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NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Combined Level 2 and Level 4 Laboratory Report, and the Sample Location Report, SDG 320-24149-1

Naval Air Station Dallas
Dallas, Texas

July 2019

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N00215_002647
NAS DALLAS, TX
SSIC 5000-33c

LABORATORY DATA PACKAGE 320-24149-1 NAS DALLAS TX

01/13/2017
TEST AMERICA, INC.

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-24149-1

Job Description: PFAS, NAS Dallas

For:
EnSafe, Inc.
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Irving, TX 75038

Attention: Thomas Wiberg

Approved for release.
David R Alltucker
Project Manager I
1/13/2017 12:16 PM

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01/13/2017

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Qualifiers

LCMS

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
E	Result exceeded calibration range.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
D	The reported value is from a dilution.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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)

CASE NARRATIVE

Client: EnSafe, Inc.

Project: PFAS, NAS Dallas

Report Number: 320-24149-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 12/07/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.2 C.

PFAS

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.

Perfluorohexanesulfonic acid (PFHxS) and Perfluorooctanoic acid (PFOA) were detected in method blank MB 320-142967/1-A at levels that were above the method detection limit but below ½ the reporting limit. The values should be considered estimates, and have been flagged.

The method blank for preparation batch 320-142967 and analytical batch 320-144253 contained Perfluorohexanoic acid (PFHxA) above half the reporting limit (1/2RL). Associated samples were not re-extracted and/or re-analyzed because results for PFHxA were either greater than 10X the value found in the method blank or not detected.

The Isotope Dilution Analyte (IDA) recoveries for several analytes in the following samples is below the method recommended limit: FSS5TMW-1216 (320-24149-2), EBWC120616 (320-24149-4. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: FSS5TMW-1216 (320-24149-2). The sample has been run at dilution and both sets of data have been reported.

The following samples (FSS4TMW-1216 (320-24149-1)) required complex dilutions in order for the target analyte concentration of Perfluorooctanesulfonic acid (PFOS) to be within the calibration range. Due to software limitations the complex dilution samples will have

a dilution factor of 1.0 in the dilution factor field and a DL2 suffix. The complex dilution factors are as follows. FSS4TMW-1216 (320-24149-1) - 4000X dilution. Detection limits have been adjusted accordingly.

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

Detection Summary

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

Client Sample ID: FSS4TMW-1216 — Lab Sample ID: 320-24149-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.7	E	0.0022	0.00041	ug/L	1		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	1.2	E	0.0022	0.00088	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	2.3	E B	0.0022	0.00070	ug/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.5	E	0.0022	0.00071	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	13	E	0.0022	0.00066	ug/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.18		0.0022	0.00058	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.026		0.0022	0.00039	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00046	J	0.0022	0.00036	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.2	E M	0.0022	0.00082	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.8	E	0.0022	0.00077	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	41	E Q	0.0036	0.0011	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	0.11		0.0036	0.0011	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.012	M	0.0022	0.00057	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	5.0	D	0.44	0.081	ug/L	200		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	12	D	0.44	0.18	ug/L	200		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	28	B D	0.44	0.14	ug/L	200		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	6.1	D	0.44	0.14	ug/L	200		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	47	D M	0.44	0.13	ug/L	200		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.17	J D	0.44	0.12	ug/L	200		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	7.2	D	0.44	0.16	ug/L	200		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	59	D	0.44	0.15	ug/L	200		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	670	E D	0.71	0.23	ug/L	200		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL2	1200		14	4.5	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: FSS5TMW-1216 — Lab Sample ID: 320-24149-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.22		0.0022	0.00040	ug/L	1		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.30		0.0022	0.00086	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.40	E B	0.0022	0.00069	ug/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.17		0.0022	0.00070	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.20	M	0.0022	0.00065	ug/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.010		0.0022	0.00057	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.0026		0.0022	0.00038	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00037	J	0.0022	0.00035	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.22		0.0022	0.00080	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.48	E	0.0022	0.00076	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	0.23	D	0.022	0.0040	ug/L	10		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	0.40	D	0.022	0.0086	ug/L	10		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	0.53	D B	0.022	0.0069	ug/L	10		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.17	D	0.022	0.0070	ug/L	10		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.21	D M	0.022	0.0065	ug/L	10		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	0.010	J D	0.022	0.0057	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.36	D	0.022	0.0080	ug/L	10		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	0.63	D M	0.022	0.0076	ug/L	10		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

Client Sample ID: FSS5TMW-1216 (Continued) — Lab Sample ID: 320-24149-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS) - DL	0.95	D	0.035	0.011	ug/L	10		537 (Modified)	Total/NA

Client Sample ID: EBGW120616 — Lab Sample ID: 320-24149-3

No Detections.

Client Sample ID: EBWC120616 — Lab Sample ID: 320-24149-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.0014	J	0.0024	0.00082	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: FSS4TMW-1216

Date Collected: 12/06/16 12:20
Date Received: 12/07/16 10:30

Lab Sample ID: 320-24149-1

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**1.7**	**E**	0.0022	0.00041	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluoropentanoic acid (PFPeA)	**1.2**	**E**	0.0022	0.00088	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorohexanoic acid (PFHxA)	**2.3**	**E B**	0.0022	0.00070	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluoroheptanoic acid (PFHpA)	**5.5**	**E**	0.0022	0.00071	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorooctanoic acid (PFOA)	**13**	**E**	0.0022	0.00066	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorononanoic acid (PFNA)	**0.18**		0.0022	0.00058	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorodecanoic acid (PFDA)	**0.026**		0.0022	0.00039	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0022	0.00066	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0022	0.00052	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0022	0.00049	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorotetradecanoic acid (PFTeA)	**0.00046**	**J**	0.0022	0.00036	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorobutanesulfonic acid (PFBS)	**2.2**	**E M**	0.0022	0.00082	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorohexanesulfonic acid (PFHxS)	**4.8**	**E**	0.0022	0.00077	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorooctanesulfonic acid (PFOS)	**41**	**E Q**	0.0036	0.0011	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorodecanesulfonic acid (PFDS)	**0.11**		0.0036	0.0011	ug/L		12/19/16 14:38	12/29/16 00:21	1
Perfluorooctane Sulfonamide (FOSA)	**0.012**	**M**	0.0022	0.00057	ug/L		12/19/16 14:38	12/29/16 00:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*61*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C4 PFBA	*29*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C5-PFPeA	*22*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C2 PFHxA	*17*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C4-PFHpA	*5*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C4 PFOA	*7*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C5 PFNA	*5*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C2 PFDA	*73*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C2 PFUnA	*110*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C2 PFDoA	*102*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
18O2 PFHxS	*13*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*
13C4 PFOS	*4*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/29/16 00:21*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**5.0**	**D**	0.44	0.081	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluoropentanoic acid (PFPeA)	**12**	**D**	0.44	0.18	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorohexanoic acid (PFHxA)	**28**	**B D**	0.44	0.14	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluoroheptanoic acid (PFHpA)	**6.1**	**D**	0.44	0.14	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorooctanoic acid (PFOA)	**47**	**D M**	0.44	0.13	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorononanoic acid (PFNA)	**0.17**	**J D**	0.44	0.12	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorodecanoic acid (PFDA)	0.18	U	0.44	0.078	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorododecanoic acid (PFDoA)	0.36	U	0.44	0.10	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorobutanesulfonic acid (PFBS)	**7.2**	**D**	0.44	0.16	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorohexanesulfonic acid (PFHxS)	**59**	**D**	0.44	0.15	ug/L		12/19/16 14:38	12/30/16 12:33	200

Client Sample ID: FSS4TMW-1216

Lab Sample ID: 320-24149-1

Date Collected: 12/06/16 12:20

Matrix: Water

Date Received: 12/07/16 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**670**	**E D**	0.71	0.23	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorodecanesulfonic acid (PFDS)	0.53	U	0.71	0.21	ug/L		12/19/16 14:38	12/30/16 12:33	200
Perfluorooctane Sulfonamide (FOSA)	0.36	U	0.44	0.11	ug/L		12/19/16 14:38	12/30/16 12:33	200

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*128*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C4 PFBA	*142*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C5-PFPeA	*134*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C2 PFHxA	*143*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C4-PFHpA	*65*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C4 PFOA	*88*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C5 PFNA	*58*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C2 PFDA	*153*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C2 PFUnA	*146*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C2 PFDoA	*160*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
18O2 PFHxS	*206*	*Q*	*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*
13C4 PFOS	*57*		*25 - 150*	*12/19/16 14:38*	*12/30/16 12:33*	*200*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL2

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**1200**		14	4.5	ug/L		12/19/16 14:38	01/04/17 21:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*117*		*25 - 150*	*12/19/16 14:38*	*01/04/17 21:25*	*1*

Client Sample ID: FSS5TMW-1216

Lab Sample ID: 320-24149-2

Date Collected: 12/06/16 11:00

Matrix: Water

Date Received: 12/07/16 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.22**		0.0022	0.00040	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluoropentanoic acid (PFPeA)	**0.30**		0.0022	0.00086	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorohexanoic acid (PFHxA)	**0.40**	**E B**	0.0022	0.00069	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluoroheptanoic acid (PFHpA)	**0.17**		0.0022	0.00070	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorooctanoic acid (PFOA)	**0.20**	**M**	0.0022	0.00065	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorononanoic acid (PFNA)	**0.010**		0.0022	0.00057	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorodecanoic acid (PFDA)	**0.0026**		0.0022	0.00038	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluoroundecanoic acid (PFUnA)	0.0017	U	0.0022	0.00065	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorododecanoic acid (PFDoA)	0.0017	U	0.0022	0.00051	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorotridecanoic Acid (PFTriA)	0.0017	U	0.0022	0.00048	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorotetradecanoic acid (PFTeA)	**0.00037**	**J**	0.0022	0.00035	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorobutanesulfonic acid (PFBS)	**0.22**		0.0022	0.00080	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorohexanesulfonic acid (PFHxS)	**0.48**	**E**	0.0022	0.00076	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorodecanesulfonic acid (PFDS)	0.0026	U	0.0035	0.0011	ug/L		12/19/16 14:38	12/29/16 00:29	1
Perfluorooctane Sulfonamide (FOSA)	0.0017	U	0.0022	0.00056	ug/L		12/19/16 14:38	12/29/16 00:29	1

Client Sample ID: FSS5TMW-1216

Date Collected: 12/06/16 11:00
Date Received: 12/07/16 10:30

Lab Sample ID: 320-24149-2

Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	4	Q	25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C4 PFBA	45		25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C5-PFPeA	79		25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C2 PFHxA	87		25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C4-PFHpA	76		25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C4 PFOA	90		25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C5 PFNA	65		25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C2 PFDA	97		25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C2 PFUnA	98		25 - 150	12/19/16 14:38	12/29/16 00:29	1
13C2 PFDoA	98		25 - 150	12/19/16 14:38	12/29/16 00:29	1
18O2 PFHxS	91		25 - 150	12/19/16 14:38	12/29/16 00:29	1

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.23**	**D**	0.022	0.0040	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluoropentanoic acid (PFPeA)	**0.40**	**D**	0.022	0.0086	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorohexanoic acid (PFHxA)	**0.53**	**D B**	0.022	0.0069	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluoroheptanoic acid (PFHpA)	**0.17**	**D**	0.022	0.0070	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorooctanoic acid (PFOA)	**0.21**	**D M**	0.022	0.0065	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorononanoic acid (PFNA)	**0.010**	**J D**	0.022	0.0057	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorodecanoic acid (PFDA)	0.0087	U	0.022	0.0038	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluoroundecanoic acid (PFUnA)	0.017	U	0.022	0.0065	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorododecanoic acid (PFDoA)	0.017	U	0.022	0.0051	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorotridecanoic Acid (PFTriA)	0.017	U	0.022	0.0048	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorotetradecanoic acid (PFTeA)	0.0087	U	0.022	0.0035	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorobutanesulfonic acid (PFBS)	**0.36**	**D**	0.022	0.0080	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorohexanesulfonic acid (PFHxS)	**0.63**	**D M**	0.022	0.0076	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorooctanesulfonic acid (PFOS)	**0.95**	**D**	0.035	0.011	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorodecanesulfonic acid (PFDS)	0.026	U	0.035	0.011	ug/L		12/19/16 14:38	12/30/16 13:03	10
Perfluorooctane Sulfonamide (FOSA)	0.017	U	0.022	0.0056	ug/L		12/19/16 14:38	12/30/16 13:03	10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	4	Q	25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C4 PFBA	96		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C5-PFPeA	116		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C2 PFHxA	102		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C4-PFHpA	100		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C4 PFOA	96		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C5 PFNA	96		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C2 PFDA	88		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C2 PFUnA	86		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C2 PFDoA	91		25 - 150	12/19/16 14:38	12/30/16 13:03	10
18O2 PFHxS	121		25 - 150	12/19/16 14:38	12/30/16 13:03	10
13C4 PFOS	112		25 - 150	12/19/16 14:38	12/30/16 13:03	10

Client Sample ID: EBGW120616

Date Collected: 12/06/16 12:45
Date Received: 12/07/16 10:30

Lab Sample ID: 320-24149-3

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.00091	U	0.0023	0.00042	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluoropentanoic acid (PFPeA)	0.0018	U	0.0023	0.00090	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorohexanoic acid (PFHxA)	0.0018	U	0.0023	0.00072	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.00073	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.00068	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00060	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorodecanoic acid (PFDA)	0.00091	U	0.0023	0.00040	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0023	0.00068	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0023	0.00053	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0023	0.00050	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorotetradecanoic acid (PFTeA)	0.00091	U	0.0023	0.00036	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.00084	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0023	0.00079	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0012	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorodecanesulfonic acid (PFDS)	0.0027	U	0.0036	0.0011	ug/L		12/19/16 14:38	12/30/16 13:26	1
Perfluorooctane Sulfonamide (FOSA)	0.0018	U	0.0023	0.00058	ug/L		12/19/16 14:38	12/30/16 13:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*42*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C4 PFBA	*131*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C5-PFPeA	*131*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C2 PFHxA	*118*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C4-PFHpA	*120*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C4 PFOA	*126*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C5 PFNA	*122*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C2 PFDA	*135*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C2 PFUnA	*133*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C2 PFDoA	*132*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
18O2 PFHxS	*122*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*
13C4 PFOS	*127*		*25 - 150*	*12/19/16 14:38*	*12/30/16 13:26*	*1*

Client Sample ID: EBWC120616

Date Collected: 12/06/16 13:10
Date Received: 12/07/16 10:30

Lab Sample ID: 320-24149-4

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.00094	U	0.0024	0.00043	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluoropentanoic acid (PFPeA)	0.0019	U	0.0024	0.00093	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorohexanoic acid (PFHxA)	0.0019	U	0.0024	0.00074	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00076	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00071	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00062	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorodecanoic acid (PFDA)	0.00094	U	0.0024	0.00042	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00071	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00055	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00052	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorotetradecanoic acid (PFTeA)	0.00094	U	0.0024	0.00038	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00087	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorohexanesulfonic acid (PFHxS)	**0.0014**	**J**	0.0024	0.00082	ug/L		12/19/16 14:38	12/29/16 00:44	1

Client Sample ID: EBWC120616

Date Collected: 12/06/16 13:10
Date Received: 12/07/16 10:30

Lab Sample ID: 320-24149-4

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0011	ug/L		12/19/16 14:38	12/29/16 00:44	1
Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.00060	ug/L		12/19/16 14:38	12/29/16 00:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*55*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C4 PFBA	*126*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C5-PFPeA	*132*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C2 PFHxA	*122*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C4-PFHpA	*126*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C4 PFOA	*129*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C5 PFNA	*124*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C2 PFDA	*127*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C2 PFUnA	*122*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
13C2 PFDoA	*118*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*
18O2 PFHxS	*126*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:44*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - RA

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.0028	U	0.0038	0.0012	ug/L		12/19/16 14:38	12/30/16 16:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*116*		*25 - 150*	*12/19/16 14:38*	*12/30/16 16:26*	*1*

Default Detection Limits

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.0025	0.00092	ug/L	537 (Modified)
Perfluorobutanoic acid (PFBA)	0.0025	0.00046	ug/L	537 (Modified)
Perfluorodecanesulfonic acid (PFDS)	0.0040	0.0012	ug/L	537 (Modified)
Perfluorodecanoic acid (PFDA)	0.0025	0.00044	ug/L	537 (Modified)
Perfluorododecanoic acid (PFDoA)	0.0025	0.00058	ug/L	537 (Modified)
Perfluoroheptanoic acid (PFHpA)	0.0025	0.00080	ug/L	537 (Modified)
Perfluorohexanesulfonic acid (PFHxS)	0.0025	0.00087	ug/L	537 (Modified)
Perfluorohexanoic acid (PFHxA)	0.0025	0.00079	ug/L	537 (Modified)
Perfluorononanoic acid (PFNA)	0.0025	0.00065	ug/L	537 (Modified)
Perfluorooctane Sulfonamide (FOSA)	0.0025	0.00064	ug/L	537 (Modified)
Perfluorooctanesulfonic acid (PFOS)	0.0040	0.0013	ug/L	537 (Modified)
Perfluorooctanoic acid (PFOA)	0.0025	0.00075	ug/L	537 (Modified)
Perfluoropentanoic acid (PFPeA)	0.0025	0.00099	ug/L	537 (Modified)
Perfluorotetradecanoic acid (PFTeA)	0.0025	0.00040	ug/L	537 (Modified)
Perfluorotridecanoic Acid (PFTriA)	0.0025	0.00055	ug/L	537 (Modified)
Perfluoroundecanoic acid (PFUnA)	0.0025	0.00075	ug/L	537 (Modified)

Isotope Dilution Summary

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C8 FOSA (25-150)	3C4 PFBA (25-150)	3C5-PFPe (25-150)	3C2 PFHx (25-150)	3C4-PFHp (25-150)	3C4 PFOA (25-150)	3C5 PFNA (25-150)	3C2 PFDA (25-150)
320-24149-1	FSS4TMW-1216	61	29	22 Q	17 Q	5 Q	7 Q	5 Q	73
320-24149-1 - DL	FSS4TMW-1216	128	142	134	143	65	88	58	153 Q
320-24149-1 - DL2	FSS4TMW-1216								
320-24149-2	FSS5TMW-1216	4 Q	45	79	87	76	90	65	97
320-24149-2 - DL	FSS5TMW-1216	4 Q	96	116	102	100	96	96	88
320-24149-3	EBGW120616	42	131	131	118	120	126	122	135
320-24149-4	EBWC120616	55	126	132	122	126	129	124	127
320-24149-4 - RA	EBWC120616								
LCS 320-142967/2-A	Lab Control Sample	62	131	132	126	128	127	123	127
LCS 320-142967/2-A - RA	Lab Control Sample								
MB 320-142967/1-A	Method Blank	64	131	137	131	132	133	126	130
MB 320-142967/1-A - RA	Method Blank								

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C2 PFUnA (25-150)	3C2 PFDoA (25-150)	3O2 PFHxS (25-150)	3C4 PFOS (25-150)				
320-24149-1	FSS4TMW-1216	110	102	13 Q	4 Q				
320-24149-1 - DL	FSS4TMW-1216	146	160 Q	206 Q	57				
320-24149-1 - DL2	FSS4TMW-1216				117				
320-24149-2	FSS5TMW-1216	98	98	91					
320-24149-2 - DL	FSS5TMW-1216	86	91	121	112				
320-24149-3	EBGW120616	133	132	122	127				
320-24149-4	EBWC120616	122	118	126					
320-24149-4 - RA	EBWC120616				116				
LCS 320-142967/2-A	Lab Control Sample	119	114	128	128				
LCS 320-142967/2-A - RA	Lab Control Sample				126				
MB 320-142967/1-A	Method Blank	127	112	130	126				
MB 320-142967/1-A - RA	Method Blank				113				

Surrogate Legend

13C8 FOSA = 13C8 FOSA
13C4 PFBA = 13C4 PFBA
13C5-PFPeA = 13C5-PFPeA
13C2 PFHxA = 13C2 PFHxA
13C4-PFHpA = 13C4-PFHpA
13C4 PFOA = 13C4 PFOA
13C5 PFNA = 13C5 PFNA
13C2 PFDA = 13C2 PFDA
13C2 PFUnA = 13C2 PFUnA
13C2 PFDoA = 13C2 PFDoA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-142967/1-A
Matrix: Water
Analysis Batch: 144253

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 142967

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.0010	U	0.0025	0.00046	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluoropentanoic acid (PFPeA)	0.0020	U	0.0025	0.00099	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorohexanoic acid (PFHxA)	0.00147	J	0.0025	0.00079	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorooctanoic acid (PFOA)	0.00116	J	0.0025	0.00075	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorodecanoic acid (PFDA)	0.0010	U	0.0025	0.00044	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluoroundecanoic acid (PFUnA)	0.0020	U	0.0025	0.00075	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorododecanoic acid (PFDoA)	0.0020	U	0.0025	0.00058	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorotridecanoic Acid (PFTriA)	0.0020	U	0.0025	0.00055	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorotetradecanoic acid (PFTeA)	0.0010	U	0.0025	0.00040	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorohexanesulfonic acid (PFHxS)	0.000944	J	0.0025	0.00087	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorodecanesulfonic acid (PFDS)	0.0030	U	0.0040	0.0012	ug/L		12/19/16 14:38	12/29/16 00:06	1
Perfluorooctane Sulfonamide (FOSA)	0.0020	U	0.0025	0.00064	ug/L		12/19/16 14:38	12/29/16 00:06	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*64*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C4 PFBA	*131*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C5-PFPeA	*137*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C2 PFHxA	*131*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C4-PFHpA	*132*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C4 PFOA	*133*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C5 PFNA	*126*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C2 PFDA	*130*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C2 PFUnA	*127*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C2 PFDoA	*112*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
18O2 PFHxS	*130*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*
13C4 PFOS	*126*		*25 - 150*	*12/19/16 14:38*	*12/29/16 00:06*	*1*

Lab Sample ID: LCS 320-142967/2-A
Matrix: Water
Analysis Batch: 144253

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 142967

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	0.0400	0.0441		ug/L		110	60 - 140
Perfluoropentanoic acid (PFPeA)	0.0400	0.0422		ug/L		105	60 - 140
Perfluorohexanoic acid (PFHxA)	0.0400	0.0413		ug/L		103	60 - 140
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0418		ug/L		104	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0406		ug/L		101	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0384		ug/L		96	60 - 140
Perfluorodecanoic acid (PFDA)	0.0400	0.0399		ug/L		100	60 - 140
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0382		ug/L		95	60 - 140
Perfluorododecanoic acid (PFDoA)	0.0400	0.0386		ug/L		96	60 - 140
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0384		ug/L		96	50 - 150

Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-142967/2-A
Matrix: Water
Analysis Batch: 144253

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 142967

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorotetradecanoic acid (PFTeA)	0.0400	0.0478		ug/L		120	50 - 150
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0432		ug/L		122	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0397		ug/L		109	60 - 140
Perfluorodecanesulfonic acid (PFDS)	0.0386	0.0385		ug/L		100	50 - 150
Perfluorooctane Sulfonamide (FOSA)	0.0400	0.0384		ug/L		96	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*62*		*25 - 150*
13C4 PFBA	*131*		*25 - 150*
13C5-PFPeA	*132*		*25 - 150*
13C2 PFHxA	*126*		*25 - 150*
13C4-PFHpA	*128*		*25 - 150*
13C4 PFOA	*127*		*25 - 150*
13C5 PFNA	*123*		*25 - 150*
13C2 PFDA	*127*		*25 - 150*
13C2 PFUnA	*119*		*25 - 150*
13C2 PFDoA	*114*		*25 - 150*
18O2 PFHxS	*128*		*25 - 150*
13C4 PFOS	*128*		*25 - 150*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - RA

Lab Sample ID: MB 320-142967/1-A
Matrix: Water
Analysis Batch: 144510

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 142967

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS) - RA	0.0030	U	0.0040	0.0013	ug/L		12/19/16 14:38	12/30/16 16:11	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS - RA	*113*		*25 - 150*	*12/19/16 14:38*	*12/30/16 16:11*	*1*

Lab Sample ID: LCS 320-142967/2-A
Matrix: Water
Analysis Batch: 144510

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 142967

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS) - RA	0.0371	0.0511		ug/L		138	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS - RA	*126*		*25 - 150*

QC Association Summary

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

LCMS

Prep Batch: 142967

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24149-1 - DL	FSS4TMW-1216	Total/NA	Water	3535	
320-24149-1	FSS4TMW-1216	Total/NA	Water	3535	
320-24149-1 - DL2	FSS4TMW-1216	Total/NA	Water	3535	
320-24149-2	FSS5TMW-1216	Total/NA	Water	3535	
320-24149-2 - DL	FSS5TMW-1216	Total/NA	Water	3535	
320-24149-3	EBGW120616	Total/NA	Water	3535	
320-24149-4 - RA	EBWC120616	Total/NA	Water	3535	
320-24149-4	EBWC120616	Total/NA	Water	3535	
MB 320-142967/1-A - RA	Method Blank	Total/NA	Water	3535	
MB 320-142967/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-142967/2-A	Lab Control Sample	Total/NA	Water	3535	
LCS 320-142967/2-A - RA	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 144253

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24149-1	FSS4TMW-1216	Total/NA	Water	537 (Modified)	142967
320-24149-2	FSS5TMW-1216	Total/NA	Water	537 (Modified)	142967
320-24149-4	EBWC120616	Total/NA	Water	537 (Modified)	142967
MB 320-142967/1-A	Method Blank	Total/NA	Water	537 (Modified)	142967
LCS 320-142967/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	142967

Analysis Batch: 144510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24149-1 - DL	FSS4TMW-1216	Total/NA	Water	537 (Modified)	142967
320-24149-2 - DL	FSS5TMW-1216	Total/NA	Water	537 (Modified)	142967
320-24149-3	EBGW120616	Total/NA	Water	537 (Modified)	142967
320-24149-4 - RA	EBWC120616	Total/NA	Water	537 (Modified)	142967
MB 320-142967/1-A - RA	Method Blank	Total/NA	Water	537 (Modified)	142967
LCS 320-142967/2-A - RA	Lab Control Sample	Total/NA	Water	537 (Modified)	142967

Analysis Batch: 145022

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24149-1 - DL2	FSS4TMW-1216	Total/NA	Water	537 (Modified)	145739

Cleanup Batch: 145739

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24149-1 - DL2	FSS4TMW-1216	Total/NA	Water	Dilution	142967

Lab Chronicle

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

Client Sample ID: FSS4TMW-1216
Lab Sample ID: 320-24149-1
Date Collected: 12/06/16 12:20
Matrix: Water
Date Received: 12/07/16 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	144253	12/29/16 00:21	TTP	TAL SAC
Total/NA	Prep	3535	DL		142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	200	144510	12/30/16 12:33	CBW	TAL SAC
Total/NA	Prep	3535	DL2		142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Cleanup	Dilution	DL2		145739	12/19/16 14:38	TTP	TAL SAC
Total/NA	Analysis	537 (Modified)	DL2	1	145022	01/04/17 21:25	SBC	TAL SAC

Client Sample ID: FSS5TMW-1216
Lab Sample ID: 320-24149-2
Date Collected: 12/06/16 11:00
Matrix: Water
Date Received: 12/07/16 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	144253	12/29/16 00:29	TTP	TAL SAC
Total/NA	Prep	3535	DL		142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10	144510	12/30/16 13:03	CBW	TAL SAC

Client Sample ID: EBGW120616
Lab Sample ID: 320-24149-3
Date Collected: 12/06/16 12:45
Matrix: Water
Date Received: 12/07/16 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	144510	12/30/16 13:26	CBW	TAL SAC

Client Sample ID: EBWC120616
Lab Sample ID: 320-24149-4
Date Collected: 12/06/16 13:10
Matrix: Water
Date Received: 12/07/16 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)		1	144253	12/29/16 00:44	TTP	TAL SAC
Total/NA	Prep	3535	RA		142967	12/19/16 14:38	VPM	TAL SAC
Total/NA	Analysis	537 (Modified)	RA	1	144510	12/30/16 16:26	CBW	TAL SAC

Laboratory References:

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

Certification Summary

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Oregon	NELAP	10	4040	01-28-18

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
537 (Modified)	3535	Water	Perfluorobutanesulfonic acid (PFBS)
537 (Modified)	3535	Water	Perfluorobutanoic acid (PFBA)
537 (Modified)	3535	Water	Perfluorodecanesulfonic acid (PFDS)
537 (Modified)	3535	Water	Perfluorodecanoic acid (PFDA)
537 (Modified)	3535	Water	Perfluorododecanoic acid (PFDoA)
537 (Modified)	3535	Water	Perfluoroheptanoic acid (PFHpA)
537 (Modified)	3535	Water	Perfluorohexanesulfonic acid (PFHxS)
537 (Modified)	3535	Water	Perfluorohexanoic acid (PFHxA)
537 (Modified)	3535	Water	Perfluorononanoic acid (PFNA)
537 (Modified)	3535	Water	Perfluorooctane Sulfonamide (FOSA)
537 (Modified)	3535	Water	Perfluorooctanesulfonic acid (PFOS)
537 (Modified)	3535	Water	Perfluorooctanoic acid (PFOA)
537 (Modified)	3535	Water	Perfluoropentanoic acid (PFPeA)
537 (Modified)	3535	Water	Perfluorotetradecanoic acid (PFTeA)
537 (Modified)	3535	Water	Perfluorotridecanoic Acid (PFTriA)
537 (Modified)	3535	Water	Perfluoroundecanoic acid (PFUnA)

Method Summary

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

Method	Method Description	Protocol	Laboratory
537 (Modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: EnSafe, Inc.
Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-24149-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24149-1	FSS4TMW-1216	Water	12/06/16 12:20	12/07/16 10:30
320-24149-2	FSS5TMW-1216	Water	12/06/16 11:00	12/07/16 10:30
320-24149-3	EBGW120616	Water	12/06/16 12:45	12/07/16 10:30
320-24149-4	EBWC120616	Water	12/06/16 13:10	12/07/16 10:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 142379

Lab Sample ID: IC 320-142379/4 Client Sample ID:

Date Analyzed: 12/15/16 12:29 Lab File ID: 15DEC2016B_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.43	Assign Peak	chandrasenas	12/15/16 13:48
Perfluorohexanesulfonic acid (PFHxS)	2.44	Assign Peak	chandrasenas	12/15/16 13:48
Perfluorooctanesulfonic acid (PFOS)	3.15	Assign Peak	chandrasenas	12/15/16 13:48
Perfluorododecanoic acid (PFDoA)	4.14	Incomplete Integration	chandrasenas	12/15/16 13:48

Lab Sample ID: IC 320-142379/5 Client Sample ID:

Date Analyzed: 12/15/16 12:36 Lab File ID: 15DEC2016B_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.15	Assign Peak	chandrasenas	12/15/16 13:50

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 144213

Lab Sample ID: CCV 320-144213/5 CCVL Client Sample ID:

Date Analyzed: 12/28/16 16:51 Lab File ID: 28DEC2016A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.21	Baseline	phomsopha t	12/29/16 08:10

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 144253

Lab Sample ID: 320-24149-1 Client Sample ID: FSS4TMW-1216

Date Analyzed: 12/29/16 00:21 Lab File ID: 28DEC2016C_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.88	Incomplete Integration	phomsopha t	01/06/17 09:10
Perfluorooctane Sulfonamide (FOSA)	3.48	Incomplete Integration	phomsopha t	12/29/16 17:32

Lab Sample ID: 320-24149-2 Client Sample ID: FSS5TMW-1216

Date Analyzed: 12/29/16 00:29 Lab File ID: 28DEC2016C_006.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.78	Incomplete Integration	phomsopha t	12/29/16 17:35

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 144510

Lab Sample ID: CCV 320-144510/5 CCVL Client Sample ID:

Date Analyzed: 12/30/16 11:26 Lab File ID: 30DEC2016A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.46	Assign Peak	chandrasenas	01/03/17 10:09
Perfluorooctanesulfonic acid (PFOS)	3.17	Assign Peak	chandrasenas	01/03/17 10:09

Lab Sample ID: 320-24149-1 DL Client Sample ID: FSS4TMW-1216 DL

Date Analyzed: 12/30/16 12:33 Lab File ID: 30DEC2016B_003.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.79	Incomplete Integration	phomsopha t	01/03/17 13:47

Lab Sample ID: 320-24149-2 DL Client Sample ID: FSS5TMW-1216 DL

Date Analyzed: 12/30/16 13:03 Lab File ID: 30DEC2016B_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.44	Incomplete Integration	phomsopha t	01/03/17 13:50
Perfluorooctanoic acid (PFOA)	2.78	Incomplete Integration	phomsopha t	01/03/17 13:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 145022

Lab Sample ID: CCV 320-145022/5 CCVL Client Sample ID:

Date Analyzed: 01/04/17 16:33 Lab File ID: 04JAN2017A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.31	Assign Peak	chandrasenas	01/05/17 09:05

537 (Modified)

