: MB 320-238978/1-A
 Matrix: Water Date Extracted: 08/09/2018 10:23
 Instrument ID: A8_N Date Analyzed: 08/10/2018 08:23
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-238978/2-A	2018.08.10L LA 008.d	08/10/2018 08:31
	LCSD 320-238978/3-A	2018.08.10L LA 009.d	08/10/2018 08:39
TP-PFC-032-TPI	320-41704-1	2018.08.10L LA 010.d	08/10/2018 08:47
TP-PFC-032-MID CARBON	320-41704-2	2018.08.10L LA 011.d	08/10/2018 08:55
TP-PFC-032-TPE	320-41704-3	2018.08.10L LA 012.d	08/10/2018 09:03
TP-PFC-032-TPE-D	320-41704-4	2018.08.10L LA 013.d	08/10/2018 09:10
TP-PFC-032-TPI DL	320-41704-1 DL	2018.08.10L LAAAX 080.d	08/10/2018 20:12

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-238978/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_007.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>08/10/2018 08:23</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.748	J M	2.0	1.5	0.59
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	1.0	U	2.0	1.0	0.47
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.5	U	2.0	1.5	0.61
335-67-1	Perfluorooctanoic acid (PFOA)	1.5	U	2.0	1.5	0.54
375-95-1	Perfluorononanoic acid (PFNA)	1.5	U	2.0	1.5	0.52
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.48
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.5	U M	2.0	1.5	0.72
307-55-1	Perfluorododecanoic acid (PFDoA)	1.5	U	2.0	1.5	0.52
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	0.76
376-06-7	Perfluorotetradecanoic acid (PFTeA)	3.0	U	4.0	3.0	0.83
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.46
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.38
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.37
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.1
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.5	U	2.0	1.5	0.56
754-91-6	Perfluorooctane Sulfonamide (FOSA)	3.0	U	4.0	3.0	1.3

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-238978/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_007.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: <u>3535</u>	Date Extracted: <u>08/09/2018 10:23</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>08/10/2018 08:23</u>
Con. Extract Vol.: <u>10.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/L</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	85		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	91		50-150
STL00993	13C2 PFHxA	85		50-150
STL01892	13C4-PFHpA	88		50-150
STL00990	13C4 PFOA	94		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	89		50-150
STL00997	13C2 PFUnA	89		50-150
STL00998	13C2 PFDoA	86		50-150
STL00994	18O2 PFHxS	85		50-150
STL02116	13C2-PFTeDA	101		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	84		50-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.10LLA_008.d
 Lab ID: LCS 320-238978/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	38.9	97	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	38.6	97	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	38.7	97	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	39.7	99	80-113	
Perfluorooctanoic acid (PFOA)	40.0	39.4	98	80-107	
Perfluorononanoic acid (PFNA)	40.0	40.9	102	83-113	
Perfluorodecanoic acid (PFDA)	40.0	40.4	101	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	32.3	81	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	39.0	98	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	39.5	99	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	38.9	97	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	37.2	105	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.7	92	81-106	M
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.9	102	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.6	99	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	39.1	101	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	39.0	98	85-114	
13C8 FOSA	100	81.2	81	50-150	
13C4 PFBA	100	90.7	91	50-150	
13C5 PFPeA	100	85.7	86	50-150	
13C2 PFHxA	100	83.0	83	50-150	
13C4-PFHpA	100	82.8	83	50-150	
13C4 PFOA	100	88.4	88	50-150	
13C5 PFNA	100	83.1	83	50-150	
13C2 PFDA	100	82.7	83	50-150	
13C2 PFUnA	100	90.2	90	50-150	
13C2 PFDoA	100	84.6	85	50-150	
18O2 PFHxS	94.6	78.3	83	50-150	
13C2-PFTeDA	100	87.4	87	50-150	
13C4 PFOS	95.6	81.8	86	50-150	
13C3-PFBS	93.0	75.1	81	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2018.08.10LLA_009.d
 Lab ID: LCSD 320-238978/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorobutanoic acid (PFBA)	40.0	38.6	96	1	30	83-118	
Perfluoropentanoic acid (PFPeA)	40.0	38.4	96	1	30	83-108	
Perfluorohexanoic acid (PFHxA)	40.0	38.8	97	0	30	83-109	
Perfluoroheptanoic acid (PFHpA)	40.0	39.3	98	1	30	80-113	
Perfluorooctanoic acid (PFOA)	40.0	39.0	97	1	30	80-107	
Perfluorononanoic acid (PFNA)	40.0	40.5	101	1	30	83-113	
Perfluorodecanoic acid (PFDA)	40.0	39.9	100	1	30	85-113	
Perfluoroundecanoic acid (PFUnA)	40.0	31.3	78	3	30	76-105	
Perfluorododecanoic acid (PFDoA)	40.0	38.0	95	3	30	87-116	
Perfluorotridecanoic Acid (PFTriA)	40.0	38.8	97	2	30	75-129	
Perfluorotetradecanoic acid (PFTeA)	40.0	39.5	99	1	30	82-115	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.3	97	8	30	87-120	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.8	93	0	30	81-106	M
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	40.0	105	3	30	80-117	
Perfluorooctanesulfonic acid (PFOS)	37.1	38.2	103	4	30	82-112	
Perfluorodecanesulfonic acid (PFDS)	38.6	39.8	103	2	30	81-114	
Perfluorooctane Sulfonamide (FOSA)	40.0	40.2	101	3	30	85-114	
13C8 FOSA	100	81.3	81			50-150	
13C4 PFBA	100	93.6	94			50-150	
13C5 PFPeA	100	87.2	87			50-150	
13C2 PFHxA	100	85.6	86			50-150	
13C4-PFHpA	100	82.2	82			50-150	
13C4 PFOA	100	88.4	88			50-150	
13C5 PFNA	100	82.6	83			50-150	
13C2 PFDA	100	84.8	85			50-150	
13C2 PFUnA	100	87.3	87			50-150	
13C2 PFDoA	100	89.7	90			50-150	
18O2 PFHxS	94.6	78.1	83			50-150	
13C2-PFTeDA	100	87.2	87			50-150	
13C4 PFOS	95.6	79.3	83			50-150	
13C3-PFBS	93.0	80.4	86			50-150	

Column to be used to flag recovery and RPD values

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/06/2018 11:10Analysis Batch Number: 238193 End Date: 08/06/2018 12:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-238193/2		08/06/2018 11:10	1	2018.08.06LLICA L 002.d	GeminiC18 3x100 3(mm)
IC 320-238193/3		08/06/2018 11:17	1	2018.08.06LLICA L 003.d	GeminiC18 3x100 3(mm)
IC 320-238193/4		08/06/2018 11:25	1	2018.08.06LLICA L 004.d	GeminiC18 3x100 3(mm)
IC 320-238193/5 ICIS		08/06/2018 11:33	1	2018.08.06LLICA L 005.d	GeminiC18 3x100 3(mm)
IC 320-238193/6		08/06/2018 11:41	1	2018.08.06LLICA L 006.d	GeminiC18 3x100 3(mm)
IC 320-238193/7		08/06/2018 11:49	1	2018.08.06LLICA L 007.d	GeminiC18 3x100 3(mm)
IC 320-238193/8		08/06/2018 11:56	1	2018.08.06LLICA L 008.d	GeminiC18 3x100 3(mm)
ICB 320-238193/9		08/06/2018 12:04	1	2018.08.06LLICA L 009.d	GeminiC18 3x100 3(mm)
ICV 320-238193/10		08/06/2018 12:12	1	2018.08.06LLICA L 010.d	GeminiC18 3x100 3(mm)

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	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		B	M1	M2								
Perfluorobutanoic acid (PFBA)	1.0356 0.9385	0.9092 0.9295	0.9181	0.9138	0.9275	AveID		0.9389				4.7		20.0			
Perfluoropentanoic acid (PFPeA)	1.3867 1.1127	1.0717 1.1007	1.0769	1.1120	1.1037	AveID		1.1378				9.8		20.0			
Perfluorobutanesulfonic acid (PFBS)	76.063 79.702	72.042 71.920	75.499	79.131	77.346	AveID		75.957				4.1		20.0			
4:2 FTS	16.899 16.409	15.948 15.581	16.354	17.979	16.820	AveID		16.570				4.7		20.0			
Perfluorohexanoic acid (PFHxA)	1.1713 1.0157	0.9838 0.9930	0.9663	1.0078	1.0064	AveID		1.0206				6.7		20.0			
Perfluoropentanesulfonic acid	68.597 72.591	70.149 63.027	67.160	70.677	70.259	AveID		68.923				4.5		20.0			
Perfluoroheptanoic acid (PFHpA)	++++ 1.0462	1.0598 1.0766	1.0410	1.0735	1.0740	AveID		1.0619				1.4		20.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2251 1.0319	1.1827 1.0319	1.0717	1.0213	1.0237	AveID		1.0841				7.8		20.0			
6:2 FTS	1.7499 1.5710	1.5746 1.6133	1.4237	1.5556	1.5255	AveID		1.5734				6.2		20.0			
Perfluorooctanoic acid (PFOA)	1.2008 1.0886	1.2853 1.0557	1.0978	1.0896	1.0969	AveID		1.1307				7.2		20.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2610 1.2616	1.2442 1.2011	1.1885	1.2551	1.2619	AveID		1.2391				2.5		20.0			
Perfluorononanoic acid (PFNA)	1.1473 1.0799	1.0748 1.0323	1.0182	0.9962	1.0249	AveID		1.0534				4.9		20.0			
Perfluorooctanesulfonic acid (PFOS)	1.1452 1.0892	1.0806 1.0719	1.0331	1.0486	1.0477	AveID		1.0738				3.5		20.0			
Perfluorononanesulfonic acid	0.7326 0.7691	0.7576 0.7460	0.7565	0.7459	0.7575	AveID		0.7522				1.6		20.0			

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.: 320-41704-1 Analy Batch No.: 238193
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	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		B	M1	M2								
8:2 FTS	1.3250 1.2730	1.4395 1.3051	1.2793	1.2063	1.2657	AveID		1.2991				5.6		20.0			
Perfluorodecanoic acid (PFDA)	1.0978 0.9968	1.0000 0.9777	1.0353	0.9399	0.9748	AveID		1.0032				5.1		20.0			
Perfluorooctane Sulfonamide (FOSA)	0.9400 1.0032	0.9765 0.9376	0.9545	0.9847	1.0189	AveID		0.9736				3.2		20.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	0.9510 0.9835	1.0084 0.9888	0.9336	0.9540	0.9328	AveID		0.9646				3.0		20.0			
Perfluorodecanesulfonic acid (PFDS)	0.6051 0.6390	0.6643 0.6091	0.6429	0.6182	0.6451	AveID		0.6320				3.4		20.0			
Perfluoroundecanoic acid (PFUnA)	++++ 1.0924	1.2343 1.0863	1.0961	1.1589	1.0738	AveID		1.1236				5.5		20.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.9845 0.8814	0.9491 0.9072	0.8112	0.8526	0.8566	AveID		0.8918				6.7		20.0			
Perfluorododecanoic acid (PFDoA)	1.1896 1.0745	1.1772 1.0999	1.0449	1.1145	1.0884	AveID		1.1127				4.8		20.0			
Perfluorotridecanoic Acid (PFTriA)	1.0415 1.1188	1.0997 1.0389	1.0944	1.0656	1.0680	AveID		1.0753				2.8		20.0			
Perfluorotetradecanoic acid (PFTeA)	++++ 0.2376	0.2550 0.2466	0.2390	0.2330	0.2410	AveID		0.2420				3.2		20.0			
13C4 PFBA	1.3454 1.4071	1.3544 1.4354	1.3670	1.3767	1.4083	Ave		1.3849				2.4		20.0			
13C5 PFPeA	0.9142 0.9681	0.9515 0.9792	0.9416	0.9284	0.9928	Ave		0.9537				2.9		20.0			
13C3-PFBS	0.0217 0.0217	0.0221 0.0231	0.0222	0.0212	0.0224	Ave		0.0221				2.7		20.0			
13C2 PFHxA	1.0908 1.0709	1.0832 1.0771	1.0664	1.0648	1.1220	Ave		1.0822				1.8		20.0			
13C4-PFHpA	1.0528 1.0755	1.0748 1.0417	1.0614	1.0647	1.0848	Ave		1.0651				1.4		20.0			
18O2 PFHxS	1.3540 1.3675	1.4005 1.3474	1.3411	1.3518	1.3975	Ave		1.3657				1.8		20.0			
M2-6:2FTS	0.2197 0.2237	0.2210 0.2189	0.2309	0.2274	0.2275	Ave		0.2242				2.0		20.0			
13C4 PFOA	0.9700 0.9794	0.9570 0.9943	0.9864	0.9624	0.9914	Ave		0.9773				1.5		20.0			
13C4 PFOS	0.8675 0.8973	0.8804 0.9183	0.9045	0.8918	0.9213	Ave		0.8973				2.2		20.0			
13C5 PFNA	0.8612 0.8554	0.8748 0.8585	0.8921	0.8848	0.9123	Ave		0.8770				2.4		20.0			

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.: 320-41704-1 Analy Batch No.: 238193
SDG No.: _____
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N
Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	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		B	M1	M2								
M2-8:2FTS	0.2727 0.2715	0.2729 0.2567	0.2676	0.2731	0.2806	Ave		0.2707				2.7		20.0			
13C2 PFDA	0.7423 0.7808	0.7526 0.7805	0.7387	0.7911	0.8001	Ave		0.7695				3.2		20.0			
13C8 FOSA	1.1730 1.1817	1.1961 1.2106	1.1997	1.1702	1.1882	Ave		1.1885				1.2		20.0			
d3-NMeFOSAA	0.3925 0.3861	0.3877 0.3984	0.3885	0.3872	0.4143	Ave		0.3935				2.6		20.0			
d5-NEtFOSAA	0.4192 0.3947	0.4132 0.3750	0.4229	0.4161	0.4128	Ave		0.4077				4.2		20.0			
13C2 PFUnA	0.6182 0.6069	0.6026 0.6096	0.6343	0.6068	0.6538	Ave		0.6189				3.0		20.0			
13C2 PFDoA	0.6320 0.6494	0.6378 0.6472	0.6693	0.6531	0.6902	Ave		0.6541				3.0		20.0			
13C2-PFTeDA	0.8409 0.8358	0.8205 0.8213	0.8511	0.8289	0.8364	Ave		0.8335				1.3		20.0			
13C2-PFHxDA	1.6553 1.6633	1.6811 1.6556	1.6239	1.6406	1.6546	Ave		1.6535				1.1		20.0			

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.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			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)		AveID	57127 10686384	100389 19976933	522272	2011540	5049773	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	51978 8717868	83129 16137329	421991	1650773	4235935	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	59862 12353528	114549 21980500	616670	2375205	5929736	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	14052 2687262	26792 5031154	141135	570176	1362407	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	52384 8802526	86871 16015982	428854	1715767	4365425	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanesulfonic acid		AveID	57284 11938702	118353 20439230	582073	2251038	5715419	0.0235 4.69	0.0469 9.38	0.235	0.938	2.35
Perfluoroheptanoic acid (PFHpA)		AveID	+++++ 9106263	92858 16791846	459833	1827459	4504362	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	61896 10391537	122877 18945578	544267	2008773	5033358	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2 FTS		AveID	14940 2696182	26890 5013052	129666	536262	1272183	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	47808 8637324	100379 15733520	451059	1678386	4208258	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	42699 8721667	85012 15722427	425894	1703787	4278634	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	40510 7475851	76644 13269892	377996	1409363	3614991	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	37801 7339820	71970 13677354	360873	1387650	3462772	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorononanesulfonic acid		AveID	25016 5361178	52199 9847776	273347	1021056	2589883	0.0240 4.80	0.0480 9.60	0.240	0.960	2.40
8:2 FTS		AveID	14190 2679186	30677 4806399	136487	504558	1315230	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			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
Perfluorodecanoic acid (PFDA)		AveID	33414 6298810	61353 11426488	318256	1188927	3015215	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctane Sulfonamide (FOSA)		AveID	45210 9594151	95215 16995473	476525	1842464	4680280	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	15304 3073336	31870 5898014	150940	590682	1493989	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	20747 4472904	45962 8074266	233277	849835	2214864	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	++++ 5365541	60636 9915678	289310	1124406	2714159	++++ 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16923 2815576	31965 5094367	142770	567205	1366918	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	30826 5646629	61213 10658790	291016	1163733	2903966	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	26989 5879570	57183 10067689	304796	1112653	2849697	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	++++ 1606848	17056 3032661	84652	308839	779223	++++ 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PF OA	Ave	5516377 5693569	5520570 5373122	5688815	5503224	5444583	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PF OA	Ave	3748386 3917323	3878229 3665379	3918495	3711287	3838069	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PF OA	Ave	82796 81531	83639 80382	85930	78945	80654	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PF OA	Ave	4472467 4333101	4415087 4032113	4437948	4256324	4337626	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PF OA	Ave	4316698 4351928	4381099 3899256	4417214	4255889	4193874	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PF OA	Ave	5251983 5234562	5400125 4771422	5279483	5111728	5111206	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PF OA	Ave	855574 859900	855666 778460	912690	863649	835688	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PF OA	Ave	3977347 3963063	3900845 3722009	4104790	3847208	3832692	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PF OA	Ave	3400422 3471061	3430647 3286355	3598367	3408113	3404908	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PF OA	Ave	3530907 3461355	3565521 3213782	3712571	3536917	3527035	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PF OA	Ave	1070959 1052330	1065531 920670	1066887	1045687	1039099	2.40 2.40	2.40 2.40	2.40	2.40	2.40
13C2 PFDA	13PF OA	Ave	3043654 3159574	3067735 2921735	3074087	3162481	3093053	2.50 2.50	2.50 2.50	2.50	2.50	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			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
13C8 FOSA	13PF OA	Ave	4809407 4781606	4875140 4531636	4992636	4677735	4593505	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1609182 1562466	1580220 1491160	1616798	1547904	1601576	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1718969 1597197	1684036 1403844	1760050	1663128	1595779	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2534521 2455806	2456263 2281933	2639555	2425508	2527555	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2591339 2627551	2599869 2422707	2785129	2610480	2668181	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3447891 3382019	3344339 3074334	3541707	3313318	3233399	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6786819 6730439	6852227 6197635	6757749	6558204	6396595	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-238193/2	2018.08.06LLICAL_002.d
Level 2	IC 320-238193/3	2018.08.06LLICAL_003.d
Level 3	IC 320-238193/4	2018.08.06LLICAL_004.d
Level 4	IC 320-238193/5	2018.08.06LLICAL_005.d
Level 5	IC 320-238193/6	2018.08.06LLICAL_006.d
Level 6	IC 320-238193/7	2018.08.06LLICAL_007.d
Level 7	IC 320-238193/8	2018.08.06LLICAL_008.d

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
Perfluorobutanoic acid (PFBA)	10.3 -1.0	-3.2	-2.2	-2.7	-1.2	0.0	30 30	30	30	30	30	30
Perfluoropentanoic acid (PFPeA)	21.9 -3.3	-5.8	-5.3	-2.3	-3.0	-2.2	30 30	30	30	30	30	30
Perfluorobutanesulfonic acid (PFBS)	0.1 -5.3	-5.2	-0.6	4.2	1.8	4.9	30 30	30	30	30	30	30
4:2 FTS	2.0 -6.0	-3.8	-1.3	8.5	1.5	-1.0	30 30	30	30	30	30	30
Perfluorohexanoic acid (PFHxA)	14.8 -2.7	-3.6	-5.3	-1.3	-1.4	-0.5	30 30	30	30	30	30	30
Perfluoropentanesulfonic acid	-0.5 -8.6	1.8	-2.6	2.5	1.9	5.3	30 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	++++ 1.4	-0.2	-2.0	1.1	1.1	-1.5	30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	13.0 -4.8	9.1	-1.1	-5.8	-5.6	-4.8	30 30	30	30	30	30	30
6:2 FTS	11.2 2.5	0.1	-9.5	-1.1	-3.0	-0.1	30 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	6.2 -6.6	13.7	-2.9	-3.6	-3.0	-3.7	30 30	30	30	30	30	30
Perfluoroheptanesulfonic Acid (PFHpS)	1.8 -3.1	0.4	-4.1	1.3	1.8	1.8	30 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	8.9 -2.0	2.0	-3.3	-5.4	-2.7	2.5	30 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	6.7 -0.2	0.6	-3.8	-2.3	-2.4	1.4	30 30	30	30	30	30	30
Perfluorononanesulfonic acid	-2.6 -0.8	0.7	0.6	-0.8	0.7	2.2	30 30	30	30	30	30	30
8:2 FTS	2.0 0.5	10.8	-1.5	-7.1	-2.6	-2.0	30 30	30	30	30	30	30

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1 Analy Batch No.: 238193

SDG No.: _____

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 08/06/2018 11:10 Calibration End Date: 08/06/2018 11:56 Calibration ID: 40493

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
Perfluorodecanoic acid (PFDA)	9.4 -2.5	-0.3	3.2	-6.3	-2.8	-0.6	30 30	30	30	30	30	30
Perfluorooctane Sulfonamide (FOSA)	-3.5 -3.7	0.3	-2.0	1.1	4.6	3.0	30 30	30	30	30	30	30
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	-1.4 2.5	4.5	-3.2	-1.1	-3.3	2.0	30 30	30	30	30	30	30
Perfluorodecanesulfonic acid (PFDS)	-4.3 -3.6	5.1	1.7	-2.2	2.1	1.1	30 30	30	30	30	30	30
Perfluoroundecanoic acid (PFUnA)	++++ -3.3	9.8	-2.5	3.1	-4.4	-2.8	30	30	30	30	30	30
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	10.4 1.7	6.4	-9.0	-4.4	-3.9	-1.2	30 30	30	30	30	30	30
Perfluorododecanoic acid (PFDoA)	6.9 -1.2	5.8	-6.1	0.2	-2.2	-3.4	30 30	30	30	30	30	30
Perfluorotridecanoic Acid (PFTriA)	-3.1 -3.4	2.3	1.8	-0.9	-0.7	4.1	30 30	30	30	30	30	30
Perfluorotetradecanoic acid (PFTeA)	++++ 1.9	5.4	-1.2	-3.7	-0.4	-1.8	30	30	30	30	30	30

Calibration

/ Perfluorobutyric acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base: AREA
RF Rounding: 0

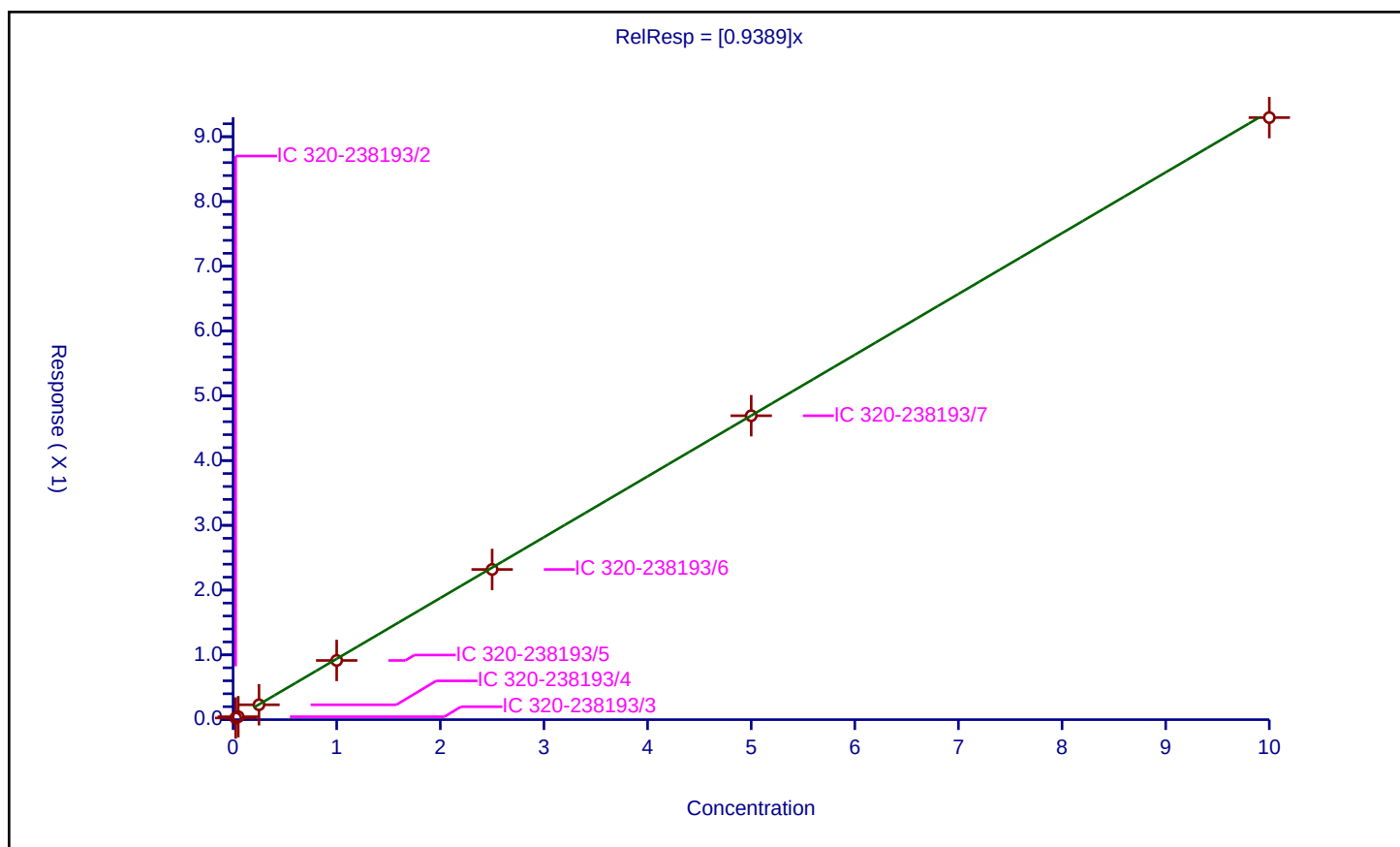
Curve Coefficients

Intercept: 0
Slope: 0.9389

Error Coefficients

Standard Error: 9510000
Relative Standard Error: 4.7
Correlation Coefficient: 0.999
Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.02589	2.5	5516377.0	1.035589	Y
2	IC 320-238193/3	0.05	0.045461	2.5	5520570.0	0.909227	Y
3	IC 320-238193/4	0.25	0.229517	2.5	5688815.0	0.918068	Y
4	IC 320-238193/5	1.0	0.913801	2.5	5503224.0	0.913801	Y
5	IC 320-238193/6	2.5	2.318714	2.5	5444583.0	0.927486	Y
6	IC 320-238193/7	5.0	4.692305	2.5	5693569.0	0.938461	Y
7	IC 320-238193/8	10.0	9.294844	2.5	5373122.0	0.929484	Y



Calibration

/ Perfluoropentanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

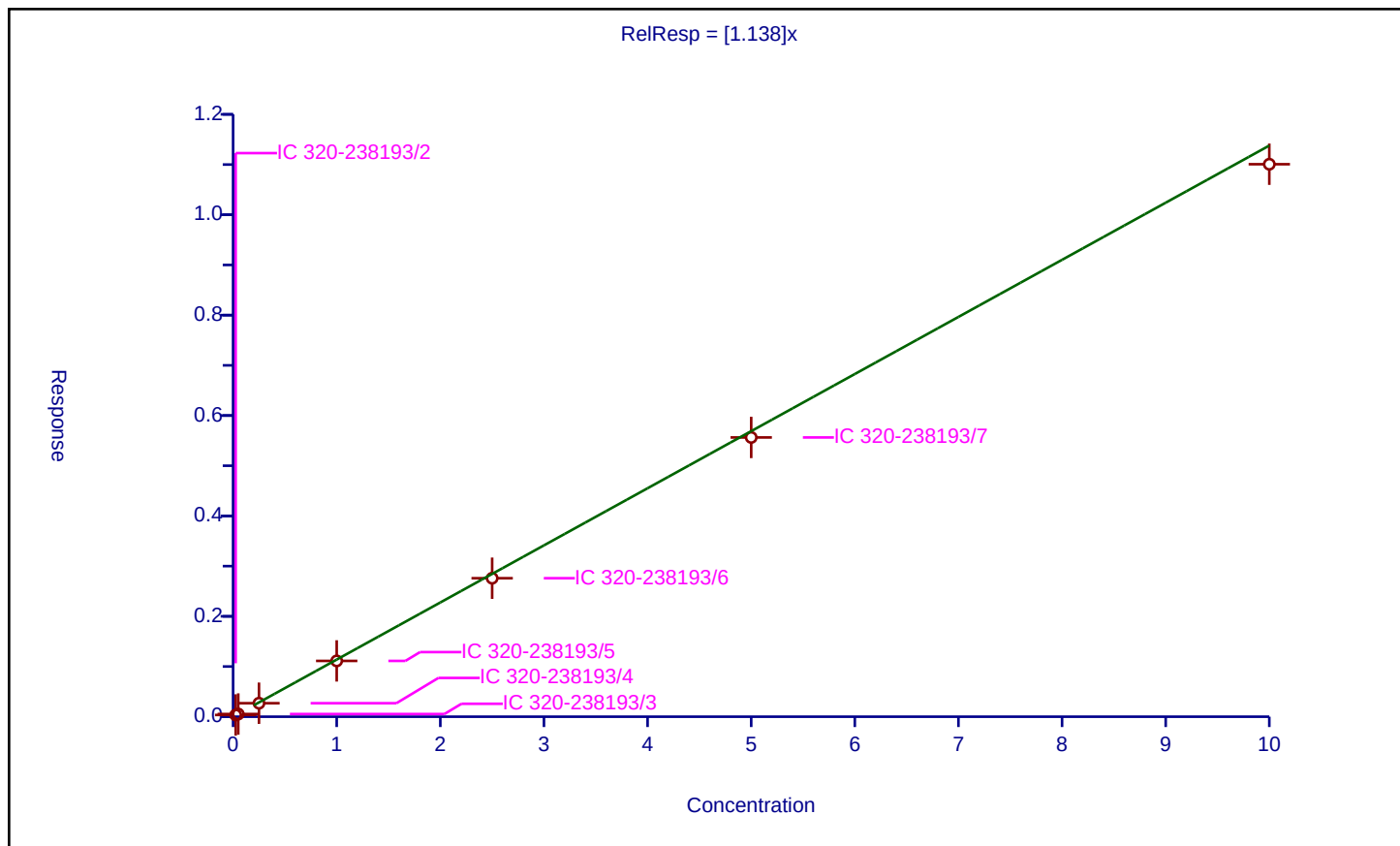
Curve Coefficients

Intercept: 0
 Slope: 1.138

Error Coefficients

Standard Error: 7720000
 Relative Standard Error: 9.8
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.034667	2.5	3748386.0	1.386677	Y
2	IC 320-238193/3	0.05	0.053587	2.5	3878229.0	1.071739	Y
3	IC 320-238193/4	0.25	0.26923	2.5	3918495.0	1.076921	Y
4	IC 320-238193/5	1.0	1.111995	2.5	3711287.0	1.111995	Y
5	IC 320-238193/6	2.5	2.759158	2.5	3838069.0	1.103663	Y
6	IC 320-238193/7	5.0	5.563664	2.5	3917323.0	1.112733	Y
7	IC 320-238193/8	10.0	11.00659	2.5	3665379.0	1.100659	Y



Calibration

/ Perfluorobutanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

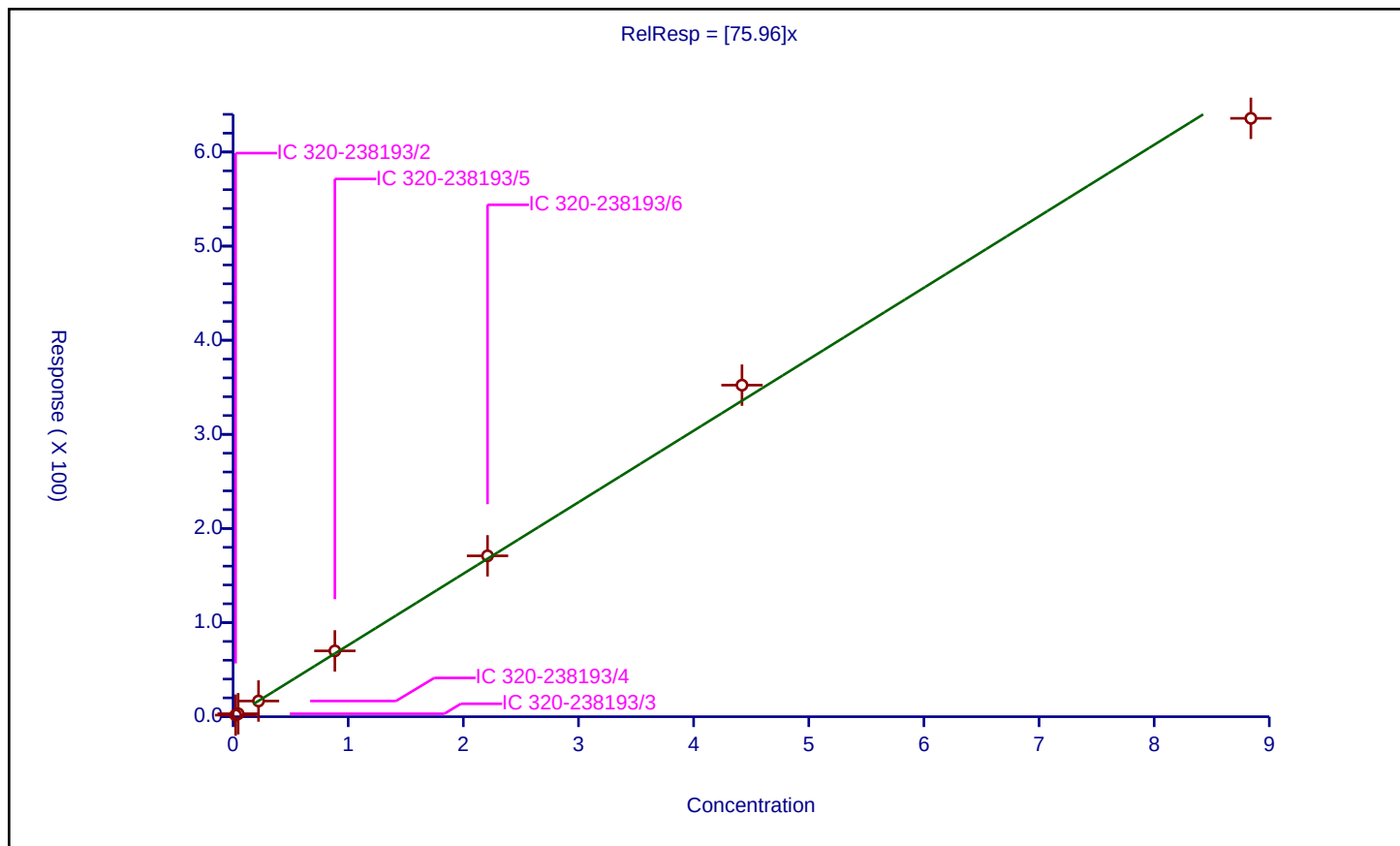
Curve Coefficients

Intercept: 0
 Slope: 75.96

Error Coefficients

Standard Error: 10600000
 Relative Standard Error: 4.1
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0221	1.680989	2.325	82796.0	76.062842	Y
2	IC 320-238193/3	0.0442	3.184237	2.325	83639.0	72.041568	Y
3	IC 320-238193/4	0.221	16.685183	2.325	85930.0	75.498564	Y
4	IC 320-238193/5	0.884	69.951886	2.325	78945.0	79.131093	Y
5	IC 320-238193/6	2.21	170.935554	2.325	80654.0	77.346405	Y
6	IC 320-238193/7	4.42	352.282599	2.325	81531.0	79.701946	Y
7	IC 320-238193/8	8.84	635.772468	2.325	80382.0	71.919962	Y



Calibration

/ 1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2)

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

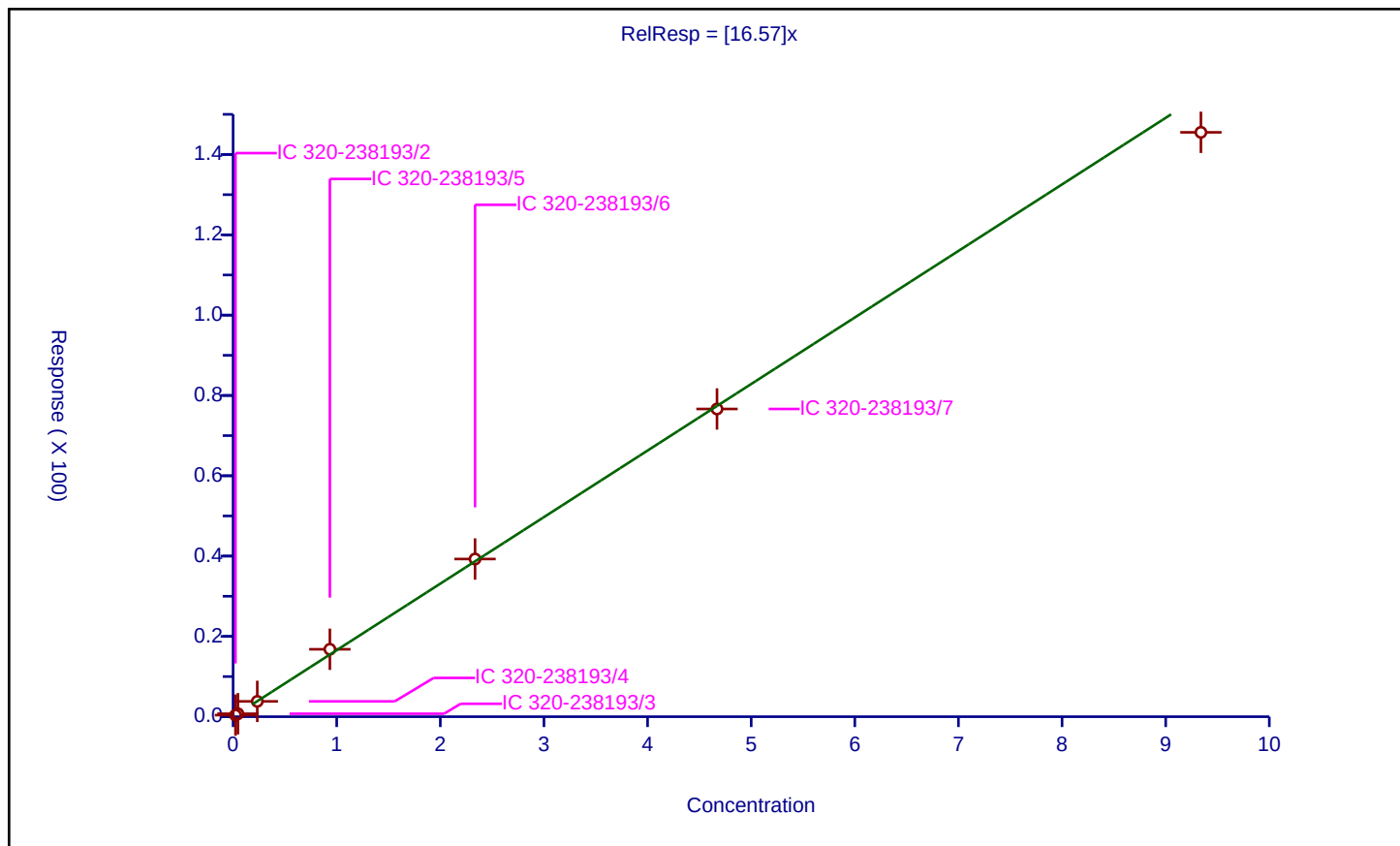
Curve Coefficients

Intercept: 0
 Slope: 16.57

Error Coefficients

Standard Error: 2410000
 Relative Standard Error: 4.7
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02335	0.394595	2.325	82796.0	16.89915	Y
2	IC 320-238193/3	0.0467	0.744765	2.325	83639.0	15.947859	Y
3	IC 320-238193/4	0.2335	3.818677	2.325	85930.0	16.354075	Y
4	IC 320-238193/5	0.934	16.792187	2.325	78945.0	17.978787	Y
5	IC 320-238193/6	2.335	39.273889	2.325	80654.0	16.819653	Y
6	IC 320-238193/7	4.67	76.632007	2.325	81531.0	16.409423	Y
7	IC 320-238193/8	9.34	145.523041	2.325	80382.0	15.580625	Y