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
.LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-L1_00022	05/15/17	12/15/16	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00071	25 uL	Perfluorobutanoic acid (PFBA)	0.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid (PFDoA)	0.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.455 ng/mL
							Perfluorononanoic acid (PFNA)	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctadecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.5 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00071	05/15/17	11/10/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00070	2000 uL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
...LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L2_00023	05/15/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00071	50 uL	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	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00071	05/15/17	11/10/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00070	2000 uL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
...LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L3_00020	05/15/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00071	250 uL	Perfluorobutanoic acid (PFBA)	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00071	05/15/17	11/10/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00070	2000 uL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L4_00024	06/14/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00074	100 uL	Perfluorobutanoic acid (PFBA)	20 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
							Perfluorodecanoic acid (PFDA)	20 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid (PFDoA)	20 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid (PFHxA)	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	18.2 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctadecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	20 ng/mL
							Perfluoropentanoic acid (PFPeA)	20 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	20 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	20 ng/mL
							Perfluoroundecanoic acid (PFUnA)	20 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00074	06/14/17	12/14/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00005	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00006	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00006	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00006	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00002	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00008	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00006	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00006	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L5_00022	06/14/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00074	250 uL	Perfluorobutanoic acid (PFBA)	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid (PFDA)	50 ng/mL
							Perfluorododecanoic acid (PFDoA)	50 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	48.2 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid (PFHxA)	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctadecanoic acid	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	46.4 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	50 ng/mL
							Perfluoropentanoic acid (PFPeA)	50 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	50 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	50 ng/mL
							Perfluoroundecanoic acid (PFUnA)	50 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00074	06/14/17	12/14/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00005	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00006	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00006	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00006	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00002	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00008	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00006	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00006	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L6_00020	06/14/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00074	1000 uL	Perfluorobutanoic acid (PFBA)	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid (PFDA)	200 ng/mL
							Perfluorododecanoic acid (PFDoA)	200 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	192.8 ng/mL
							Perfluoroheptanoic acid (PFHpA)	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid (PFHxA)	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	182 ng/mL
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctadecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	185.6 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	200 ng/mL
							Perfluoropentanoic acid (PFPeA)	200 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	200 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	200 ng/mL
							Perfluoroundecanoic acid (PFUnA)	200 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00074	06/14/17	12/14/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00005	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00006	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00006	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00006	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00002	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00008	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00006	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00006	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC2-L1_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00014	25 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	0.5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
							MeFOSA	0.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfonamide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
..LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
...LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L2_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00014	50 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	1 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							MeFOSA	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfonamide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
..LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
...LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
...LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L3_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00014	250 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	4.74 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	4.79 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							MeFOSA	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfonamide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
..LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
...LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
...LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L4_00003	02/26/17	09/22/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00008	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00017	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	18.96 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	19.16 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	20 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
							MeFOSA	20 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
.LCMPFC2SU_00008	02/26/17	08/26/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00002	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00002	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00002	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00002	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00002	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00002	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00002	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00002	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00002	01/20/21	WELLINGTON, Lot d3NMeFOSAA0116			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00002	12/07/20	WELLINGTON, Lot d5NEtFOSAA1115			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00002	01/08/21	WELLINGTON, Lot M262FTS0116			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00002	01/08/21	WELLINGTON, Lot M282FTS0116			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00017	03/02/17	09/02/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ug/mL
					LC8:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ug/mL
					LCN-EtFOSA-M_00003	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.5 ug/mL
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M_00002	100 uL	MeFOSA	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
..LC6:2FTS_00002	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00002	10/23/20	WELLINGTON, Lot 82FTS1015			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00003	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00002	01/20/21	WELLINGTON, Lot NEtFOSAA0116			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00002	05/24/21	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00003	01/20/21	WELLINGTON, Lot NMeFOSAA0116			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L5_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00013	250 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	50 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	50 ng/mL
							MeFOSA	50 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	50 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19	WELLINGTON, Lot dNMeFOSA0114M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18	WELLINGTON, Lot d3NMeFOSAA0113			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20	WELLINGTON, Lot d5NEtFOSAA0515			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17	WELLINGTON, Lot M262FTS0714			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17	WELLINGTON, Lot M282FTS0414			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
..LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NEtFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00001	07/15/19	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00001	12/09/19	WELLINGTON, Lot NMeFOSAA1214			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L6_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00013	1000 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	189.6 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	191.6 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	200 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
							MeFOSA	200 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00001	03/10/19	WELLINGTON, Lot dNEtFOSA0314M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd-NMeFOSA-M_00001	01/28/19		WELLINGTON, Lot dNMeFOSA0114M		(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00001	01/31/18		WELLINGTON, Lot d3NMeFOSAA0113		(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00001	05/08/20		WELLINGTON, Lot d5NEtFOSAA0515		(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00001	07/15/17		WELLINGTON, Lot M262FTS0714		(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00001	04/13/17		WELLINGTON, Lot M282FTS0414		(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfonamide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
..LC6:2FTS_00001	10/03/17		WELLINGTON, Lot 62FTS1014		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS1014		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00002	07/14/19		WELLINGTON, Lot NEtFOSA0714M		(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00001	01/29/18		WELLINGTON, Lot NEtFOSAA0113		(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00001	07/15/19		WELLINGTON, Lot NMeFOSA0714M		(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00001	12/09/19		WELLINGTON, Lot NMeFOSAA1214		(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFCIC_00020	03/01/17	12/01/16	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00046	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFACMXB_00007	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluorobutanoic acid (PFBA)	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanesulfonic acid (PFDS)	48.25 ng/mL
							Perfluorodecanoic acid (PFDA)	50 ng/mL
							Perfluorododecanoic acid (PFDoA)	50 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorohexanoic acid (PFHxA)	50 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluoropentanoic acid (PFPeA)	50 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	50 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	50 ng/mL
							Perfluoroundecanoic acid (PFUnA)	50 ng/mL
					LCPFC3IM_00005	250 uL	Perfluorooctane Sulfonamide (FOSA)	50 ng/mL
.LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00008	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00007	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00007	05/27/21	Wellington Laboratories, Lot M4PFHpA0516			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00008	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00011	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00008	05/24/21	Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00011	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00008	04/08/21	Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00012	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00008	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00007	11/06/20	Wellington Laboratories, Lot PFACMXB1115			(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
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 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
.LCPFC3IM_00005	06/01/17	12/01/16	Methanol, Lot 090285	5 mL	LCPFOSA_00008	0.1 mL	Perfluorooctane Sulfonamide (FOSA)	1000 ng/mL
..LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFCSP_00073	05/28/17	11/28/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutane Sulfonate	0.442 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00006	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptane Sulfonate	0.476 ug/mL
							Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00005	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00002	100 uL	Perfluorohexane Sulfonate	0.455 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00006	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00006	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00008	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00005	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00005	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
.LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00006	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00006	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC6:2FTS_00001

r: 7/6/15 SV
S: 7/20/15 SV

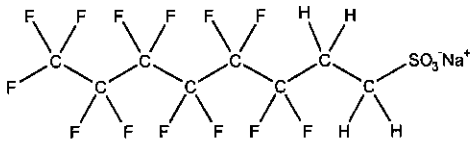
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS1014

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 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/ml	(6:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	10/03/2014			
EXPIRY DATE: (mm/dd/yyyy)	10/03/2017			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/27/2015
B.G. Chittim (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,...x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO Guide 34 REFERENCE MATERIAL PRODUCER

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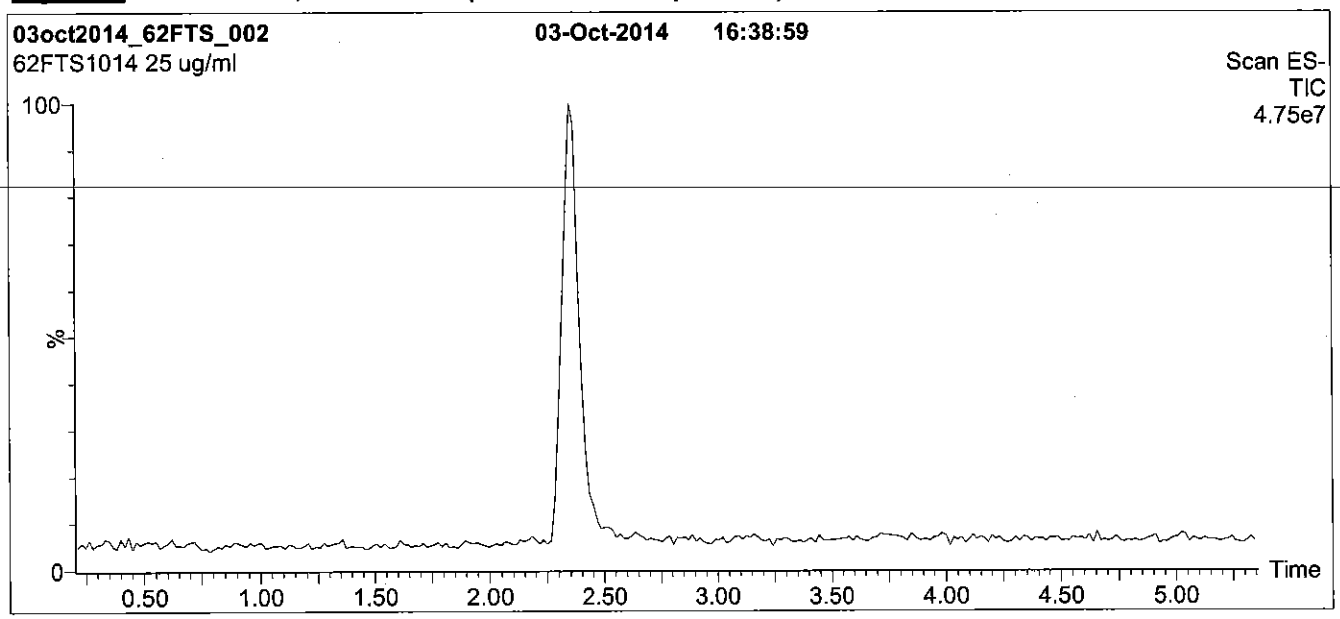
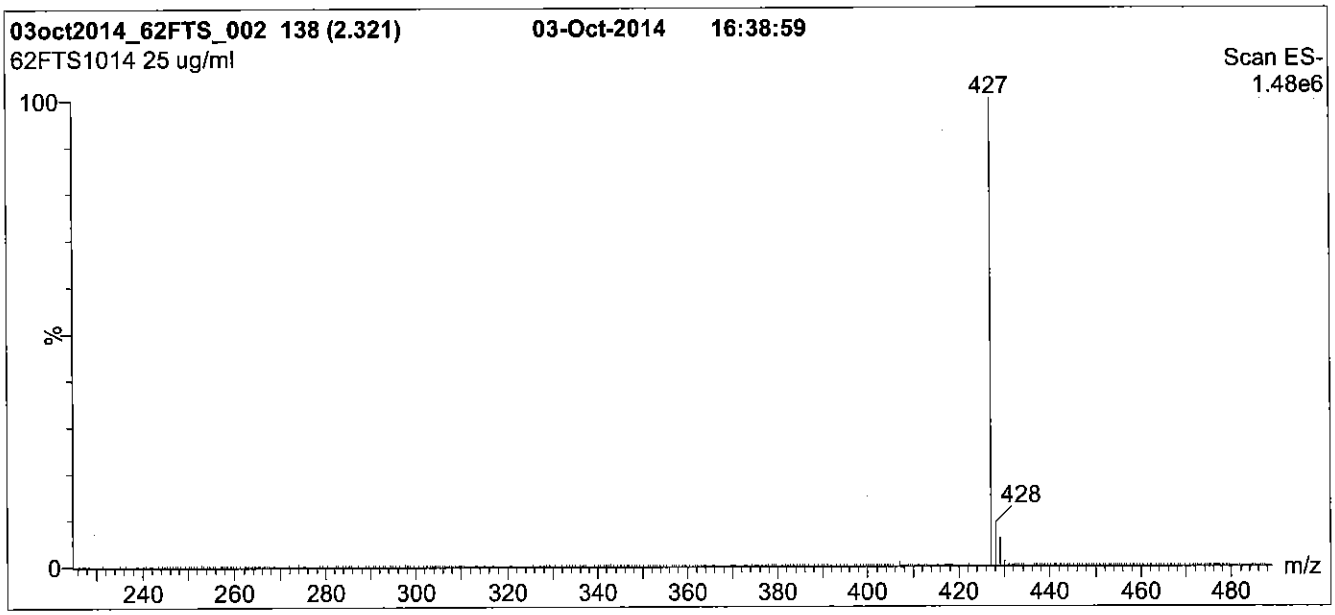
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc 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

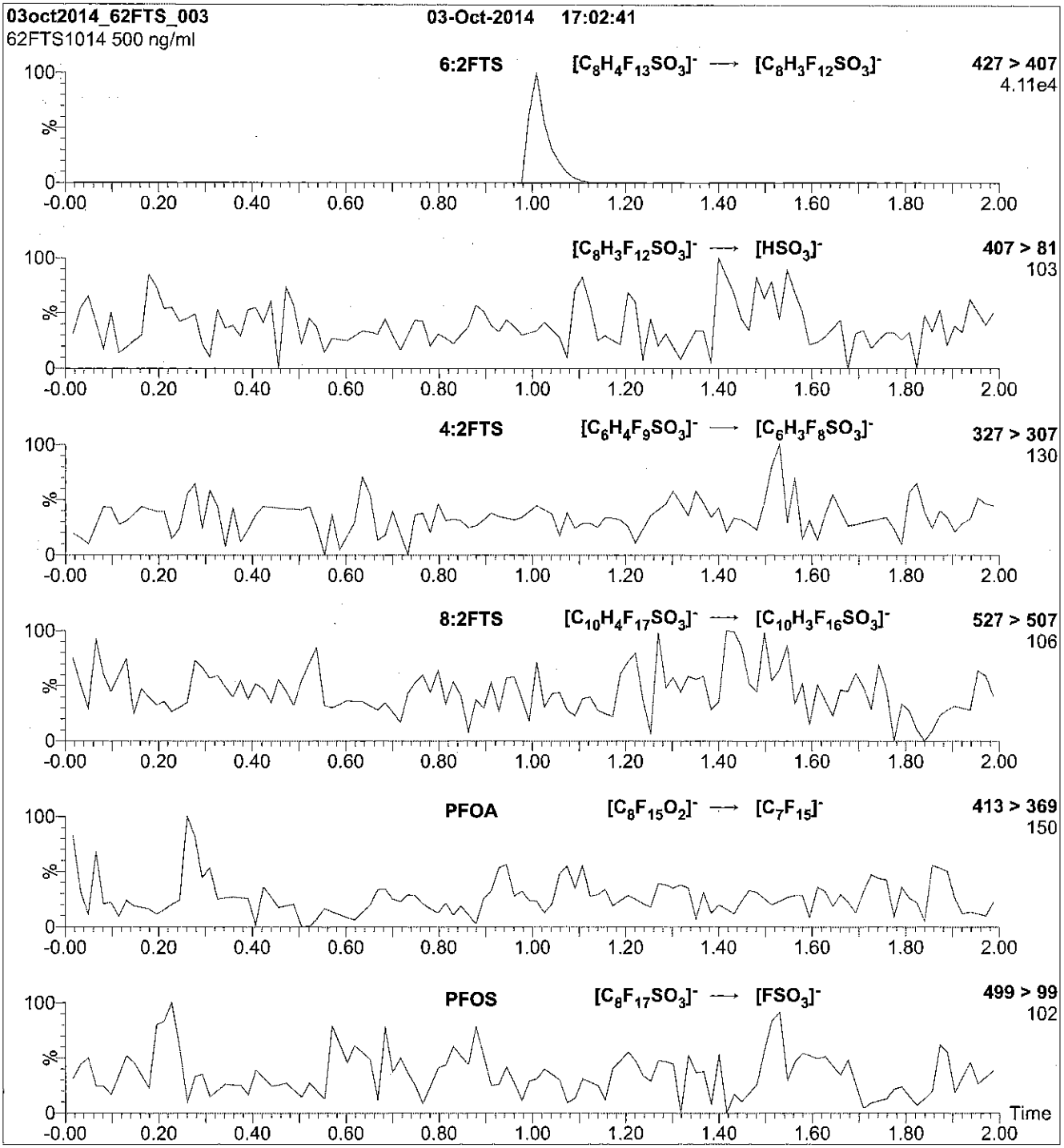
Flow: 300 µl/min

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) = 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 µl (500 ng/ml 6:2FTS)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LC6:2FTS_00002

R: 8/23/16 SBC

715544
ID: LC6:2FTS_00002
Exp: 06/25/21 Prpd: SBC
6:2FTS

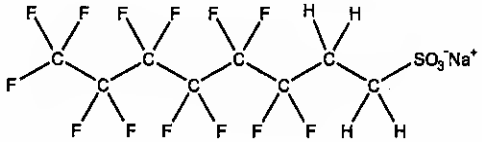
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS0616

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_8H_4F_{13}SO_3Na$		**MOLECULAR WEIGHT:**	450.15
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/ml	(6:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	06/25/2016			
EXPIRY DATE: (mm/dd/yyyy)	06/25/2021			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/29/2016 (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:

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HAZARDS:

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UNCERTAINTY:

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

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

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

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

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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.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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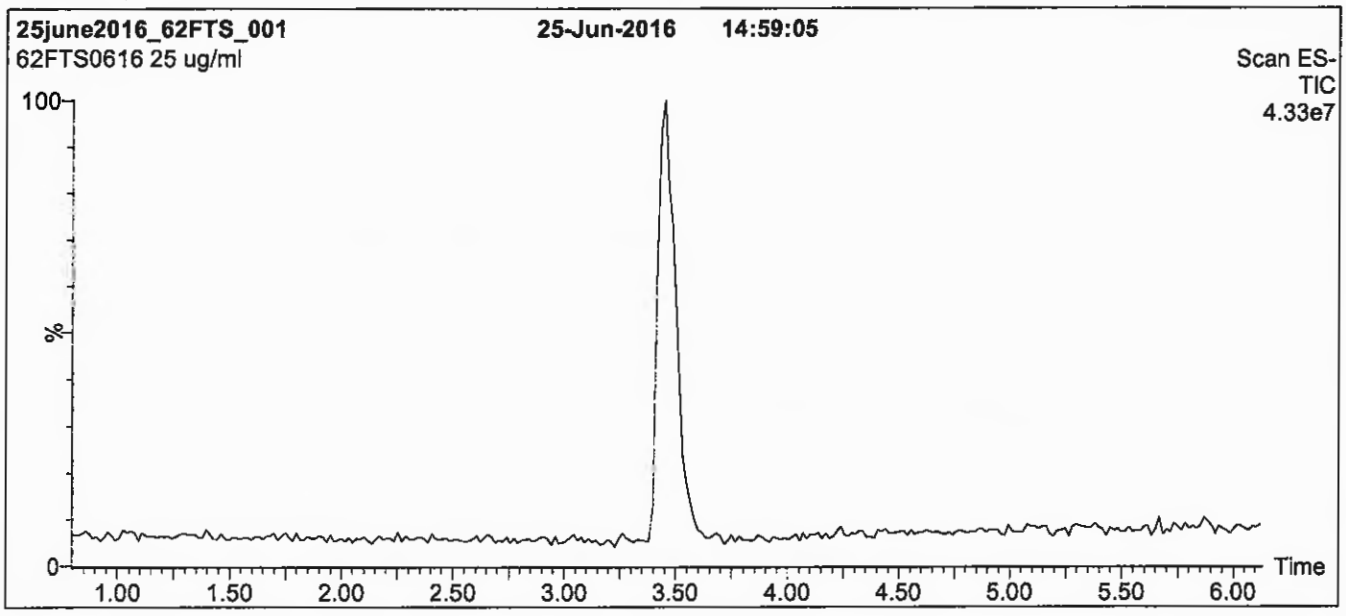

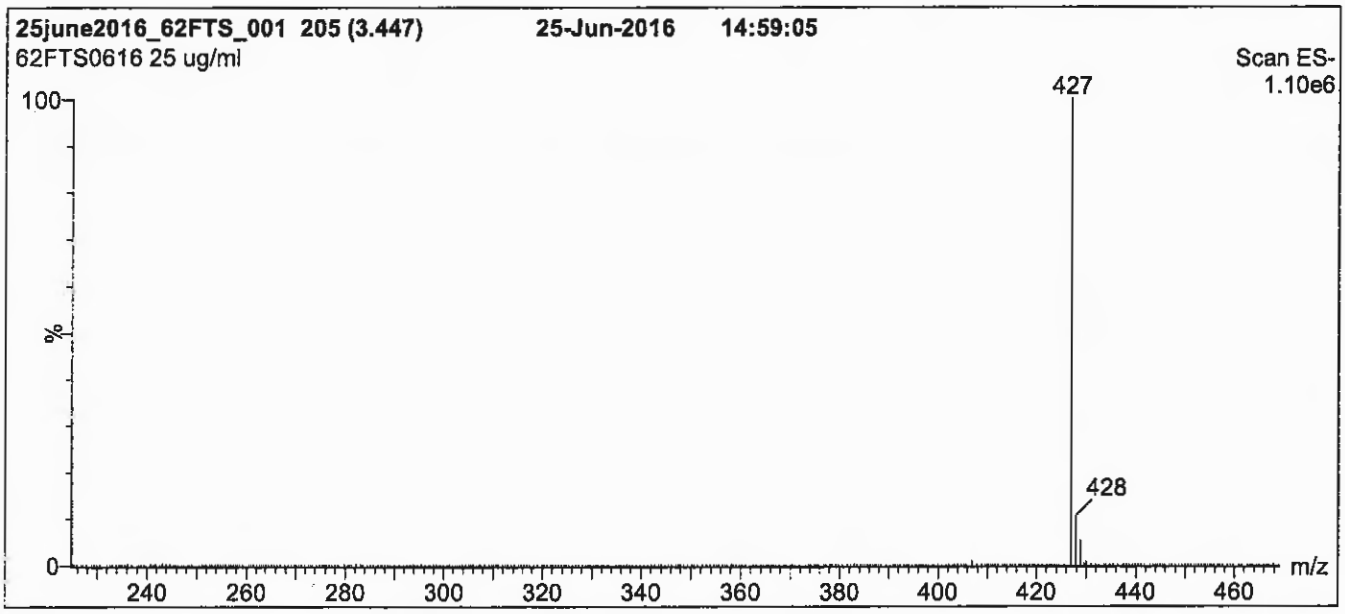

Conditions for Figure 1:

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MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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 µl/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) = 50
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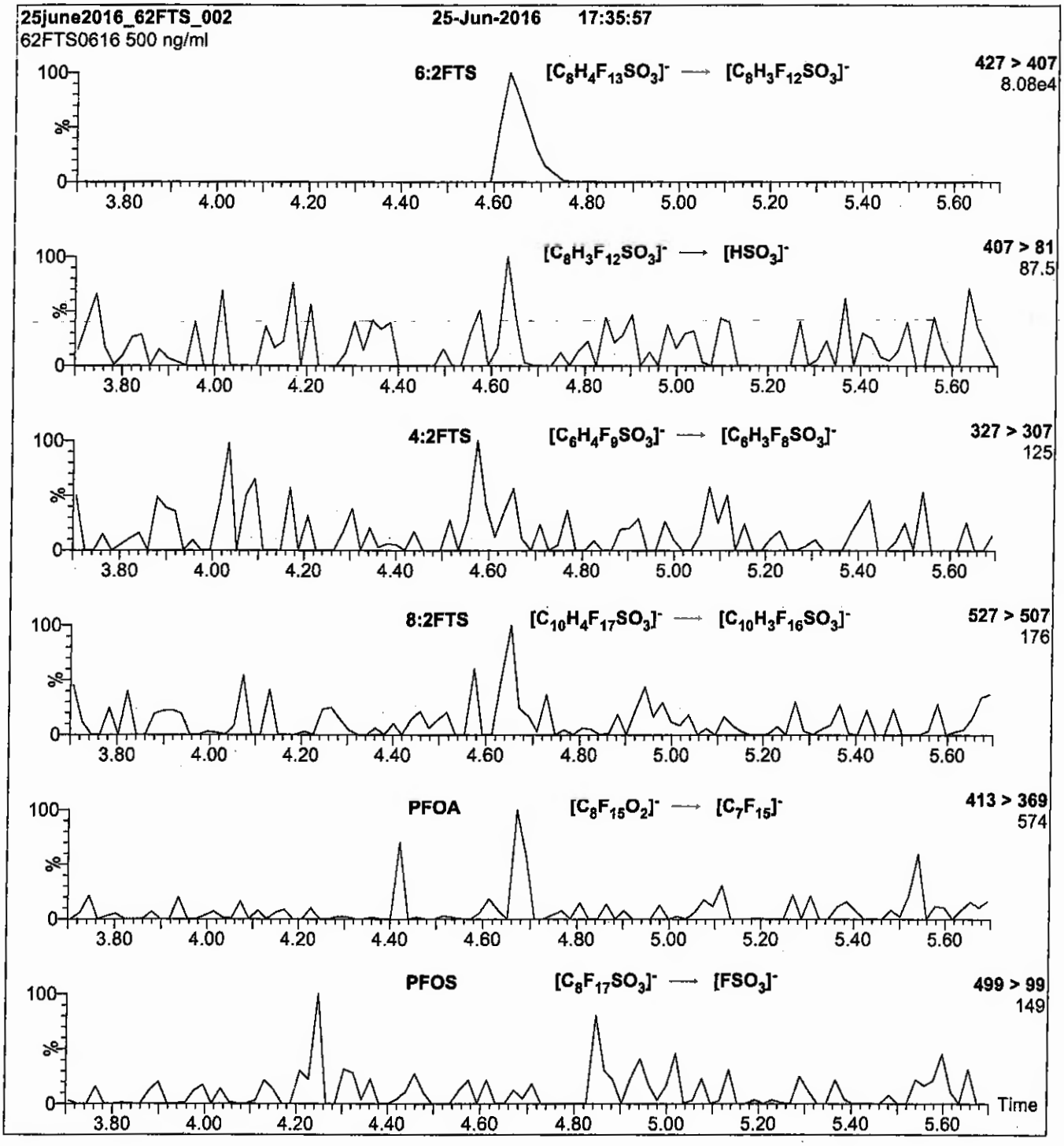
Figure 2: **6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 25

Reagent

LC8:2FTS_00001

r: 7/16/15 SV
S: 7/24/15 SV

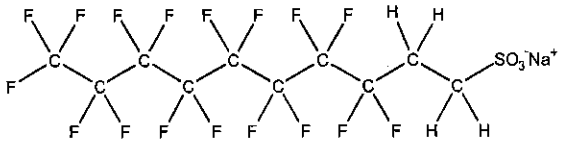
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS1014

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)	10/03/2014			
EXPIRY DATE: (mm/dd/yyyy)	10/03/2017			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/27/2015
B.G. Chittim (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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17025 ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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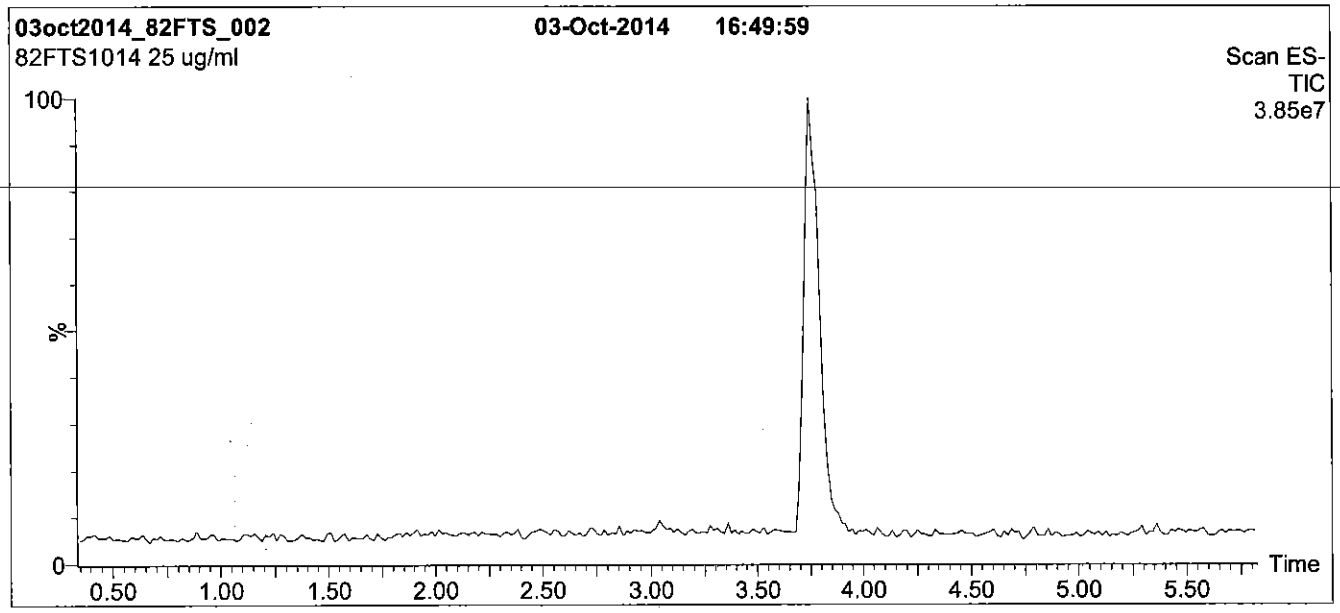
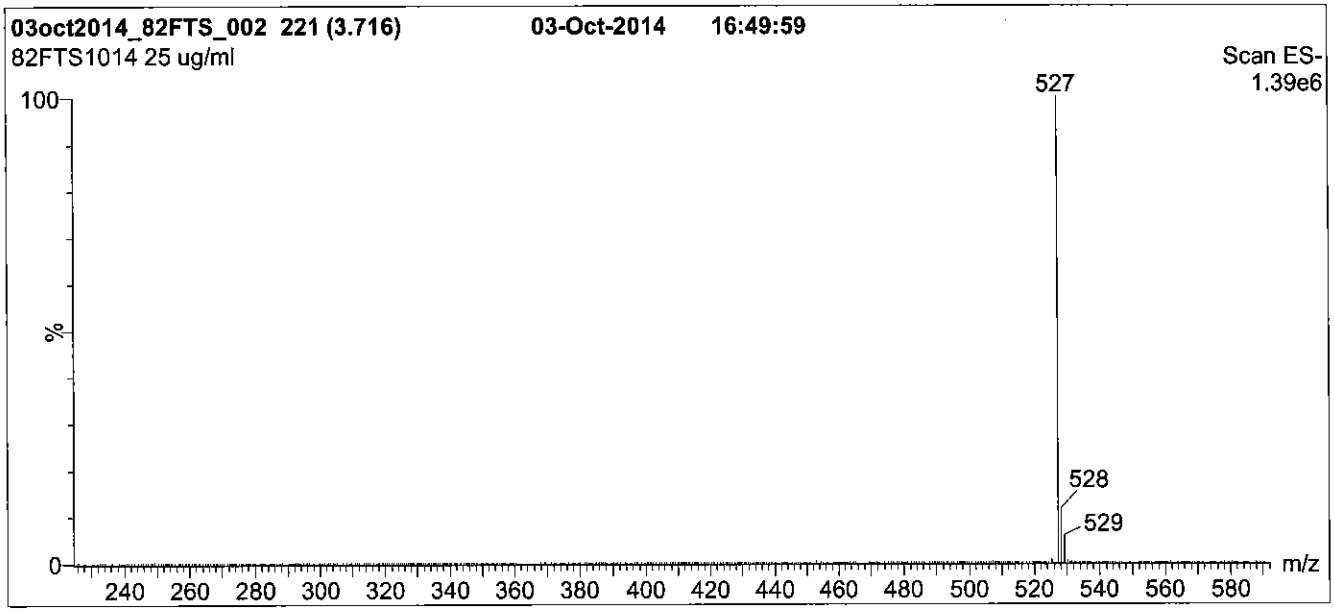
Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min.
Return to initial conditions in 0.5 min.
Time: 10 min

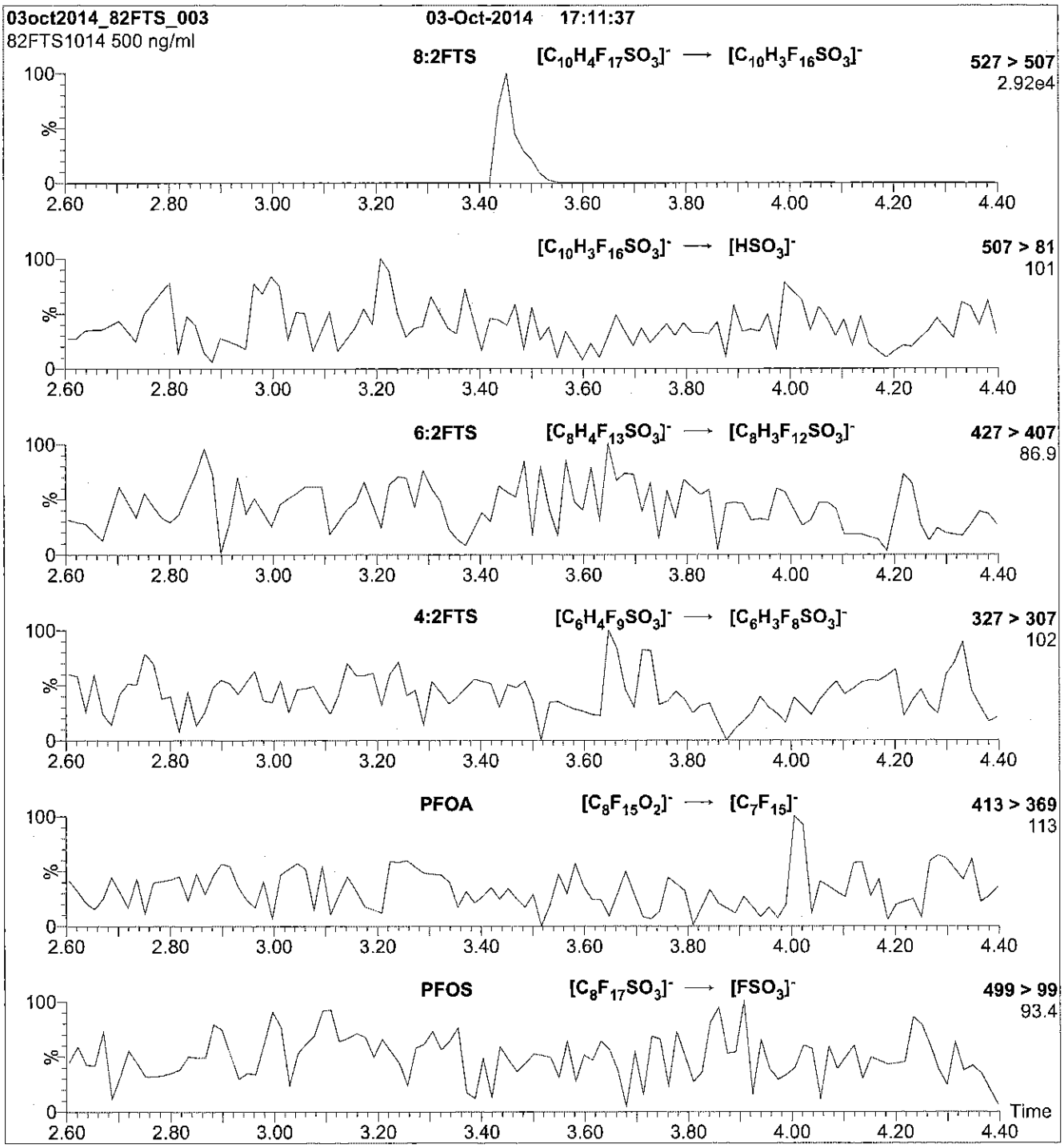
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 µl (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 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 30

Reagent

LC8:2FTS_00002

R: 8/23/16 SBC

715545
ID: LC8:2FTS_00002
Exp: 10/23/20 Prpd: SBC
8:2FTS

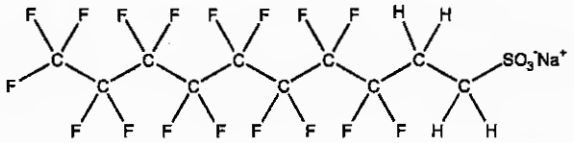
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS1015

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
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	47.9 ± 2.4 µg/ml	(8:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	10/23/2015			
EXPIRY DATE: (mm/dd/yyyy)	10/23/2020			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

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ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 10/27/2015 (mm/dd/yyyy)

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CALA

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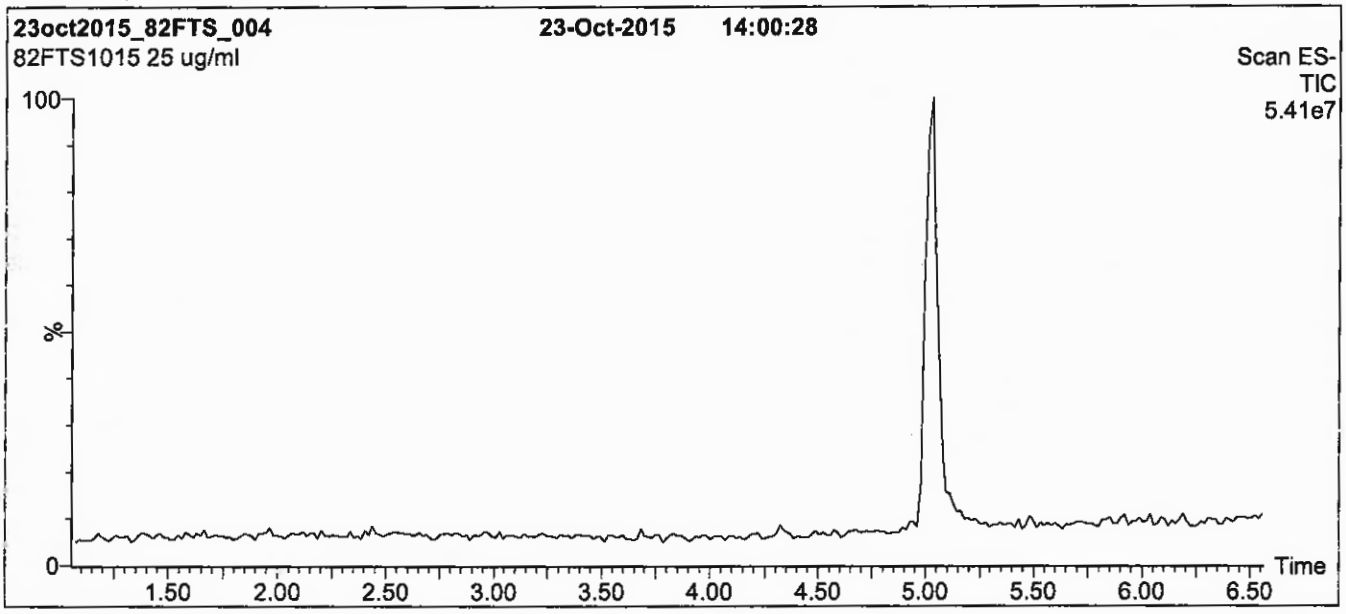
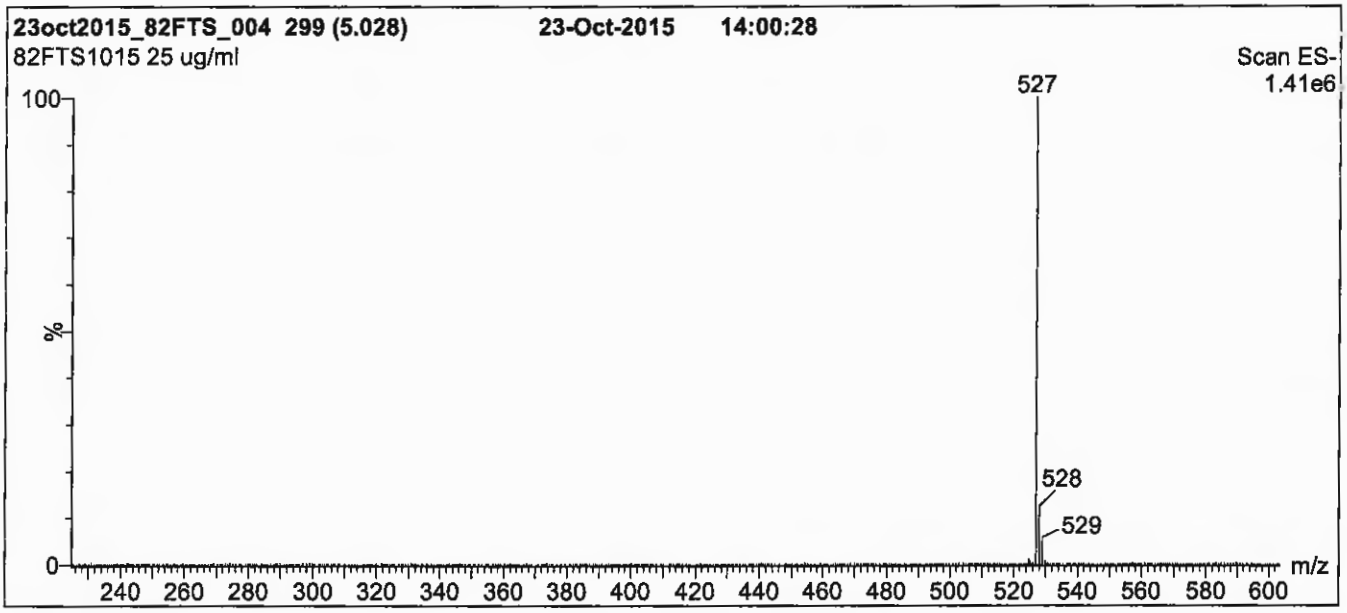




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min.
Return to Initial conditions in 0.5 min.
Time: 10 min

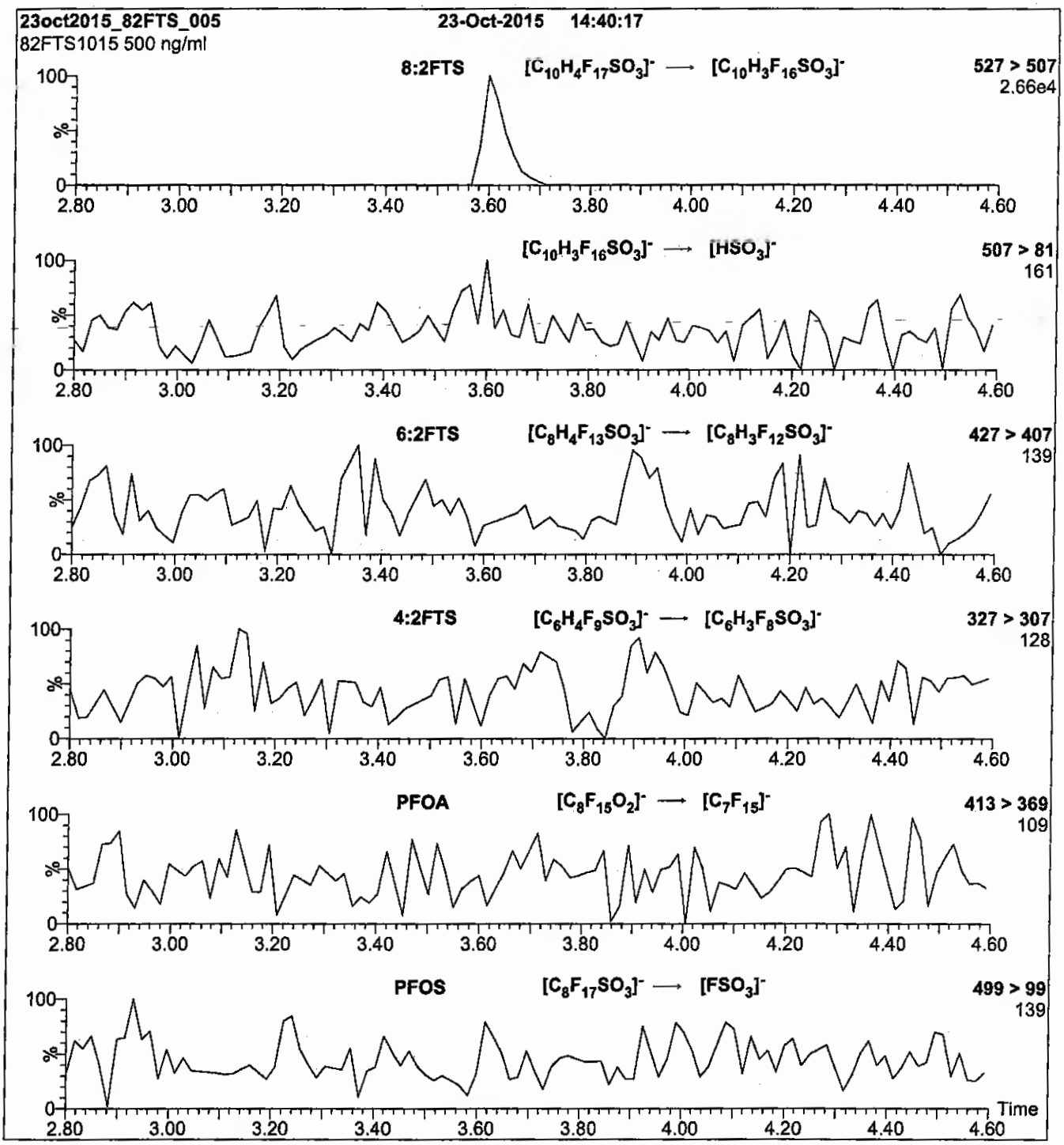
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 µl (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 µl/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00001

R: 7/16/15 SV

WELLINGTON LABORATORIES

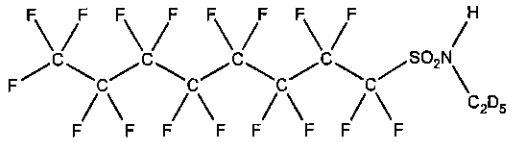
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-EtFOSA-M
COMPOUND: N-ethyl-d_5-perfluoro-1-octanesulfonamide

LOT NUMBER: dNEtFOSA0314M

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_{10}D_5HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	532.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	03/10/2014		
EXPIRY DATE: (mm/dd/yyyy)	03/10/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/01/2015
B.G. Chittim (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

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HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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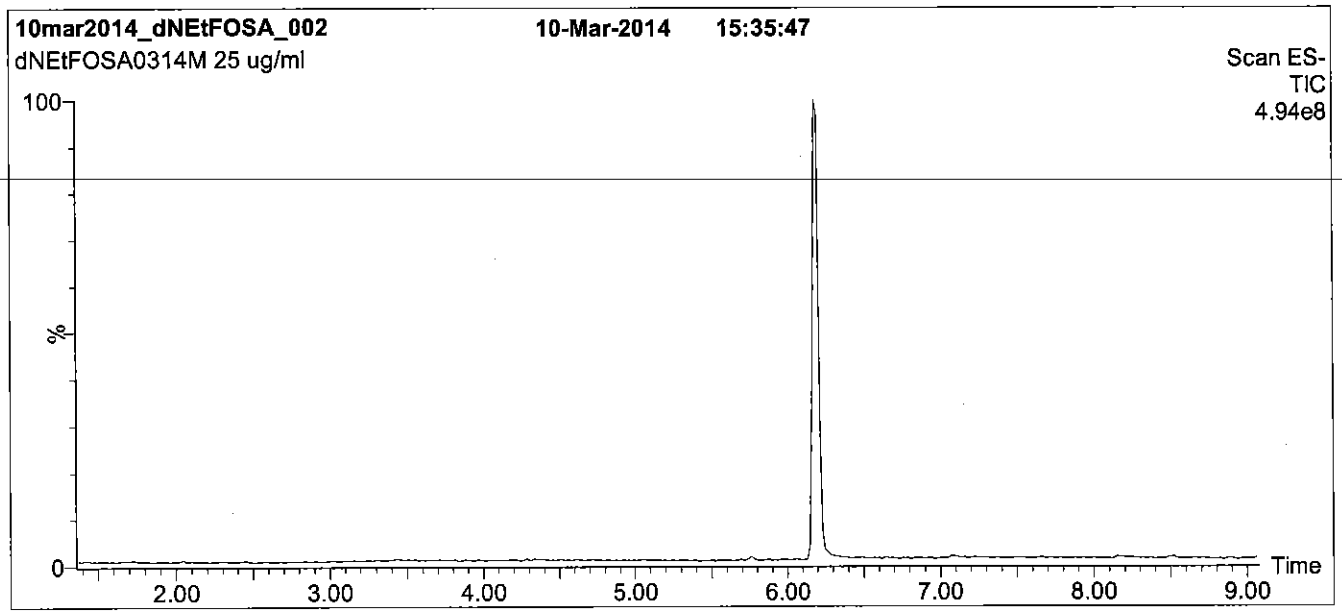
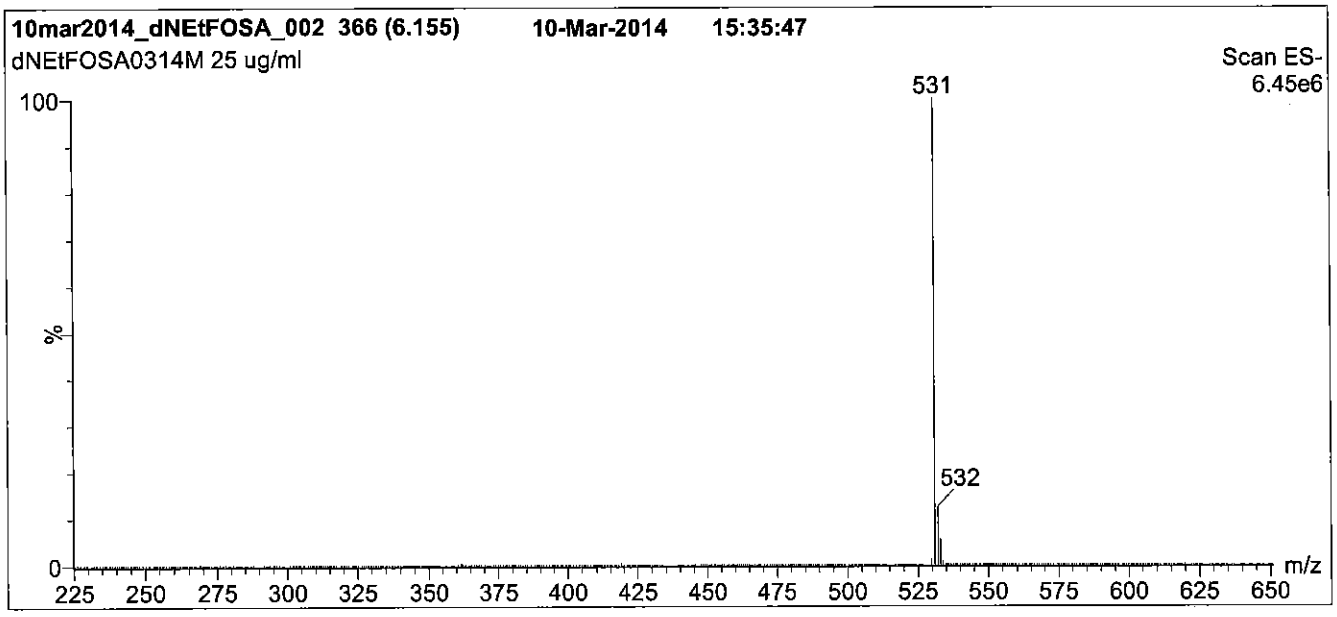
Figure 1: **d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gracient
Start: 40% H_2O / 60% (80:20 MeOH:ACN)
(both with 10mM NH_4OAc 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

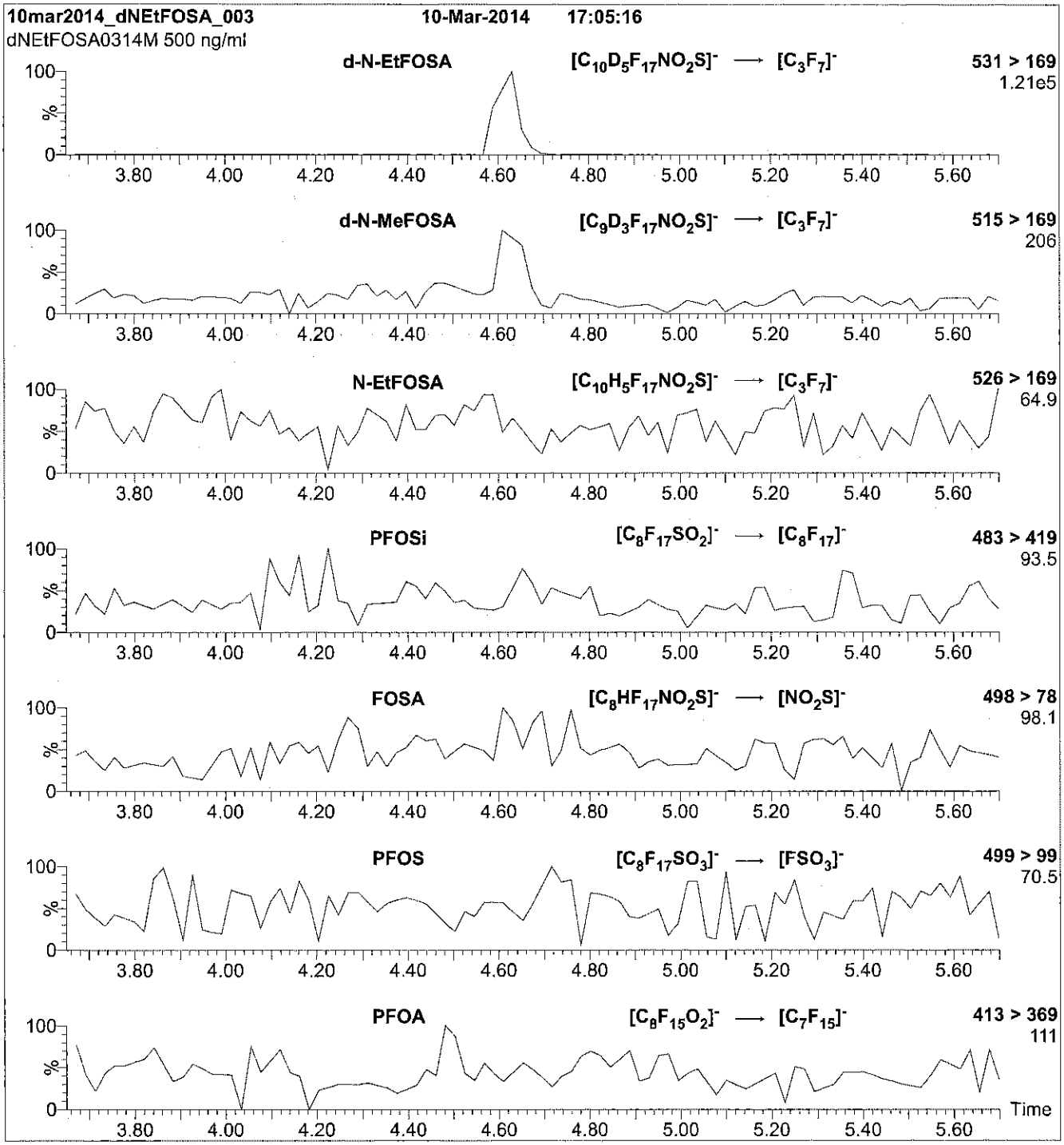
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d-N-EtFOSA-M)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00002

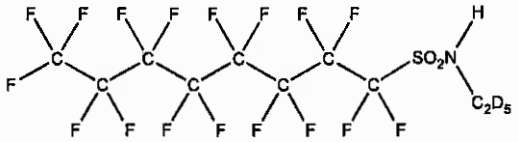
R = 7/6/16 CBW

671571
ID: LCd-NEtFOSA-M_00002
Exp: 03/10/19 Prpd: CBW
d-N-EtFOSA-M

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	d-N-EtFOSA-M	**LOT NUMBER:**	dNEtFOSA0314M
COMPOUND:	N-ethyl-d_5-perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_{10}D_5HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	532.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	03/10/2014		
EXPIRY DATE: (mm/dd/yyyy)	03/10/2019		
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CALA

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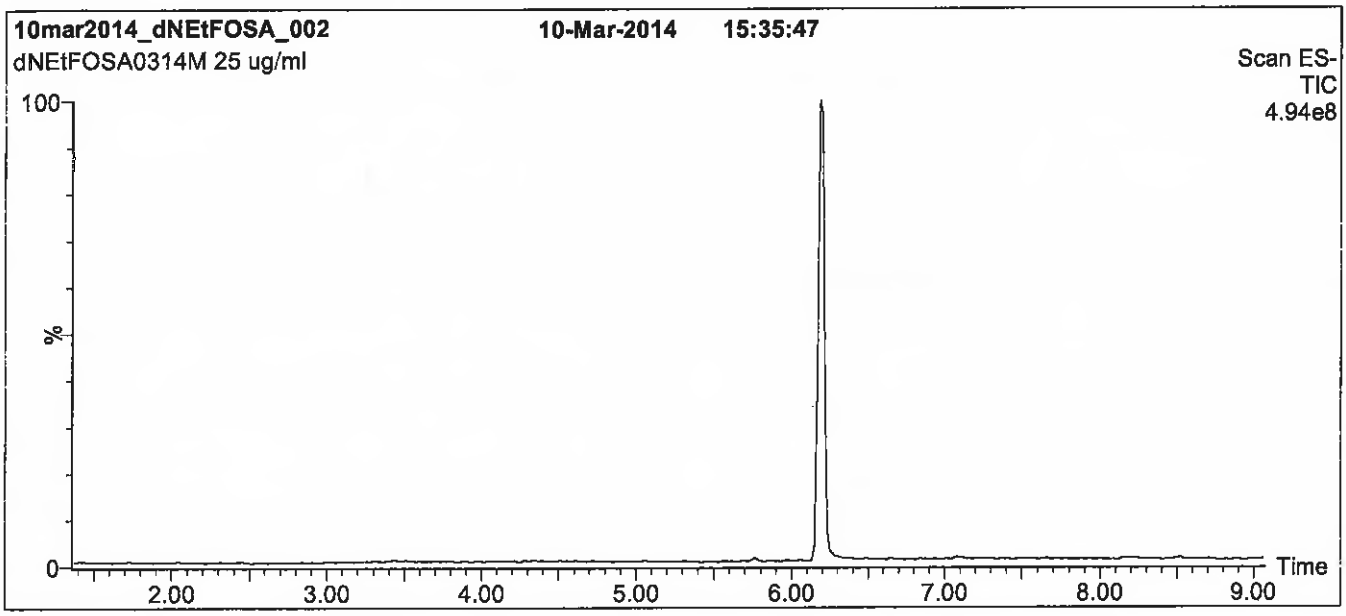
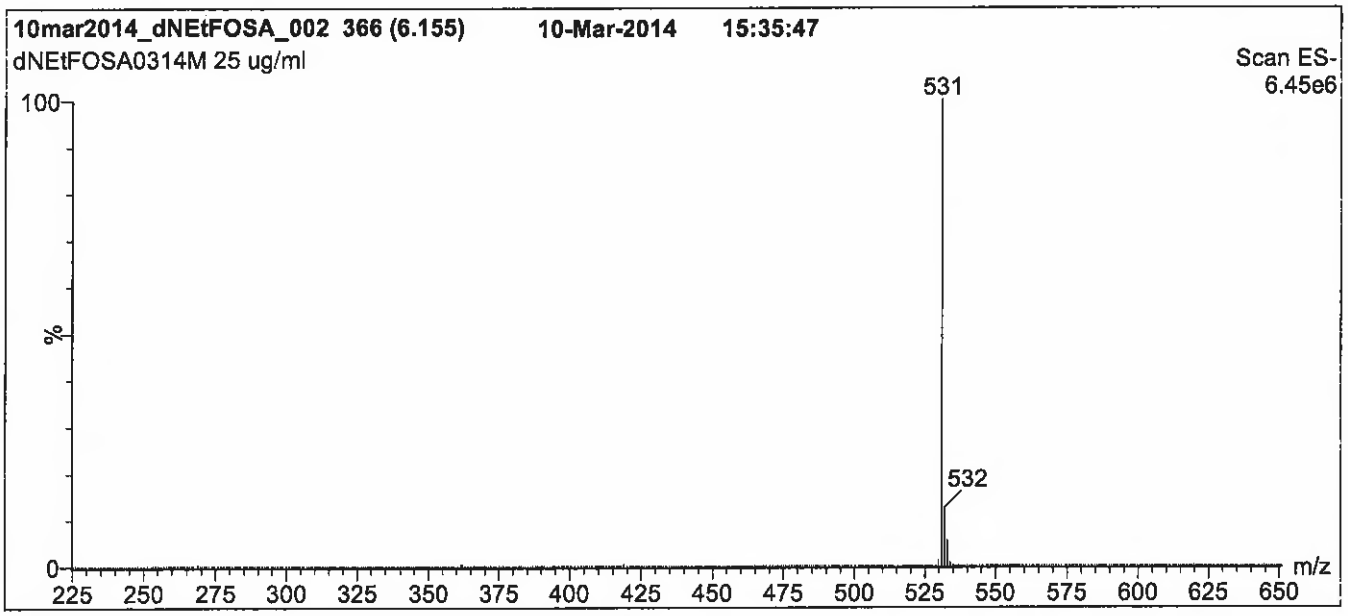




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gracient
Start: 40% H_2O / 60% (80:20 MeOH:ACN)
(both with 10mM NH_4OAc 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

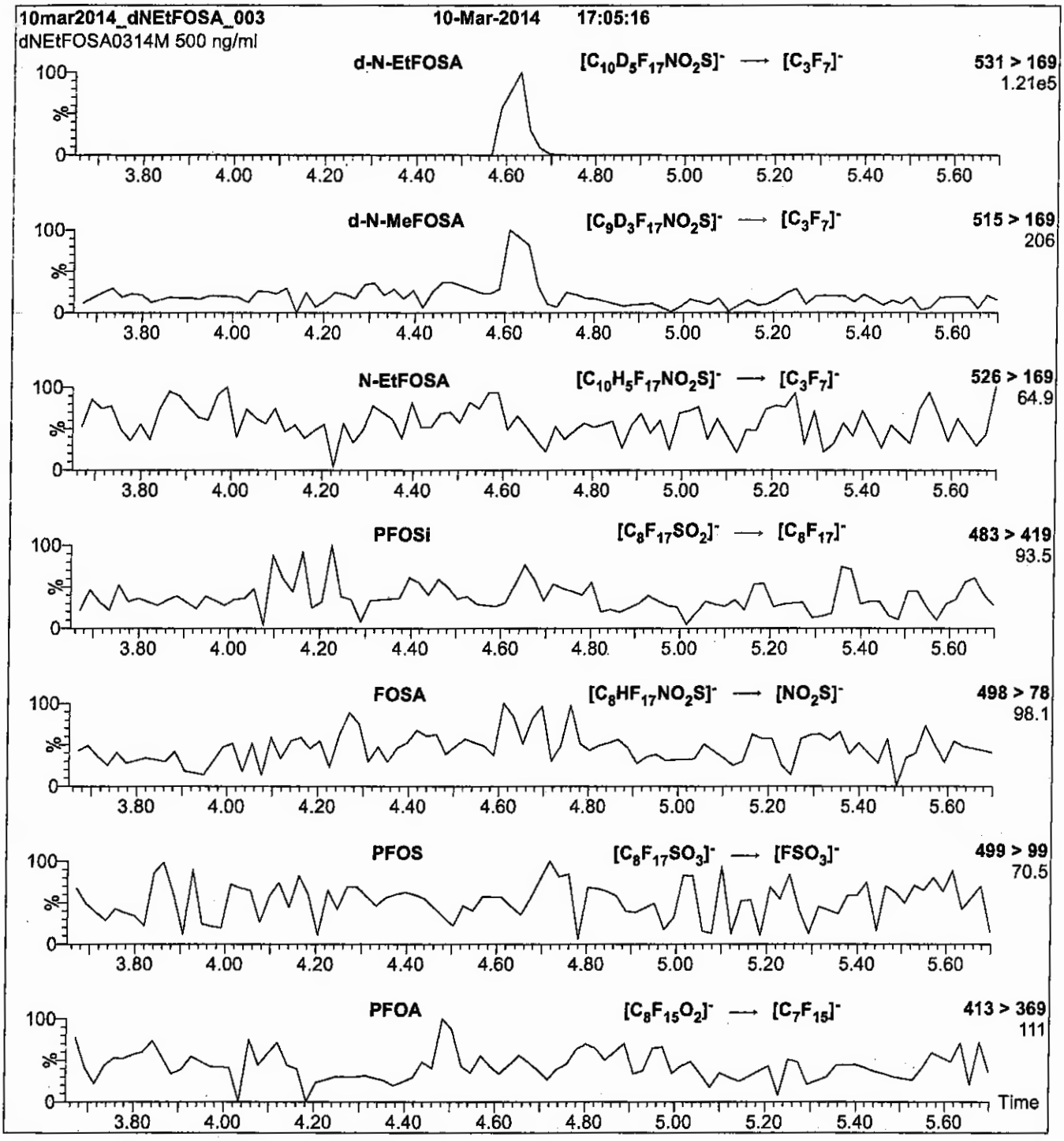
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d-N-EtFOSA-M)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00001

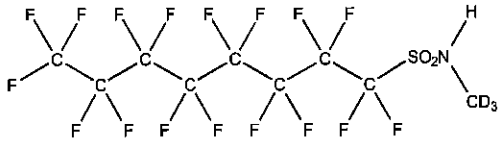
R: 7/16/15 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-MeFOSA-M
LOT NUMBER: dNMeFOSA0114M
COMPOUND: N-methyl-d_3-perfluoro-1-octanesulfonamide

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_9D_3HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	516.19
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	01/28/2014		
EXPIRY DATE: (mm/dd/yyyy)	01/28/2019		
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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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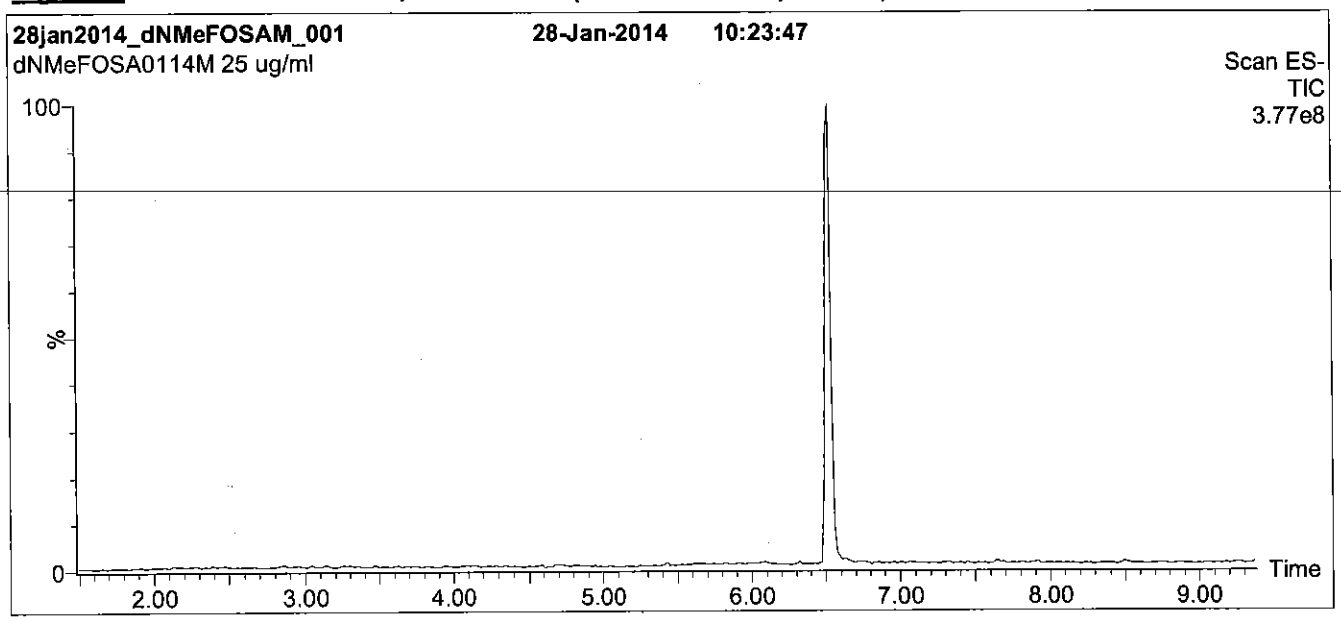
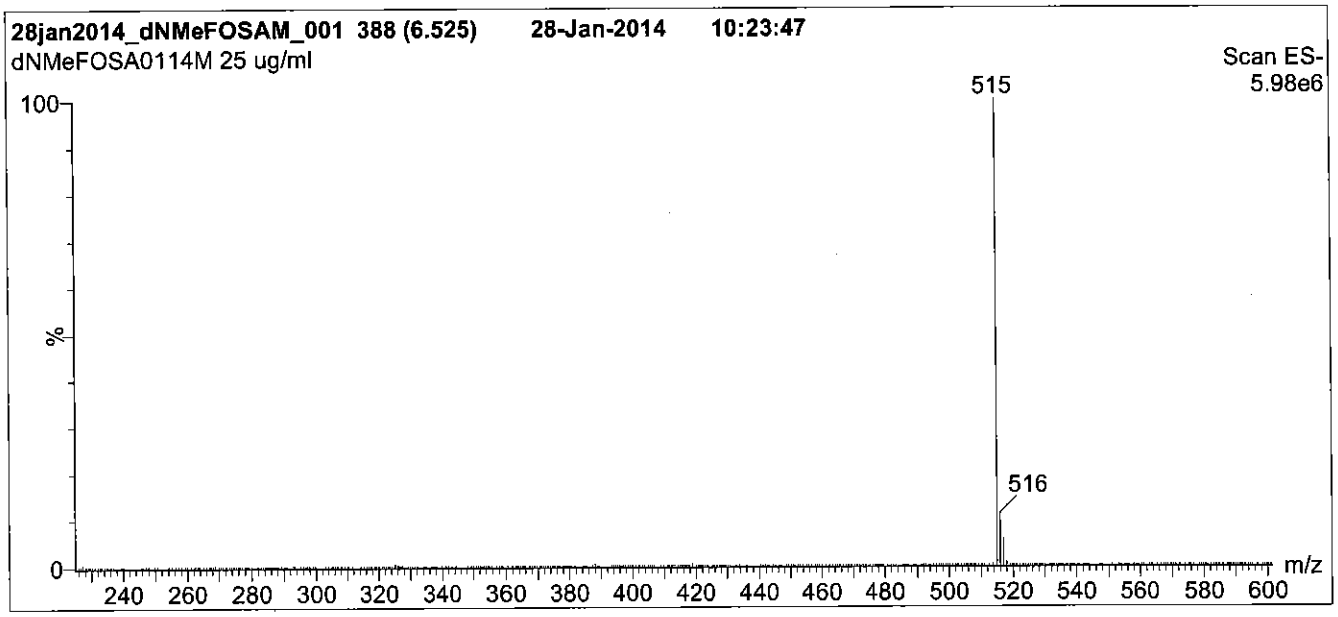
Figure 1: **d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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MS: **Micromass Quattro *micro* API MS**