Calibration

/ Perfluorohexanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

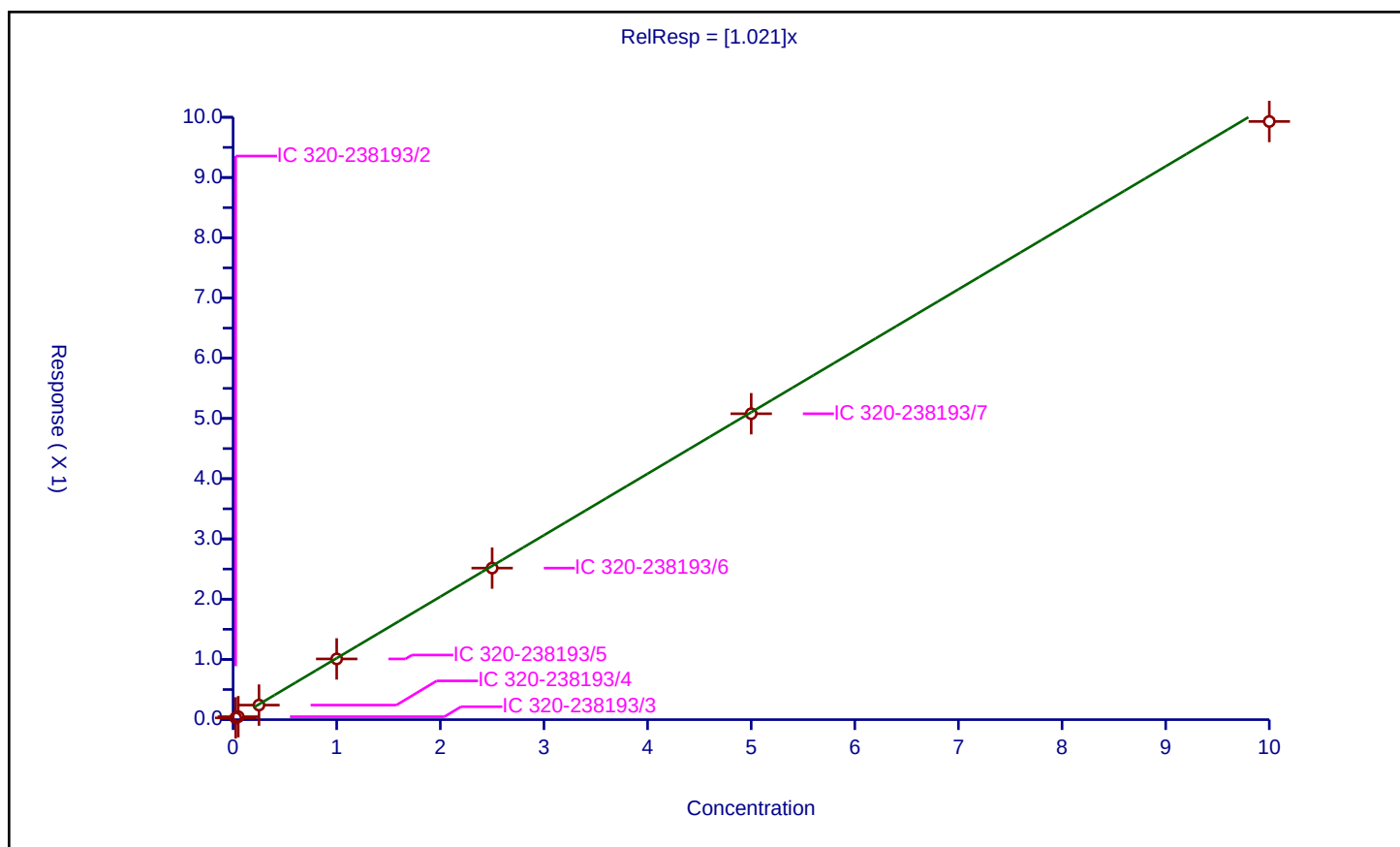
Curve Coefficients

Intercept: 0
 Slope: 1.021

Error Coefficients

Standard Error: 7700000
 Relative Standard Error: 6.7
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.029281	2.5	4472467.0	1.171255	Y
2	IC 320-238193/3	0.05	0.04919	2.5	4415087.0	0.983797	Y
3	IC 320-238193/4	0.25	0.241583	2.5	4437948.0	0.966334	Y
4	IC 320-238193/5	1.0	1.007775	2.5	4256324.0	1.007775	Y
5	IC 320-238193/6	2.5	2.516022	2.5	4337626.0	1.006409	Y
6	IC 320-238193/7	5.0	5.078653	2.5	4333101.0	1.015731	Y
7	IC 320-238193/8	10.0	9.930266	2.5	4032113.0	0.993027	Y



Calibration

/ Perfluoropentanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

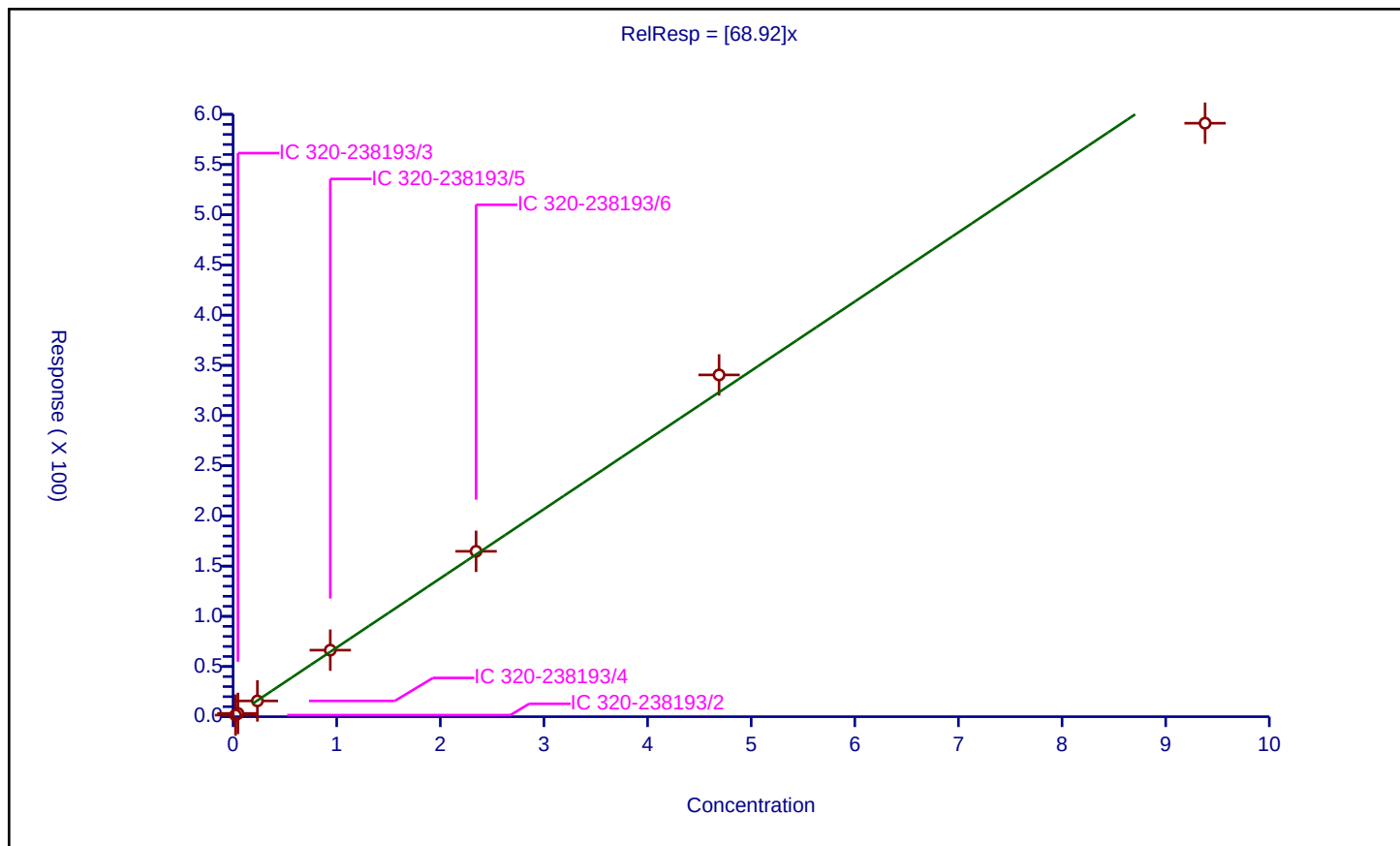
Curve Coefficients

Intercept: 0
 Slope: 68.92

Error Coefficients

Standard Error: 9990000
 Relative Standard Error: 4.5
 Correlation Coefficient: 0.994
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02345	1.608596	2.325	82796.0	68.596837	Y
2	IC 320-238193/3	0.0469	3.289981	2.325	83639.0	70.14885	Y
3	IC 320-238193/4	0.2345	15.749095	2.325	85930.0	67.160319	Y
4	IC 320-238193/5	0.938	66.295058	2.325	78945.0	70.677034	Y
5	IC 320-238193/6	2.345	164.757472	2.325	80654.0	70.25905	Y
6	IC 320-238193/7	4.69	340.453106	2.325	81531.0	72.591281	Y
7	IC 320-238193/8	9.38	591.192179	2.325	80382.0	63.026885	Y



Calibration

/ Perfluoroheptanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

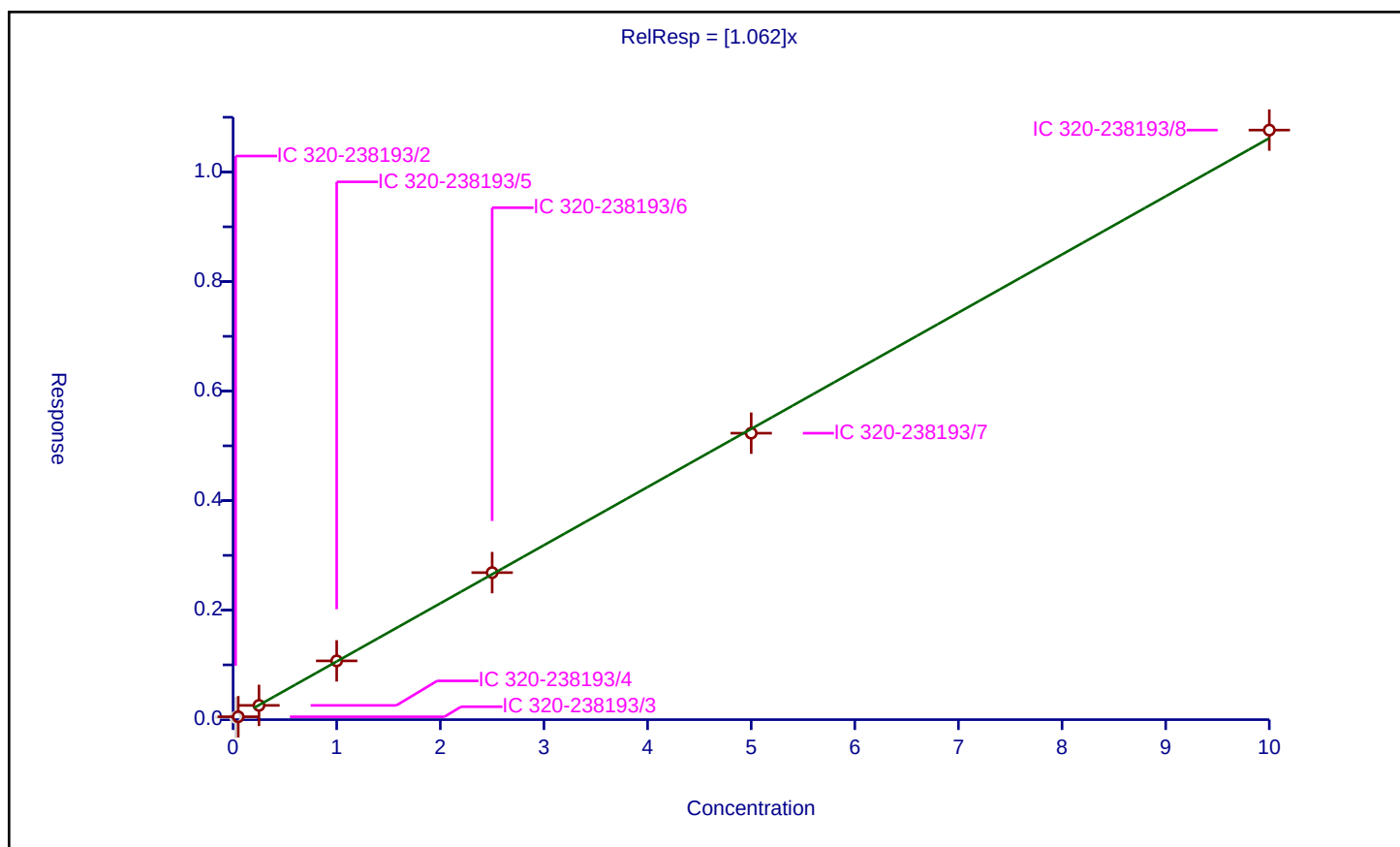
Curve Coefficients

Intercept: 0
 Slope: 1.062

Error Coefficients

Standard Error: 8820000
 Relative Standard Error: 1.4
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.041093	2.5	4316698.0	1.643733	N
2	IC 320-238193/3	0.05	0.052988	2.5	4381099.0	1.059757	Y
3	IC 320-238193/4	0.25	0.260251	2.5	4417214.0	1.041002	Y
4	IC 320-238193/5	1.0	1.073488	2.5	4255889.0	1.073488	Y
5	IC 320-238193/6	2.5	2.685084	2.5	4193874.0	1.074034	Y
6	IC 320-238193/7	5.0	5.231166	2.5	4351928.0	1.046233	Y
7	IC 320-238193/8	10.0	10.766058	2.5	3899256.0	1.076606	Y



Calibration

/ Perfluorohexanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

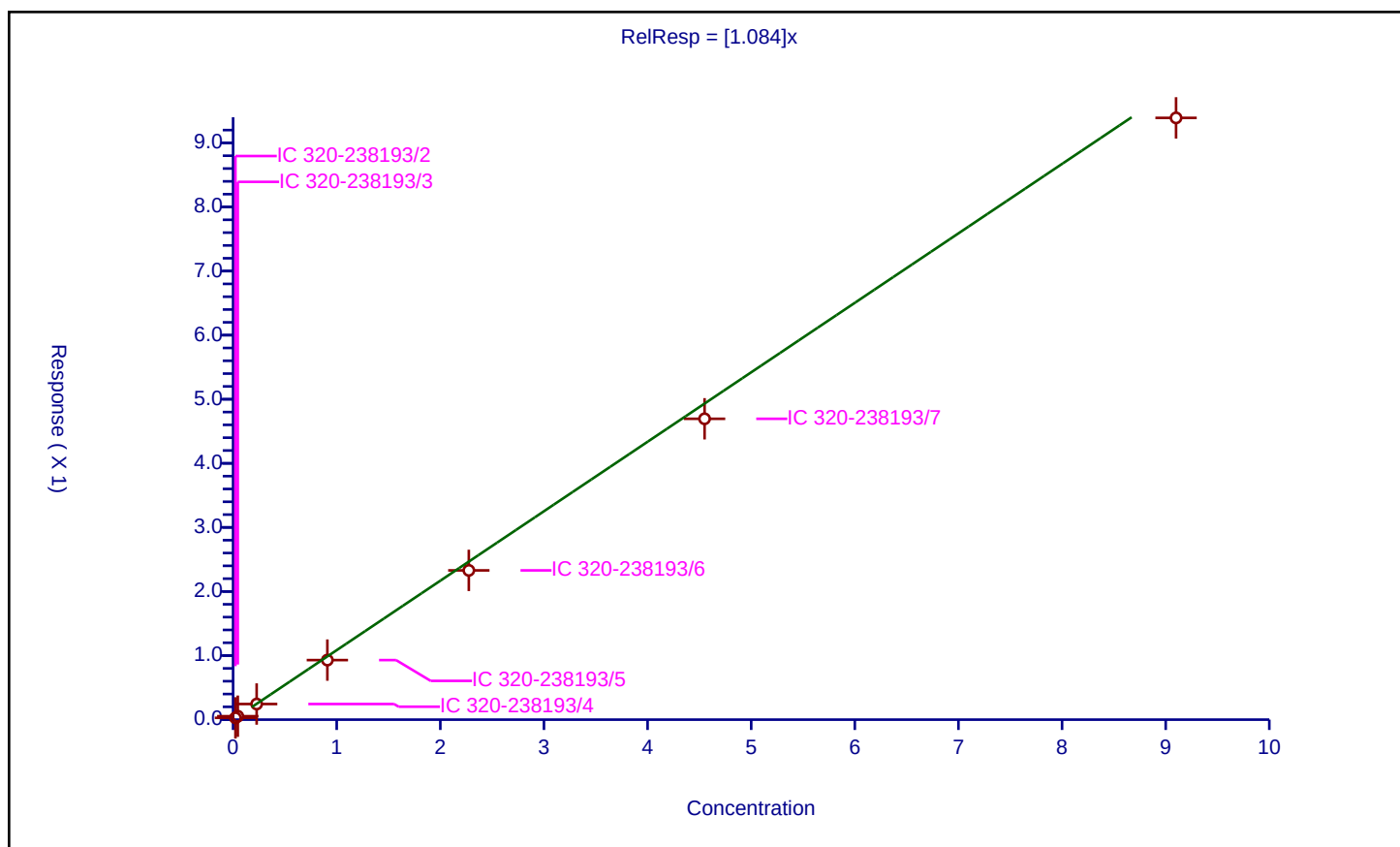
Curve Coefficients

Intercept: 0
 Slope: 1.084

Error Coefficients

Standard Error: 9100000
 Relative Standard Error: 7.8
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02275	0.027872	2.365	5251983.0	1.225149	Y
2	IC 320-238193/3	0.0455	0.053814	2.365	5400125.0	1.182733	Y
3	IC 320-238193/4	0.2275	0.24381	2.365	5279483.0	1.071693	Y
4	IC 320-238193/5	0.91	0.929382	2.365	5111728.0	1.021299	Y
5	IC 320-238193/6	2.275	2.328979	2.365	5111206.0	1.023727	Y
6	IC 320-238193/7	4.55	4.694946	2.365	5234562.0	1.031856	Y
7	IC 320-238193/8	9.1	9.390553	2.365	4771422.0	1.031929	Y



Calibration

/ 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

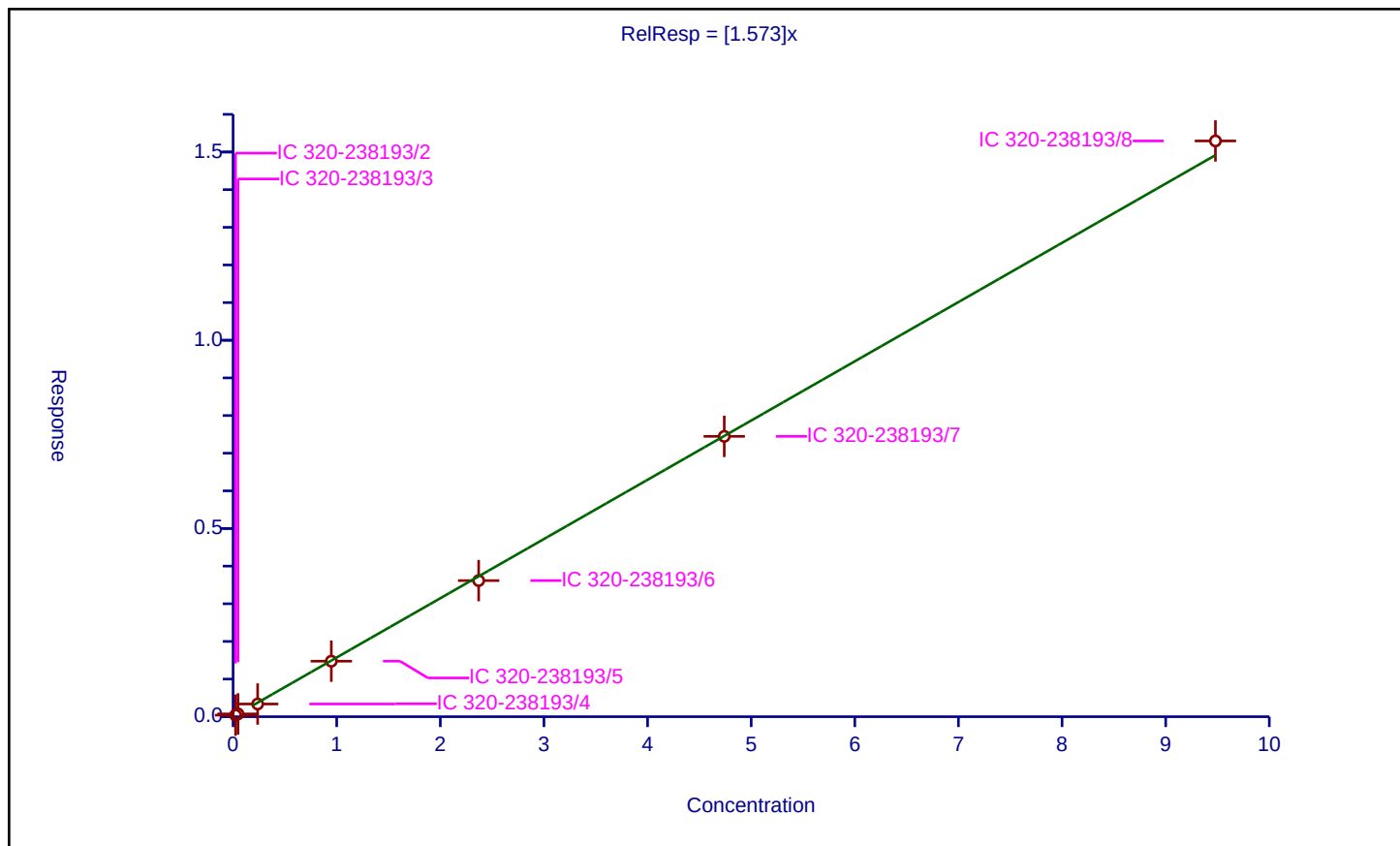
Curve Coefficients

Intercept: 0
 Slope: 1.573

Error Coefficients

Standard Error: 2390000
 Relative Standard Error: 6.2
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0237	0.041472	2.375	855574.0	1.74988	Y
2	IC 320-238193/3	0.0474	0.074636	2.375	855666.0	1.574606	Y
3	IC 320-238193/4	0.237	0.337417	2.375	912690.0	1.423699	Y
4	IC 320-238193/5	0.948	1.474699	2.375	863649.0	1.55559	Y
5	IC 320-238193/6	2.37	3.615506	2.375	835688.0	1.52553	Y
6	IC 320-238193/7	4.74	7.446717	2.375	859900.0	1.571037	Y
7	IC 320-238193/8	9.48	15.294297	2.375	778460.0	1.613322	Y