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
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(both with 10mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min. Return to initial conditions over 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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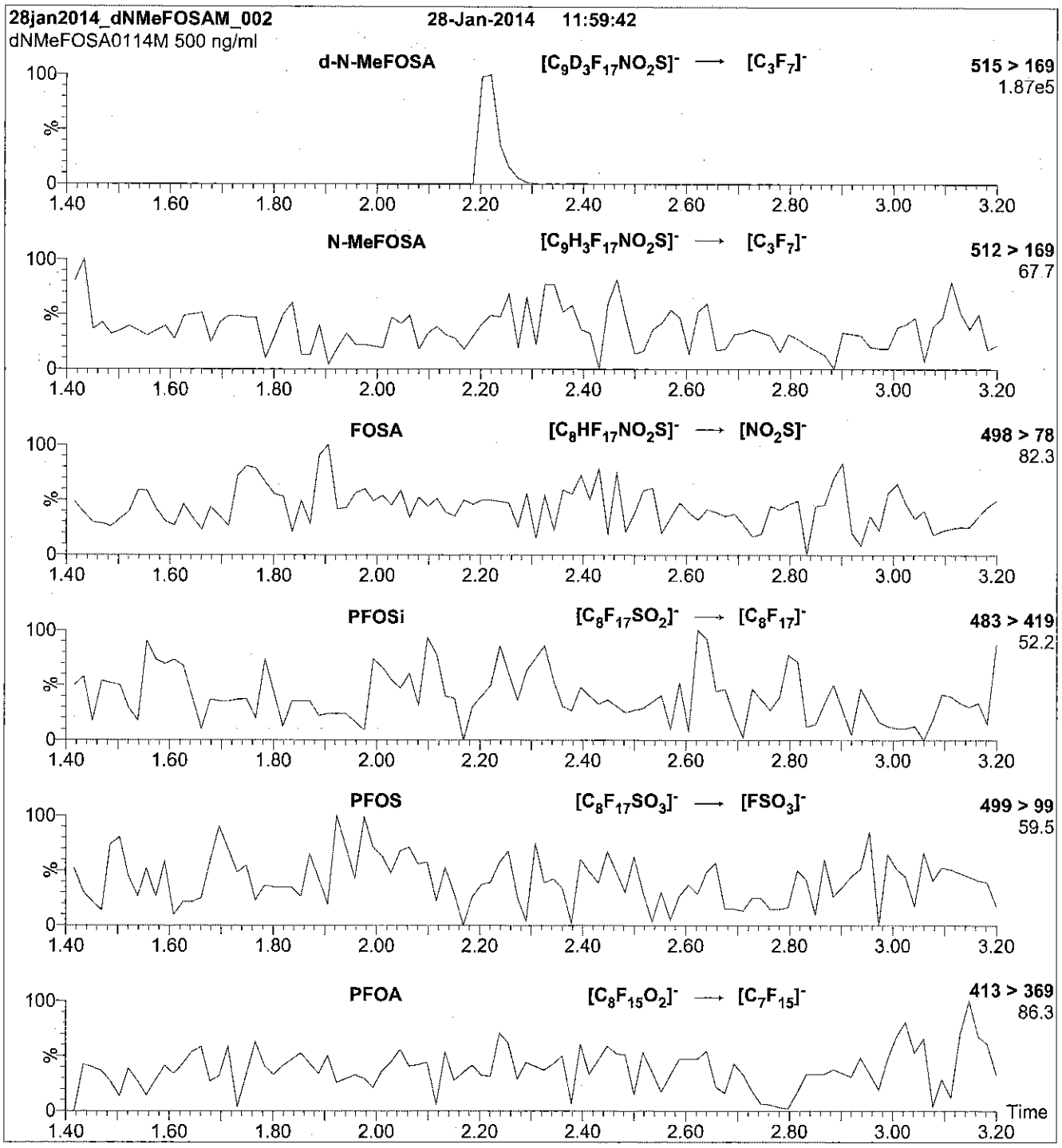
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d-N-MeFOSA-M)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 30

Reagent

LCd-NMeFOSA-M_00002

R: 7/6/16 CBW

671625
ID: LCd-NMeFOSA-M_00002
Exp: 06/13/21 Prpd: CBW
d-N-MeFOSA-M

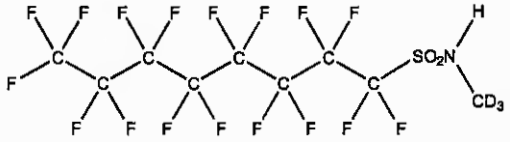
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d-N-MeFOSA-M
LOT NUMBER: dNMeFOSA0616M
COMPOUND: N-methyl-d_3-perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_8D_3HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	516.19
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	06/10/2016		
EXPIRY DATE: (mm/dd/yyyy)	06/10/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/16/2016 (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.

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HOMOGENEITY:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2,...x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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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).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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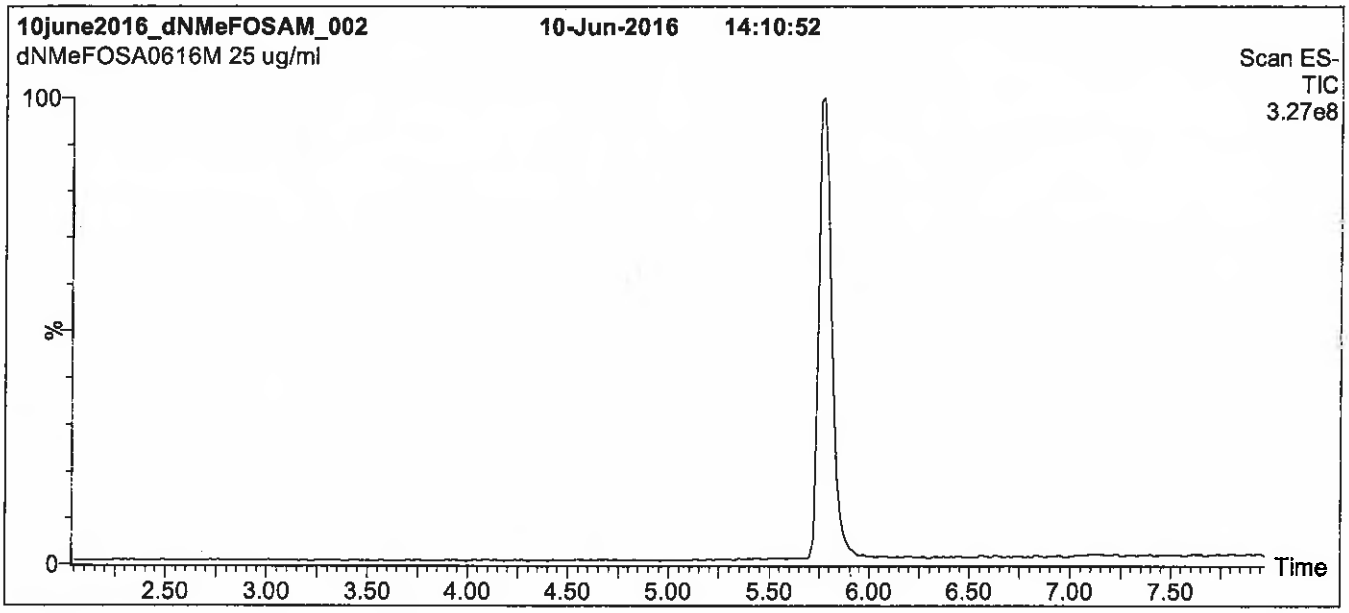
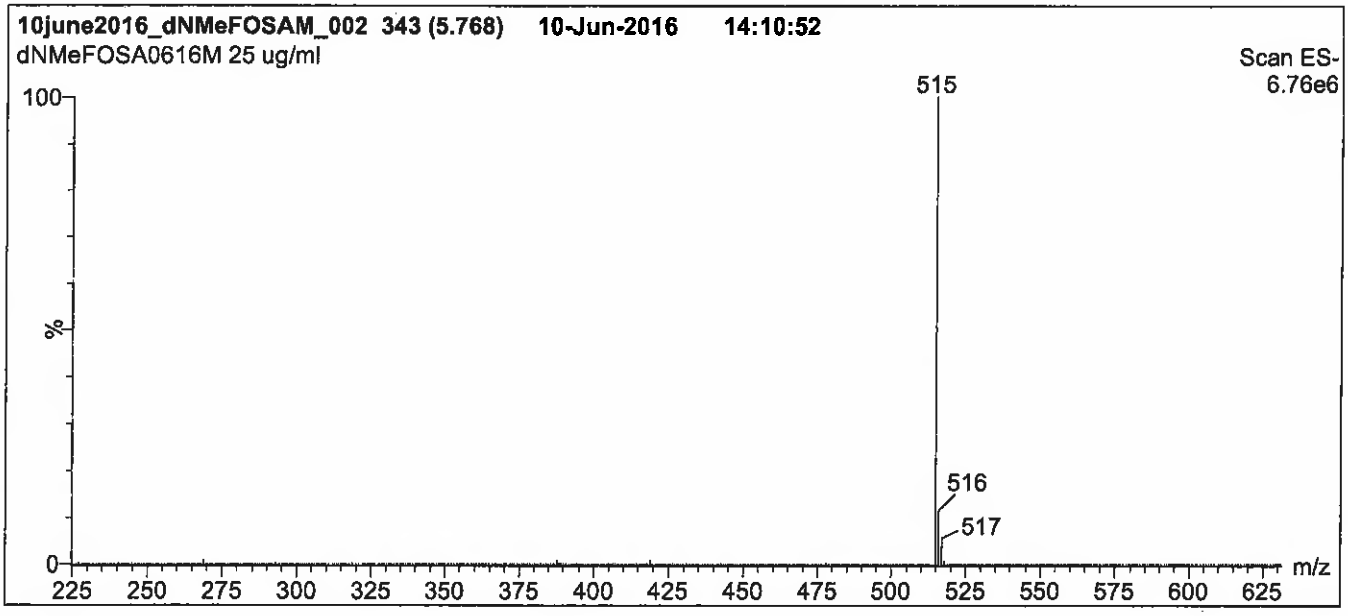
Figure 1: **d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% H_2O / 60% (80:20 MeOH:ACN)
(both with 10mM NH_4OAc 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

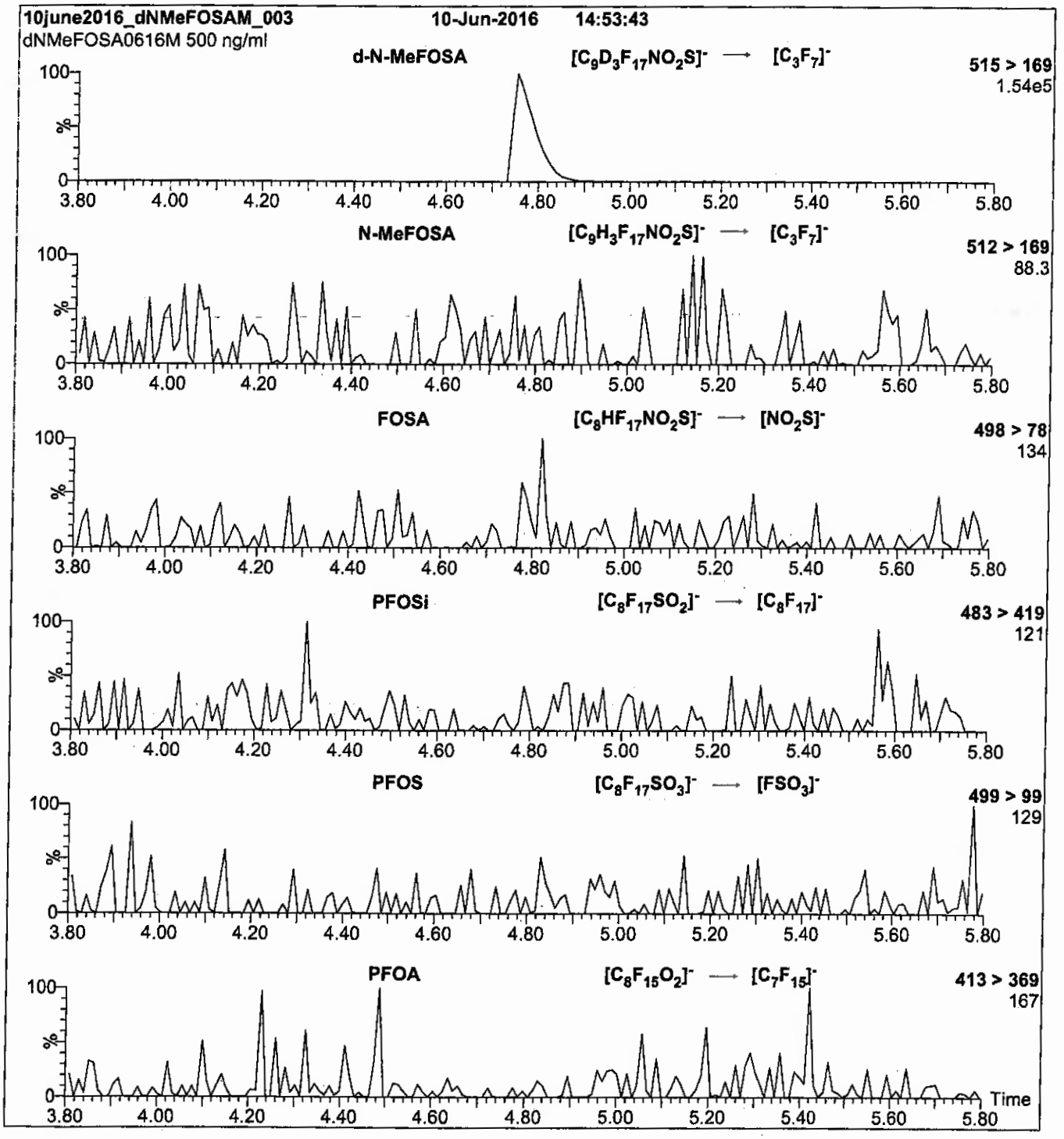
Flow: 300 µl/min

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: **d-N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d-N-MeFOSA-M)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00001

r: 7/16/15 SKV

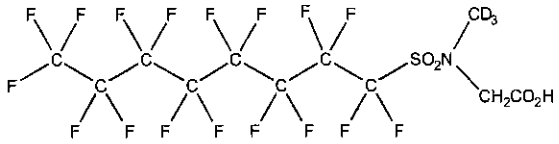
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0113

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	01/31/2013		
EXPIRY DATE: (mm/dd/yyyy)	01/31/2018		
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 **Date:** 04/06/2015 (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:

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SYNTHESIS / CHARACTERIZATION:

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

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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:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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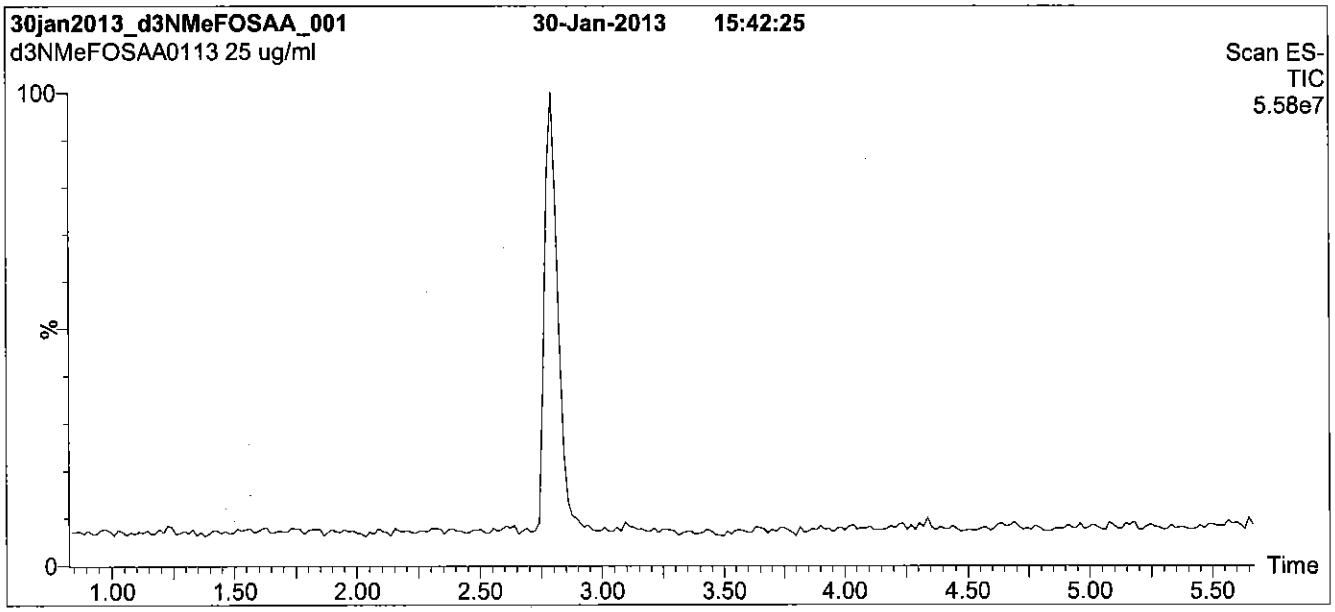
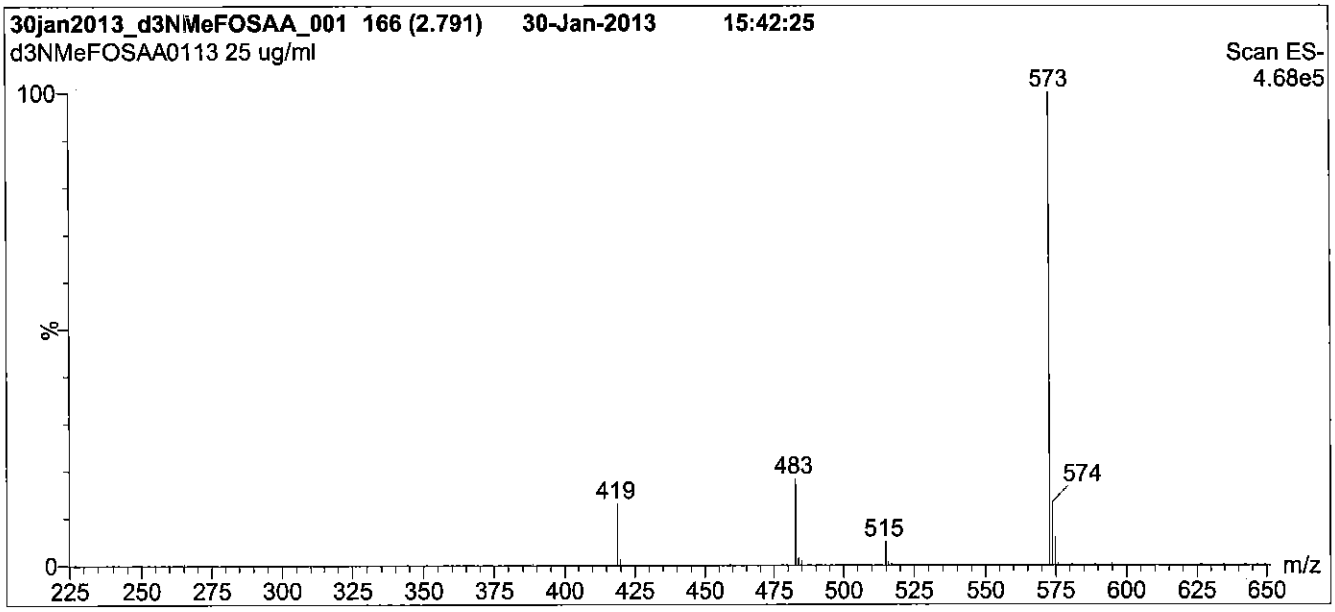
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc 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

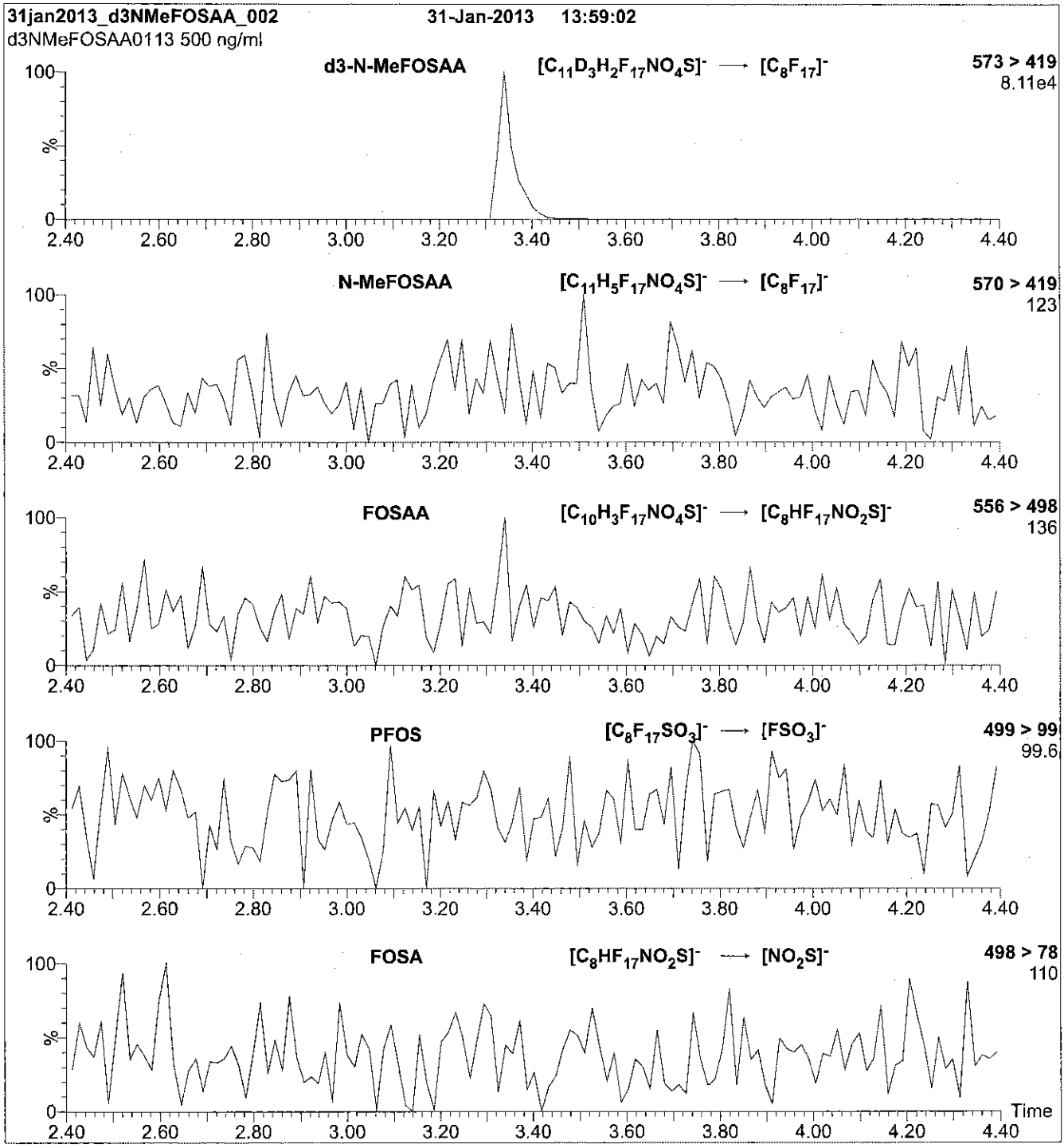
Flow: 300 µl/min

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 µl (500 ng/ml d3-N-MeFOSAA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00002

R: 7/6/16 CBW

671572
ID: LCd3-NMeFOSAA_00002
Exp: 01/20/21 Prpd: CBW
d3-N-MeFOSAA

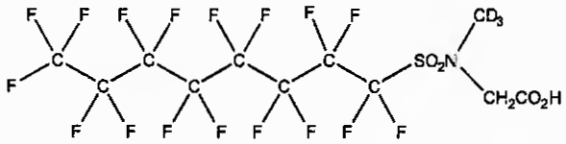
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0116

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	01/20/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/20/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

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Certified By: B.G. Chittim **Date:** 01/25/2016 (mm/dd/yyyy)

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CALA

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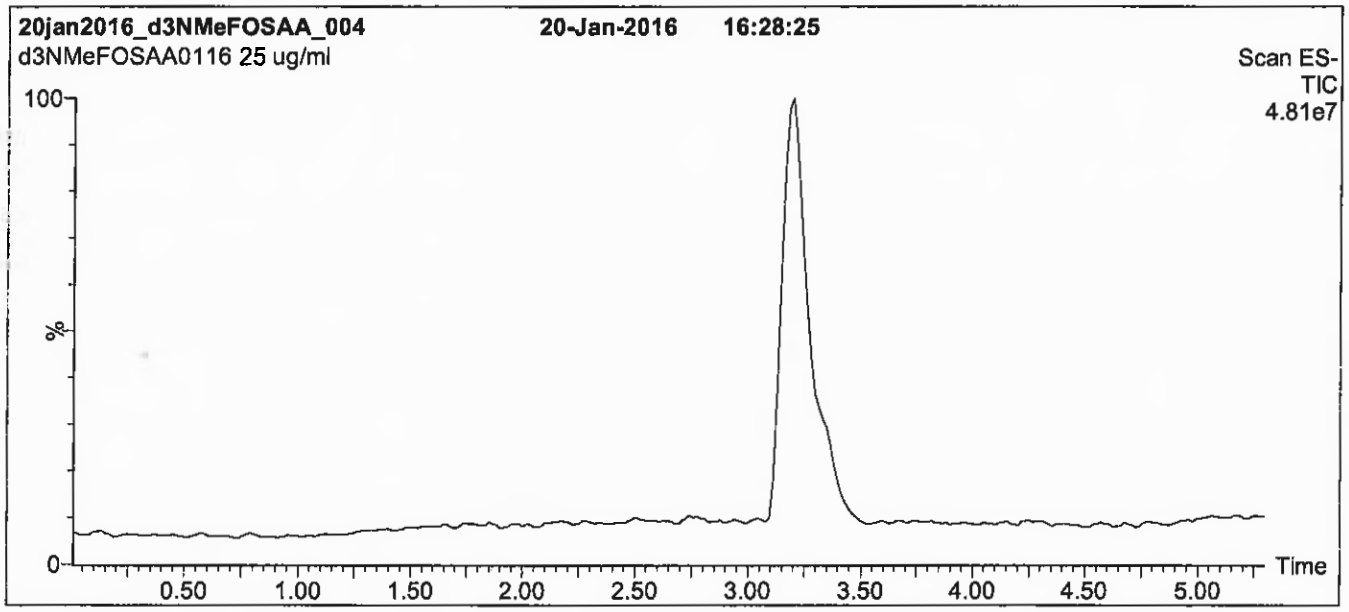
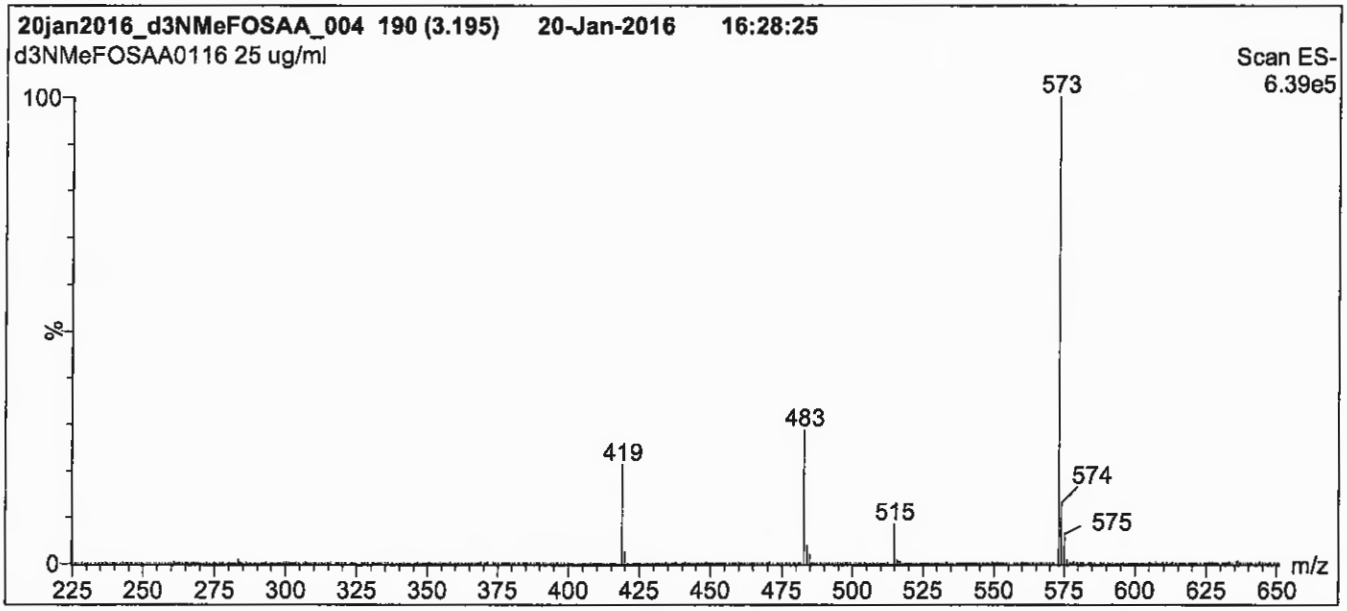




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

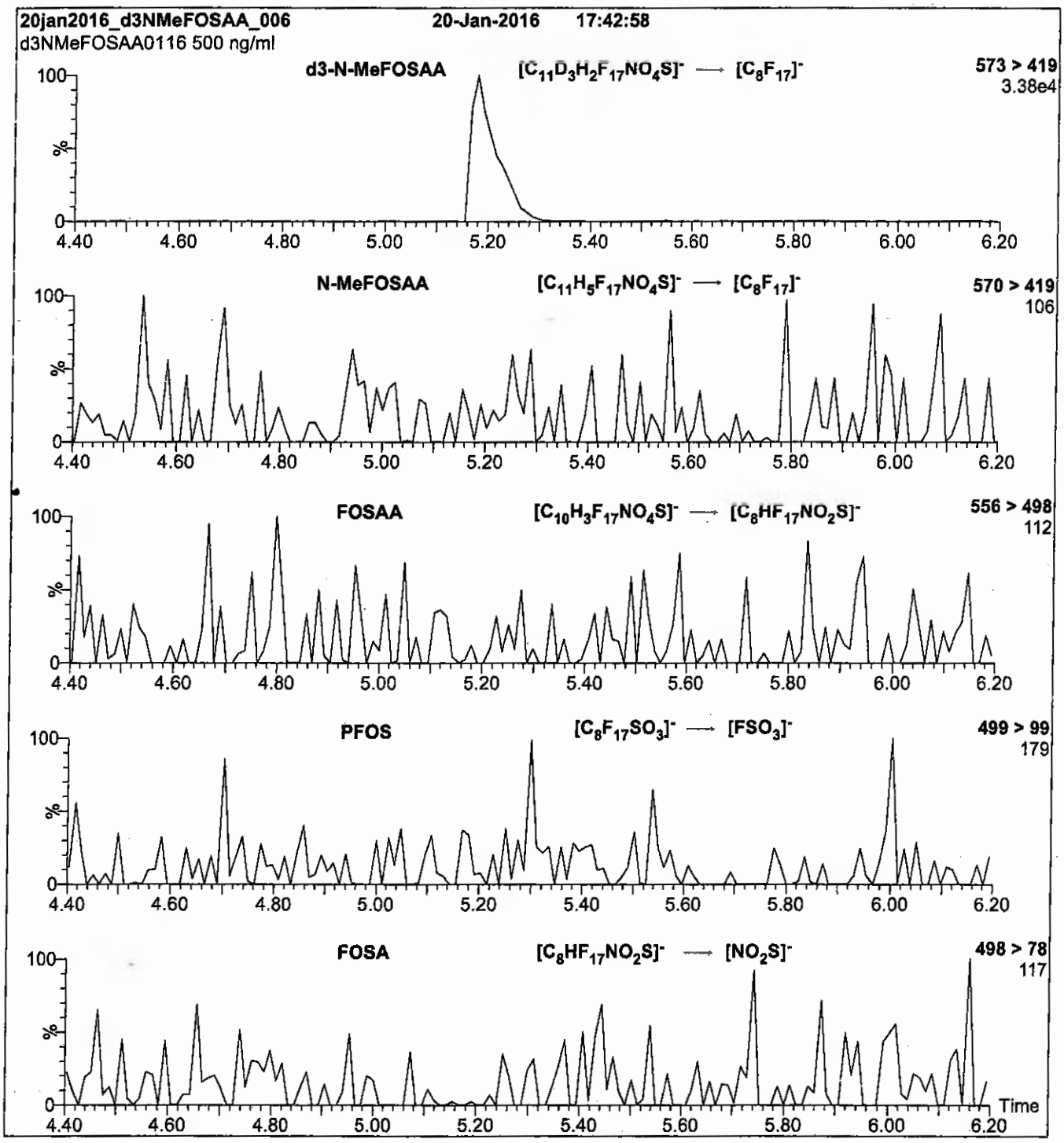
Flow: 300 µl/min

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 µl (500 ng/ml d3-N-MeFOSAA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 25

Reagent

LCd5-NEtFOSAA_00001

P: 7/10/15 SW

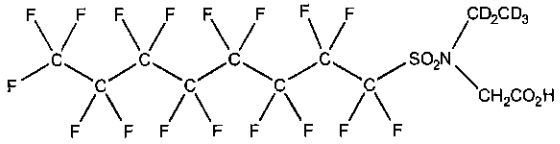
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA0515

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{12}D_5H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	590.27
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	05/08/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/08/2020		
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 **Date:** 05/11/2015 (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:

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

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

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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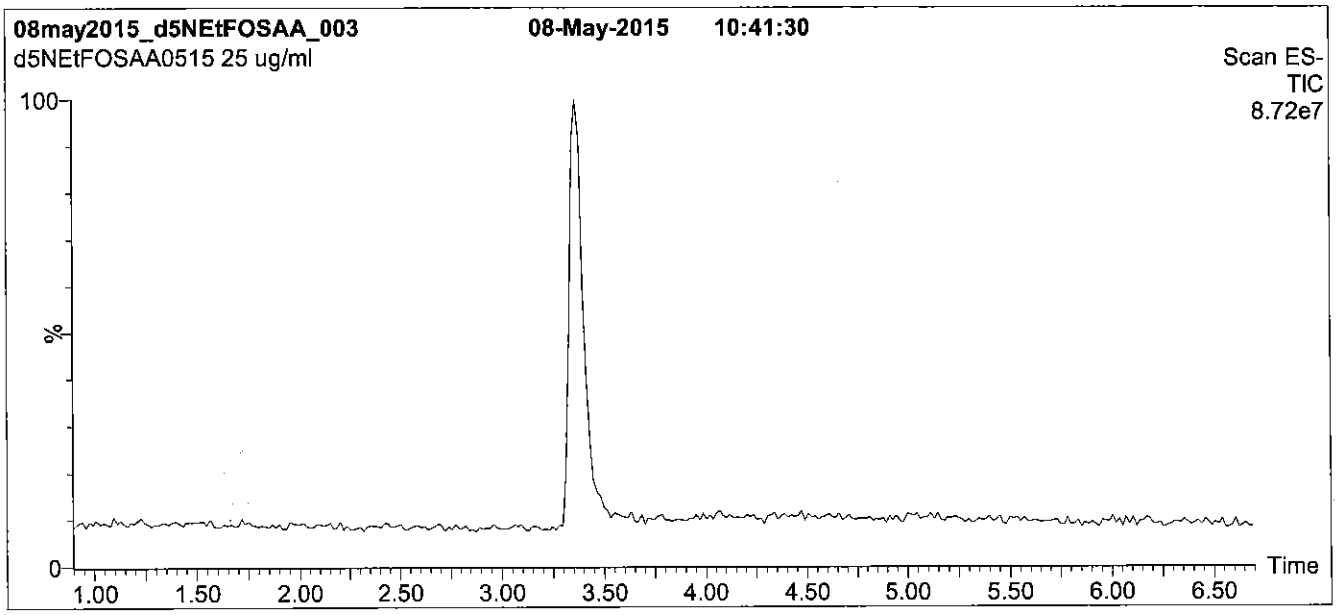
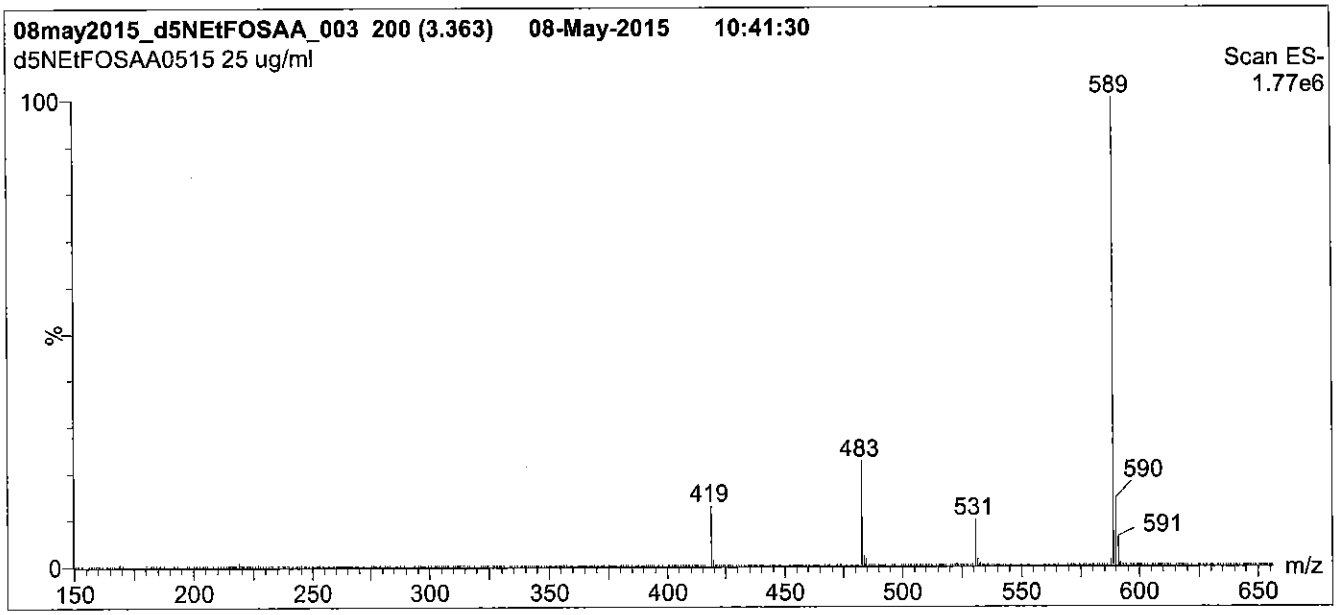
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc 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

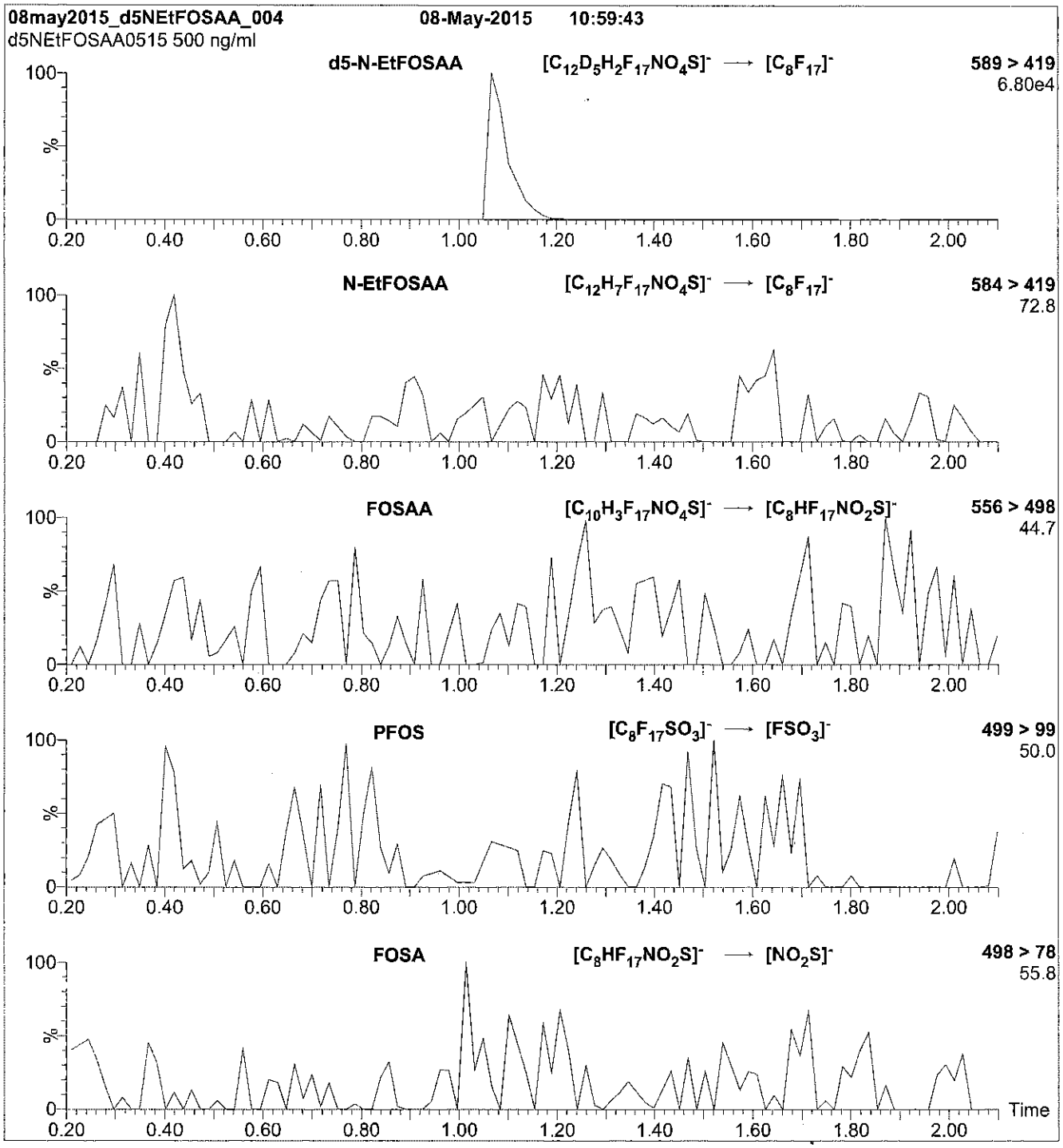
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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 µl (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 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 25

Reagent

LCd5-NEtFOSAA_00002

R: 7/6/16 CBW

671603
ID: LCd5-NEtFOSAA_00002
Exp: 12/07/20 Prpd: CBW
d5-N-EtFOSAA

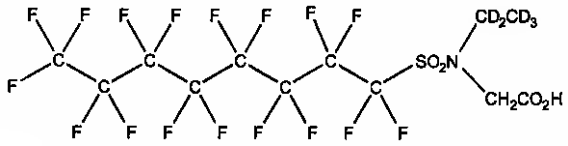
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1115

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{12}D_5H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	590.27
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_6$
LAST TESTED: (mm/dd/yyyy)	12/07/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/07/2020		
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.

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Certified By: B.G. Chittim **Date:** 12/07/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

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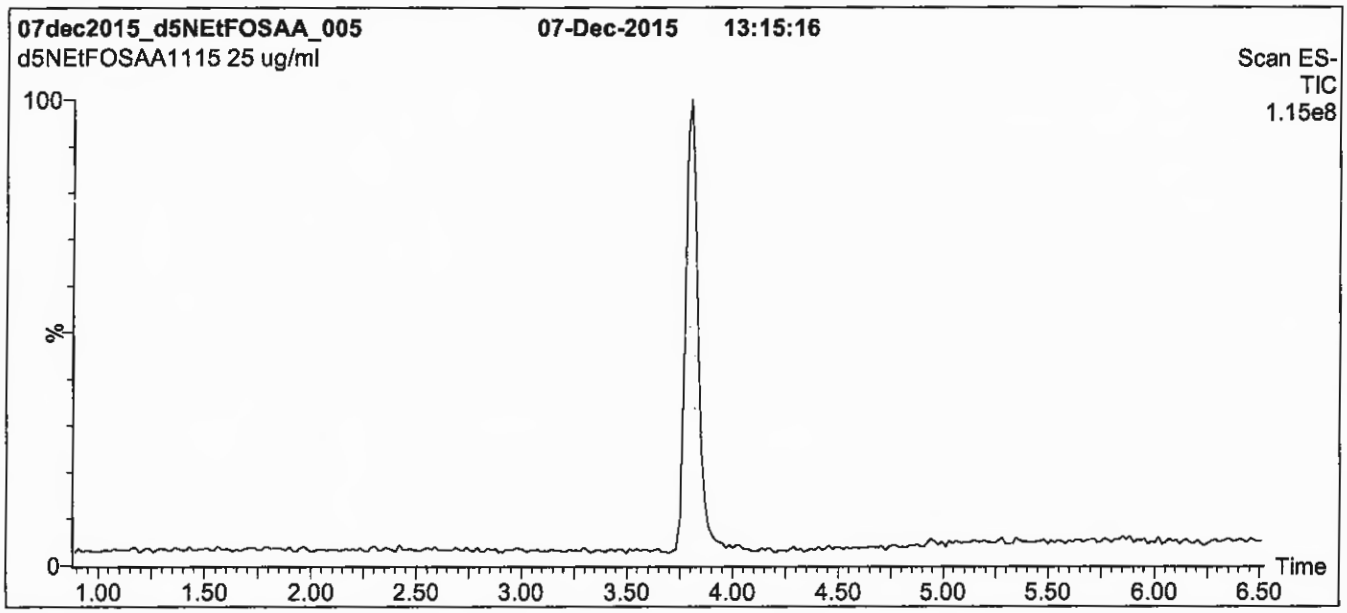
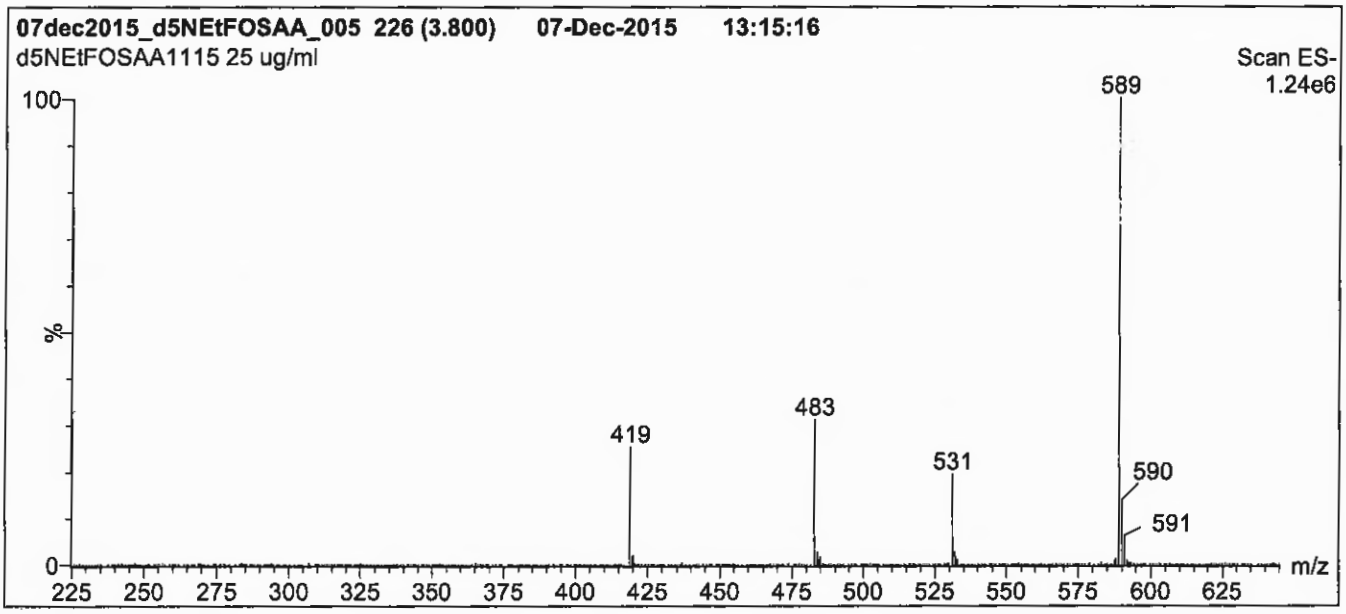




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc 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

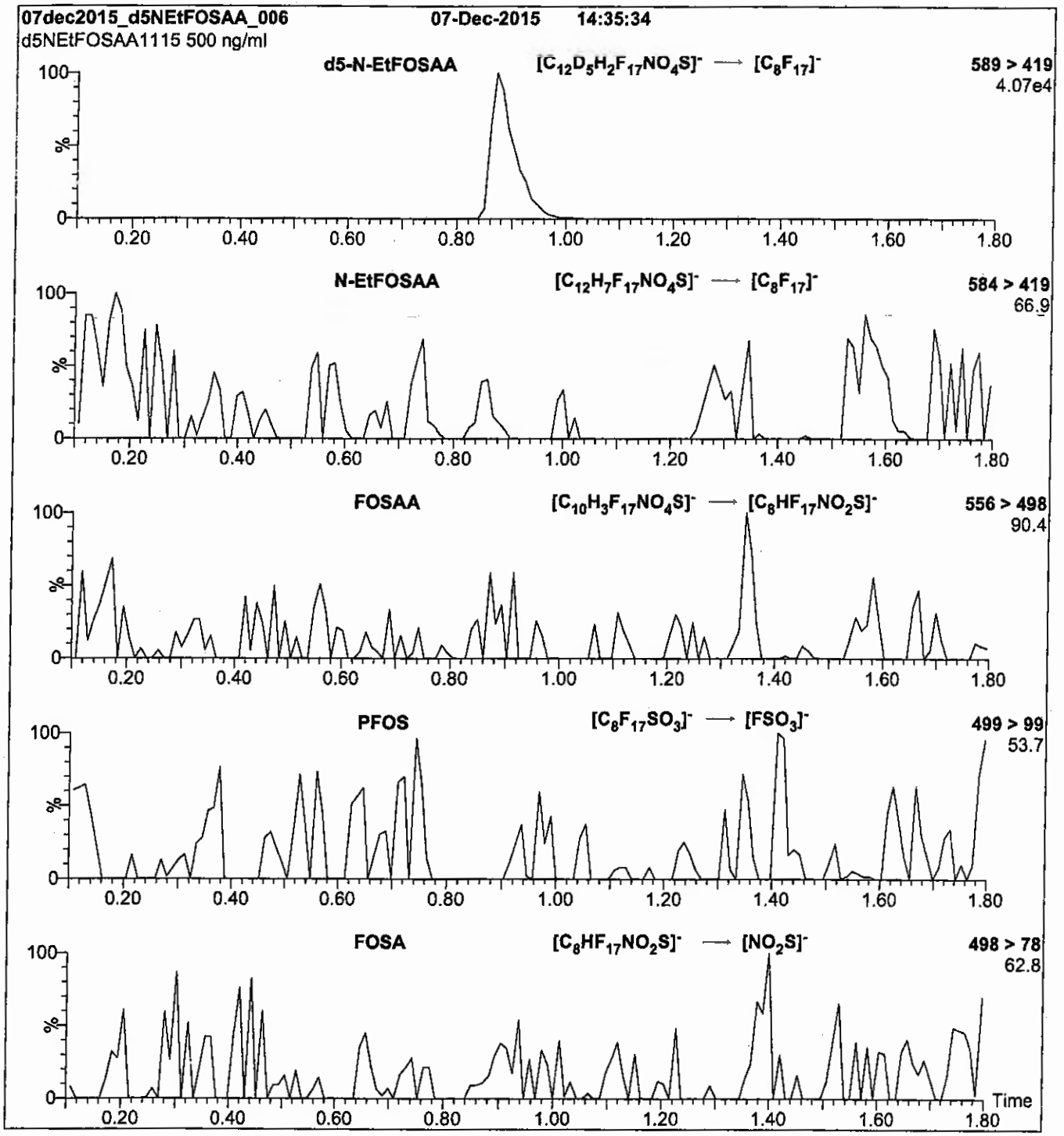
Flow: 300 µl/min

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 µl (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 µl/min

MS Parameters

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

Reagent

LCM2-6:FTS_00001

R: 7/16/15 SN
S: 7/20/15 SN

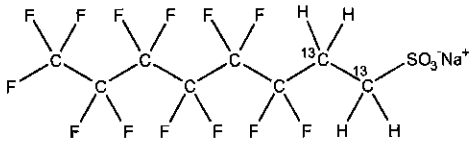
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0714

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.5 ± 2.4 µg/ml (M2-6:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/15/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/15/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

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- The native 6:2FTS contains 4.22% of ^{34}S (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).

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Certified By: _____ **Date:** 03/27/2015 (mm/dd/yyyy)
B.G. Chittim

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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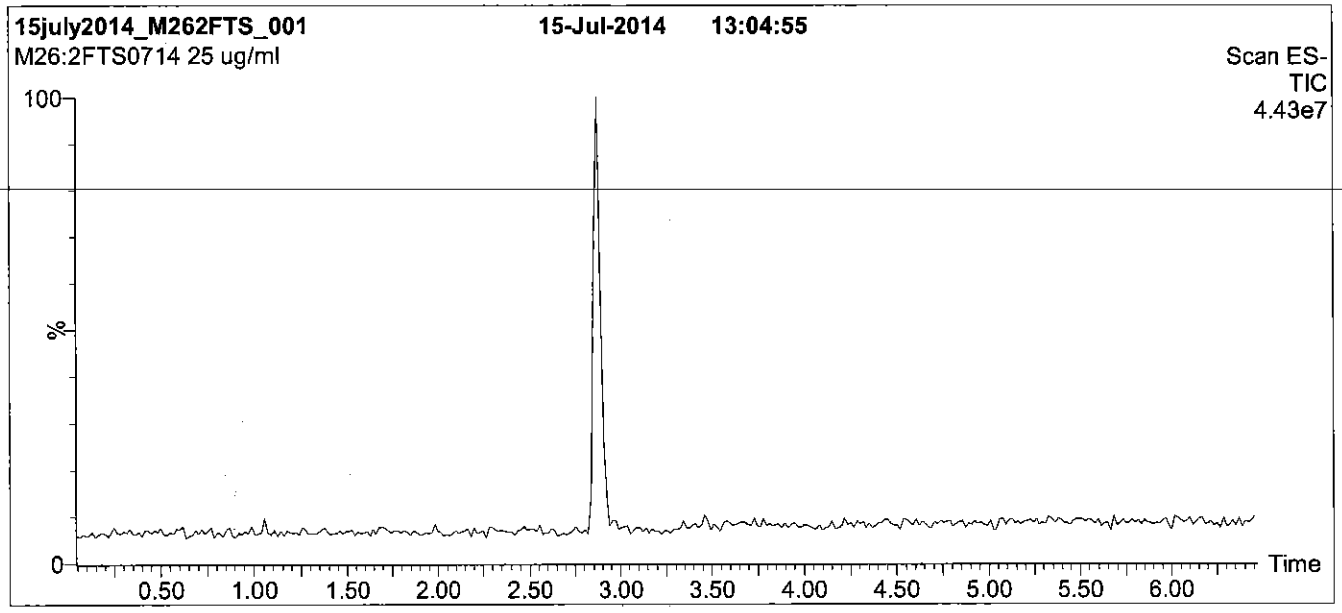

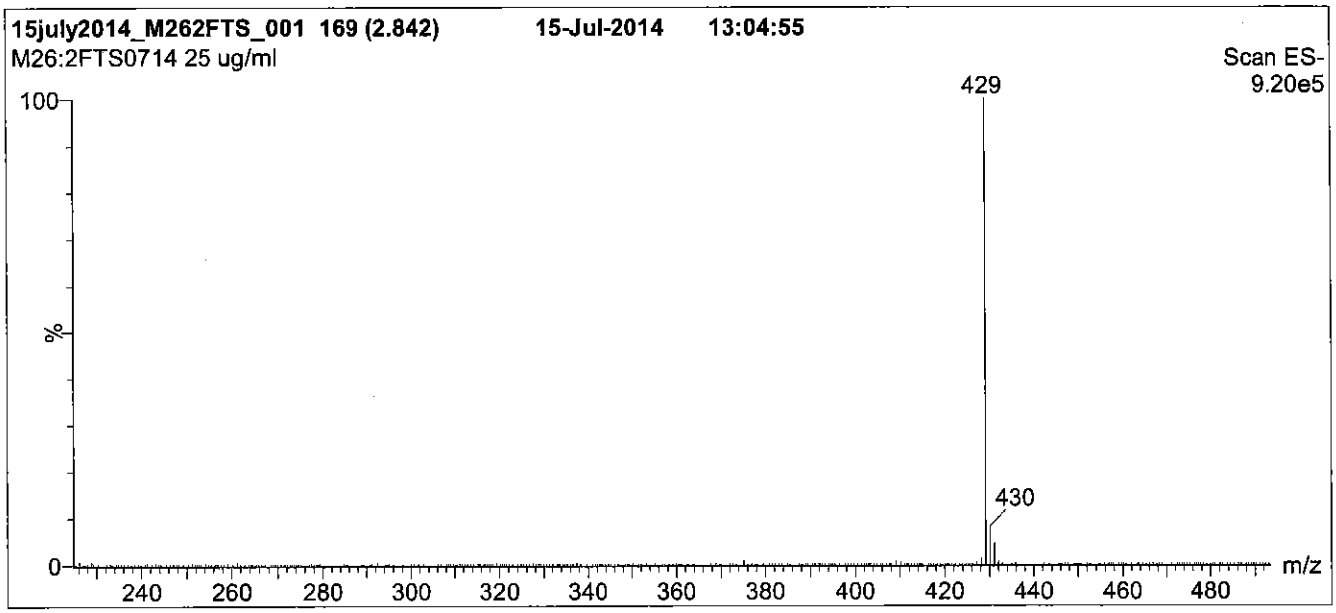

Conditions for Figure 1:

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MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc 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

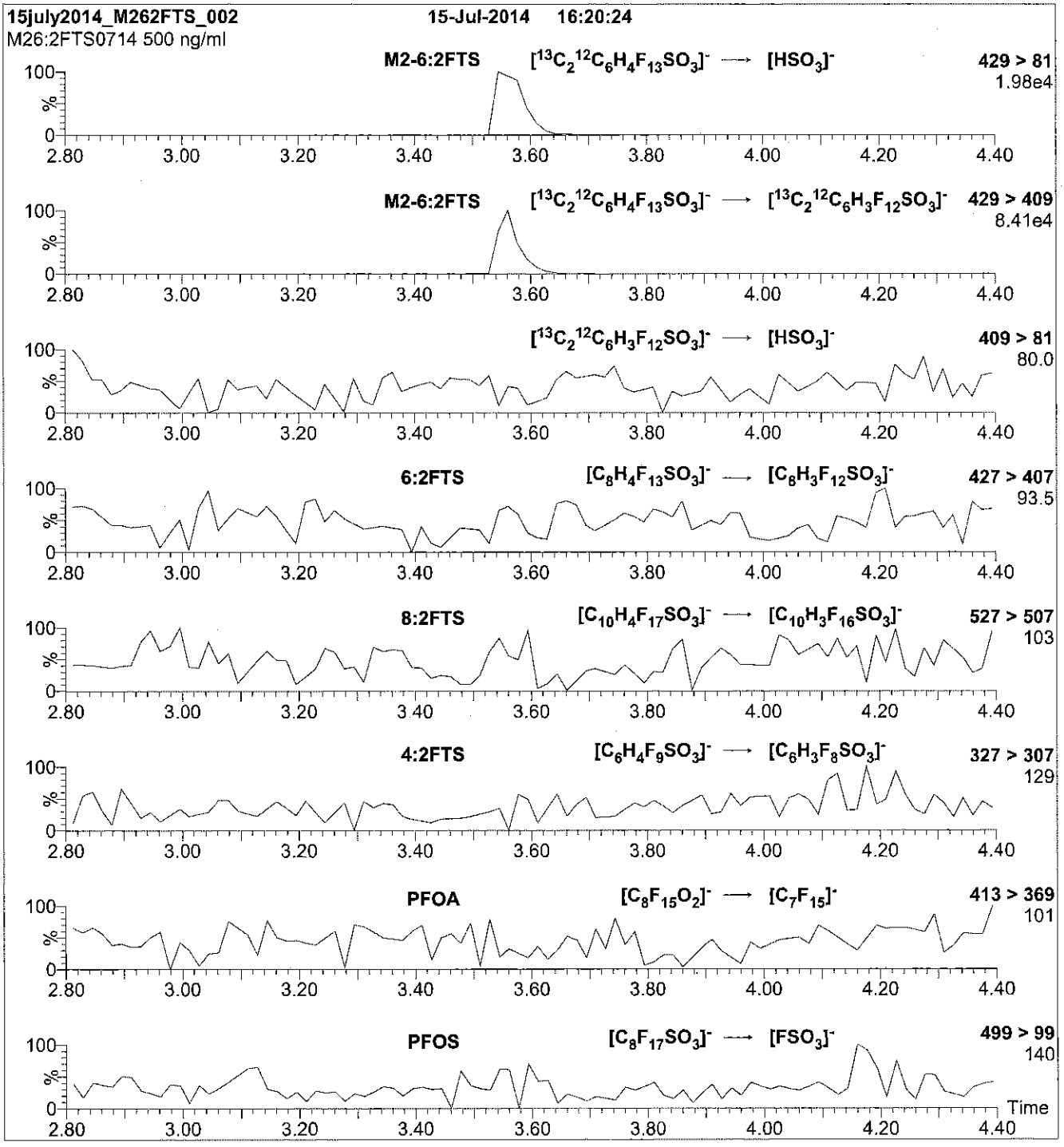
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 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 µl/min

MS Parameters

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

Reagent

LCM2-6:FTS_00002

R: 7/6/16 CSW

671575
ID: LCM2-6:FTS_00002
Exp: 01/08/21 Prpd: CSW
M2-6:2FTS

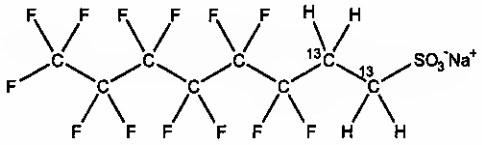
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0116

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



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LAST TESTED: (mm/dd/yyyy)	01/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/08/2021		
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where x is expressed as a relative standard uncertainty of the individual parameter.

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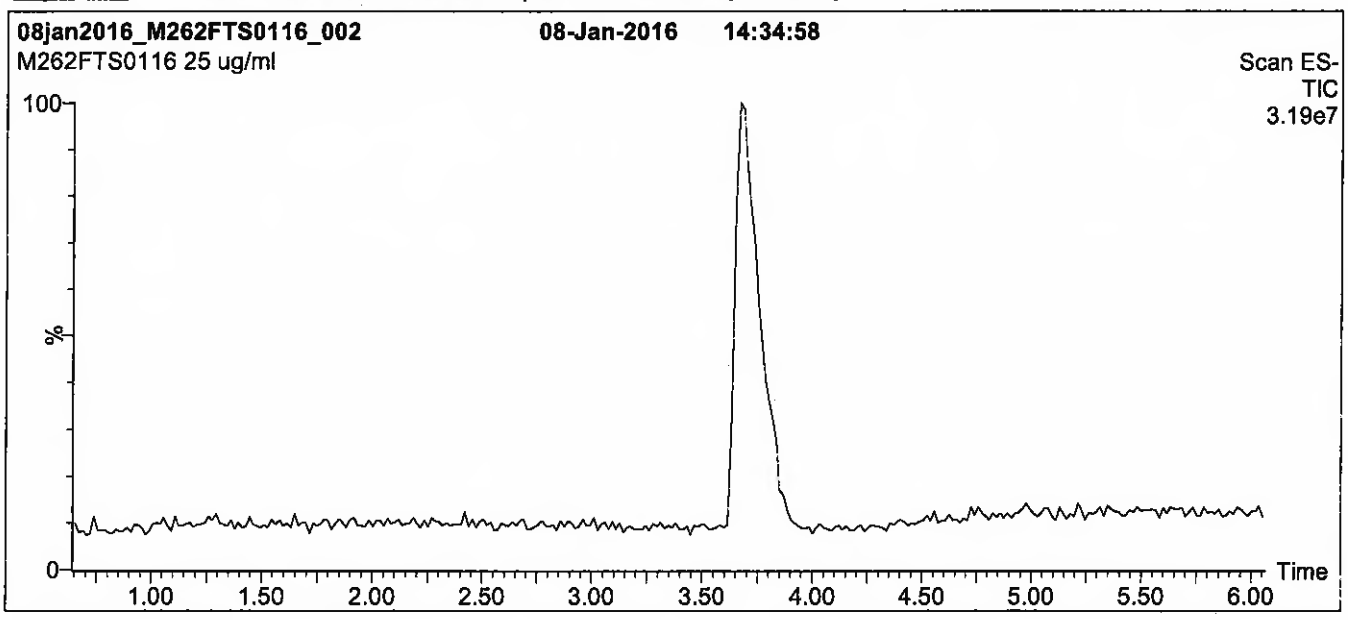
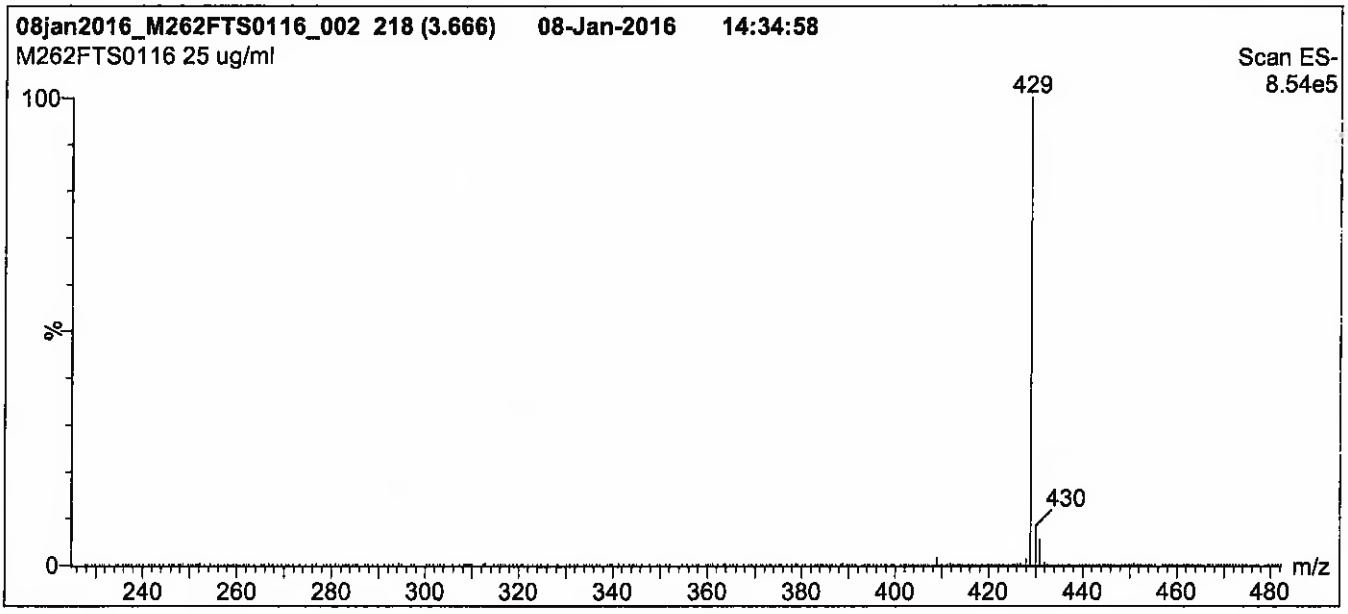
Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