Calibration

/ Perfluorooctanoic acid

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base: AREA
RF Rounding: 0

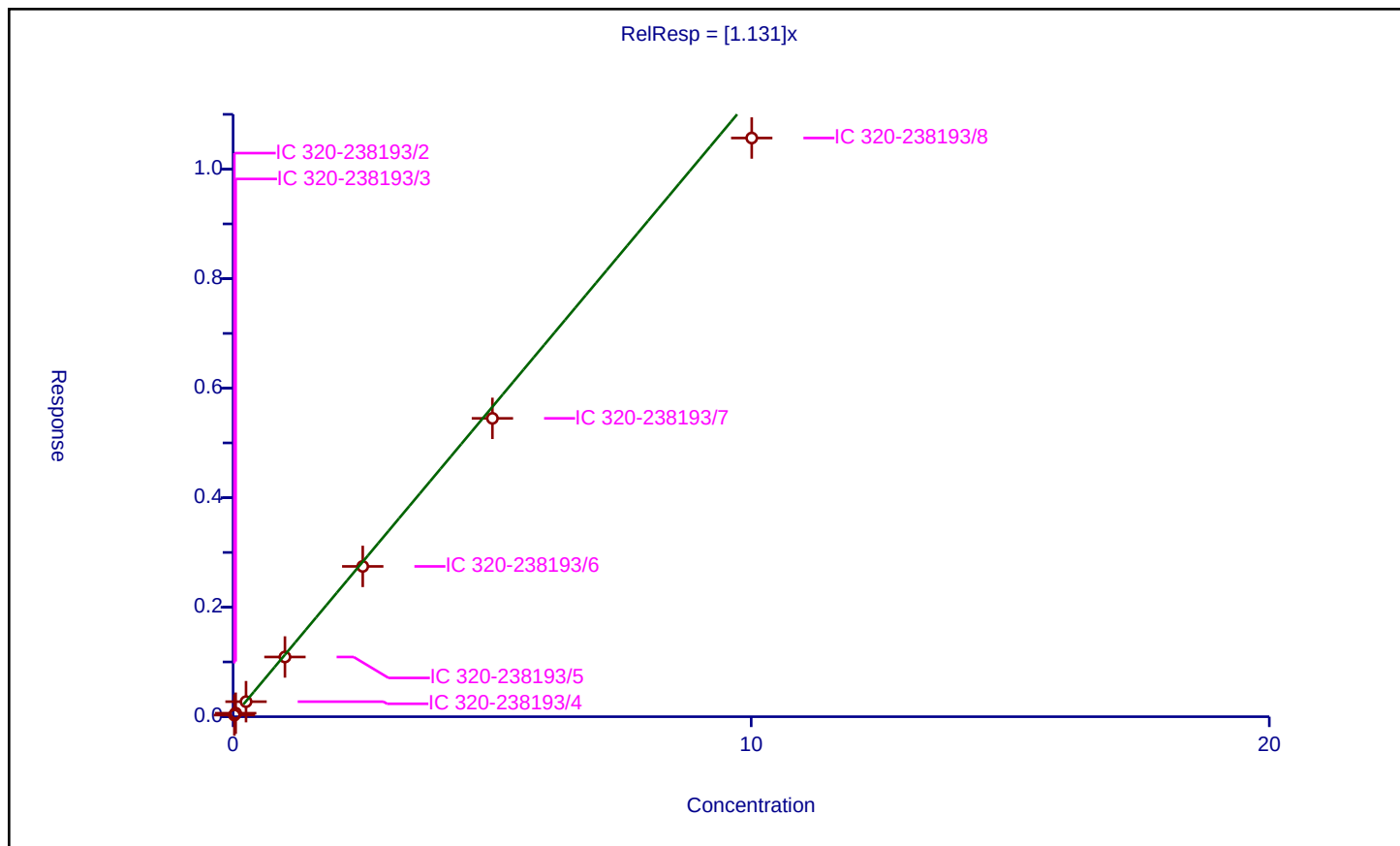
Curve Coefficients

Intercept: 0
Slope: 1.131

Error Coefficients

Standard Error: 7560000
Relative Standard Error: 7.2
Correlation Coefficient: 0.998
Coefficient of Determination (Adjusted): 0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025025	0.03005	2.5	3977347.0	1.200806	Y
2	IC 320-238193/3	0.05005	0.064332	2.5	3900845.0	1.285346	Y
3	IC 320-238193/4	0.25025	0.274715	2.5	4104790.0	1.097762	Y
4	IC 320-238193/5	1.001	1.090652	2.5	3847208.0	1.089562	Y
5	IC 320-238193/6	2.5025	2.744975	2.5	3832692.0	1.096893	Y
6	IC 320-238193/7	5.005	5.448642	2.5	3963063.0	1.08864	Y
7	IC 320-238193/8	10.01	10.567895	2.5	3722009.0	1.055734	Y



Calibration

/ Perfluoroheptanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

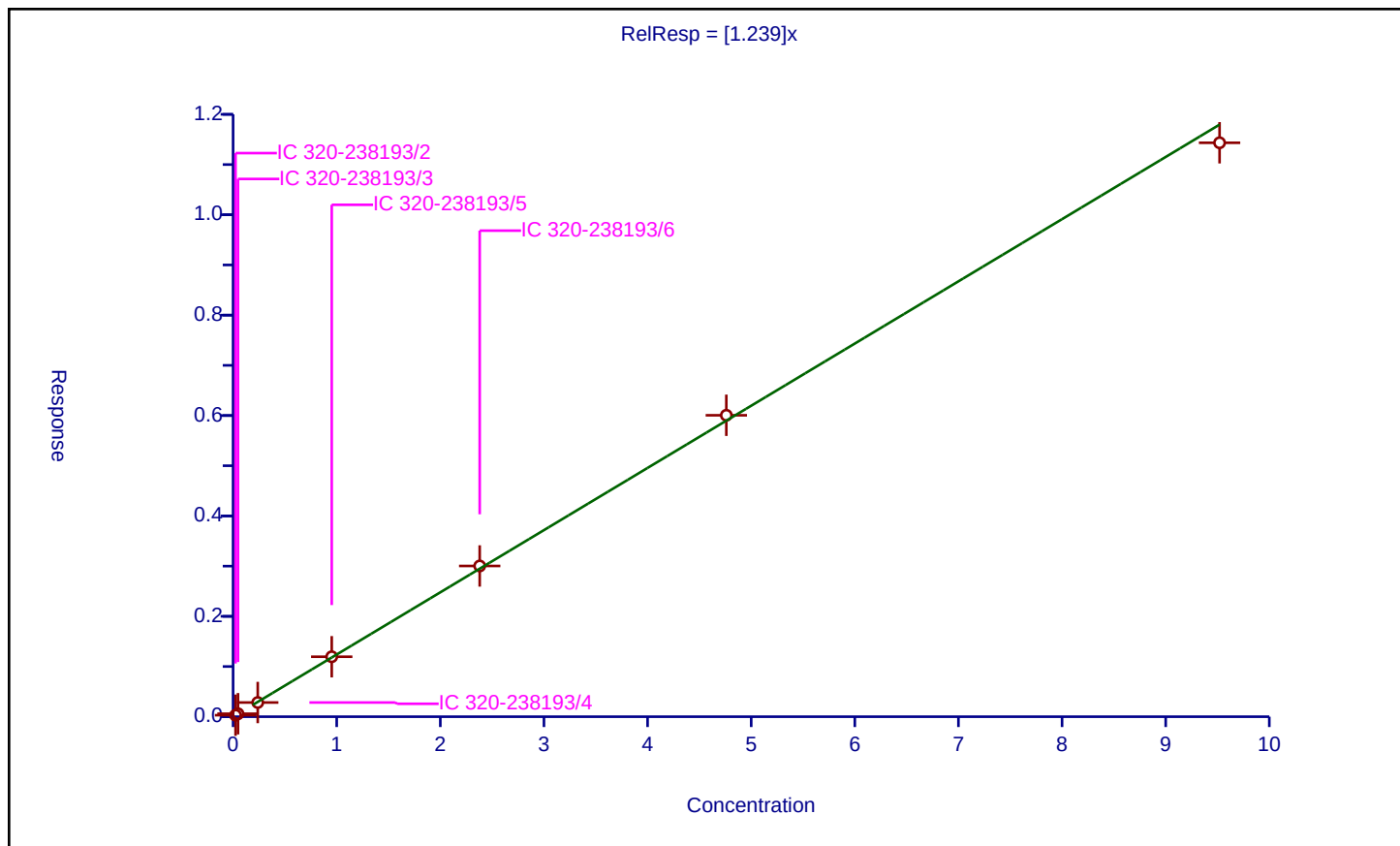
Curve Coefficients

Intercept: 0
 Slope: 1.239

Error Coefficients

Standard Error: 7580000
 Relative Standard Error: 2.5
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0238	0.030011	2.39	3400422.0	1.260973	Y
2	IC 320-238193/3	0.0476	0.059225	2.39	3430647.0	1.244214	Y
3	IC 320-238193/4	0.238	0.282875	2.39	3598367.0	1.188549	Y
4	IC 320-238193/5	0.952	1.194811	2.39	3408113.0	1.255054	Y
5	IC 320-238193/6	2.38	3.003293	2.39	3404908.0	1.261888	Y
6	IC 320-238193/7	4.76	6.005306	2.39	3471061.0	1.261619	Y
7	IC 320-238193/8	9.52	11.434127	2.39	3286355.0	1.201064	Y



Calibration

/ Perfluorononanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

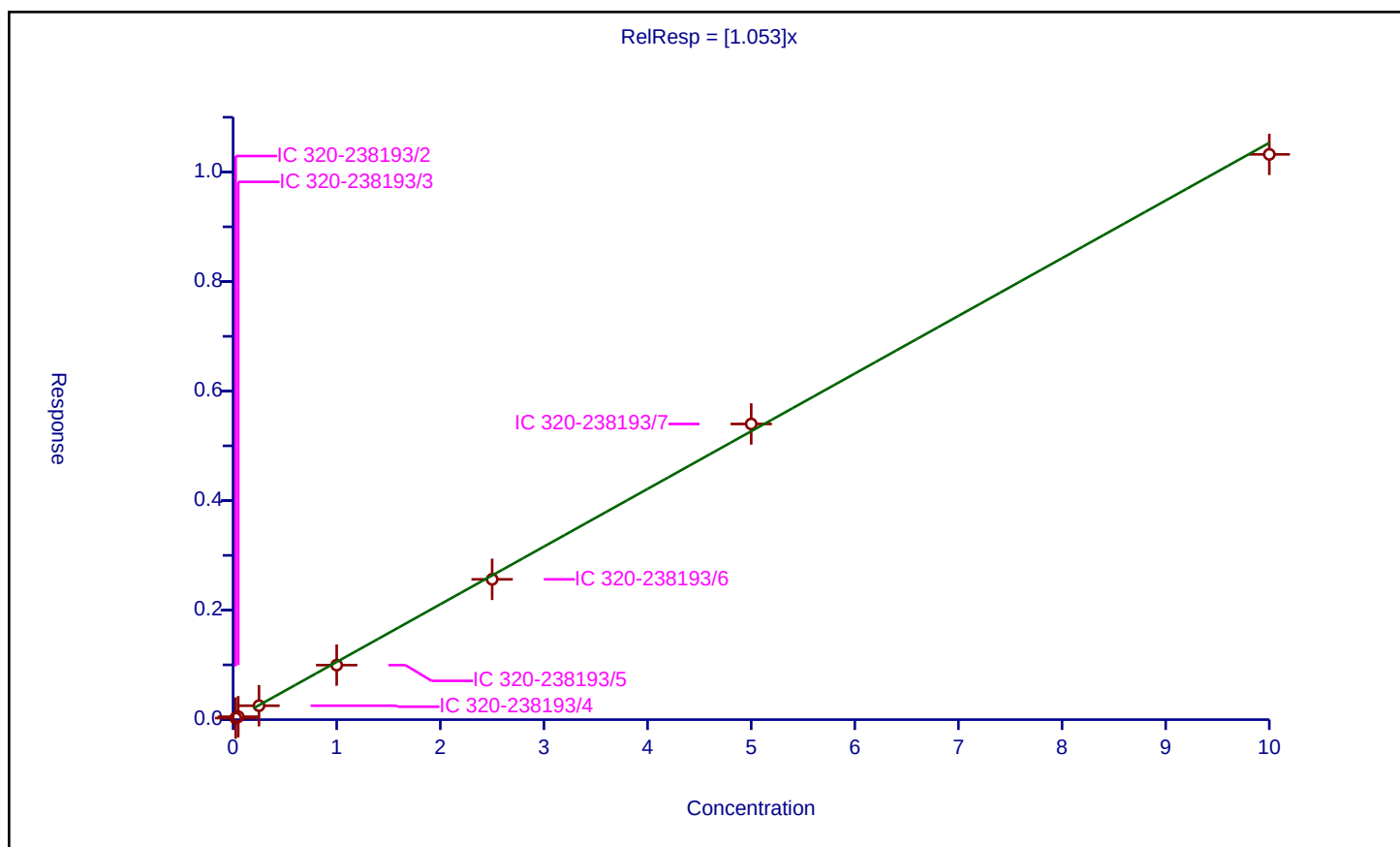
Curve Coefficients

Intercept: 0
 Slope: 1.053

Error Coefficients

Standard Error: 6420000
 Relative Standard Error: 4.9
 Correlation Coefficient: 0.996
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.028682	2.5	3530907.0	1.147297	Y
2	IC 320-238193/3	0.05	0.05374	2.5	3565521.0	1.074794	Y
3	IC 320-238193/4	0.25	0.254538	2.5	3712571.0	1.018152	Y
4	IC 320-238193/5	1.0	0.99618	2.5	3536917.0	0.99618	Y
5	IC 320-238193/6	2.5	2.562344	2.5	3527035.0	1.024938	Y
6	IC 320-238193/7	5.0	5.399512	2.5	3461355.0	1.079902	Y
7	IC 320-238193/8	10.0	10.322645	2.5	3213782.0	1.032264	Y



Calibration

/ Perfluorooctane sulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

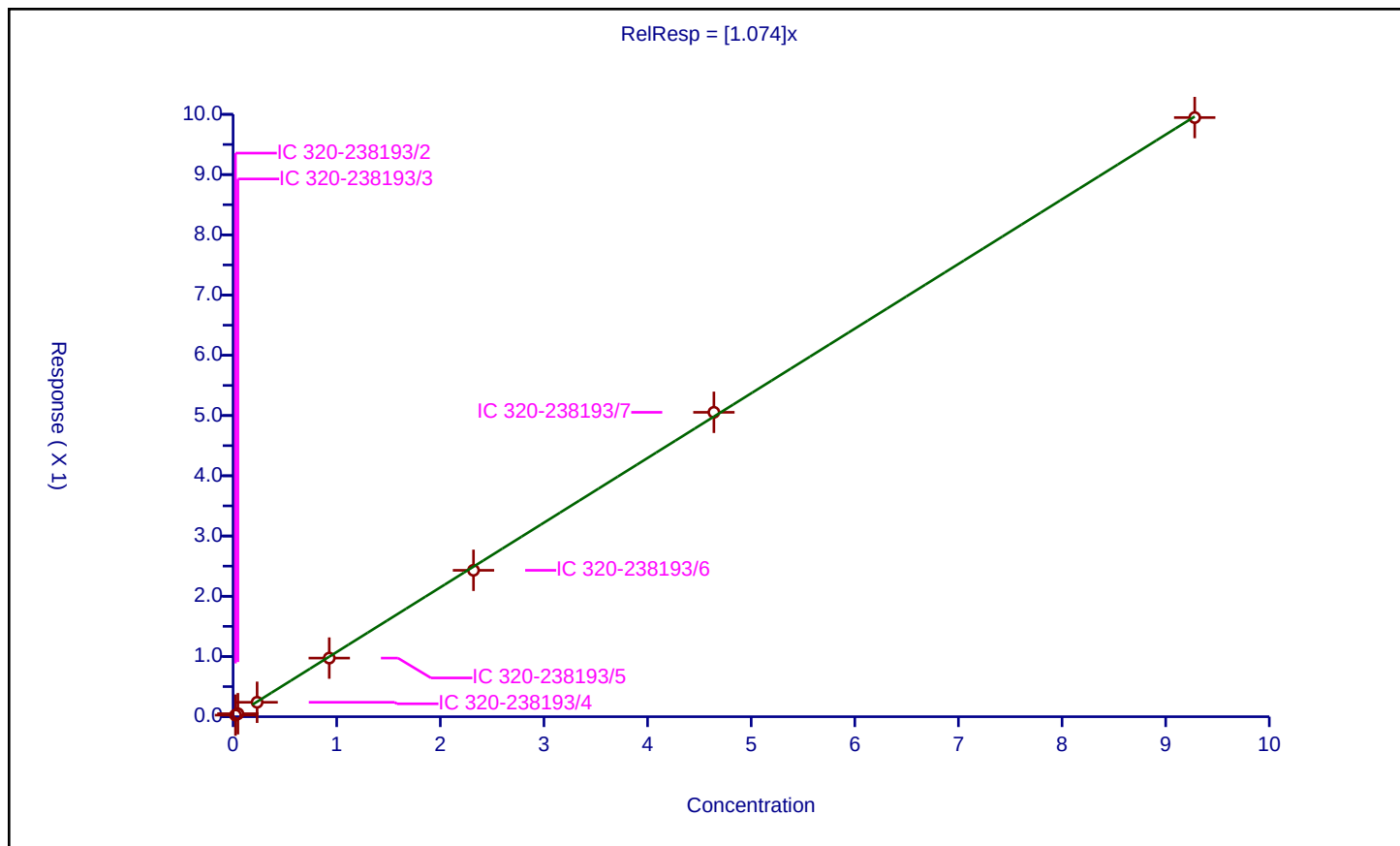
Curve Coefficients

Intercept: 0
 Slope: 1.074

Error Coefficients

Standard Error: 6520000
 Relative Standard Error: 3.5
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0232	0.026569	2.39	3400422.0	1.145197	Y
2	IC 320-238193/3	0.0464	0.050139	2.39	3430647.0	1.080576	Y
3	IC 320-238193/4	0.232	0.239688	2.39	3598367.0	1.033139	Y
4	IC 320-238193/5	0.928	0.973114	2.39	3408113.0	1.048615	Y
5	IC 320-238193/6	2.32	2.430616	2.39	3404908.0	1.047679	Y
6	IC 320-238193/7	4.64	5.053835	2.39	3471061.0	1.089189	Y
7	IC 320-238193/8	9.28	9.946849	2.39	3286355.0	1.071859	Y



Calibration

/ 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

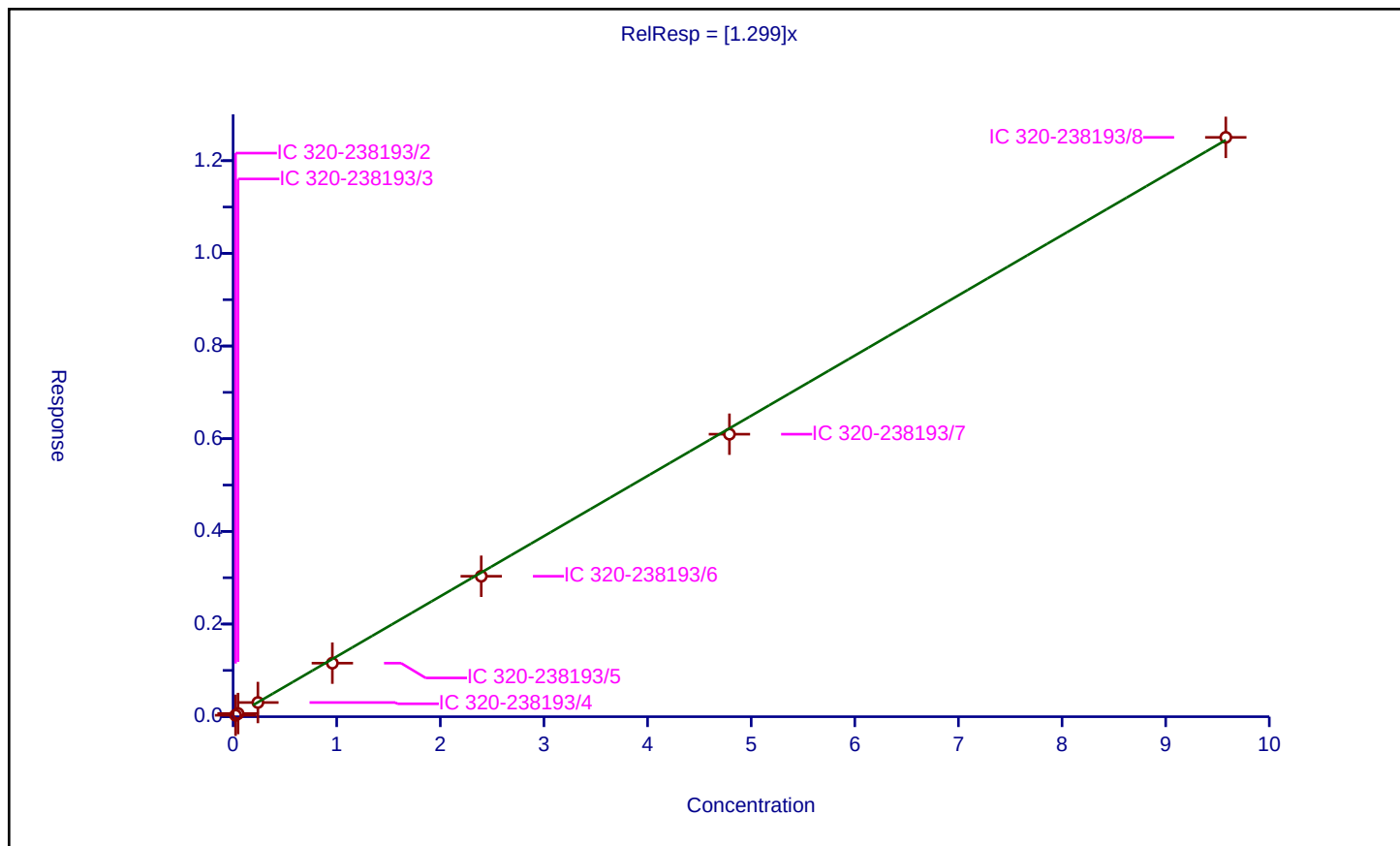
Curve Coefficients

Intercept: 0
 Slope: 1.299

Error Coefficients

Standard Error: 2320000
 Relative Standard Error: 5.6
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.02395	0.031733	2.395	1070959.0	1.324981	Y
2	IC 320-238193/3	0.0479	0.068953	2.395	1065531.0	1.439517	Y
3	IC 320-238193/4	0.2395	0.306393	2.395	1066887.0	1.279301	Y
4	IC 320-238193/5	0.958	1.15562	2.395	1045687.0	1.206284	Y
5	IC 320-238193/6	2.395	3.031449	2.395	1039099.0	1.265741	Y
6	IC 320-238193/7	4.79	6.097565	2.395	1052330.0	1.272978	Y
7	IC 320-238193/8	9.58	12.503205	2.395	920670.0	1.305136	Y