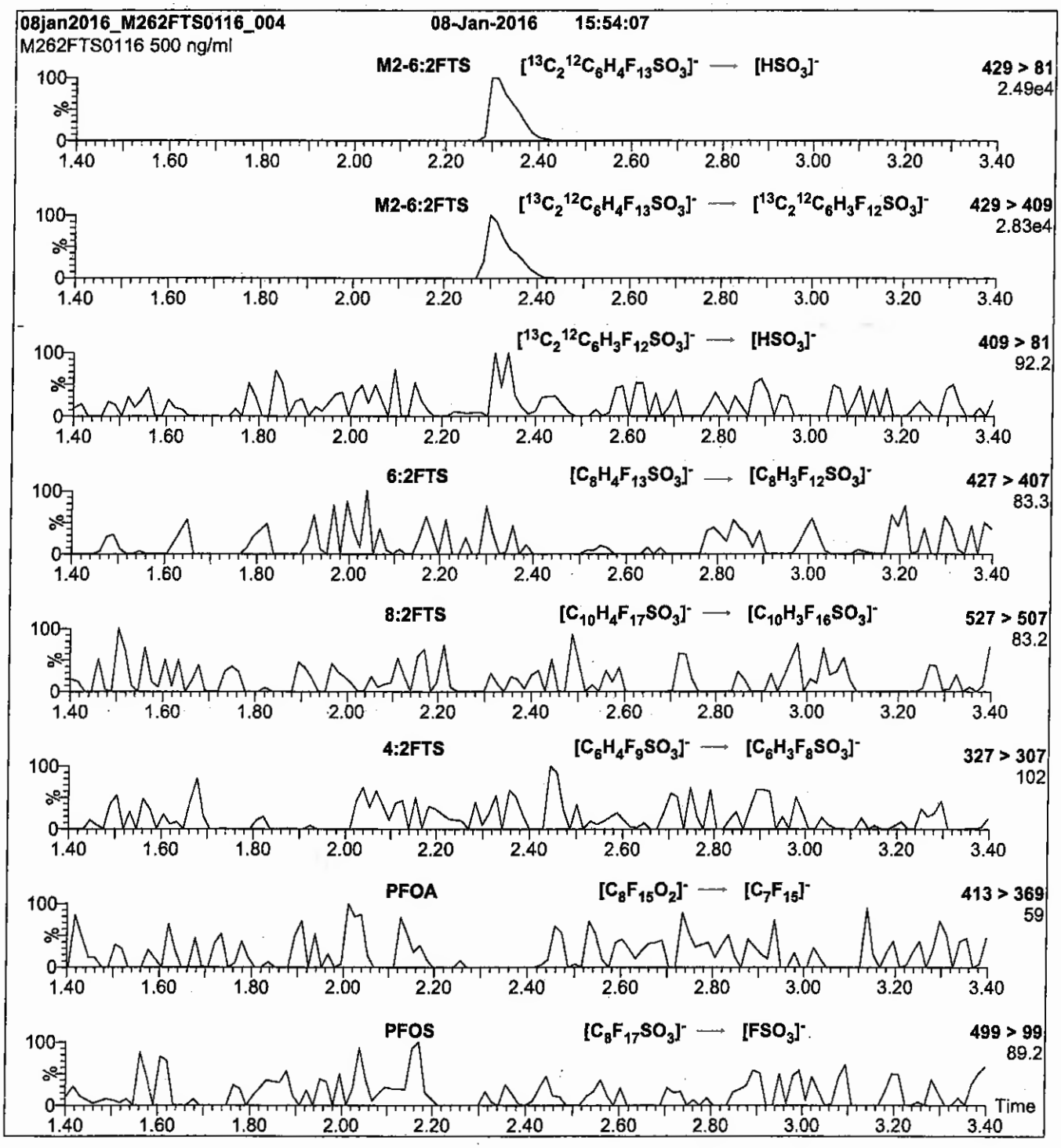
Flow: 300 µl/min

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: **M2-6:2FTS; 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 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00001

r: 7/16/15 BV
s · 7/22/15 STV

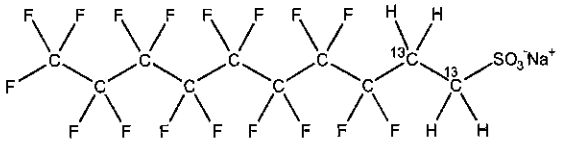
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0414

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/13/2014		
EXPIRY DATE: (mm/dd/yyyy)	04/13/2017		
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 ^{34}S (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 **Date:** 03/27/2015 (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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 ISO 17034 REFERENCE MATERIAL PRODUCER

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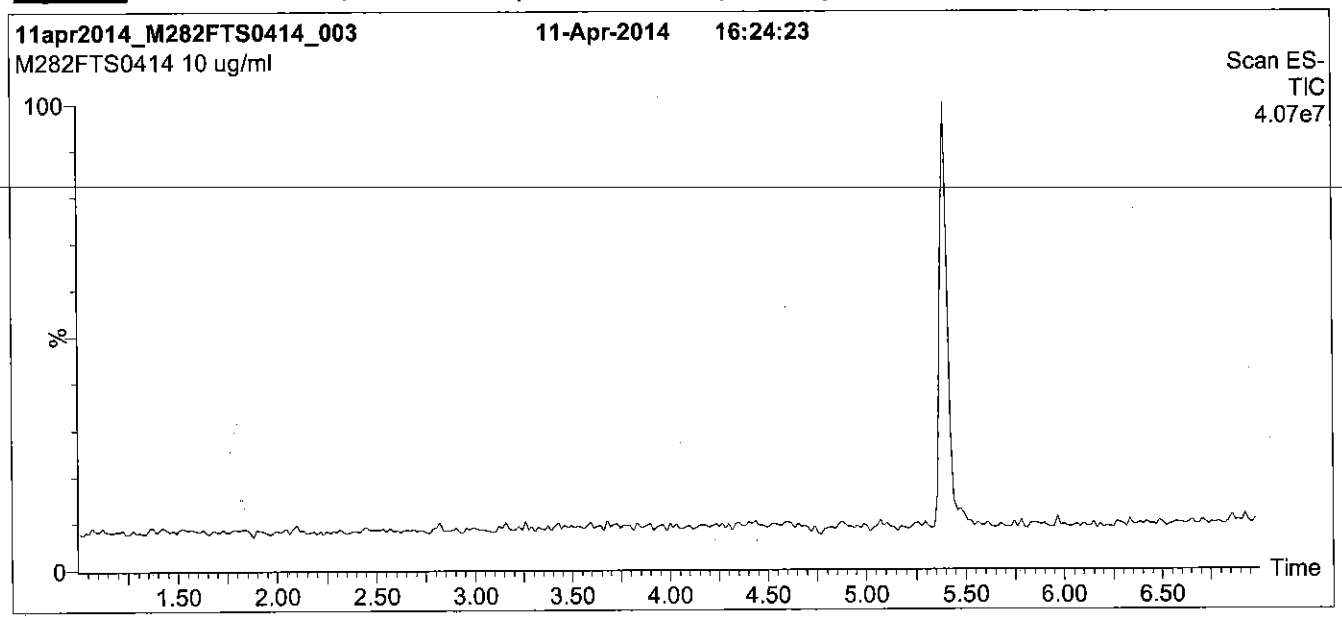
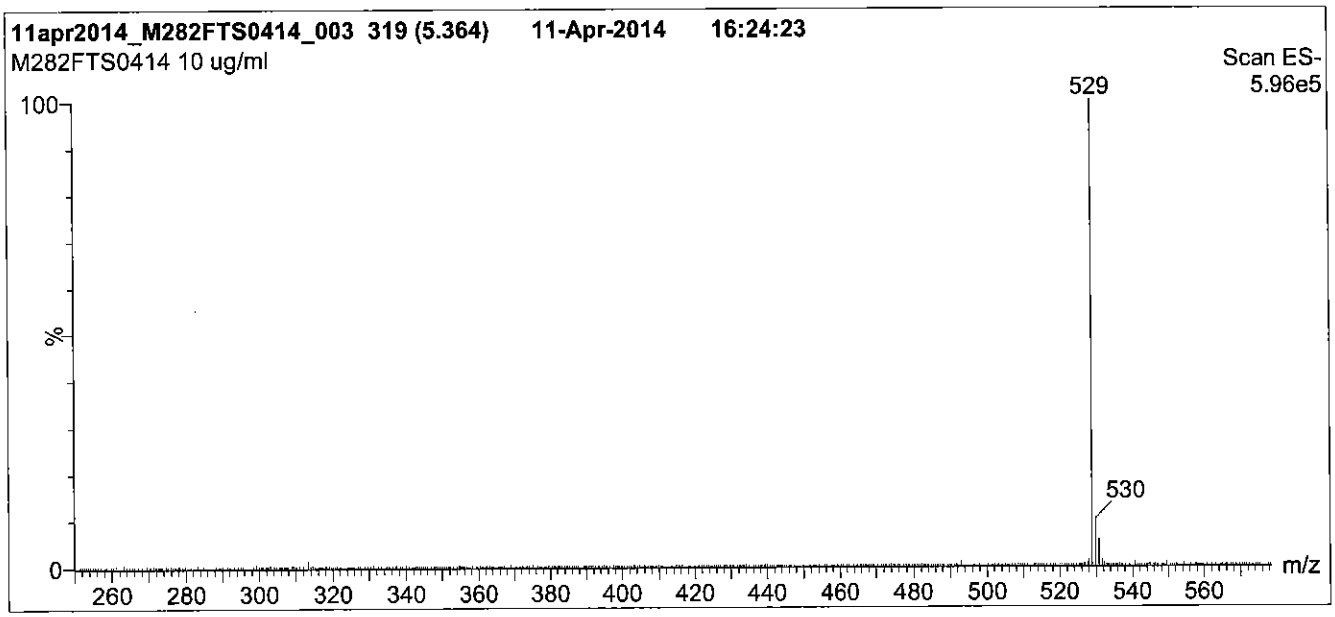




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

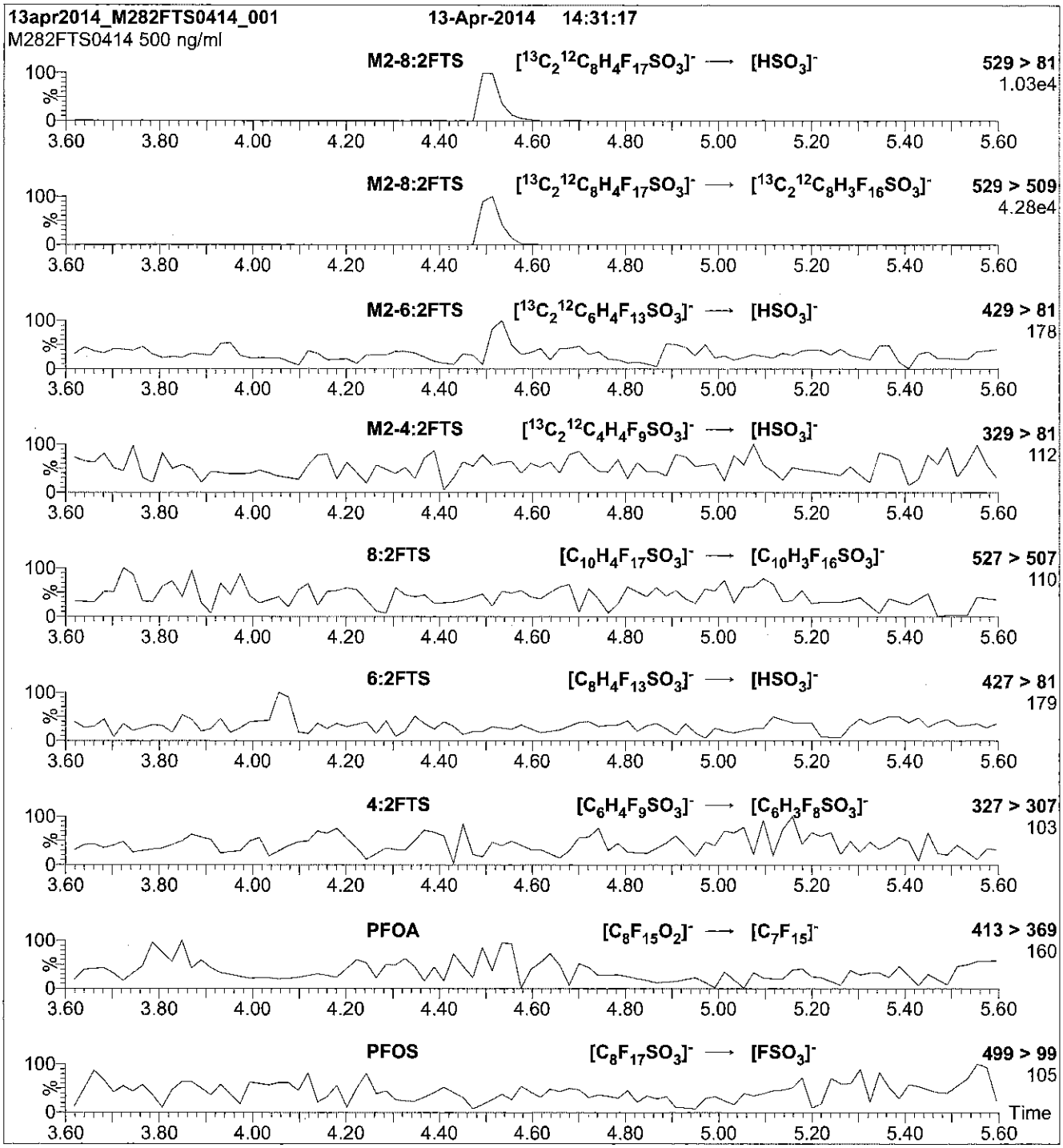
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00002

R: 7/6/16 cdw

671602
ID: LCM2-8:2FTS_00002
Exp: 01/08/21 Prpd: CBW
M2-8:2FTS

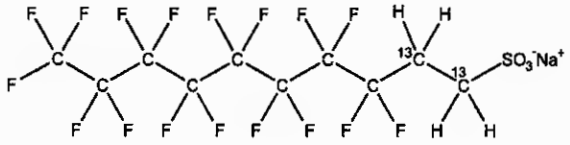
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0116

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.9 ± 2.4 µg/ml (M2-8:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/08/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

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ADDITIONAL INFORMATION:

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Certified By: B.G. Chittim **Date:** 01/18/2016 (mm/dd/yyyy)

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CALA

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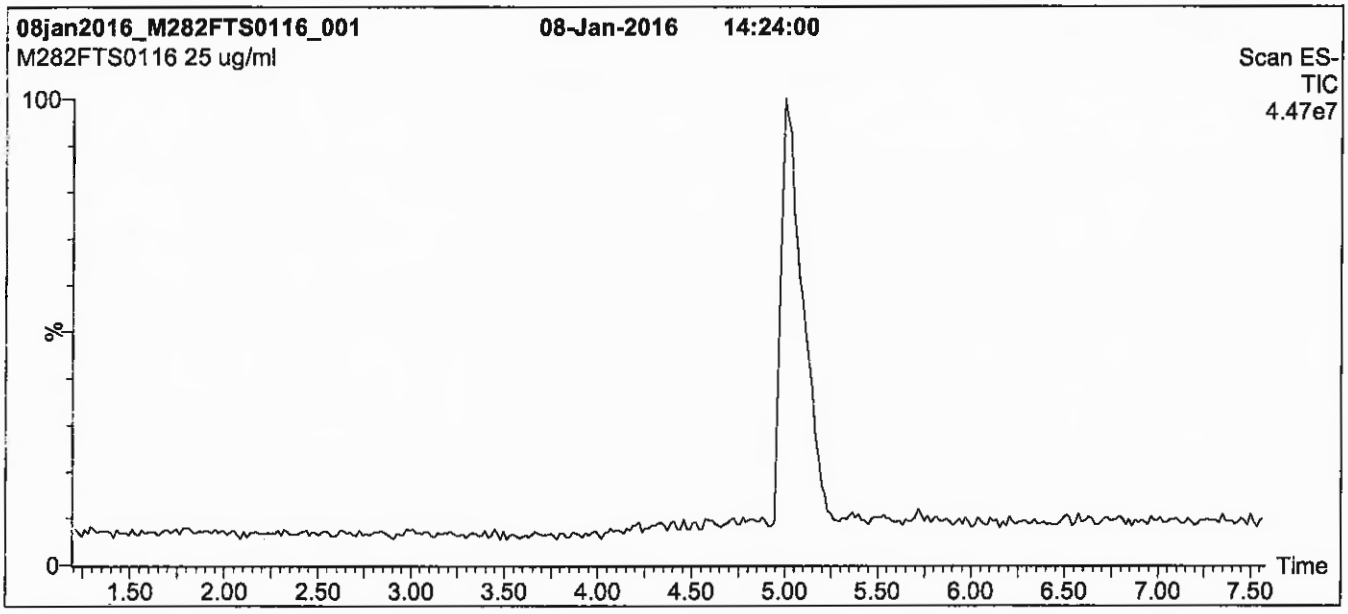
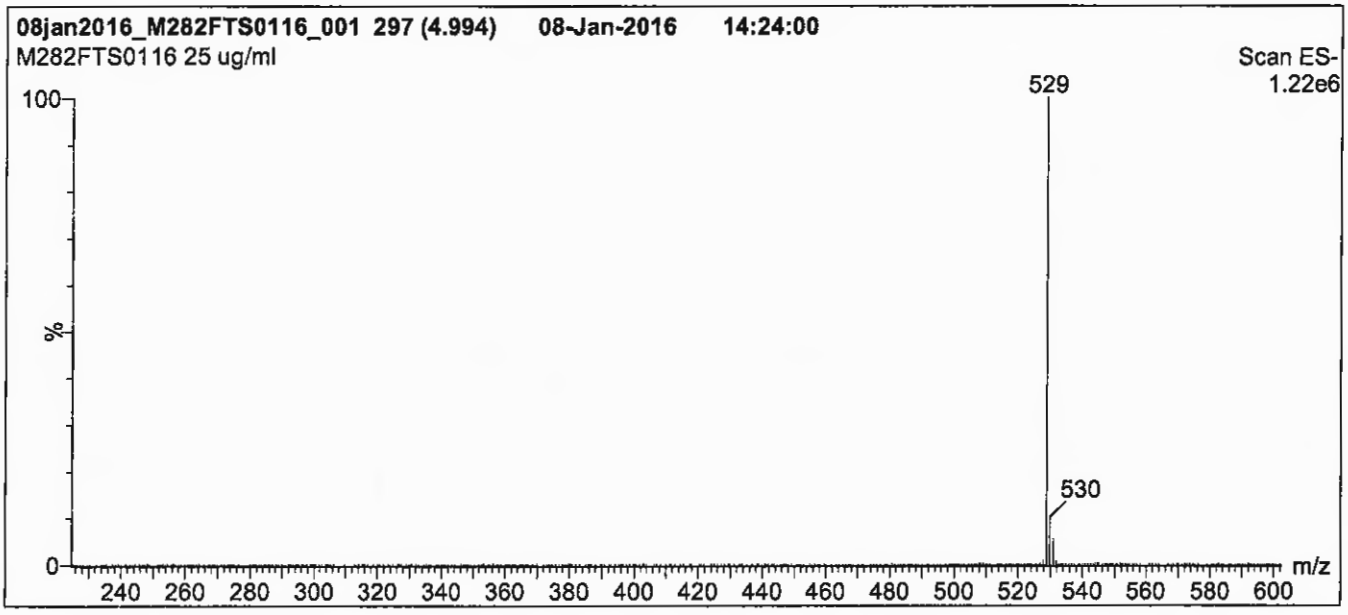




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

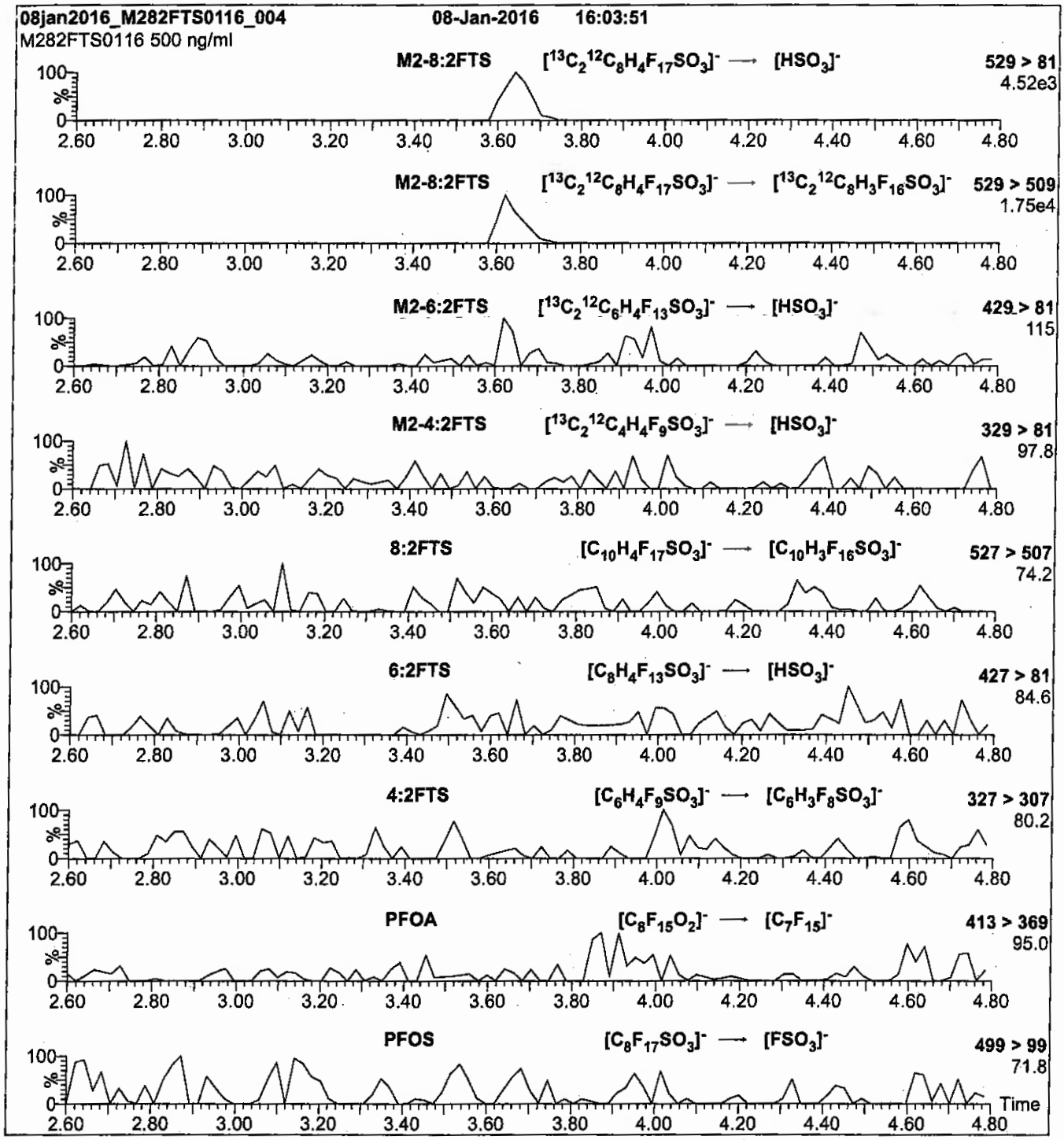
Flow: 300 µl/min

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 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

Reagent

LCM2PFHxDA_00008

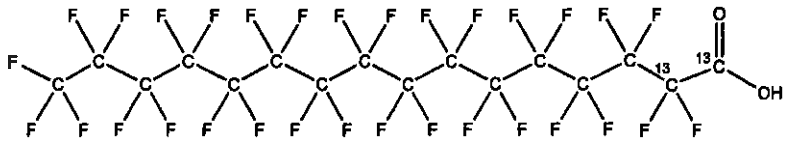
R: SBC 9/22/16

739512
ID: LCM2PFHxDA_00008
Exp: 01/07/21 Prpd: SBC
13C2-PFHxDA at 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2PFHxDA	**LOT NUMBER:**	M2PFHxDA1112
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/07/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/07/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

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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:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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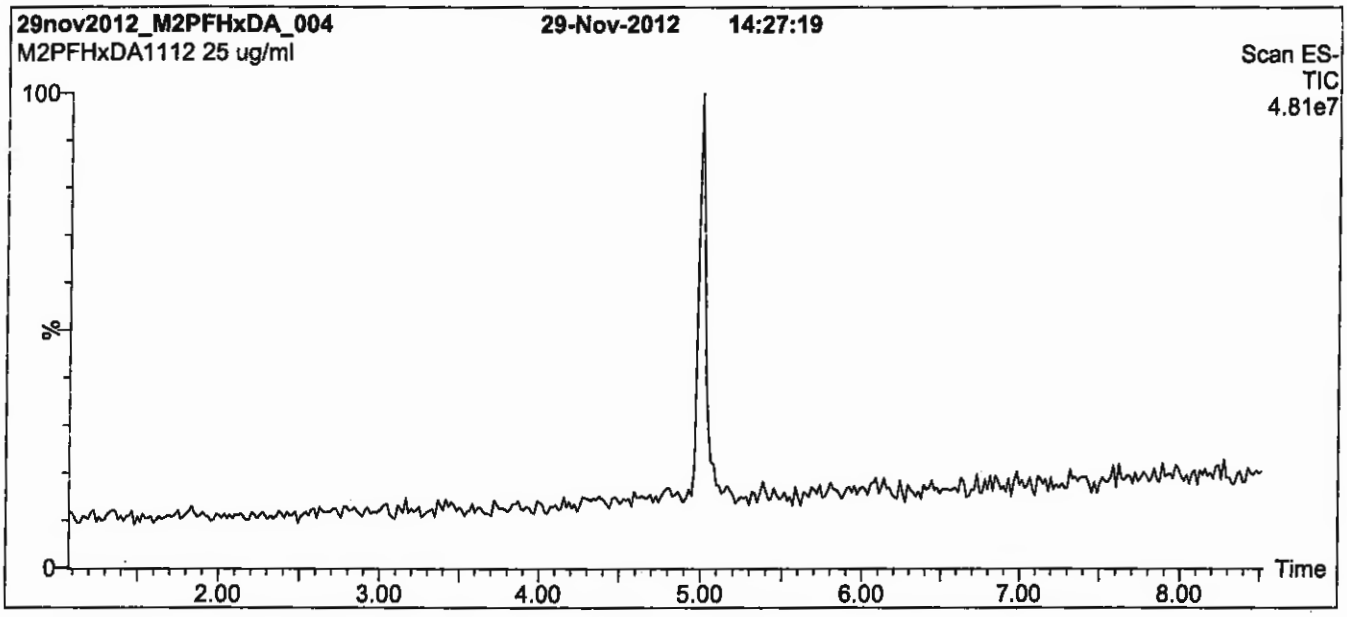
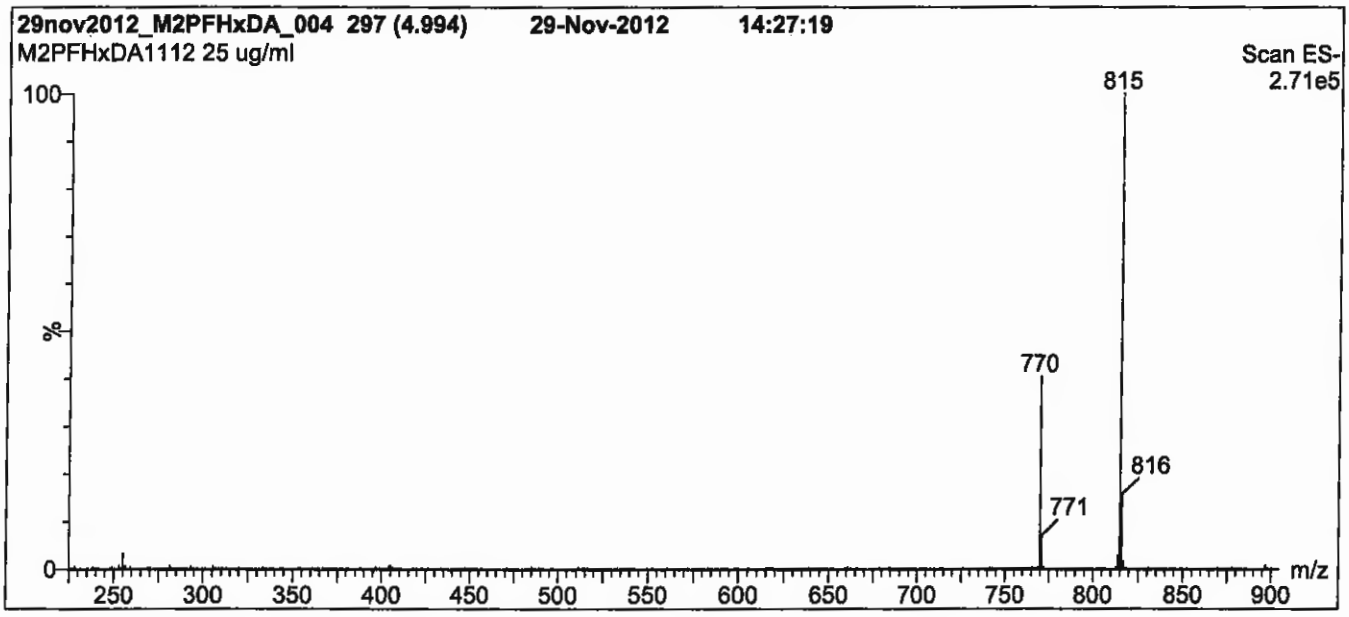
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 100% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

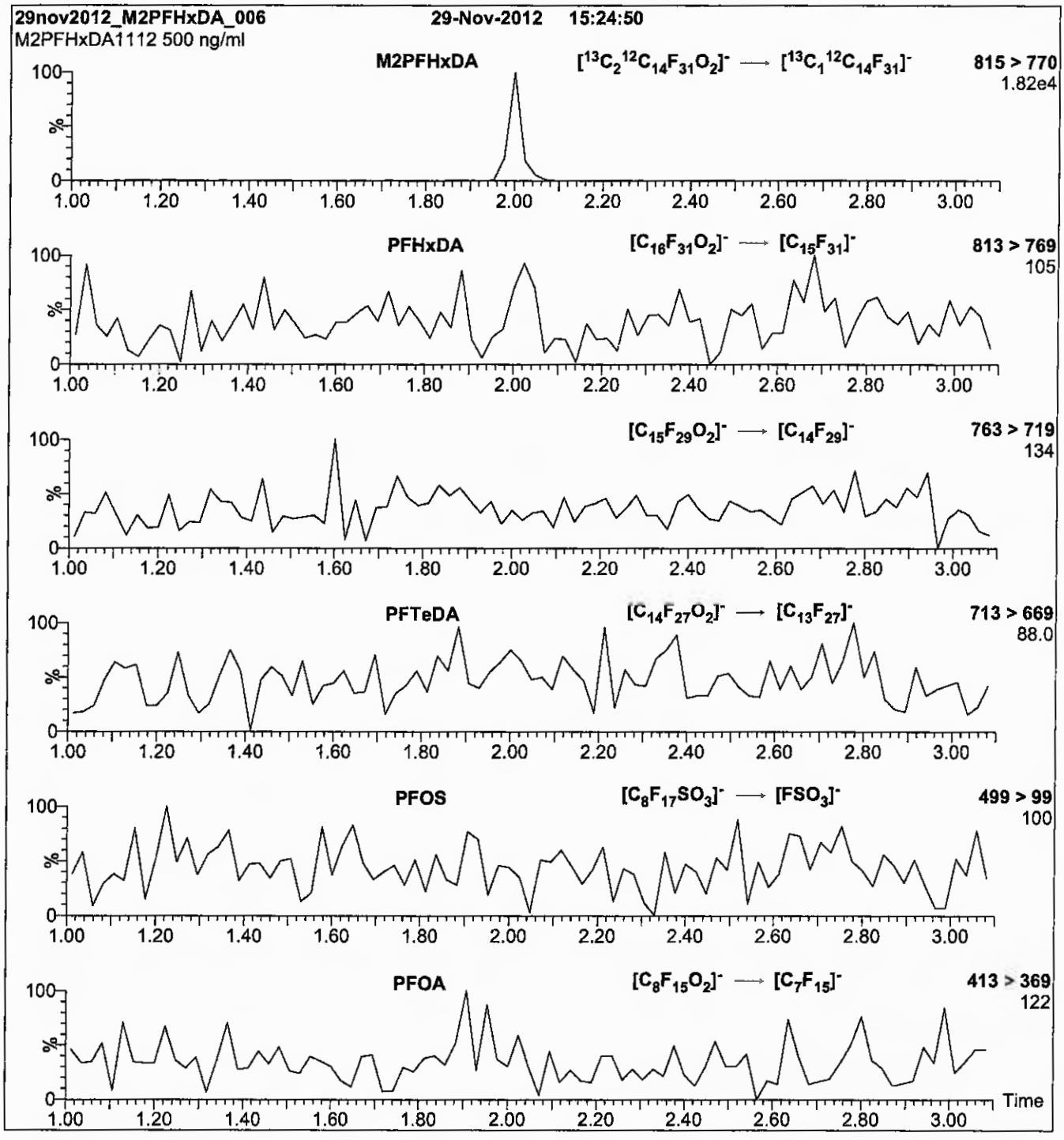
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCM2PFTeDA_00007

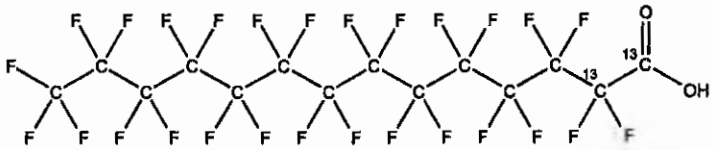
Scanned 10/14/16 R: 80c 9/22/16 SC

739563
ID: LCM2PFTeDA_00007
Exp: 12/07/20 Prpd: SBC
13C2-PFTeDA at 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFTeDA	**LOT NUMBER:**	M2PFTeDA1115
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	12/07/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/07/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/08/2015 (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:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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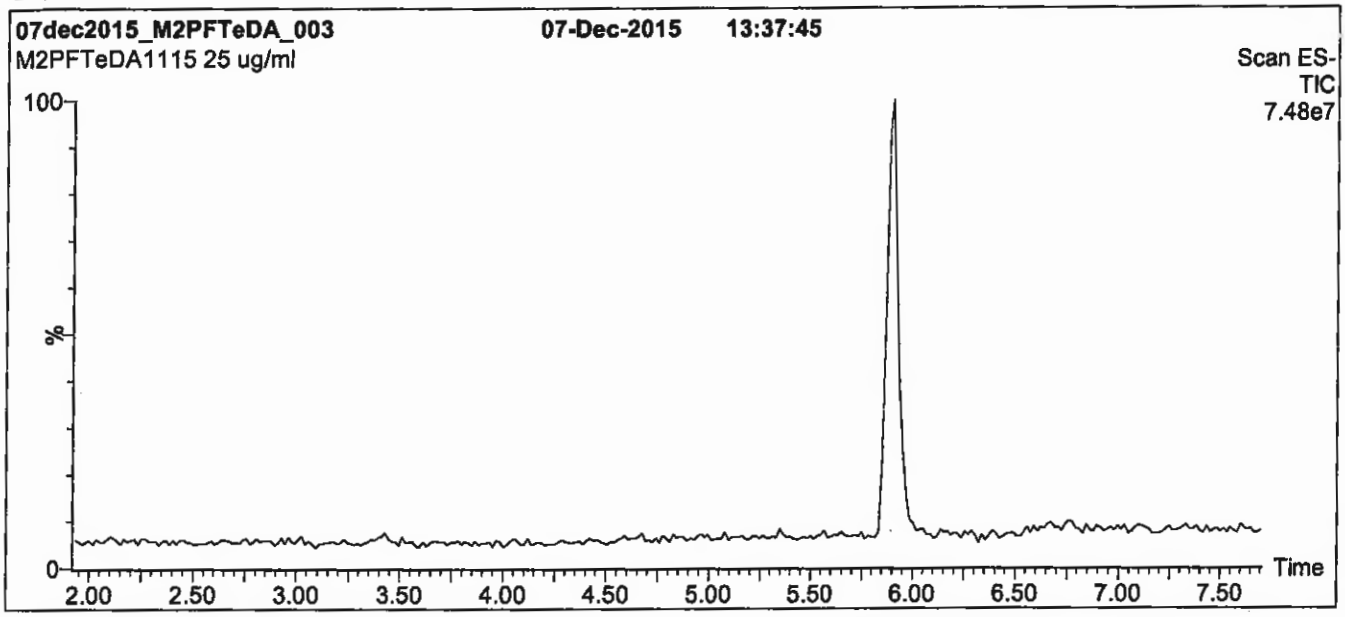
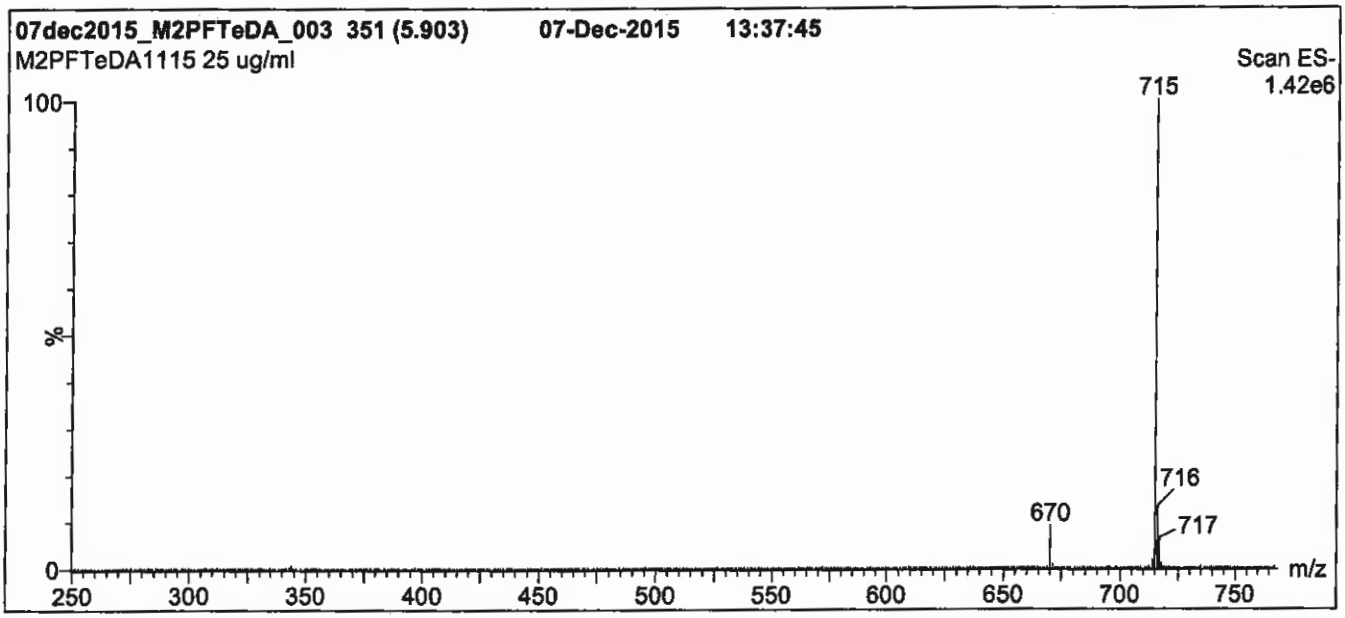
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc 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

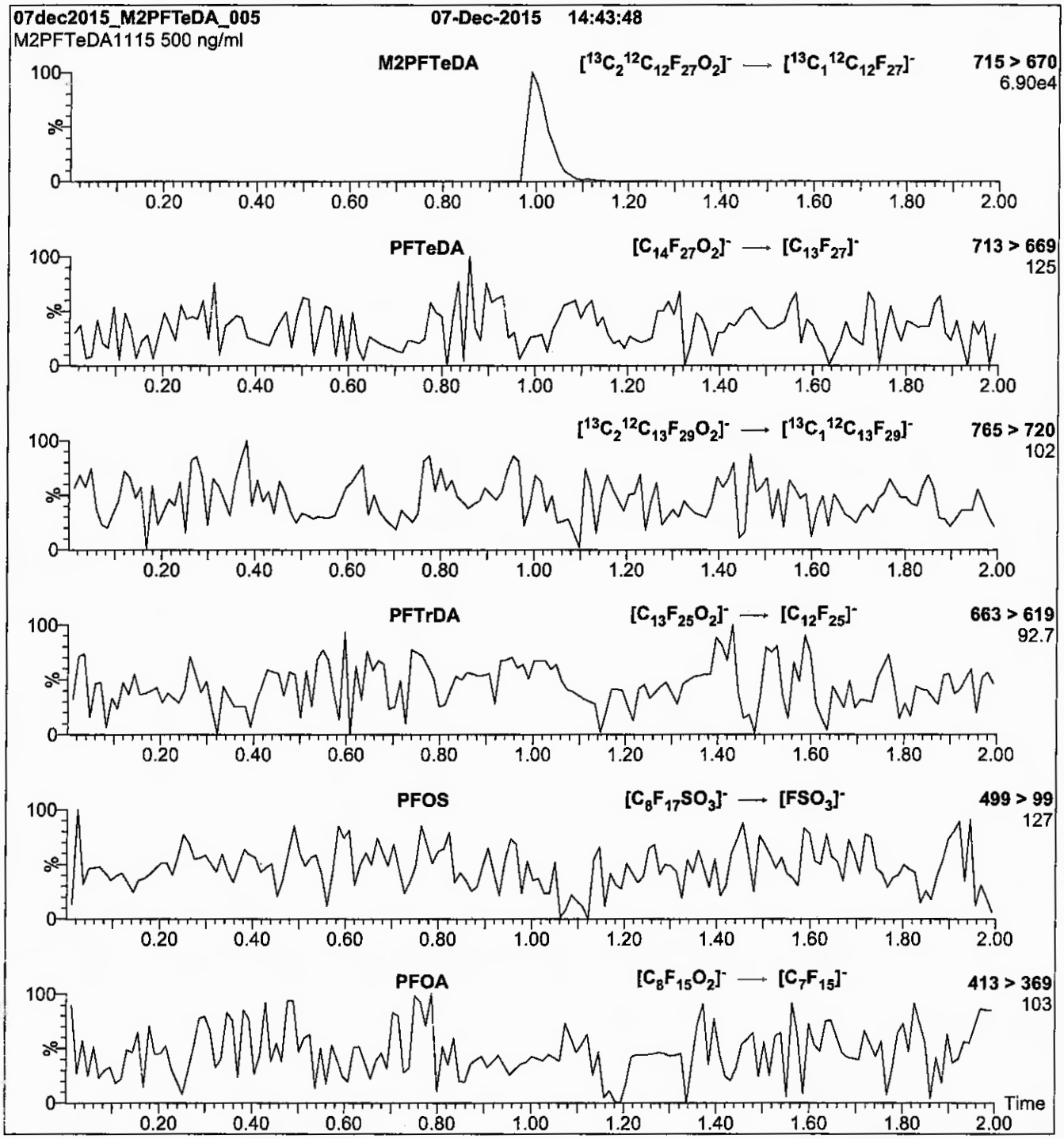
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 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: **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 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00007

R: SBC 9/22/16

739567
ID: LCM4PFHPA_00007
Exp: 05/27/21 Prpd: SBC
13C4-Perfluoroheptanoic a

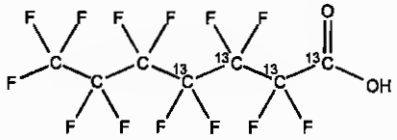
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS

DOCUMENTATION

Scanned 10/14/16 SBC

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA0516
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_3HF_{13}O_2$	**MOLECULAR WEIGHT:**	368.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/27/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/27/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 07/05/2016 (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:

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HAZARDS:

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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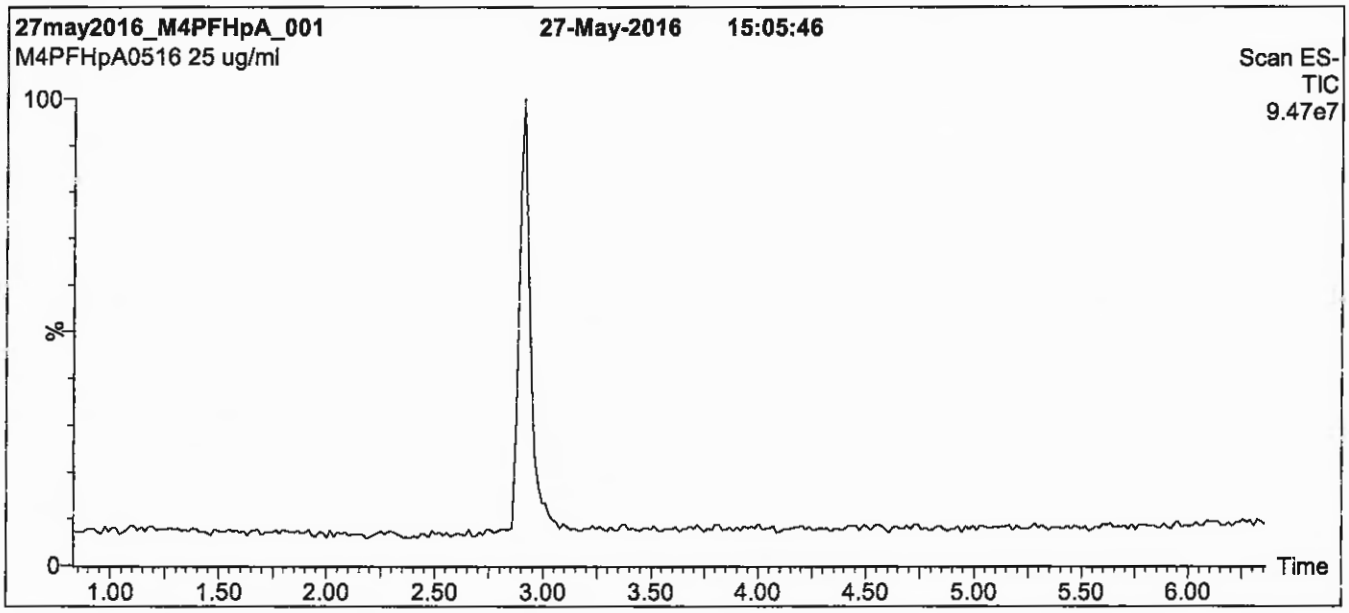
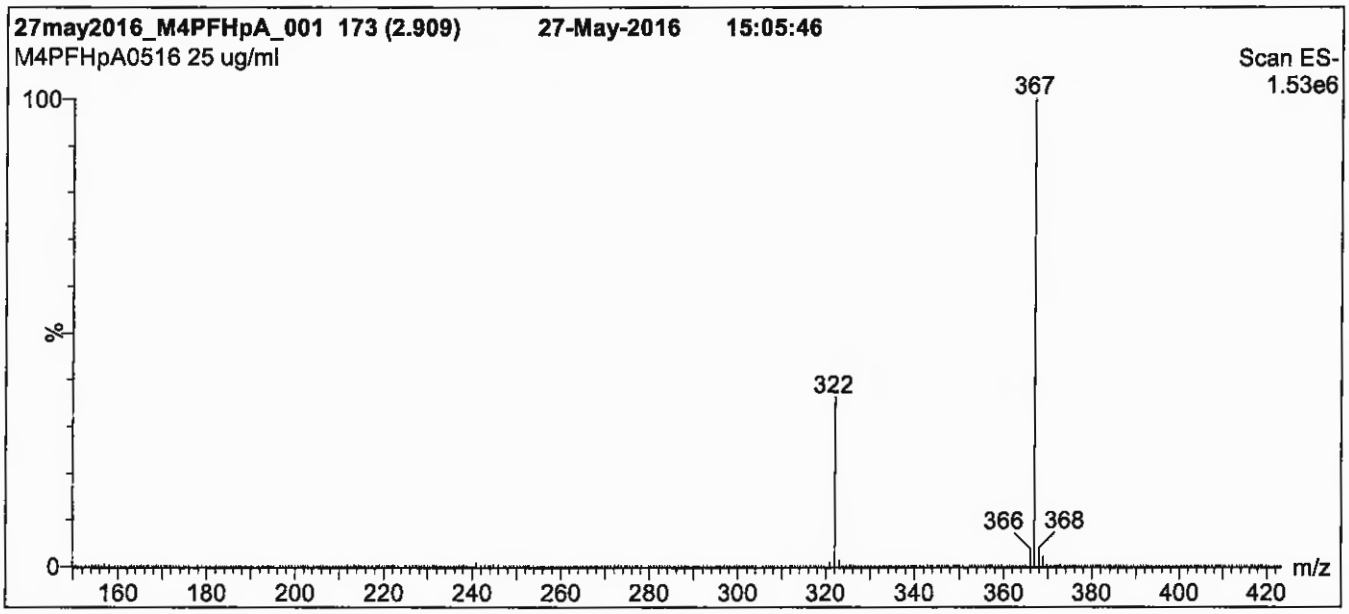
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

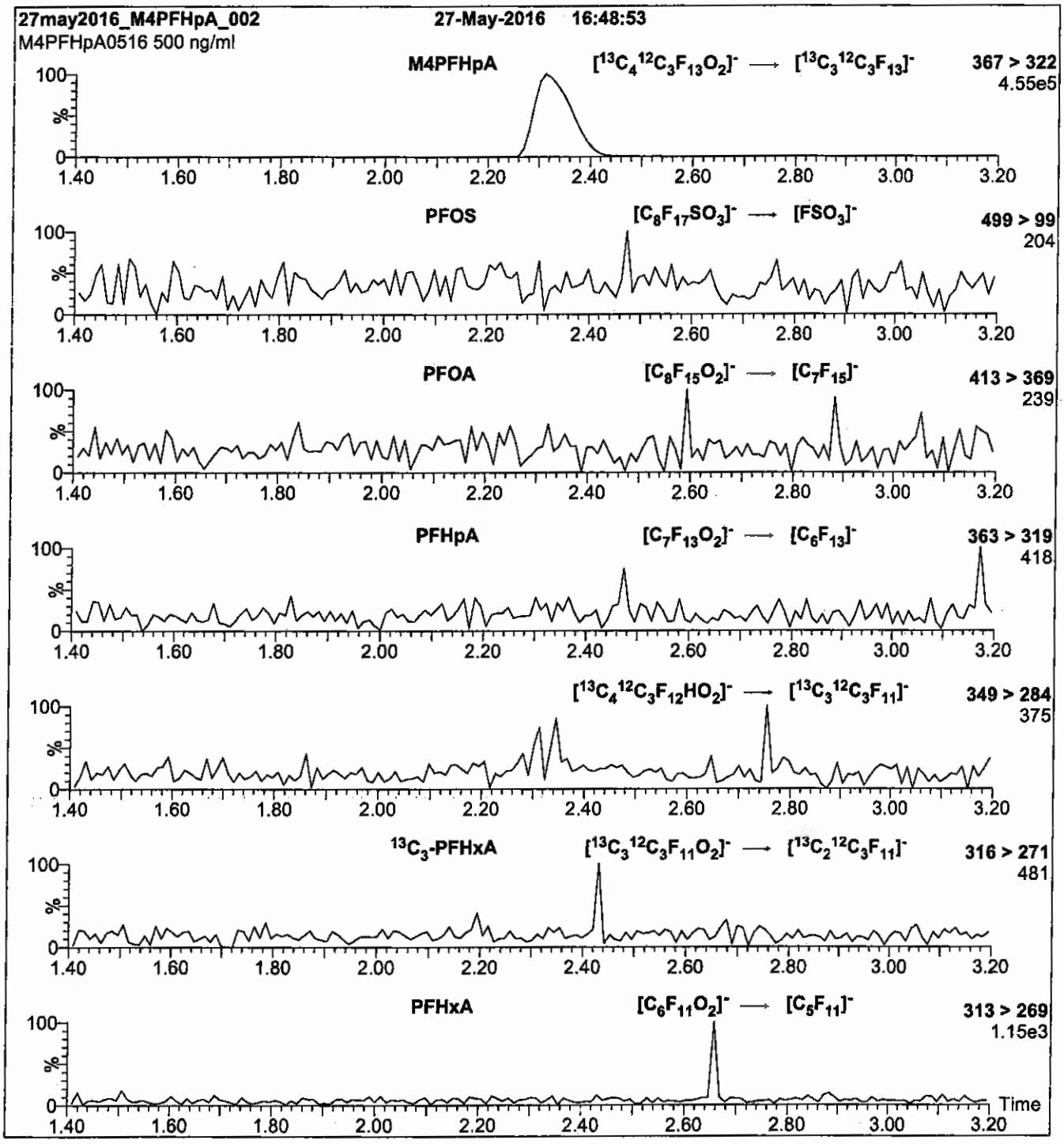
Flow: 300 µl/min

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: **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 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCM5PFPEA_00008

R: SBC 9/22/16

739590
ID: LCM5PFPEA_00008
Exp: 05/22/20 Prpd: SBC
13C5-Perfluoropentanoic a

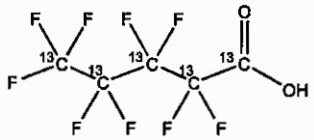
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS

DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0515
COMPOUND:	Perfluoro-n-[$^{13}C_5$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	05/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/22/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

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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:

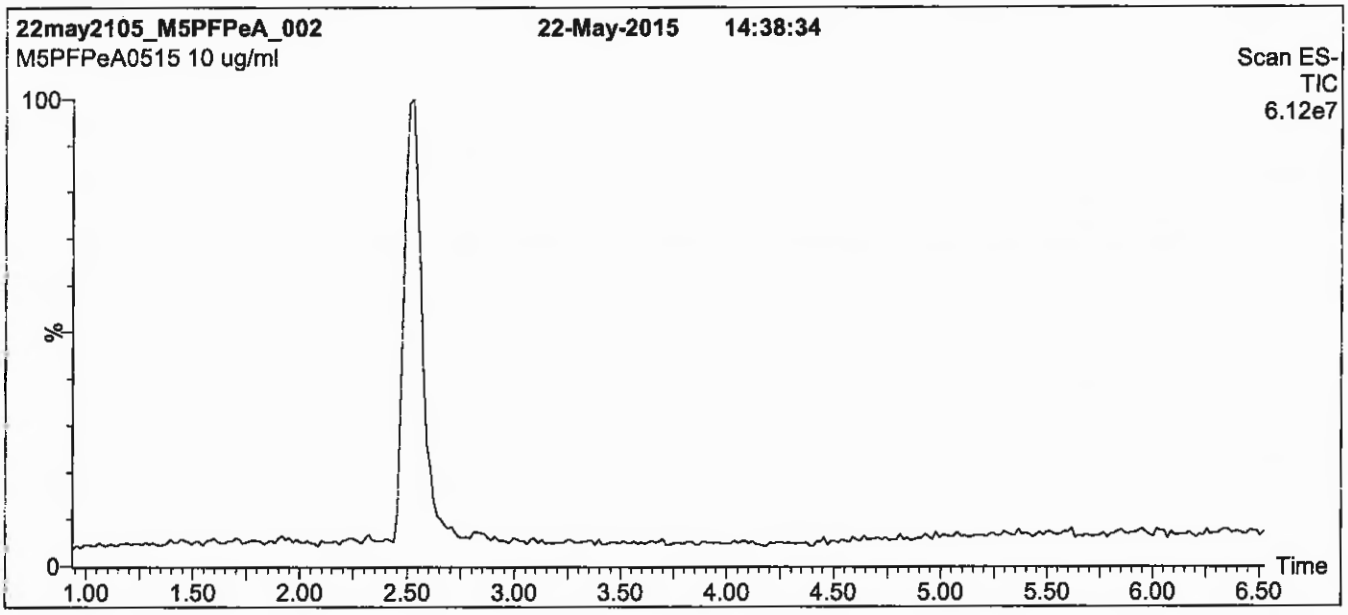
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

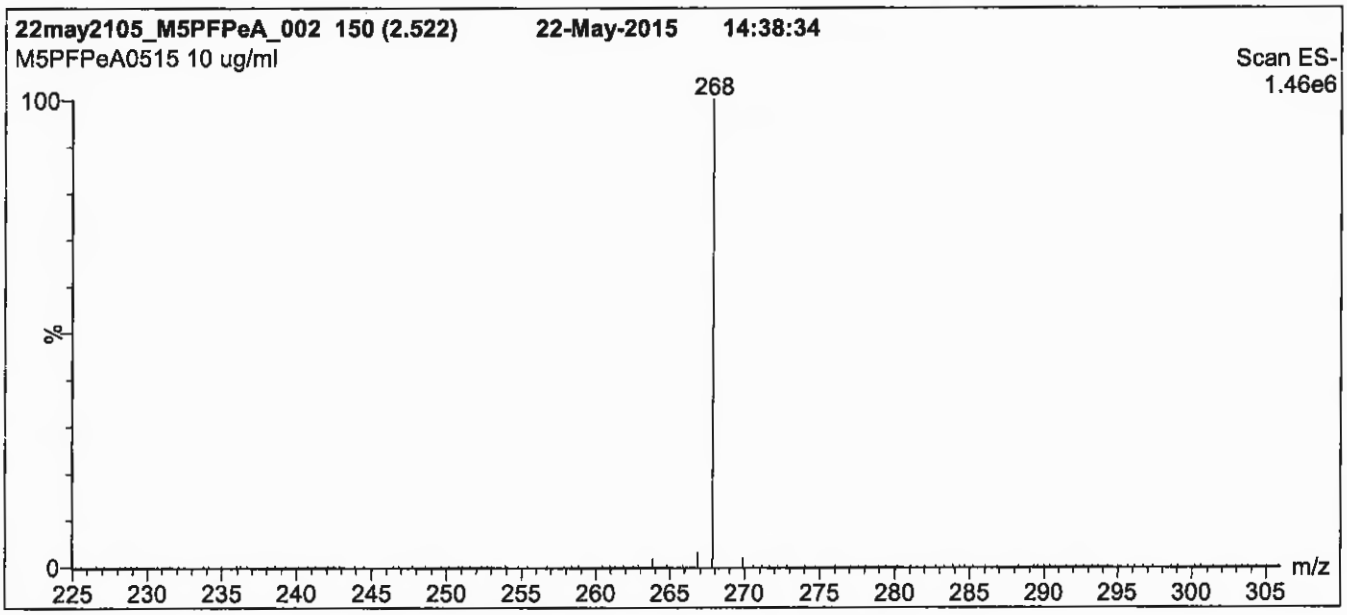
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc 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

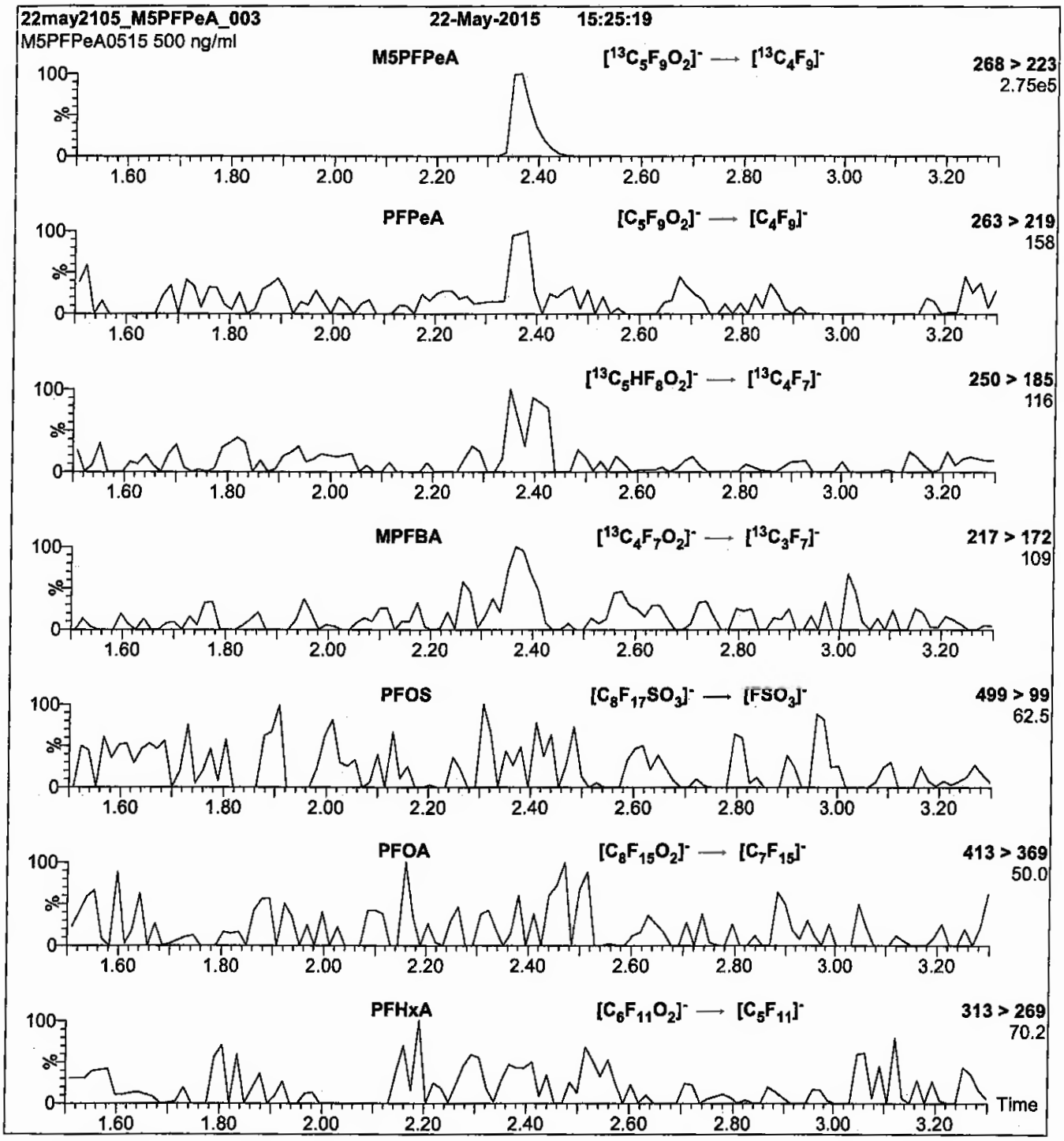
Flow: 300 µl/min

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 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCM8FOSA_00011

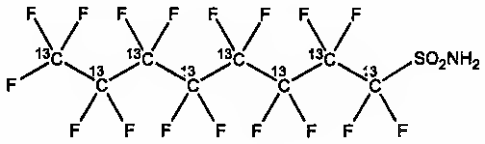
R: SBC 9/22/16
Scanned 10/14/16 SBC

739615
ID: LCM8FOSA_00011
Exp: 12/22/17 Prpd: SBC
13C8-Perfluorooctanesulfo

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA1215I
COMPOUND:	Perfluoro-1-[$^{13}C_8$]octanesulfonamide		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	12/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2017		
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:** 01/14/2016 (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.

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HOMOGENEITY:

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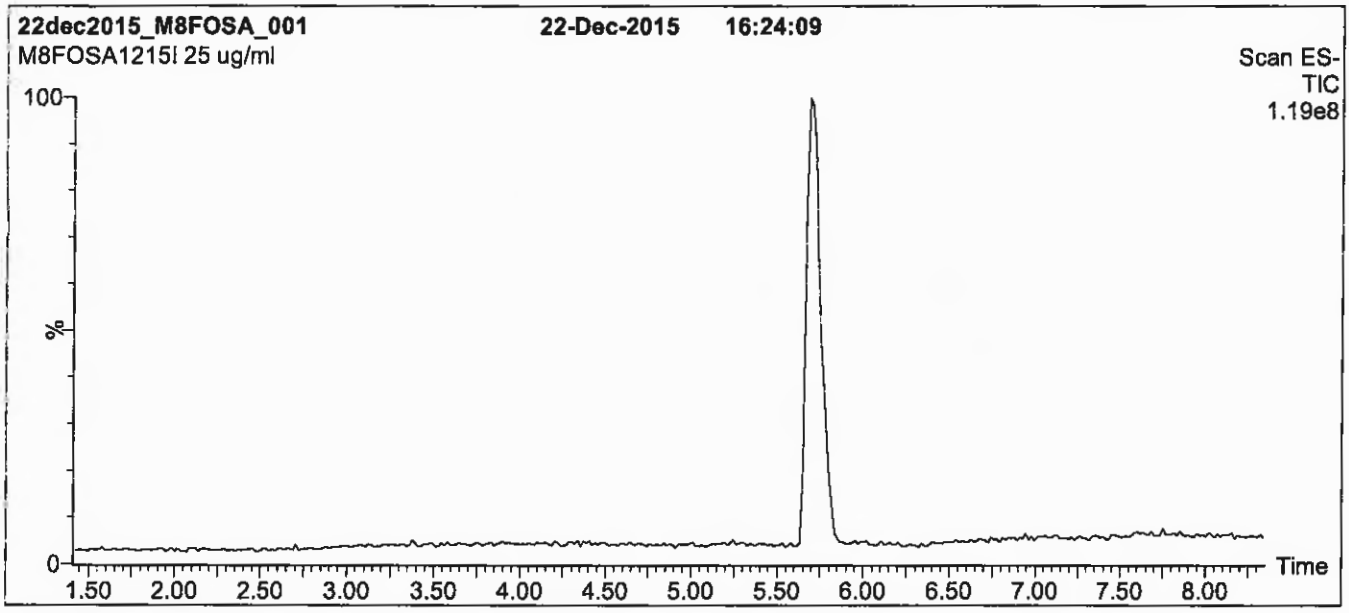
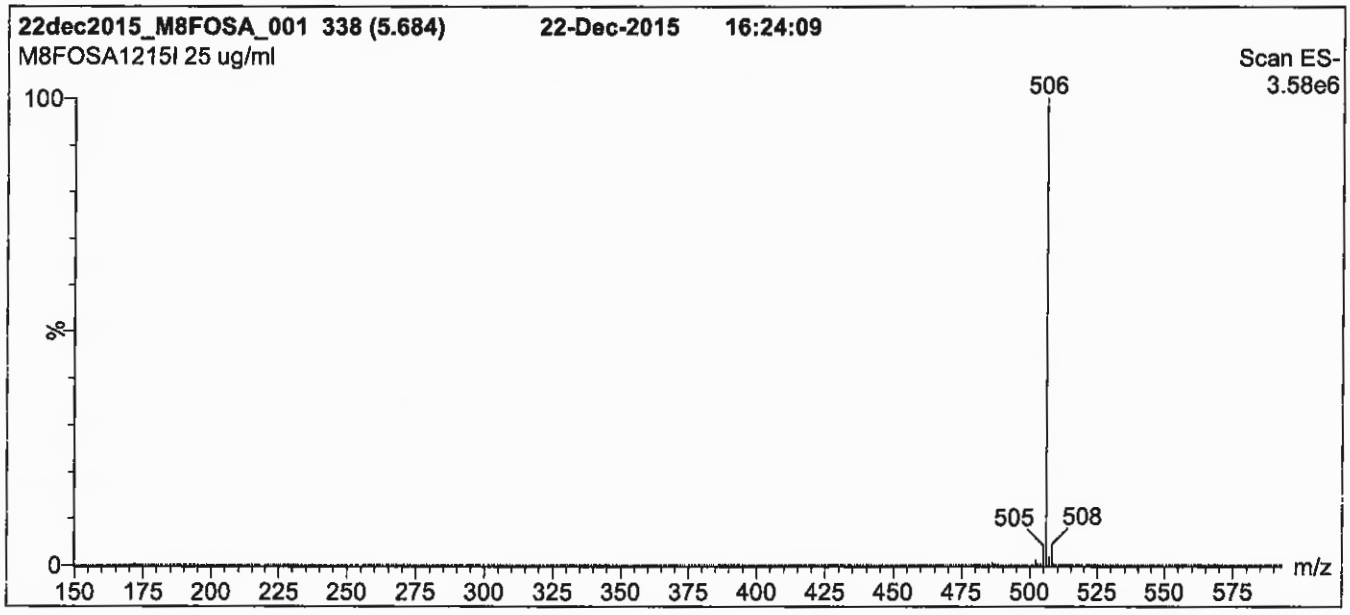
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