Calibration

/ Perfluorononanesulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

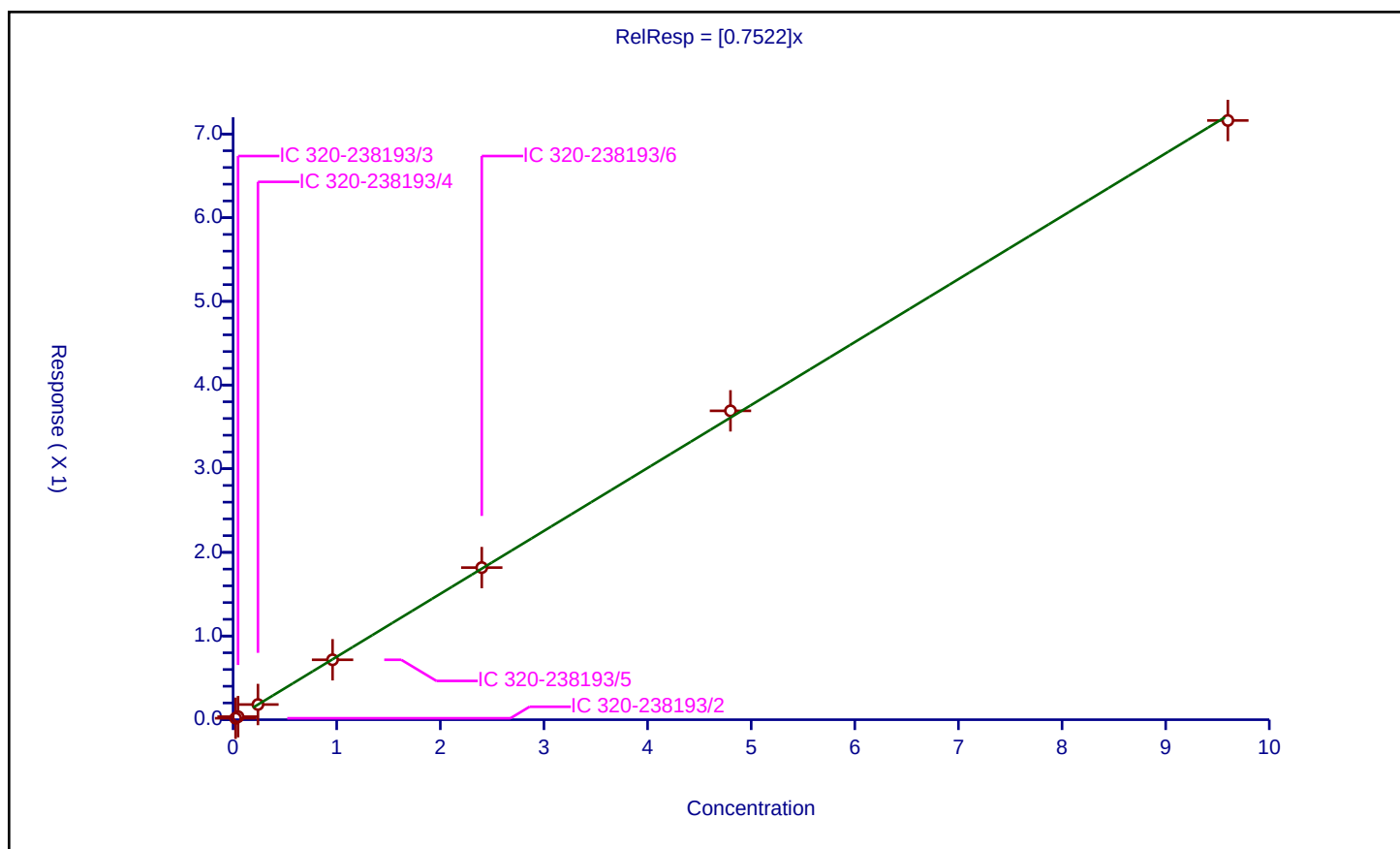
Curve Coefficients

Intercept: 0
 Slope: 0.7522

Error Coefficients

Standard Error: 4720000
 Relative Standard Error: 1.6
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 1.000

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.024	0.017583	2.39	3400422.0	0.732608	Y
2	IC 320-238193/3	0.048	0.036365	2.39	3430647.0	0.757605	Y
3	IC 320-238193/4	0.24	0.181554	2.39	3598367.0	0.756477	Y
4	IC 320-238193/5	0.96	0.716034	2.39	3408113.0	0.745868	Y
5	IC 320-238193/6	2.4	1.817911	2.39	3404908.0	0.757463	Y
6	IC 320-238193/7	4.8	3.691441	2.39	3471061.0	0.76905	Y
7	IC 320-238193/8	9.6	7.16179	2.39	3286355.0	0.74602	Y



Calibration

/ Perfluorodecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

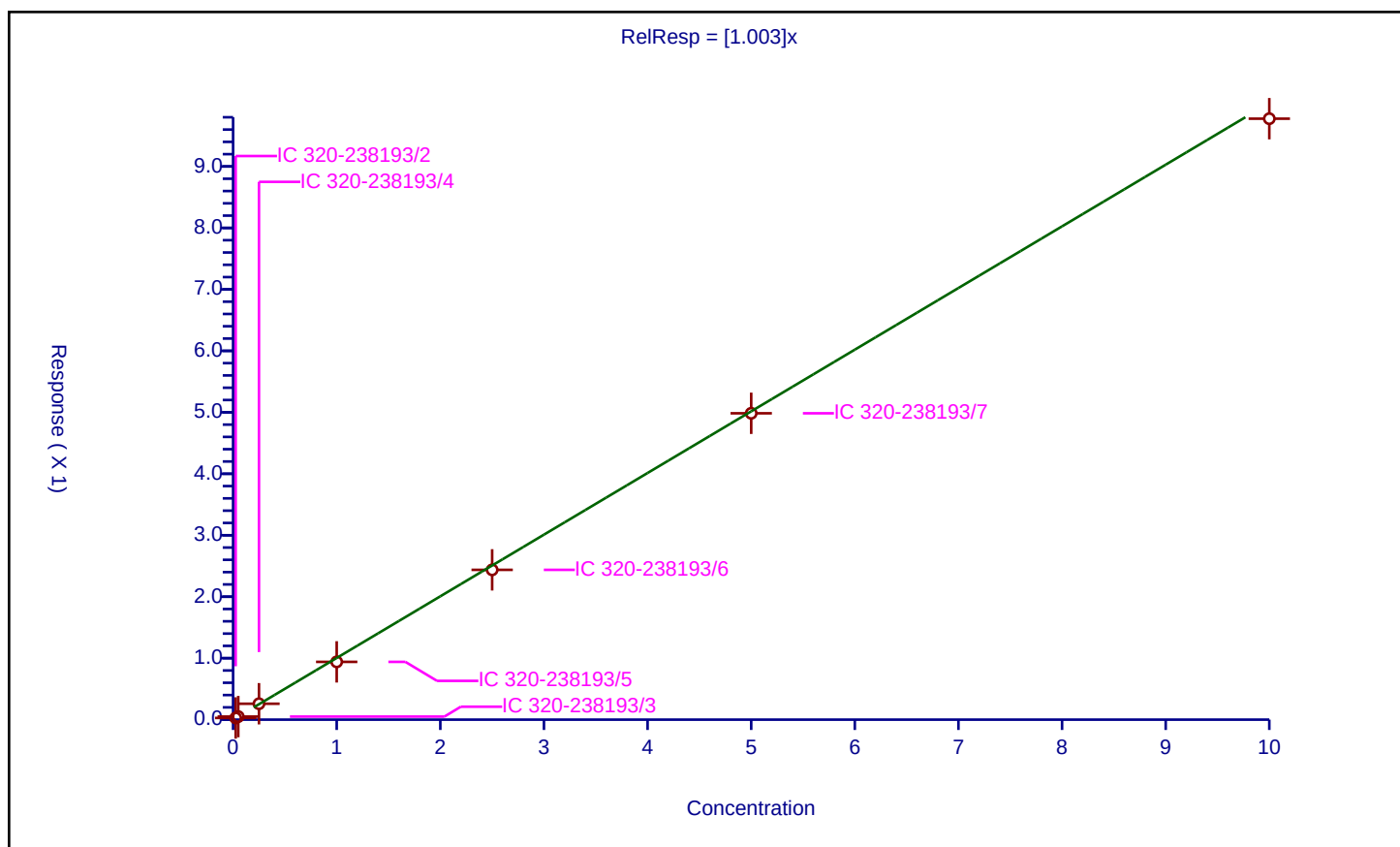
Curve Coefficients

Intercept: 0
 Slope: 1.003

Error Coefficients

Standard Error: 5490000
 Relative Standard Error: 5.1
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.027446	2.5	3043654.0	1.097825	Y
2	IC 320-238193/3	0.05	0.049999	2.5	3067735.0	0.999972	Y
3	IC 320-238193/4	0.25	0.258822	2.5	3074087.0	1.035286	Y
4	IC 320-238193/5	1.0	0.939869	2.5	3162481.0	0.939869	Y
5	IC 320-238193/6	2.5	2.437086	2.5	3093053.0	0.974835	Y
6	IC 320-238193/7	5.0	4.983908	2.5	3159574.0	0.996782	Y
7	IC 320-238193/8	10.0	9.777143	2.5	2921735.0	0.977714	Y



Calibration

/ Perfluorooctane Sulfonamide

Curve Type: Average
Weighting: Conc_Sq
Origin: Force
Dependency: Response
Calib Mode: IsoDil
Response Base: AREA
RF Rounding: 0

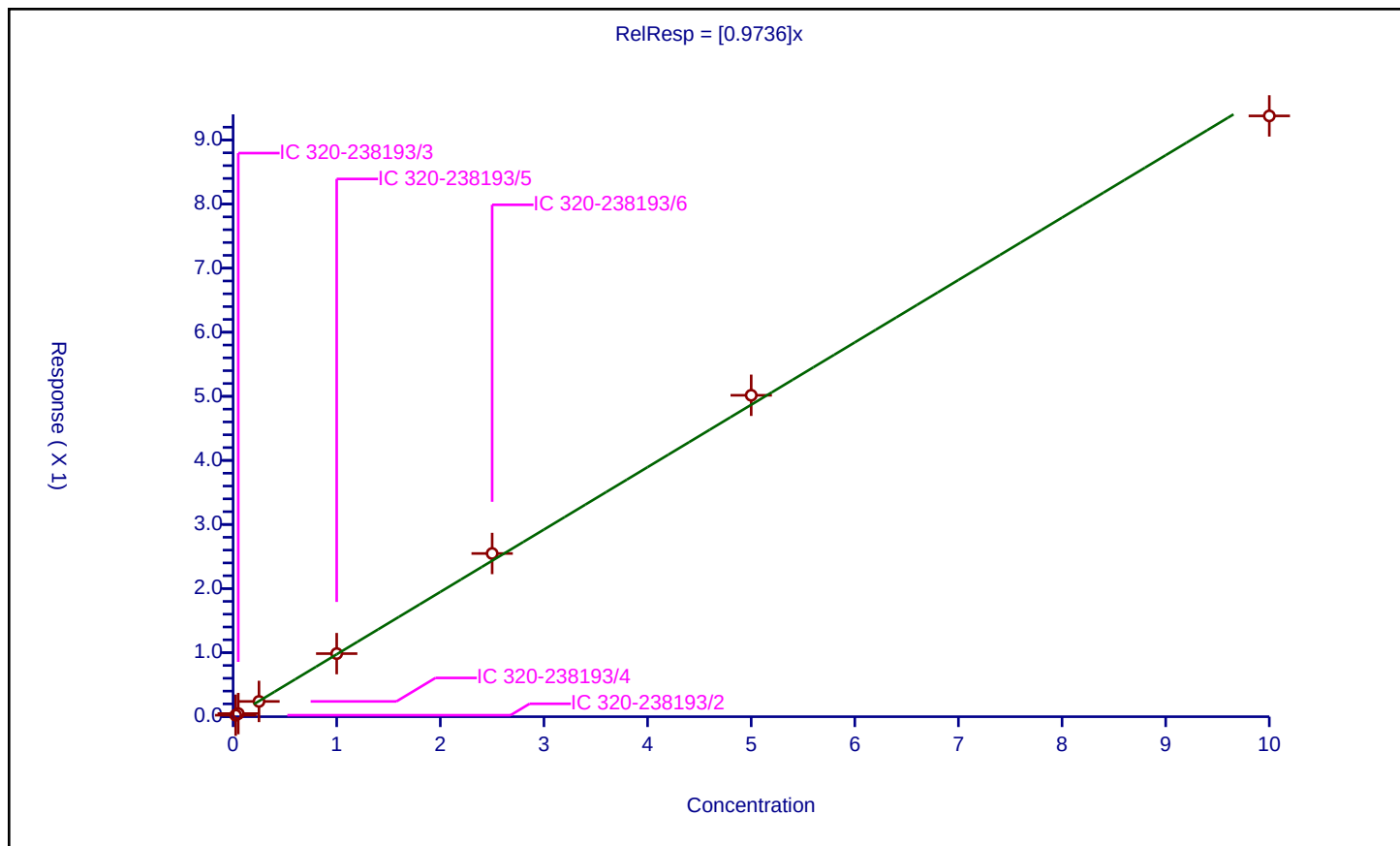
Curve Coefficients

Intercept: 0
Slope: 0.9736

Error Coefficients

Standard Error: 8230000
Relative Standard Error: 3.2
Correlation Coefficient: 0.996
Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.023501	2.5	4809407.0	0.940033	Y
2	IC 320-238193/3	0.05	0.048827	2.5	4875140.0	0.976536	Y
3	IC 320-238193/4	0.25	0.238614	2.5	4992636.0	0.954456	Y
4	IC 320-238193/5	1.0	0.984699	2.5	4677735.0	0.984699	Y
5	IC 320-238193/6	2.5	2.547227	2.5	4593505.0	1.018891	Y
6	IC 320-238193/7	5.0	5.016176	2.5	4781606.0	1.003235	Y
7	IC 320-238193/8	10.0	9.376014	2.5	4531636.0	0.937601	Y



Calibration

/ N-methyl perfluorooctane sulfonamidoacetic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

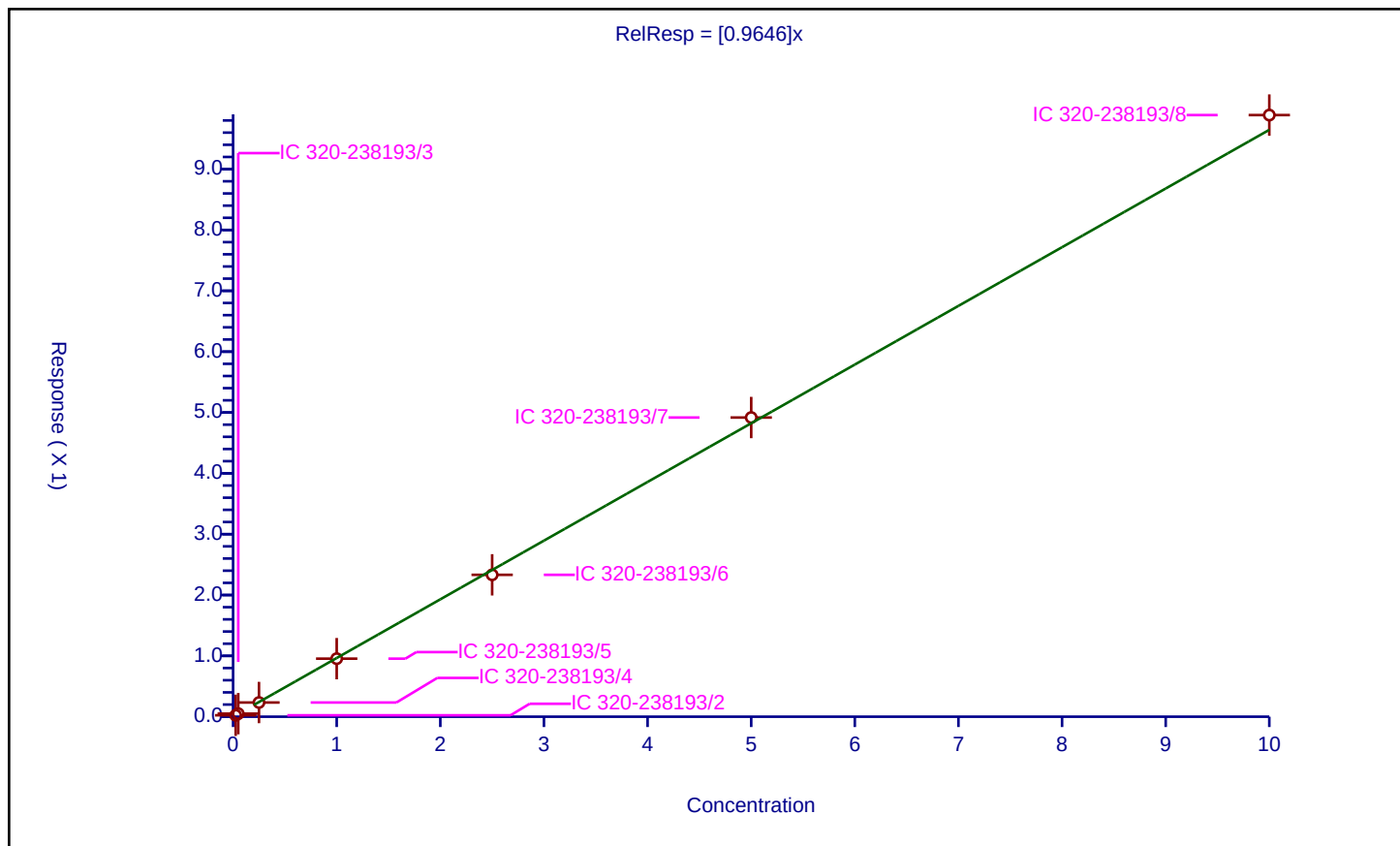
Curve Coefficients

Intercept: 0
 Slope: 0.9646

Error Coefficients

Standard Error: 2790000
 Relative Standard Error: 3.0
 Correlation Coefficient: 1.000
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.023776	2.5	1609182.0	0.951042	Y
2	IC 320-238193/3	0.05	0.05042	2.5	1580220.0	1.008404	Y
3	IC 320-238193/4	0.25	0.233393	2.5	1616798.0	0.933574	Y
4	IC 320-238193/5	1.0	0.954003	2.5	1547904.0	0.954003	Y
5	IC 320-238193/6	2.5	2.332061	2.5	1601576.0	0.932824	Y
6	IC 320-238193/7	5.0	4.917445	2.5	1562466.0	0.983489	Y
7	IC 320-238193/8	10.0	9.888298	2.5	1491160.0	0.98883	Y



Calibration

/ Perfluorodecane Sulfonic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

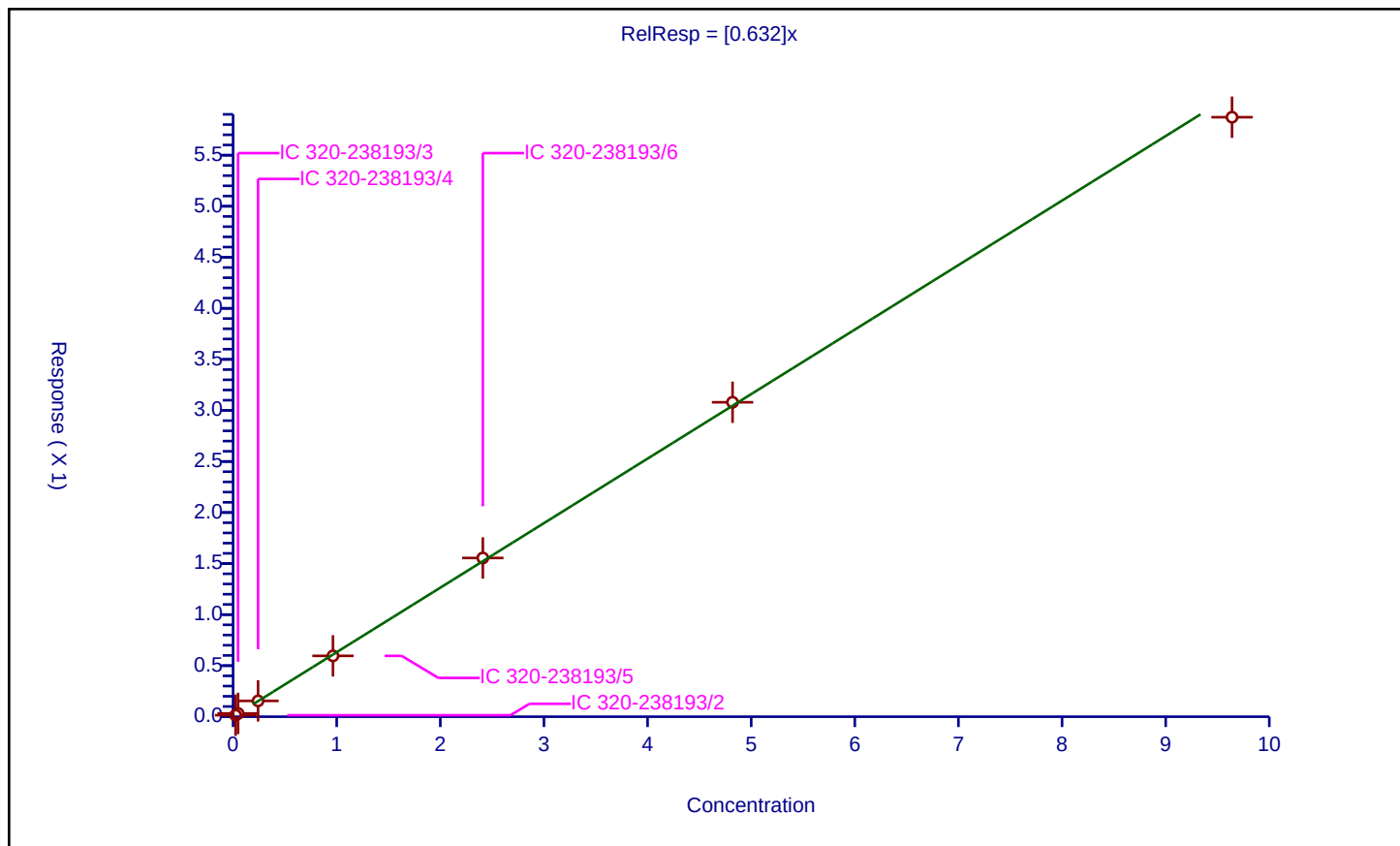
Curve Coefficients

Intercept: 0
 Slope: 0.632

Error Coefficients

Standard Error: 3890000
 Relative Standard Error: 3.4
 Correlation Coefficient: 0.997
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.0241	0.014582	2.39	3400422.0	0.605067	Y
2	IC 320-238193/3	0.0482	0.03202	2.39	3430647.0	0.664315	Y
3	IC 320-238193/4	0.241	0.15494	2.39	3598367.0	0.642906	Y
4	IC 320-238193/5	0.964	0.595962	2.39	3408113.0	0.618218	Y
5	IC 320-238193/6	2.41	1.554675	2.39	3404908.0	0.645093	Y
6	IC 320-238193/7	4.82	3.079819	2.39	3471061.0	0.638967	Y
7	IC 320-238193/8	9.64	5.872006	2.39	3286355.0	0.609129	Y



Calibration

/ N-ethyl perfluorooctane sulfonamidoacetic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

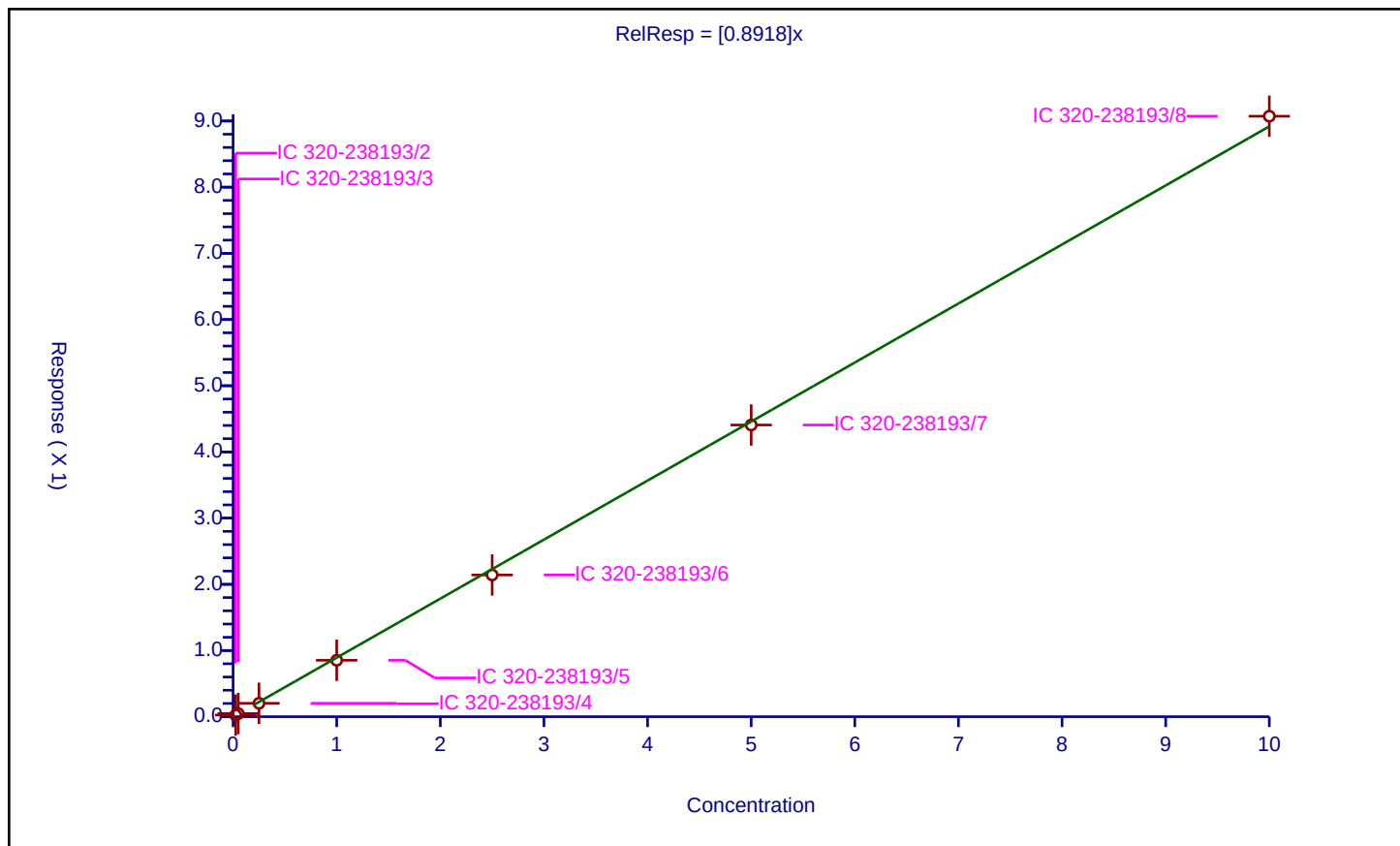
Curve Coefficients

Intercept: 0
 Slope: 0.8918

Error Coefficients

Standard Error: 2450000
 Relative Standard Error: 6.7
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.024612	2.5	1718969.0	0.984485	Y
2	IC 320-238193/3	0.05	0.047453	2.5	1684036.0	0.949059	Y
3	IC 320-238193/4	0.25	0.202793	2.5	1760050.0	0.81117	Y
4	IC 320-238193/5	1.0	0.852618	2.5	1663128.0	0.852618	Y
5	IC 320-238193/6	2.5	2.141459	2.5	1595779.0	0.856584	Y
6	IC 320-238193/7	5.0	4.407058	2.5	1597197.0	0.881412	Y
7	IC 320-238193/8	10.0	9.072174	2.5	1403844.0	0.907217	Y



Calibration

/ Perfluoroundecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

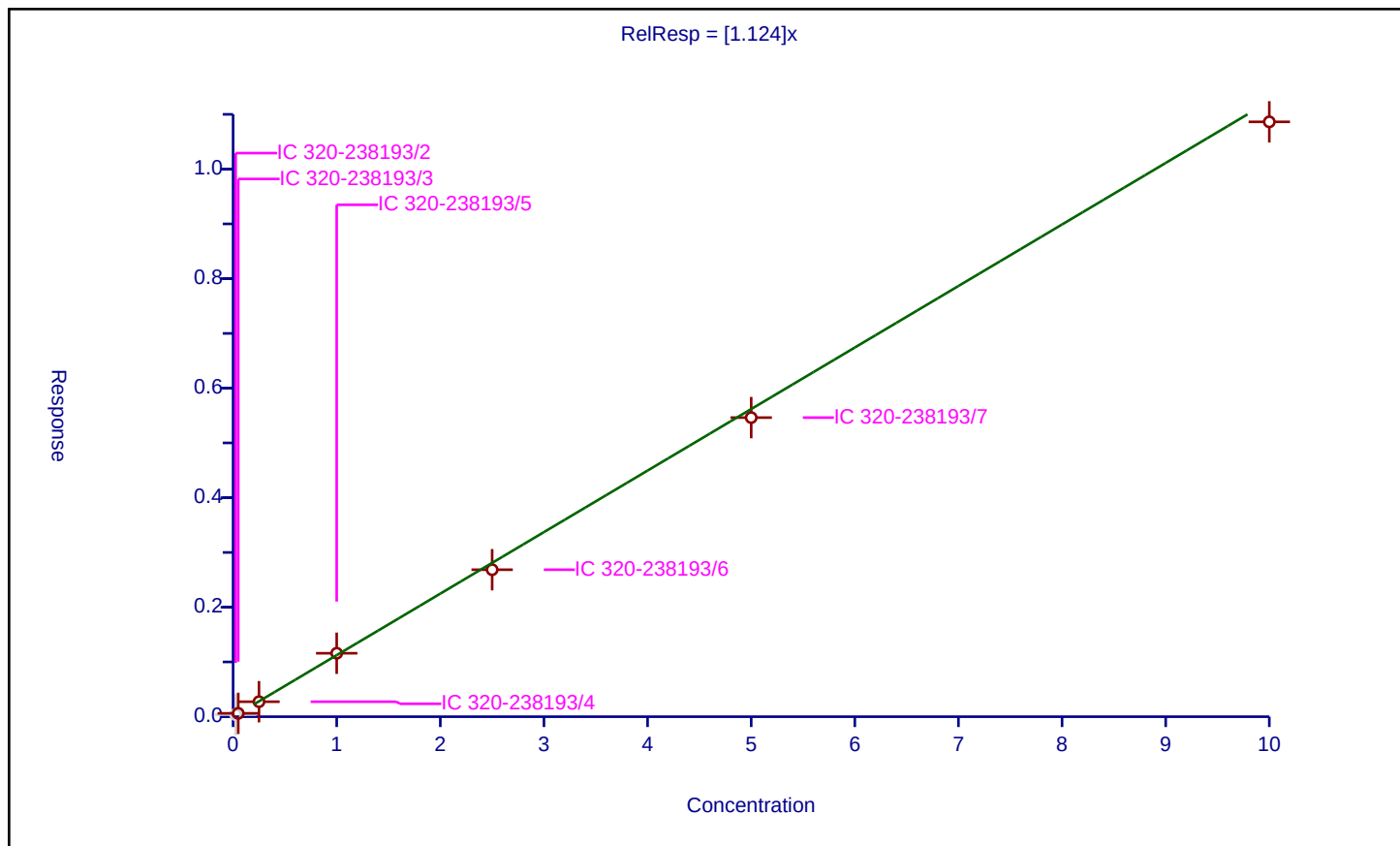
Curve Coefficients

Intercept: 0
 Slope: 1.124

Error Coefficients

Standard Error: 5210000
 Relative Standard Error: 5.5
 Correlation Coefficient: 0.998
 Coefficient of Determination (Adjusted): 0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.038626	2.5	2534521.0	1.545026	N
2	IC 320-238193/3	0.05	0.061716	2.5	2456263.0	1.234314	Y
3	IC 320-238193/4	0.25	0.274014	2.5	2639555.0	1.096056	Y
4	IC 320-238193/5	1.0	1.158939	2.5	2425508.0	1.158939	Y
5	IC 320-238193/6	2.5	2.68457	2.5	2527555.0	1.073828	Y
6	IC 320-238193/7	5.0	5.462098	2.5	2455806.0	1.09242	Y
7	IC 320-238193/8	10.0	10.863244	2.5	2281933.0	1.086324	Y



Calibration

/ Perfluorododecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

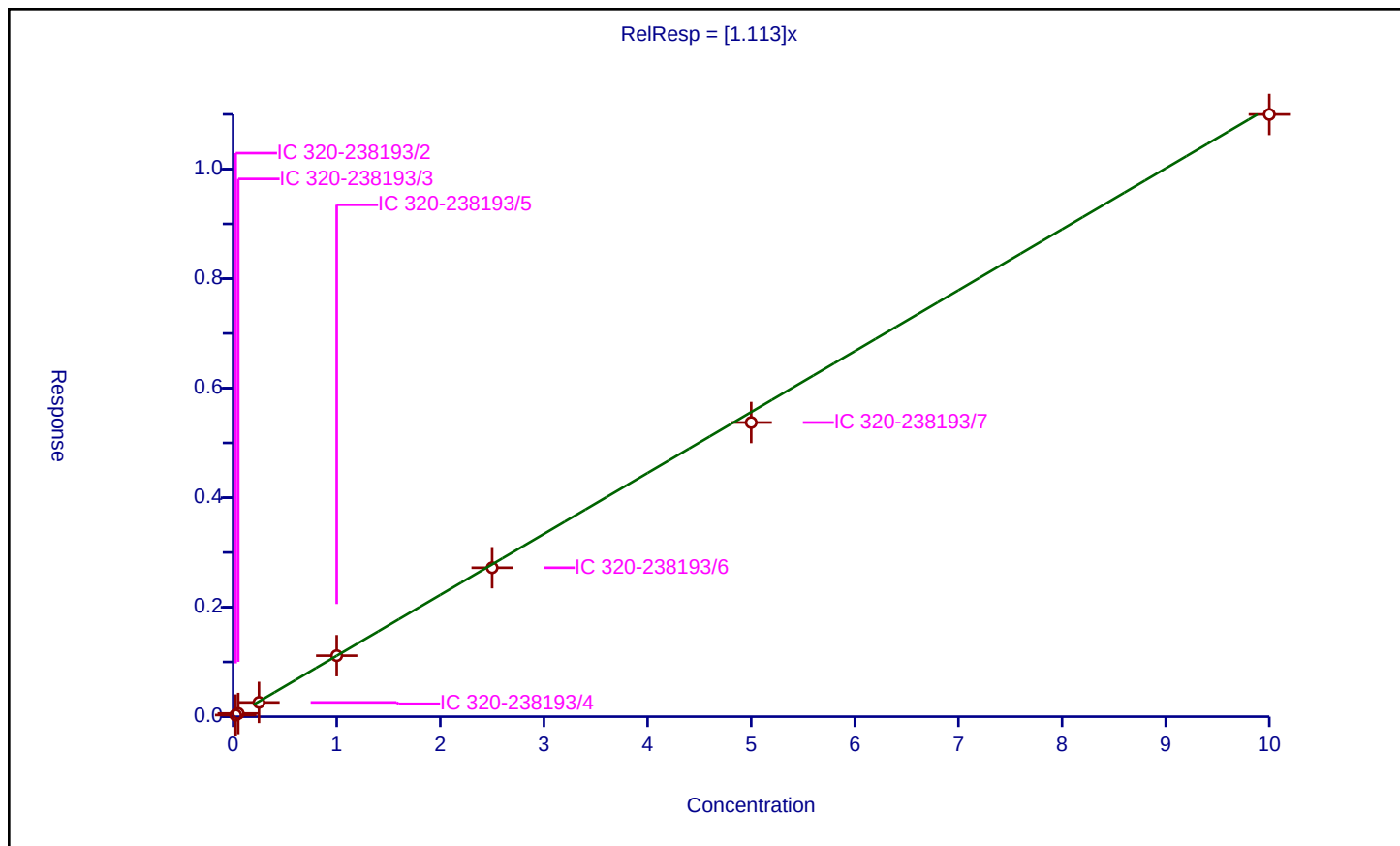
Curve Coefficients

Intercept: 0
 Slope: 1.113

Error Coefficients

Standard Error: 5090000
 Relative Standard Error: 4.8
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.029739	2.5	2591339.0	1.189578	Y
2	IC 320-238193/3	0.05	0.058862	2.5	2599869.0	1.177232	Y
3	IC 320-238193/4	0.25	0.261223	2.5	2785129.0	1.044892	Y
4	IC 320-238193/5	1.0	1.114482	2.5	2610480.0	1.114482	Y
5	IC 320-238193/6	2.5	2.720923	2.5	2668181.0	1.088369	Y
6	IC 320-238193/7	5.0	5.372521	2.5	2627551.0	1.074504	Y
7	IC 320-238193/8	10.0	10.998843	2.5	2422707.0	1.099884	Y



Calibration

/ Perfluorotridecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

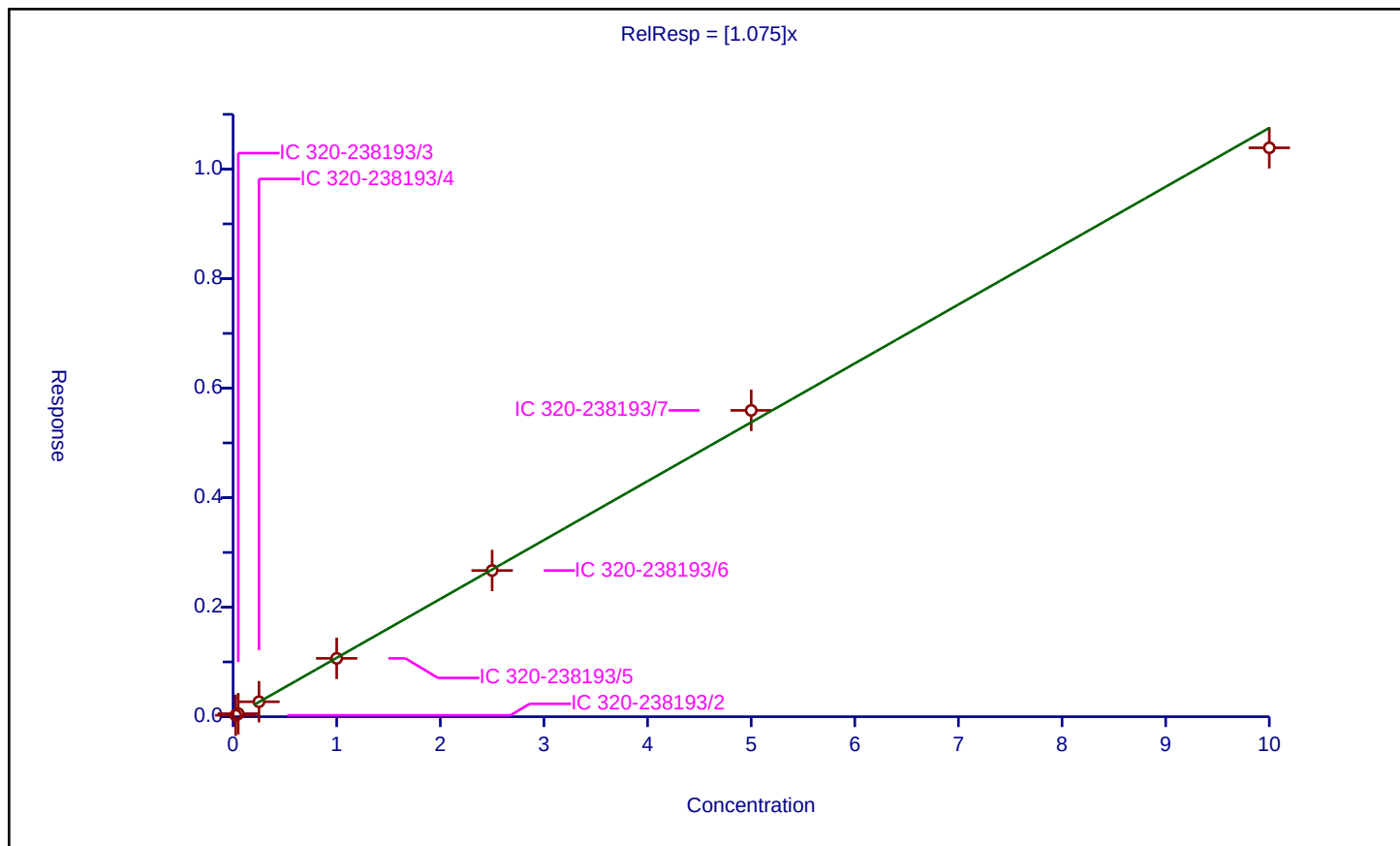
Curve Coefficients

Intercept: 0
 Slope: 1.075

Error Coefficients

Standard Error: 4920000
 Relative Standard Error: 2.8
 Correlation Coefficient: 0.994
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.026038	2.5	2591339.0	1.041508	Y
2	IC 320-238193/3	0.05	0.054986	2.5	2599869.0	1.099728	Y
3	IC 320-238193/4	0.25	0.273592	2.5	2785129.0	1.094369	Y
4	IC 320-238193/5	1.0	1.065564	2.5	2610480.0	1.065564	Y
5	IC 320-238193/6	2.5	2.670075	2.5	2668181.0	1.06803	Y
6	IC 320-238193/7	5.0	5.594154	2.5	2627551.0	1.118831	Y
7	IC 320-238193/8	10.0	10.388884	2.5	2422707.0	1.038888	Y



Calibration

/ Perfluorotetradecanoic acid

Curve Type: Average
 Weighting: Conc_Sq
 Origin: Force
 Dependency: Response
 Calib Mode: IsoDil
 Response Base: AREA
 RF Rounding: 0

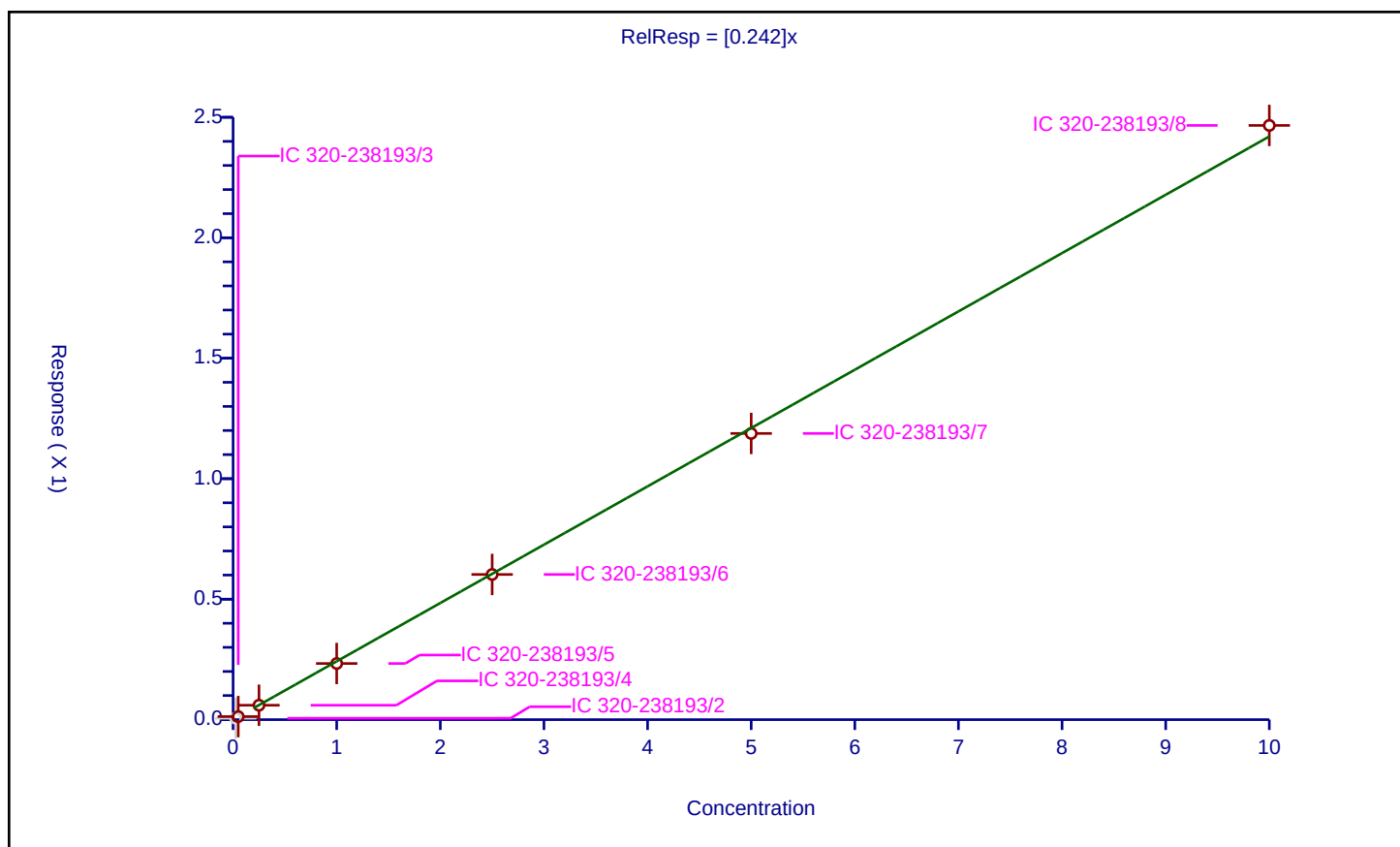
Curve Coefficients

Intercept: 0
 Slope: 0.242

Error Coefficients

Standard Error: 1580000
 Relative Standard Error: 3.2
 Correlation Coefficient: 0.999
 Coefficient of Determination (Adjusted): 0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 320-238193/2	0.025	0.005847	2.5	3447891.0	0.233882	N
2	IC 320-238193/3	0.05	0.01275	2.5	3344339.0	0.254998	Y
3	IC 320-238193/4	0.25	0.059754	2.5	3541707.0	0.239015	Y
4	IC 320-238193/5	1.0	0.233028	2.5	3313318.0	0.233028	Y
5	IC 320-238193/6	2.5	0.60248	2.5	3233399.0	0.240992	Y
6	IC 320-238193/7	5.0	1.187788	2.5	3382019.0	0.237558	Y
7	IC 320-238193/8	10.0	2.466112	2.5	3074334.0	0.246611	Y



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: ICV 320-238193/10 Calibration Date: 08/06/2018 12:12

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.06LLICAL_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	0.9389	0.9111		2.43	2.50	-3.0	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.131		2.49	2.50	-0.6	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	75.88		2.21	2.21	-0.1	30.0
4:2 FTS	AveID	16.57	16.30		2.30	2.34	-1.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9745		2.39	2.50	-4.5	30.0
Perfluoropentanesulfonic acid	AveID	68.92	67.78		2.31	2.35	-1.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.095		2.58	2.50	3.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.006		2.12	2.28	-7.2	30.0
6:2 FTS	AveID	1.573	1.480		2.23	2.38	-5.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.105		2.44	2.50	-2.2	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.268		2.43	2.38	2.3	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.063		2.52	2.50	0.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.062		2.29	2.31	-1.1	30.0
8:2 FTS	AveID	1.299	1.302		2.41	2.40	0.2	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7949		2.54	2.40	5.7	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9537		2.38	2.50	-4.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.033		2.65	2.50	6.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	1.046		2.71	2.50	8.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6548		2.50	2.41	3.6	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.9360		2.62	2.50	5.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.111		2.47	2.50	-1.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.112		2.50	2.50	-0.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.081		2.51	2.50	0.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2415		2.49	2.50	-0.2	30.0
13C4 PFBA	Ave	1.385	1.395		2.52	2.50	0.7	30.0
13C5 PFPeA	Ave	0.9537	0.9739		2.55	2.50	2.1	30.0
13C3-PFBS	Ave	0.0221	0.0228		2.41	2.33	3.5	30.0
13C2 PFHxA	Ave	1.082	1.136		2.62	2.50	5.0	30.0
13C4-PFHpA	Ave	1.065	1.049		2.46	2.50	-1.5	30.0
18O2 PFHxS	Ave	1.366	1.389		2.41	2.37	1.7	30.0
M2-6:2FTS	Ave	0.2242	0.2398		2.54	2.38	7.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: ICV 320-238193/10 Calibration Date: 08/06/2018 12:12
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.06LLICAL_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	1.001		2.56	2.50	2.4	30.0
13C5 PFNA	Ave	0.8770	0.8835		2.52	2.50	0.7	30.0
13C4 PFOS	Ave	0.8973	0.9046		2.41	2.39	0.8	30.0
M2-8:2FTS	Ave	0.2707	0.2722		2.41	2.40	0.5	30.0
13C2 PFDA	Ave	0.7695	0.8085		2.63	2.50	5.1	30.0
13C8 FOSA	Ave	1.188	1.221		2.57	2.50	2.7	30.0
d3-NMeFOSAA	Ave	0.3935	0.4029		2.56	2.50	2.4	30.0
d5-NEtFOSAA	Ave	0.4077	0.4067		2.49	2.50	-0.2	30.0
13C2 PFUnA	Ave	0.6189	0.6228		2.52	2.50	0.6	30.0
13C2 PFDoA	Ave	0.6541	0.6517		2.49	2.50	-0.4	30.0
13C2-PFTeDA	Ave	0.8335	0.8309		2.49	2.50	-0.3	30.0
13C2-PFHxDA	Ave	1.653	1.653		2.50	2.50	-0.0	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_NStart Date: 08/10/2018 08:00Analysis Batch Number: 239237End Date: 08/10/2018 09:57

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-239237/1		08/10/2018 08:00	1	2018.08.10LLA_0 04.d	GeminiC18 3x100 3(mm)
CCVL 320-239237/2		08/10/2018 08:08	1	2018.08.10LLA_0 05.d	GeminiC18 3x100 3(mm)
CCV 320-239237/3 CCVIS		08/10/2018 08:15	1	2018.08.10LLA_0 06.d	GeminiC18 3x100 3(mm)
MB 320-238978/1-A		08/10/2018 08:23	1	2018.08.10LLA_0 07.d	GeminiC18 3x100 3(mm)
LCS 320-238978/2-A		08/10/2018 08:31	1	2018.08.10LLA_0 08.d	GeminiC18 3x100 3(mm)
LCSD 320-238978/3-A		08/10/2018 08:39	1	2018.08.10LLA_0 09.d	GeminiC18 3x100 3(mm)
320-41704-1		08/10/2018 08:47	1	2018.08.10LLA_0 10.d	GeminiC18 3x100 3(mm)
320-41704-2		08/10/2018 08:55	1	2018.08.10LLA_0 11.d	GeminiC18 3x100 3(mm)
320-41704-3		08/10/2018 09:03	1	2018.08.10LLA_0 12.d	GeminiC18 3x100 3(mm)
320-41704-4		08/10/2018 09:10	1	2018.08.10LLA_0 13.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 09:18	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 09:26	1		GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 09:34	1		GeminiC18 3x100 3(mm)
CCV 320-239237/14		08/10/2018 09:42	1	2018.08.10LLA_0 17.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 09:49	1		GeminiC18 3x100 3(mm)
CCV 320-239237/16		08/10/2018 09:57	1		GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-239237/2 Calibration Date: 08/10/2018 08:08
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9376		0.0499	0.0500	-0.1	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.110		0.0488	0.0500	-2.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	79.34		0.0462	0.0442	4.5	30.0
4:2 FTS	AveID	16.57	18.14		0.400	0.0467	9.5	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.078		0.0528	0.0500	5.6	30.0
Perfluoropentanesulfonic acid	AveID	68.92	70.13		0.0477	0.0469	1.8	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.111		0.0523	0.0500	4.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.120		0.0470	0.0455	3.3	30.0
6:2 FTS	AveID	1.573	1.650		0.400	0.0474	4.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.197		0.0530	0.0501	5.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.380		0.0530	0.0476	11.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.055		0.0501	0.0500	0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.142		0.0494	0.0464	6.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.8826		0.0453	0.0500	-9.4	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.8022		0.0512	0.0480	6.6	30.0
8:2 FTS	AveID	1.299	1.349		0.400	0.0479	3.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9903		0.0494	0.0500	-1.3	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9290		0.400	0.0500	-3.7	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6506		0.0496	0.0482	2.9	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.063		0.0473	0.0500	-5.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8020		0.400	0.0500	-10.1	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.024		0.0460	0.0500	-8.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.114		0.0518	0.0500	3.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2600		0.0537	0.0500	7.4	30.0
13C4 PFBA	Ave	1.385	1.308		2.36	2.50	-5.5	30.0
13C5 PFPeA	Ave	0.9537	0.8727		2.29	2.50	-8.5	30.0
13C3-PFBS	Ave	0.0221	0.0190		2.00	2.33	-13.8	30.0
13C2 PFHxA	Ave	1.082	0.996		2.30	2.50	-8.0	30.0
13C4-PFHpA	Ave	1.065	0.9413		2.21	2.50	-11.6	30.0
18O2 PFHxS	Ave	1.366	1.212		2.10	2.37	-11.2	30.0
M2-6:2FTS	Ave	0.2242	0.2354		2.49	2.38	5.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-239237/2 Calibration Date: 08/10/2018 08:08
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLA_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9639		2.47	2.50	-1.4	30.0
13C4 PFOS	Ave	0.8973	0.8143		2.17	2.39	-9.2	30.0
13C5 PFNA	Ave	0.8770	0.7918		2.26	2.50	-9.7	30.0
13C8 FOSA	Ave	1.188	1.151		2.42	2.50	-3.1	30.0
M2-8:2FTS	Ave	0.2707	0.2559		2.26	2.40	-5.5	30.0
13C2 PFDA	Ave	0.7695	0.7132		2.32	2.50	-7.3	30.0
d3-NMeFOSAA	Ave	0.3935	0.3849		2.45	2.50	-2.2	30.0
d5-NEtFOSAA	Ave	0.4077	0.4273		2.62	2.50	4.8	30.0
13C2 PFUnA	Ave	0.6189	0.6258		2.53	2.50	1.1	30.0
13C2 PFDoA	Ave	0.6541	0.6622		2.53	2.50	1.2	30.0
13C2-PFTeDA	Ave	0.8335	0.8609		2.58	2.50	3.3	30.0
13C2-PFHxDA	Ave	1.653	1.401		2.12	2.50	-15.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239237/3 Calibration Date: 08/10/2018 08:15

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.8970		0.955	1.00	-4.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.054		0.926	1.00	-7.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	71.94		0.837	0.884	-5.3	30.0
4:2 FTS	AveID	16.57	16.08		0.907	0.934	-2.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9799		0.960	1.00	-4.0	30.0
Perfluoropentanesulfonic acid	AveID	68.92	66.17		0.900	0.938	-4.0	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.047		0.986	1.00	-1.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.048		0.880	0.910	-3.3	30.0
6:2 FTS	AveID	1.573	1.451		0.874	0.948	-7.8	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.075		0.951	1.00	-4.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.286		0.988	0.952	3.8	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.022		0.971	1.00	-2.9	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.069		0.924	0.928	-0.4	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9435		0.969	1.00	-3.1	30.0
8:2 FTS	AveID	1.299	1.240		0.914	0.958	-4.6	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.8070		1.03	0.960	7.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.008		1.00	1.00	0.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9567		0.992	1.00	-0.8	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6987		1.07	0.964	10.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	0.9059		0.806	1.00	-19.4	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8174		0.917	1.00	-8.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.045		0.940	1.00	-6.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.080		1.00	1.00	0.5	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2352		0.972	1.00	-2.8	30.0
13C4 PFBA	Ave	1.385	1.342		2.42	2.50	-3.1	30.0
13C5 PFPeA	Ave	0.9537	0.8798		2.31	2.50	-7.8	30.0
13C3-PFBS	Ave	0.0221	0.0213		2.25	2.33	-3.2	30.0
13C2 PFHxA	Ave	1.082	0.9854		2.28	2.50	-8.9	30.0
13C4-PFHpA	Ave	1.065	0.9922		2.33	2.50	-6.8	30.0
18O2 PFHxS	Ave	1.366	1.222		2.12	2.37	-10.5	30.0
M2-6:2FTS	Ave	0.2242	0.2453		2.60	2.38	9.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239237/3 Calibration Date: 08/10/2018 08:15
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLA_006.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9614		2.46	2.50	-1.6	30.0
13C4 PFOS	Ave	0.8973	0.8196		2.18	2.39	-8.7	30.0
13C5 PFNA	Ave	0.8770	0.8102		2.31	2.50	-7.6	30.0
13C8 FOSA	Ave	1.188	1.174		2.47	2.50	-1.2	30.0
M2-8:2FTS	Ave	0.2707	0.2711		2.40	2.40	0.1	30.0
13C2 PFDA	Ave	0.7695	0.7195		2.34	2.50	-6.5	30.0
d3-NMeFOSAA	Ave	0.3935	0.3879		2.46	2.50	-1.4	30.0
d5-NEtFOSAA	Ave	0.4077	0.4325		2.65	2.50	6.1	30.0
13C2 PFUnA	Ave	0.6189	0.6090		2.46	2.50	-1.6	30.0
13C2 PFDoA	Ave	0.6541	0.6353		2.43	2.50	-2.9	30.0
13C2-PFTeDA	Ave	0.8335	0.8820		2.65	2.50	5.8	30.0
13C2-PFHxDA	Ave	1.653	1.434		2.17	2.50	-13.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239237/14 Calibration Date: 08/10/2018 09:42

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLA_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9172		2.44	2.50	-2.3	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.090		2.39	2.50	-4.2	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	74.08		2.16	2.21	-2.5	30.0
4:2 FTS	AveID	16.57	16.23		2.29	2.34	-2.0	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.002		2.45	2.50	-1.8	30.0
Perfluoropentanesulfonic acid	AveID	68.92	67.18		2.29	2.35	-2.5	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.091		2.57	2.50	2.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.016		2.13	2.28	-6.3	30.0
6:2 FTS	AveID	1.573	1.465		2.21	2.37	-6.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.044		2.31	2.50	-7.6	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.351		2.60	2.38	9.1	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.041		2.47	2.50	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.103		2.38	2.32	2.7	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9772		2.51	2.50	0.4	30.0
8:2 FTS	AveID	1.299	1.331		2.45	2.40	2.5	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.8181		2.61	2.40	8.8	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.024		2.55	2.50	2.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9748		2.53	2.50	1.1	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6802		2.59	2.41	7.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	0.9766		2.17	2.50	-13.1	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8355		2.34	2.50	-6.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.092		2.45	2.50	-1.9	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.057		2.46	2.50	-1.7	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2450		2.53	2.50	1.2	30.0
13C4 PFBA	Ave	1.385	1.372		2.48	2.50	-1.0	30.0
13C5 PFPeA	Ave	0.9537	0.8975		2.35	2.50	-5.9	30.0
13C3-PFBS	Ave	0.0221	0.0212		2.24	2.33	-3.7	30.0
13C2 PFHxA	Ave	1.082	1.017		2.35	2.50	-6.0	30.0
13C4-PFHpA	Ave	1.065	0.9424		2.21	2.50	-11.5	30.0
18O2 PFHxS	Ave	1.366	1.257		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2242	0.2304		2.44	2.38	2.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239237/14 Calibration Date: 08/10/2018 09:42
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLA_017.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	1.003		2.57	2.50	2.6	30.0
13C4 PFOS	Ave	0.8973	0.8171		2.18	2.39	-8.9	30.0
13C5 PFNA	Ave	0.8770	0.7899		2.25	2.50	-9.9	30.0
13C8 FOSA	Ave	1.188	1.139		2.40	2.50	-4.2	30.0
M2-8:2FTS	Ave	0.2707	0.2458		2.17	2.40	-9.2	30.0
13C2 PFDA	Ave	0.7695	0.7175		2.33	2.50	-6.8	30.0
d3-NMeFOSAA	Ave	0.3935	0.3829		2.43	2.50	-2.7	30.0
d5-NEtFOSAA	Ave	0.4077	0.4182		2.56	2.50	2.6	30.0
13C2 PFUnA	Ave	0.6189	0.5893		2.38	2.50	-4.8	30.0
13C2 PFDoA	Ave	0.6541	0.6426		2.46	2.50	-1.8	30.0
13C2-PFTeDA	Ave	0.8335	0.8479		2.54	2.50	1.7	30.0
13C2-PFHxDA	Ave	1.653	1.466		2.22	2.50	-11.4	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/10/2018 16:33Analysis Batch Number: 239308 End Date: 08/10/2018 18:07

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCB 320-239308/1		08/10/2018 16:33	1	2018.08.10LLAAAX 004.d	GeminiC18 3x100 3(mm)
CCVL 320-239308/2		08/10/2018 16:41	1	2018.08.10LLAAAX 005.d	GeminiC18 3x100 3(mm)
CCV 320-239308/3 CCVIS		08/10/2018 16:48	1	2018.08.10LLAAAX 045.d	GeminiC18 3x100 3(mm)
CCV 320-239308/13		08/10/2018 18:07	1		GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCVL 320-239308/2 Calibration Date: 08/10/2018 16:41

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLAAAX_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.8499		0.0453	0.0500	-9.5	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.219		0.0535	0.0500	7.1	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	77.41		0.0450	0.0442	1.9	30.0
4:2 FTS	AveID	16.57	15.43		0.400	0.0467	-6.9	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.077		0.0527	0.0500	5.5	30.0
Perfluoropentanesulfonic acid	AveID	68.92	68.83		0.0468	0.0469	-0.1	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.032		0.0486	0.0500	-2.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.146		0.0481	0.0455	5.7	30.0
6:2 FTS	AveID	1.573	1.377		0.400	0.0474	-12.5	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.254		0.0555	0.0501	10.9	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.256		0.0483	0.0476	1.4	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	0.9887		0.0469	0.0500	-6.1	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.084		0.0468	0.0464	1.0	30.0
8:2 FTS	AveID	1.299	1.171		0.400	0.0479	-9.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.8606		0.0442	0.0500	-11.6	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7435		0.0474	0.0480	-1.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.034		0.0515	0.0500	3.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9228		0.400	0.0500	-4.3	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6398		0.0488	0.0482	1.2	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.210		0.0539	0.0500	7.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.9297		0.0521	0.0500	4.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.157		0.0520	0.0500	4.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.136		0.0528	0.0500	5.6	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2395		0.0495	0.0500	-1.0	30.0
13C4 PFBA	Ave	1.385	1.292		2.33	2.50	-6.7	30.0
13C5 PFPeA	Ave	0.9537	0.8485		2.22	2.50	-11.0	30.0
13C3-PFBS	Ave	0.0221	0.0199		2.09	2.33	-9.9	30.0
13C2 PFHxA	Ave	1.082	0.9799		2.26	2.50	-9.5	30.0
13C4-PFHpA	Ave	1.065	0.9566		2.25	2.50	-10.2	30.0
18O2 PFHxS	Ave	1.366	1.211		2.10	2.37	-11.3	30.0
M2-6:2FTS	Ave	0.2242	0.2133		2.26	2.38	-4.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-239308/2 Calibration Date: 08/10/2018 16:41
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLAAAX_005.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9737		2.49	2.50	-0.4	30.0
13C4 PFOS	Ave	0.8973	0.8176		2.18	2.39	-8.9	30.0
13C5 PFNA	Ave	0.8770	0.8231		2.35	2.50	-6.1	30.0
13C8 FOSA	Ave	1.188	1.111		2.34	2.50	-6.5	30.0
M2-8:2FTS	Ave	0.2707	0.2439		2.16	2.40	-9.9	30.0
13C2 PFDA	Ave	0.7695	0.7241		2.35	2.50	-5.9	30.0
d3-NMeFOSAA	Ave	0.3935	0.3592		2.28	2.50	-8.7	30.0
d5-NEtFOSAA	Ave	0.4077	0.3804		2.33	2.50	-6.7	30.0
13C2 PFUnA	Ave	0.6189	0.5848		2.36	2.50	-5.5	30.0
13C2 PFDoA	Ave	0.6541	0.6084		2.33	2.50	-7.0	30.0
13C2-PFTeDA	Ave	0.8335	0.8020		2.41	2.50	-3.8	30.0
13C2-PFHxDA	Ave	1.653	1.301		1.97	2.50	-21.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239308/3 Calibration Date: 08/10/2018 16:48

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLAAAX_045.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9018		2.40	2.50	-3.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.117		2.45	2.50	-1.8	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	75.51		2.20	2.21	-0.6	30.0
4:2 FTS	AveID	16.57	15.65		2.20	2.34	-5.6	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9815		2.40	2.50	-3.8	30.0
Perfluoropentanesulfonic acid	AveID	68.92	70.76		2.41	2.35	2.7	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.092		2.57	2.50	2.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.038		2.18	2.28	-4.3	30.0
6:2 FTS	AveID	1.573	1.579		2.38	2.37	0.3	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.122		2.48	2.50	-0.8	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.313		2.52	2.38	6.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.019		2.42	2.50	-3.3	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.082		2.34	2.32	0.8	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9690		2.49	2.50	-0.5	30.0
8:2 FTS	AveID	1.299	1.264		2.33	2.40	-2.7	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.8054		2.57	2.40	7.1	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.998		2.49	2.50	-0.5	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9599		2.49	2.50	-0.5	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6676		2.55	2.41	5.6	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	0.9921		2.21	2.50	-11.7	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8298		2.33	2.50	-6.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.089		2.45	2.50	-2.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.097		2.55	2.50	2.0	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2401		2.48	2.50	-0.8	30.0
13C4 PFBA	Ave	1.385	1.363		2.46	2.50	-1.6	30.0
13C5 PFPeA	Ave	0.9537	0.8970		2.35	2.50	-5.9	30.0
13C3-PFBS	Ave	0.0221	0.0211		2.22	2.33	-4.4	30.0
13C2 PFHxA	Ave	1.082	1.032		2.38	2.50	-4.6	30.0
13C4-PFHpA	Ave	1.065	0.9773		2.29	2.50	-8.2	30.0
18O2 PFHxS	Ave	1.366	1.258		2.18	2.37	-7.9	30.0
M2-6:2FTS	Ave	0.2242	0.2159		2.29	2.38	-3.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239308/3 Calibration Date: 08/10/2018 16:48
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLAAAX_045.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9682		2.48	2.50	-0.9	30.0
13C4 PFOS	Ave	0.8973	0.8474		2.26	2.39	-5.6	30.0
13C5 PFNA	Ave	0.8770	0.8312		2.37	2.50	-5.2	30.0
13C8 FOSA	Ave	1.188	1.183		2.49	2.50	-0.5	30.0
M2-8:2FTS	Ave	0.2707	0.2500		2.21	2.40	-7.7	30.0
13C2 PFDA	Ave	0.7695	0.7349		2.39	2.50	-4.5	30.0
d3-NMeFOSAA	Ave	0.3935	0.3743		2.38	2.50	-4.9	30.0
d5-NEtFOSAA	Ave	0.4077	0.4089		2.51	2.50	0.3	30.0
13C2 PFUnA	Ave	0.6189	0.6107		2.47	2.50	-1.3	30.0
13C2 PFDoA	Ave	0.6541	0.6256		2.39	2.50	-4.4	30.0
13C2-PFTeDA	Ave	0.8335	0.8579		2.57	2.50	2.9	30.0
13C2-PFHxDA	Ave	1.653	1.423		2.15	2.50	-13.9	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/10/2018 20:04Analysis Batch Number: 239343 End Date: 08/10/2018 20:27

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-239343/1		08/10/2018 20:04	1	2018.08.10LLAAAX 079.d	GeminiC18 3x100 3(mm)
320-41704-1 DL		08/10/2018 20:12	20	2018.08.10LLAAAX 080.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/10/2018 20:20	1		GeminiC18 3x100 3(mm)
CCV 320-239343/4		08/10/2018 20:27	1	2018.08.10LLAAAX 082.d	GeminiC18 3x100 3(mm)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239343/1 Calibration Date: 08/10/2018 20:04

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLAAAX_079.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.8974		0.956	1.00	-4.4	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.069		0.940	1.00	-6.0	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	75.92		0.884	0.884	-0.0	30.0
4:2 FTS	AveID	16.57	16.77		0.945	0.934	1.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	0.9681		0.949	1.00	-5.1	30.0
Perfluoropentanesulfonic acid	AveID	68.92	67.99		0.925	0.938	-1.4	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.015		0.956	1.00	-4.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.006		0.844	0.910	-7.2	30.0
6:2 FTS	AveID	1.573	1.504		0.906	0.948	-4.4	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.081		0.957	1.00	-4.4	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.301		1.00	0.952	5.0	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.056		1.00	1.00	0.2	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.054		0.911	0.928	-1.9	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	0.9721		0.998	1.00	-0.2	30.0
8:2 FTS	AveID	1.299	1.296		0.956	0.958	-0.3	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7685		0.981	0.960	2.2	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	0.9936		0.990	1.00	-1.0	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9746		1.01	1.00	1.0	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.6682		1.02	0.964	5.7	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	1.000		0.890	1.00	-11.0	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.7818		0.877	1.00	-12.3	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.034		0.929	1.00	-7.1	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.019		0.948	1.00	-5.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2427		1.00	1.00	0.3	30.0
13C4 PFBA	Ave	1.385	1.302		2.35	2.50	-6.0	30.0
13C5 PFPeA	Ave	0.9537	0.8697		2.28	2.50	-8.8	30.0
13C3-PFBS	Ave	0.0221	0.0200		2.11	2.33	-9.4	30.0
13C2 PFHxA	Ave	1.082	0.9778		2.26	2.50	-9.6	30.0
13C4-PFHpA	Ave	1.065	0.9513		2.23	2.50	-10.7	30.0
18O2 PFHxS	Ave	1.366	1.180		2.04	2.37	-13.6	30.0
M2-6:2FTS	Ave	0.2242	0.2338		2.48	2.38	4.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239343/1 Calibration Date: 08/10/2018 20:04
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLAAAX_079.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9569		2.45	2.50	-2.1	30.0
13C4 PFOS	Ave	0.8973	0.8111		2.16	2.39	-9.6	30.0
13C5 PFNA	Ave	0.8770	0.7896		2.25	2.50	-10.0	30.0
13C8 FOSA	Ave	1.188	1.097		2.31	2.50	-7.7	30.0
M2-8:2FTS	Ave	0.2707	0.2685		2.38	2.40	-0.8	30.0
13C2 PFDA	Ave	0.7695	0.7124		2.31	2.50	-7.4	30.0
d3-NMeFOSAA	Ave	0.3935	0.3772		2.40	2.50	-4.1	30.0
d5-NEtFOSAA	Ave	0.4077	0.4210		2.58	2.50	3.3	30.0
13C2 PFUnA	Ave	0.6189	0.5901		2.38	2.50	-4.6	30.0
13C2 PFDoA	Ave	0.6541	0.6469		2.47	2.50	-1.1	30.0
13C2-PFTeDA	Ave	0.8335	0.8417		2.52	2.50	1.0	30.0
13C2-PFHxDA	Ave	1.653	1.420		2.15	2.50	-14.1	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Lab Sample ID: CCV 320-239343/4 Calibration Date: 08/10/2018 20:27

Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56

Lab File ID: 2018.08.10LLAAAX_082.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9389	0.9211		2.45	2.50	-1.9	30.0
Perfluoropentanoic acid (PFPeA)	AveID	1.138	1.154		2.53	2.50	1.4	30.0
Perfluorobutanesulfonic acid (PFBS)	AveID	75.96	78.98		2.30	2.21	4.0	30.0
4:2 FTS	AveID	16.57	16.60		2.34	2.34	0.2	30.0
Perfluorohexanoic acid (PFHxA)	AveID	1.021	1.022		2.50	2.50	0.0	30.0
Perfluoropentanesulfonic acid	AveID	68.92	69.54		2.37	2.35	0.9	30.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.062	1.038		2.44	2.50	-2.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.084	1.014		2.13	2.28	-6.5	30.0
6:2 FTS	AveID	1.573	1.544		2.33	2.37	-1.9	30.0
Perfluorooctanoic acid (PFOA)	AveID	1.131	1.068		2.36	2.50	-5.5	30.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.239	1.321		2.54	2.38	6.6	30.0
Perfluorononanoic acid (PFNA)	AveID	1.053	1.049		2.49	2.50	-0.5	30.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.074	1.099		2.37	2.32	2.3	30.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9736	1.034		2.66	2.50	6.2	30.0
Perfluorononanesulfonic acid	AveID	0.7522	0.7967		2.54	2.40	5.9	30.0
8:2 FTS	AveID	1.299	1.231		2.27	2.40	-5.3	30.0
Perfluorodecanoic acid (PFDA)	AveID	1.003	1.034		2.58	2.50	3.1	30.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	0.9646	0.9629		2.50	2.50	-0.2	30.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6320	0.7067		2.69	2.41	11.8	30.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.8918	0.8296		2.33	2.50	-7.0	30.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.124	0.9560		2.13	2.50	-14.9	30.0
Perfluorododecanoic acid (PFDoA)	AveID	1.113	1.023		2.30	2.50	-8.0	30.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.075	1.020		2.37	2.50	-5.2	30.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2420	0.2412		2.49	2.50	-0.3	30.0
13C4 PFBA	Ave	1.385	1.370		2.47	2.50	-1.1	30.0
13C5 PFPeA	Ave	0.9537	0.8781		2.30	2.50	-7.9	30.0
13C3-PFBS	Ave	0.0221	0.0210		2.21	2.33	-5.0	30.0
13C2 PFHxA	Ave	1.082	1.022		2.36	2.50	-5.6	30.0
13C4-PFHpA	Ave	1.065	0.9885		2.32	2.50	-7.2	30.0
18O2 PFHxS	Ave	1.366	1.275		2.21	2.37	-6.7	30.0
M2-6:2FTS	Ave	0.2242	0.2340		2.48	2.38	4.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Lab Sample ID: CCV 320-239343/4 Calibration Date: 08/10/2018 20:27
 Instrument ID: A8_N Calib Start Date: 08/06/2018 11:10
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/06/2018 11:56
 Lab File ID: 2018.08.10LLAAAX_082.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9773	0.9916		2.54	2.50	1.5	30.0
13C4 PFOS	Ave	0.8973	0.8273		2.20	2.39	-7.8	30.0
13C5 PFNA	Ave	0.8770	0.8137		2.32	2.50	-7.2	30.0
13C8 FOSA	Ave	1.188	1.099		2.31	2.50	-7.6	30.0
M2-8:2FTS	Ave	0.2707	0.2781		2.46	2.40	2.7	30.0
13C2 PFDA	Ave	0.7695	0.7151		2.32	2.50	-7.1	30.0
d3-NMeFOSAA	Ave	0.3935	0.3940		2.50	2.50	0.1	30.0
d5-NEtFOSAA	Ave	0.4077	0.4056		2.49	2.50	-0.5	30.0
13C2 PFUnA	Ave	0.6189	0.5722		2.31	2.50	-7.5	30.0
13C2 PFDoA	Ave	0.6541	0.6790		2.60	2.50	3.8	30.0
13C2-PFTeDA	Ave	0.8335	0.8692		2.61	2.50	4.3	30.0
13C2-PFHxDA	Ave	1.653	1.490		2.25	2.50	-9.9	30.0

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-238193/9
 Matrix: Water Lab File ID: 2018.08.06LLICAL_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 08/06/2018 12:04
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238193 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTrIA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00768	J	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00720	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: ICB 320-238193/9
 Matrix: Water Lab File ID: 2018.08.06LLICAL_009.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 08/06/2018 12:04
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 238193 Units: ng/mL

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	96		50-150
STL00992	13C4 PFBA	96		50-150
STL01893	13C5 PFPeA	94		50-150
STL00993	13C2 PFHxA	97		50-150
STL01892	13C4-PFHpA	99		50-150
STL00990	13C4 PFOA	99		50-150
STL00995	13C5 PFNA	100		50-150
STL00996	13C2 PFDA	100		50-150
STL00997	13C2 PFUnA	104		50-150
STL00998	13C2 PFDoA	98		50-150
STL00994	18O2 PFHxS	98		50-150
STL02116	13C2-PFTeDA	98		50-150
STL00991	13C4 PFOS	96		50-150
STL02337	13C3-PFBS	92		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
SDG No.: _____
Client Sample ID: _____ Lab Sample ID: CCB 320-239237/1
Matrix: Water Lab File ID: 2018.08.10LLA_004.d
Analysis Method: EPA 537 (Mod) Date Collected: _____
Extraction Method: _____ Date Extracted: _____
Sample wt/vol: 1(mL) Date Analyzed: 08/10/2018 08:00
Con. Extract Vol.: _____ Dilution Factor: 1
Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 239237 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00729	U	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>CCB 320-239237/1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLA_004.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: _____	Date Extracted: _____
Sample wt/vol: <u>1(mL)</u>	Date Analyzed: <u>08/10/2018 08:00</u>
Con. Extract Vol.: _____	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239237</u>	Units: <u>ng/mL</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	97		50-150
STL00992	13C4 PFBA	95		50-150
STL01893	13C5 PFPeA	89		50-150
STL00993	13C2 PFHxA	89		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	101		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	91		50-150
STL00997	13C2 PFUnA	97		50-150
STL00998	13C2 PFDoA	99		50-150
STL00994	18O2 PFHxS	88		50-150
STL02116	13C2-PFTeDA	104		50-150
STL00991	13C4 PFOS	90		50-150
STL02337	13C3-PFBS	87		50-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 320-239308/1
 Matrix: Water Lab File ID: 2018.08.10LLAAAX_004.d
 Analysis Method: EPA 537 (Mod) Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1(mL) Date Analyzed: 08/10/2018 16:33
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 239308 Units: ng/mL

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.040	U M	0.050	0.040	0.0088
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.040	U	0.050	0.040	0.012
307-24-4	Perfluorohexanoic acid (PFHxA)	0.040	U	0.050	0.040	0.015
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.040	U	0.050	0.040	0.0063
335-67-1	Perfluorooctanoic acid (PFOA)	0.040	U	0.050	0.040	0.021
375-95-1	Perfluorononanoic acid (PFNA)	0.040	U	0.050	0.040	0.0068
335-76-2	Perfluorodecanoic acid (PFDA)	0.040	U	0.050	0.040	0.0078
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.040	U	0.050	0.040	0.028
307-55-1	Perfluorododecanoic acid (PFDoA)	0.040	U	0.050	0.040	0.014
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.040	U	0.050	0.040	0.033
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.040	U	0.050	0.040	0.0073
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.040	U	0.050	0.040	0.0050
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00720	J	0.050	0.040	0.0043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.040	U	0.050	0.040	0.0048
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.040	U	0.050	0.040	0.014
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.040	U	0.050	0.040	0.0080
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.040	U	0.050	0.040	0.0088

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-41704-1</u>
SDG No.: _____	
Client Sample ID: _____	Lab Sample ID: <u>CCB 320-239308/1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2018.08.10LLAAAX_004.d</u>
Analysis Method: <u>EPA 537 (Mod)</u>	Date Collected: _____
Extraction Method: _____	Date Extracted: _____
Sample wt/vol: <u>1(mL)</u>	Date Analyzed: <u>08/10/2018 16:33</u>
Con. Extract Vol.: _____	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100</u> ID: <u>3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>239308</u>	Units: <u>ng/mL</u>

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	94		50-150
STL00992	13C4 PFBA	94		50-150
STL01893	13C5 PFPeA	91		50-150
STL00993	13C2 PFHxA	93		50-150
STL01892	13C4-PFHpA	91		50-150
STL00990	13C4 PFOA	102		50-150
STL00995	13C5 PFNA	92		50-150
STL00996	13C2 PFDA	98		50-150
STL00997	13C2 PFUnA	99		50-150
STL00998	13C2 PFDoA	93		50-150
STL00994	18O2 PFHxS	89		50-150
STL02116	13C2-PFTeDA	99		50-150
STL00991	13C4 PFOS	91		50-150
STL02337	13C3-PFBS	93		50-150

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

SDG No.: _____

Batch Number: 238978 Batch Start Date: 08/09/18 10:23 Batch Analyst: Kolstad, Kate MBatch Method: 3535 Batch End Date: 08/09/18 18:13

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00092	LCPFC-IS 00073
MB 320-238978/1		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCS 320-238978/2		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
LCSD 320-238978/3		3535, EPA 537 (Mod)				250 mL	10.00 mL	500 uL	500 uL
320-41704-C-1	TP-PFC-032-TPI	3535, EPA 537 (Mod)	T	318.48 g	28.60 g	289.9 mL	10.00 mL	500 uL	500 uL
320-41704-A-2	TP-PFC-032-MID CARBON	3535, EPA 537 (Mod)	T	317.68 g	27.84 g	289.8 mL	10.00 mL	500 uL	500 uL
320-41704-B-3	TP-PFC-032-TPE	3535, EPA 537 (Mod)	T	308.82 g	27.52 g	281.3 mL	10.00 mL	500 uL	500 uL
320-41704-A-4	TP-PFC-032-TPE-D	3535, EPA 537 (Mod)	T	310.84 g	27.58 g	283.3 mL	10.00 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00163					
MB 320-238978/1		3535, EPA 537 (Mod)							
LCS 320-238978/2		3535, EPA 537 (Mod)		500 uL					
LCSD 320-238978/3		3535, EPA 537 (Mod)		500 uL					
320-41704-C-1	TP-PFC-032-TPI	3535, EPA 537 (Mod)	T						
320-41704-A-2	TP-PFC-032-MID CARBON	3535, EPA 537 (Mod)	T						
320-41704-B-3	TP-PFC-032-TPE	3535, EPA 537 (Mod)	T						
320-41704-A-4	TP-PFC-032-TPE-D	3535, EPA 537 (Mod)	T						

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.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-41704-1

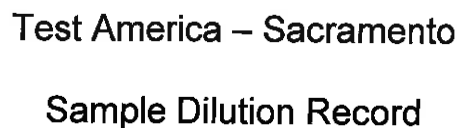
SDG No.: _____

Batch Number: 238978 Batch Start Date: 08/09/18 10:23 Batch Analyst: Kolstad, Kate MBatch Method: 3535 Batch End Date: 08/09/18 18:13

Batch Notes	
Analyst ID - Aliquot Step	KMK
Balance ID	QA-078
Batch Comment	Client labels match TA label, KMK. Envi-Carb: 103369.
Analyst ID - Final Volume Step	KMK
H2O ID	8-7-18
Hexane ID	1313826
Internal Standard ID#	1314760
Manifold ID	N
Methanol ID	1313683
Sodium Hydroxide ID	1325869
Pipette ID	I46345G
Analyst ID - Reagent Drop	KMK
Analyst ID - IS Reagent Drop	KMK
Analyst ID - IS Reagent Drop Witness	TWL
Analyst ID - SU Reagent Drop	KMK
Analyst ID - SU Reagent Drop Witness	TWL
Solvent Lot #	1320119
Solvent Name	0.3% NH4OH/MEOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003237137A

Basis	Basis Description
T	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.



Date 8/10/18

<u>Job #</u>	<u>Sample #</u>	<u>Original F.V.</u> <u>(uL)</u>	<u>Aliquot (uL)</u>	<u>Dilution F.V.</u> <u>(uL)</u>	<u>Dilution Factor</u>
320-41704	1	10,00	15	300	20
ABH 8/10/18					

Comments:

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	320-41704-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-032-TPE-D	Ground water	Field duplicate	1-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-41704-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-032-TPI	Ground water	Normal (Regular)	1-Aug-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-41704-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-032-TPE	Ground water	Normal (Regular)	1-Aug-18	537	Perfluoroalkyl Compounds