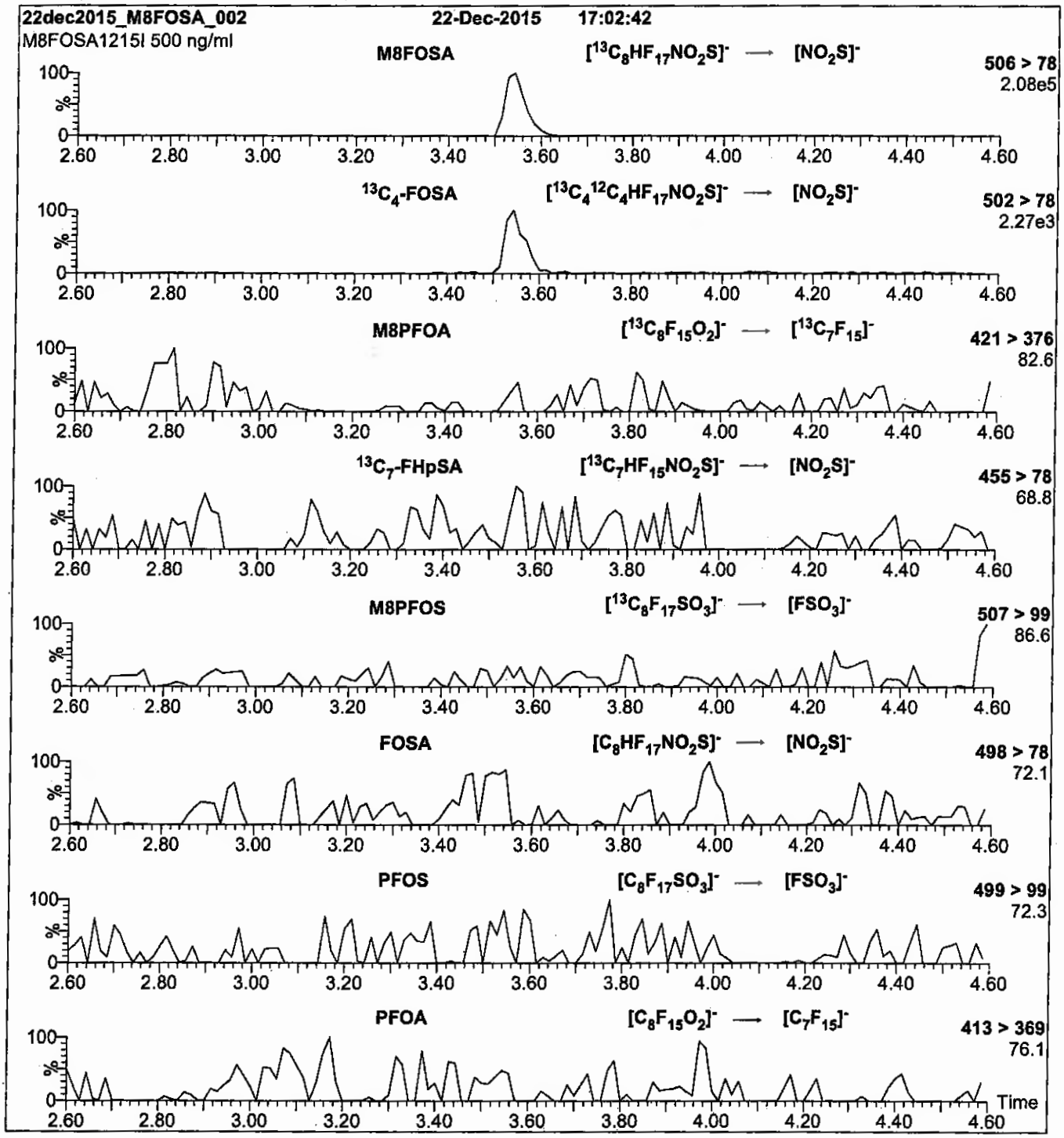
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00008

R: SBC 9/22/16

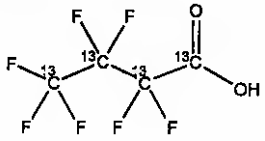
739593
ID: LCMPFBA_00008
Exp: 05/24/21 Prpd: SBC
13C4-Perfluorobutanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA0516
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- 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:** 05/30/2016 (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:

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HOMOGENEITY:

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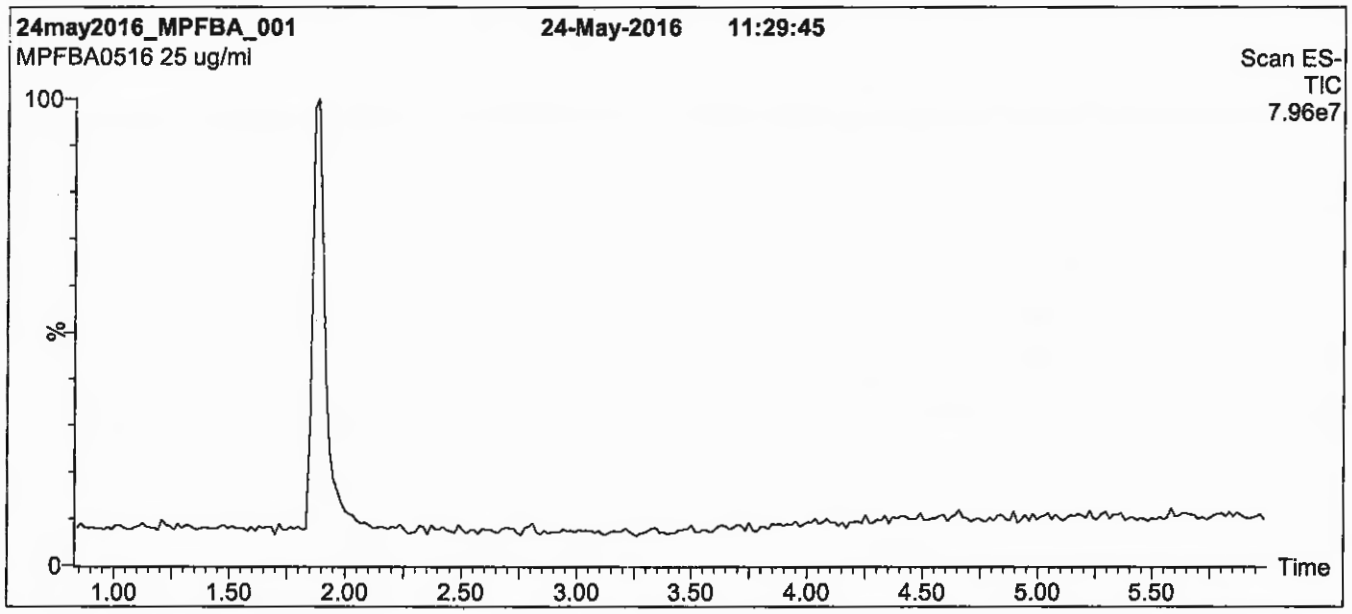
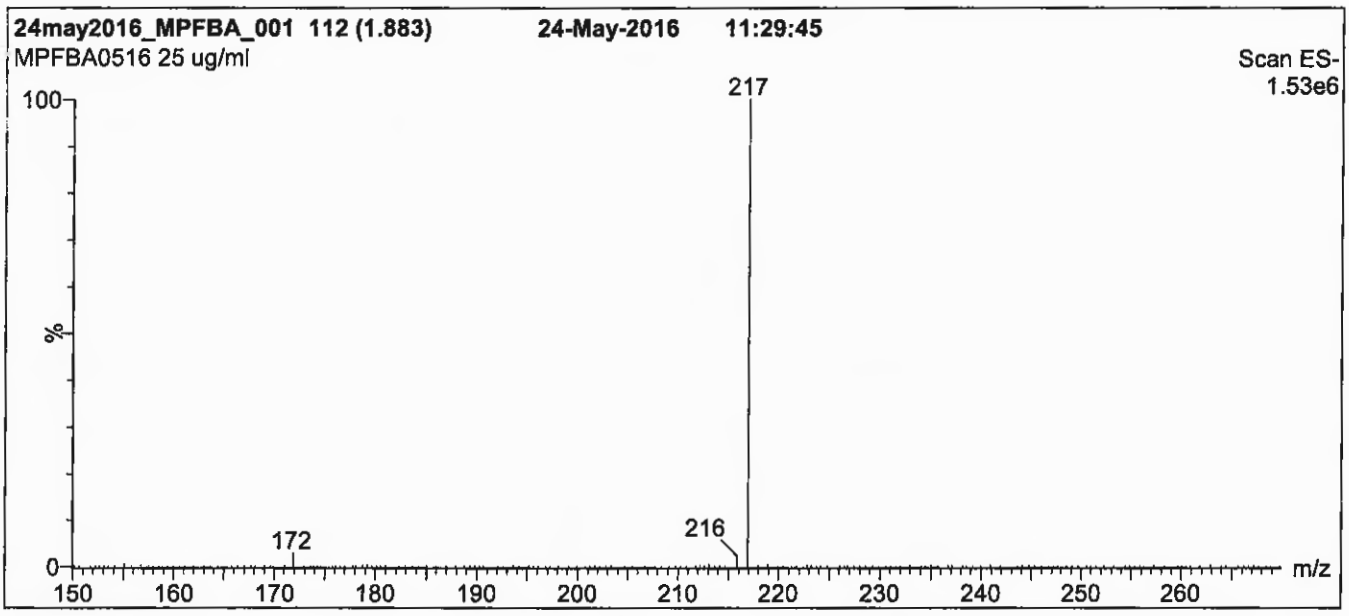
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc 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

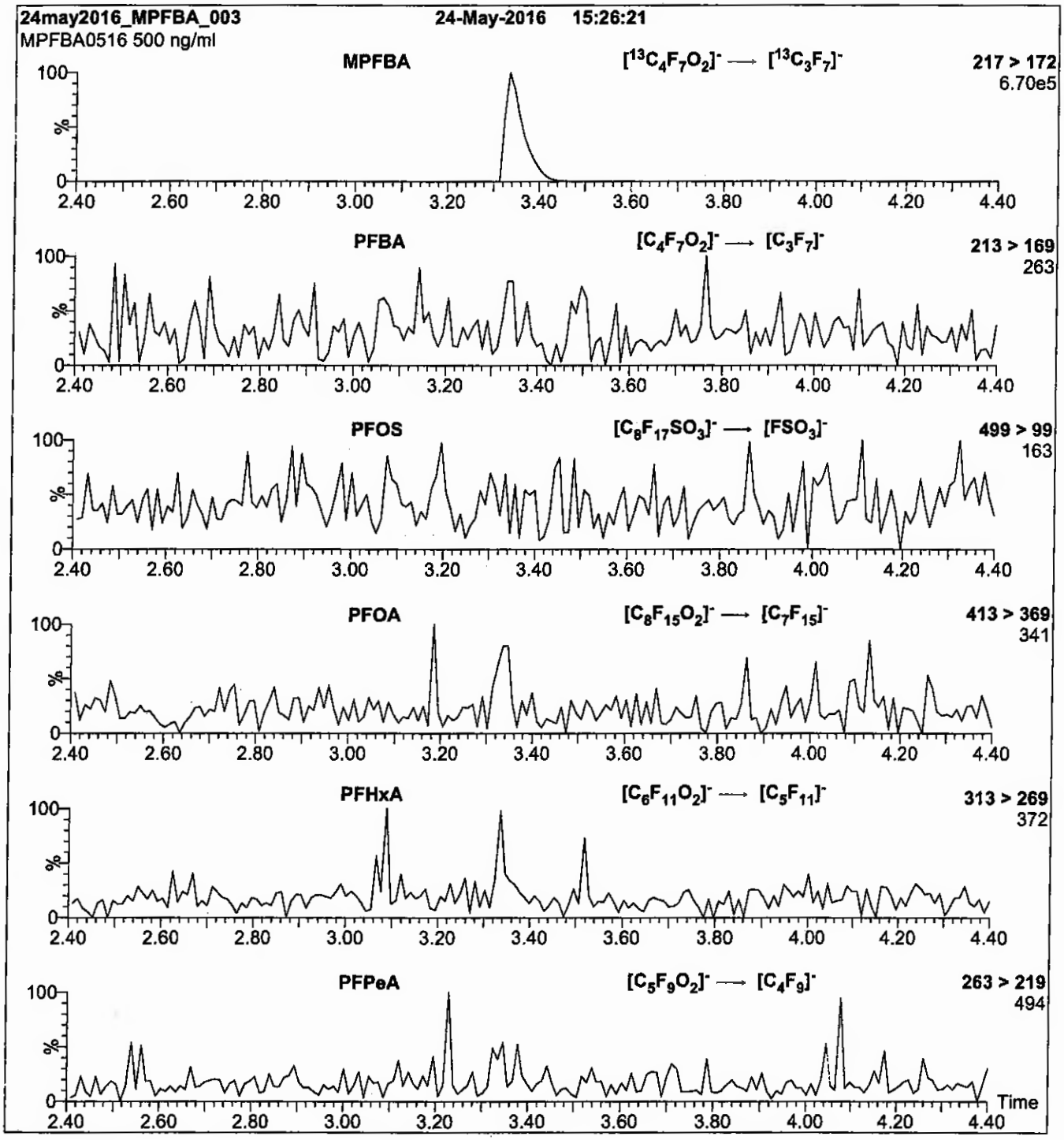
Flow: 300 µl/min

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 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 10

Reagent

LCMPFDA_00011

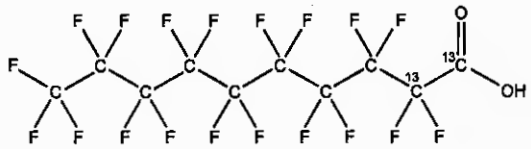
Scanned 10/14/16 R: SBC 9/22/16

739609
ID: LCMPFDA_00011
Exp: 08/19/20 Prpd: SBC
13C2-Perfluorodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0815
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	08/19/2015		
EXPIRY DATE: (mm/dd/yyyy)	08/19/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/21/2015
B.G. Chittim (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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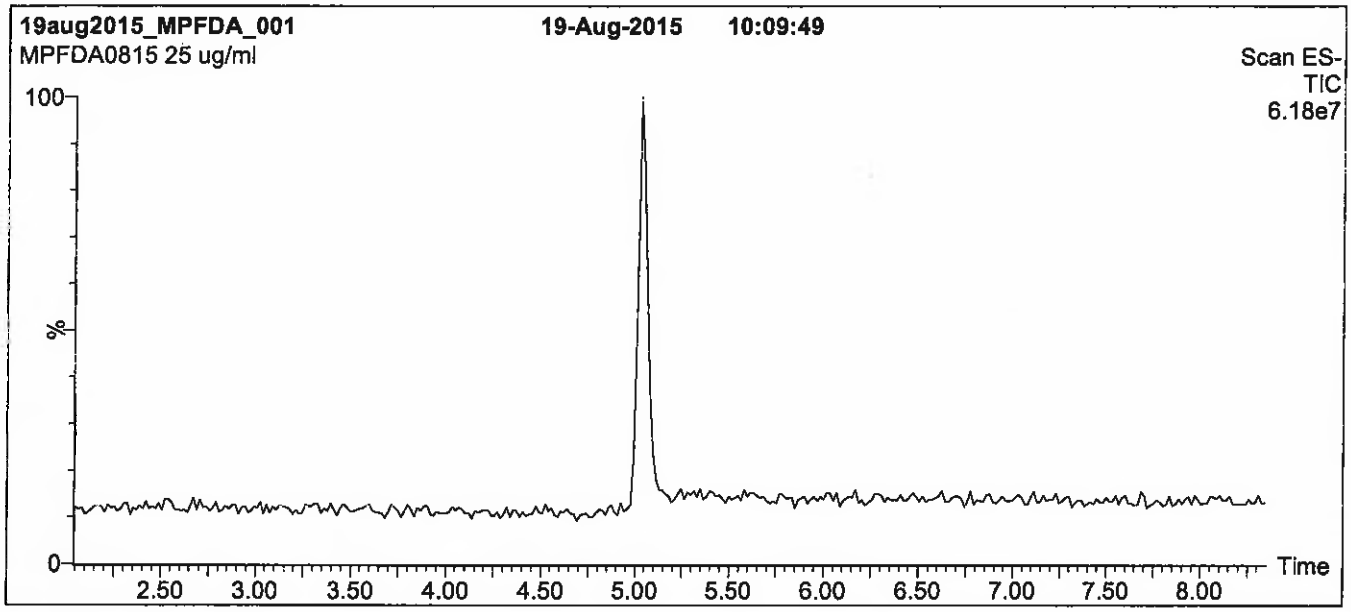
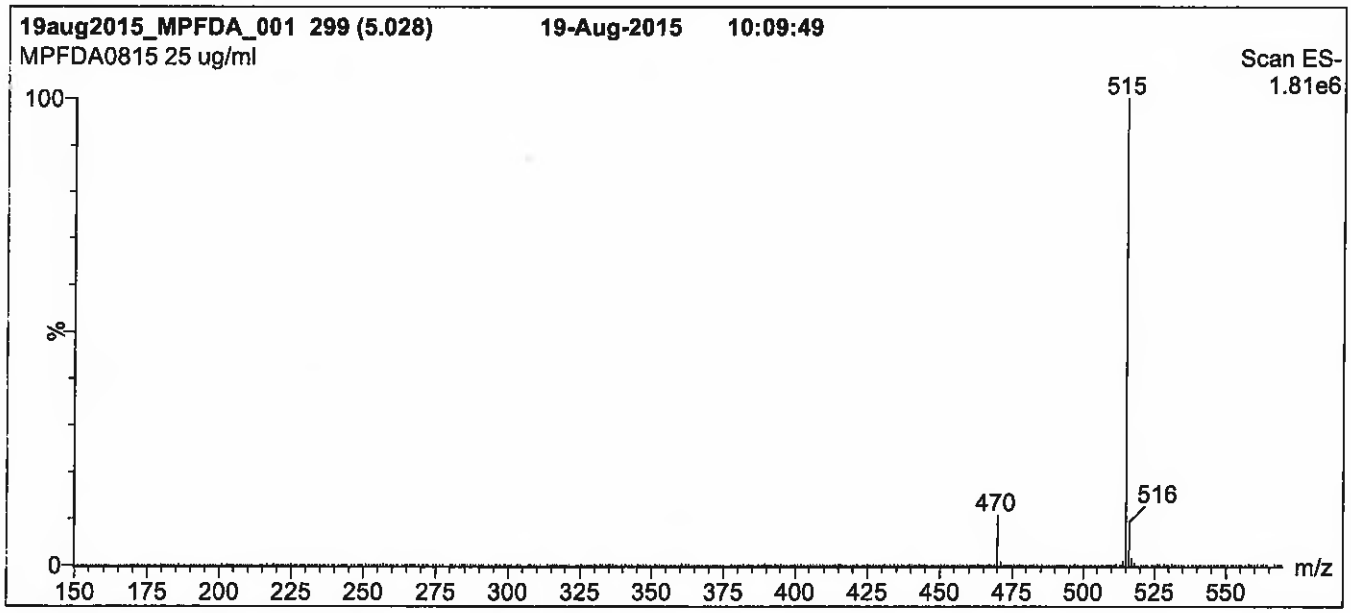
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

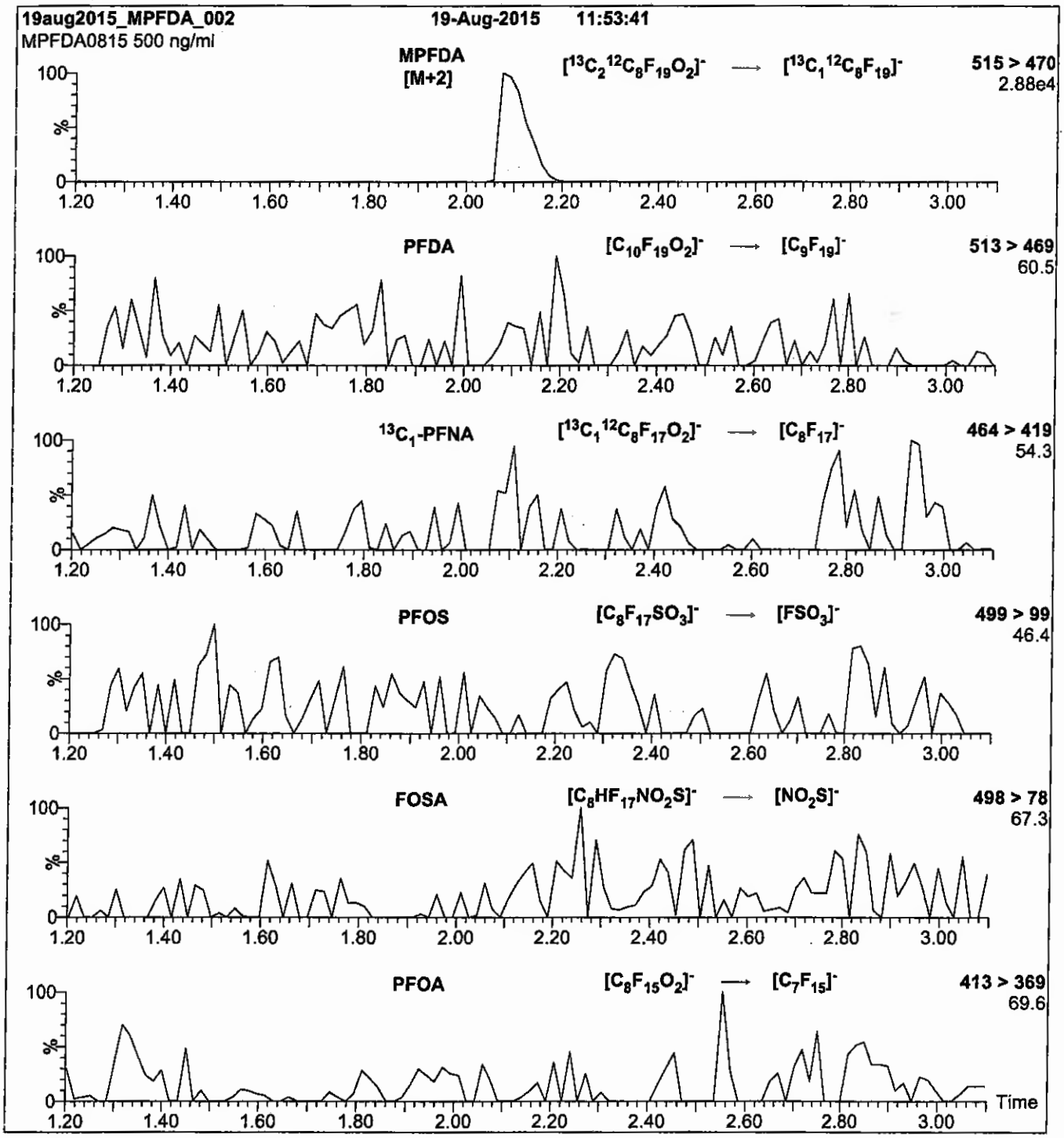
Flow: 300 µl/min

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00008

R: SBC 9/22/16

739598
ID: LCMPFDoA_00008
Exp: 04/08/21 Prpd: SBC
13C2-Perfluorododecanoic

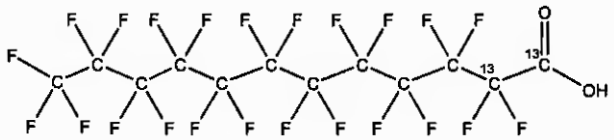
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE: MPFDoA
LOT NUMBER: MPFDoA0416
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/08/2021		
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:** 04/15/2016 (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 $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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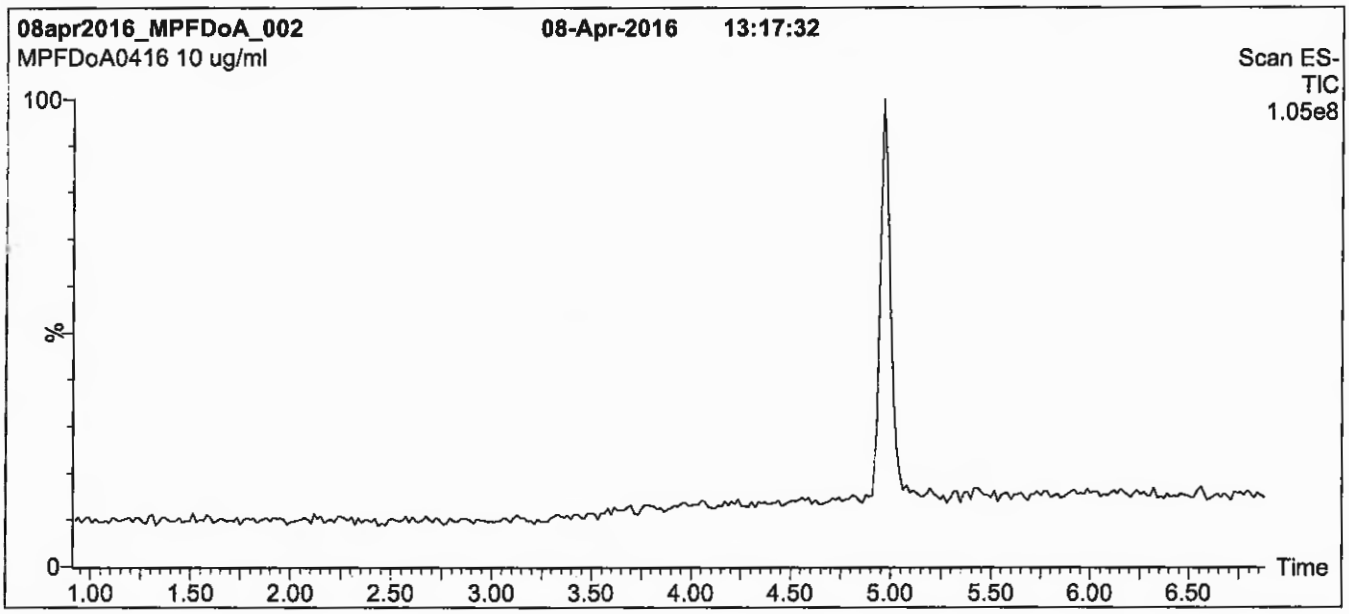

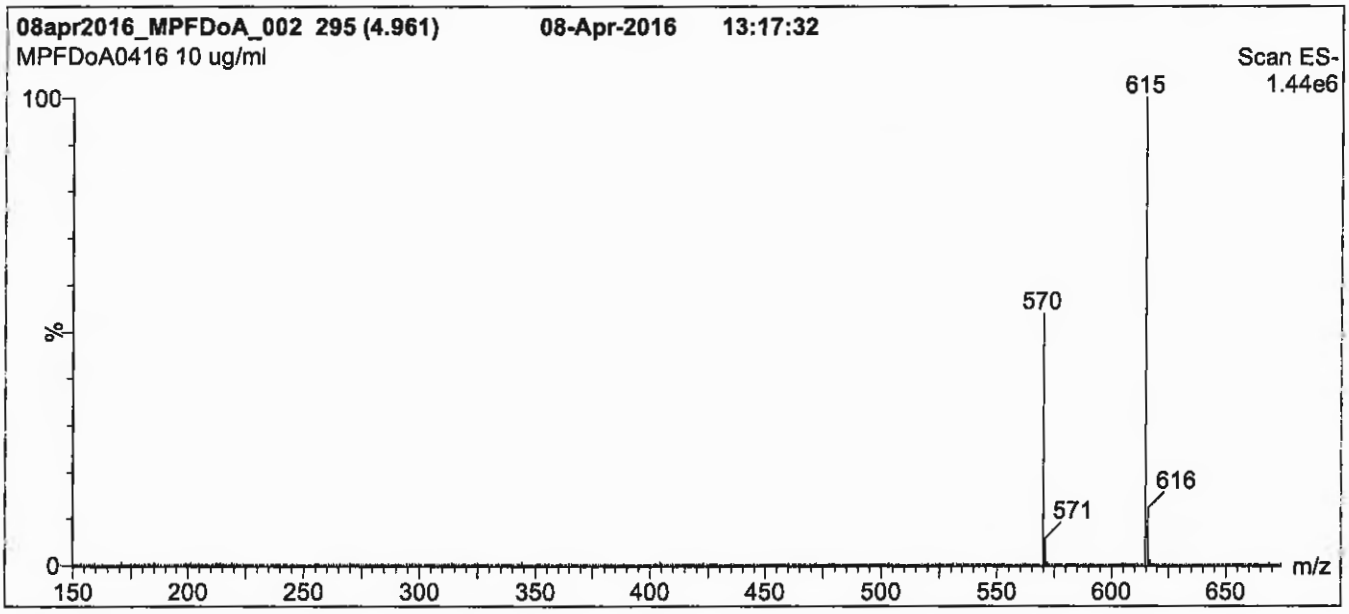

Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
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Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

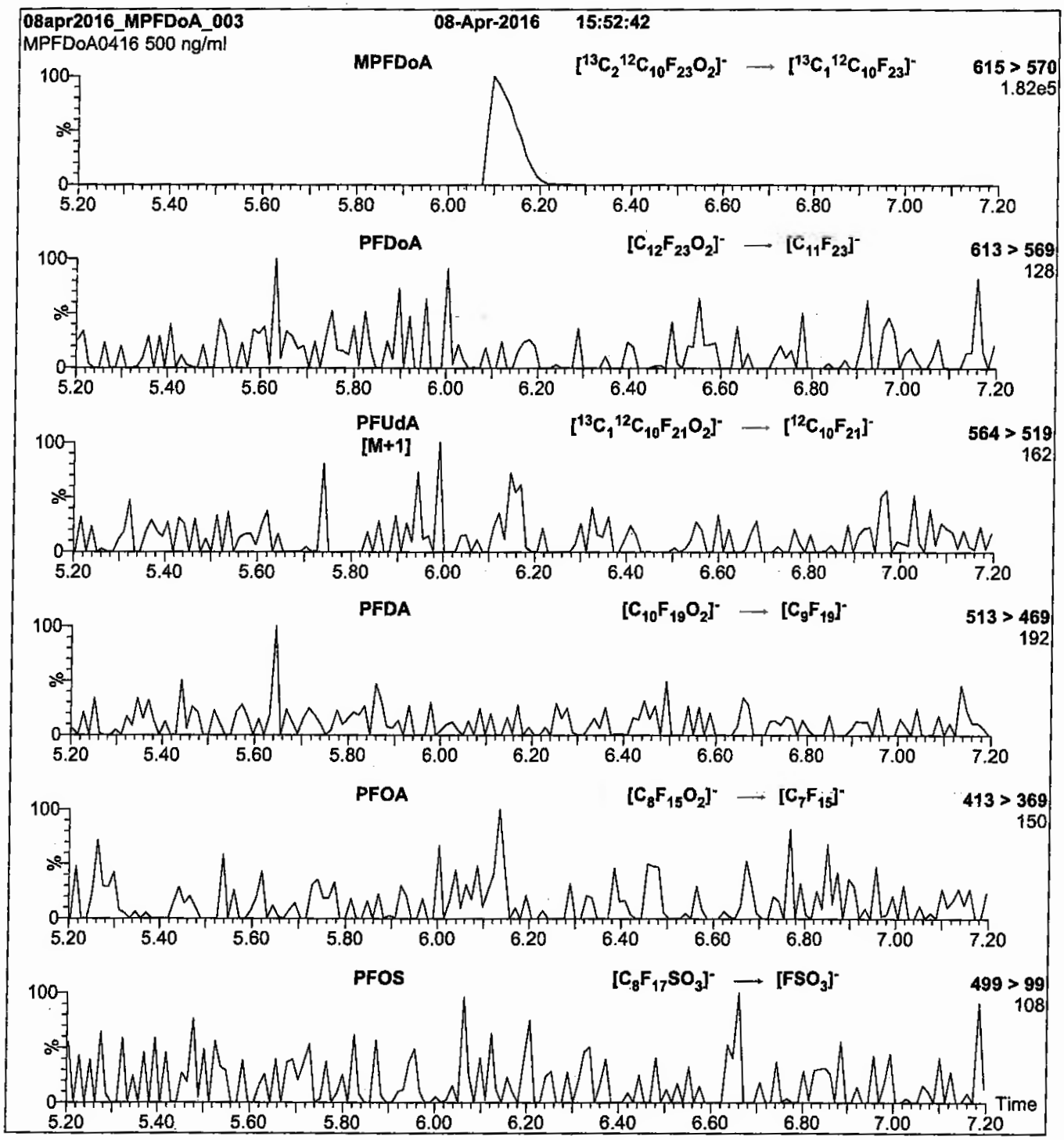
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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: **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 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00012

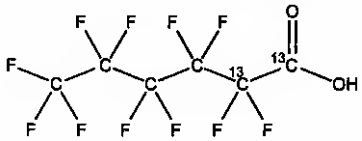
Scanned 10/14/16 JR R: SBC 9/22/16

739612
ID: LCMPFHxA_00012
Exp: 04/08/21 Prpd: SBC
13C2-Perfluorohexanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA0416
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/08/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of 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 **Date:** 04/29/2016 (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:

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

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CALA

ANAB ACCREDITED

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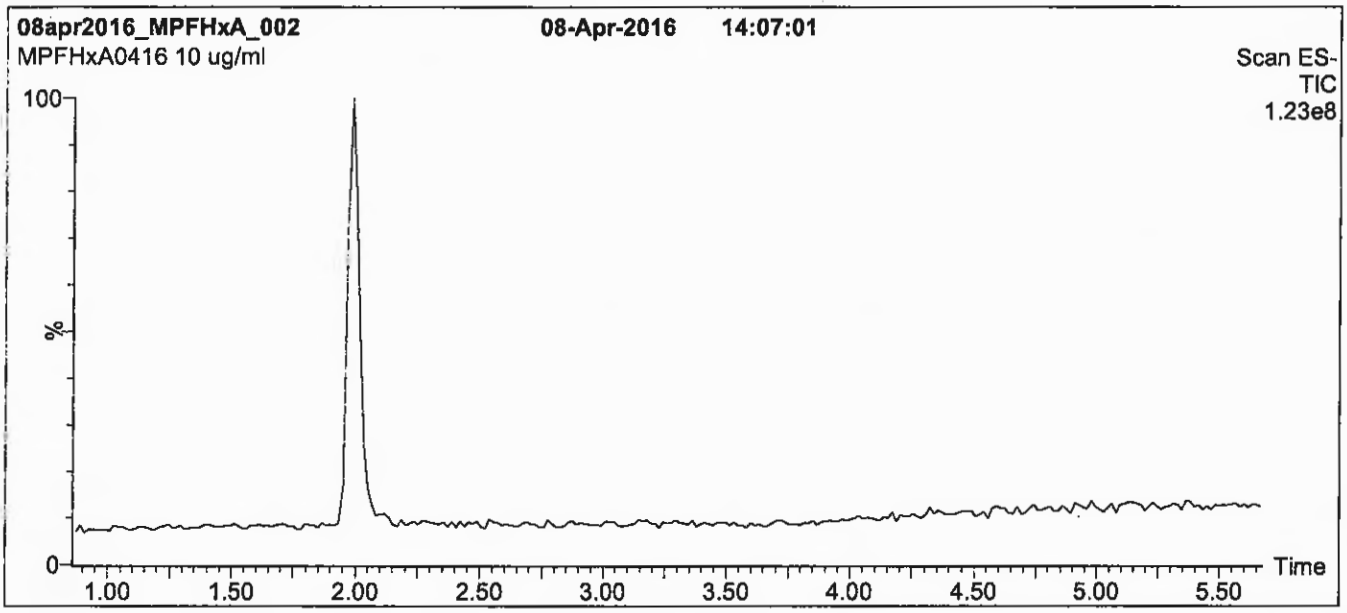
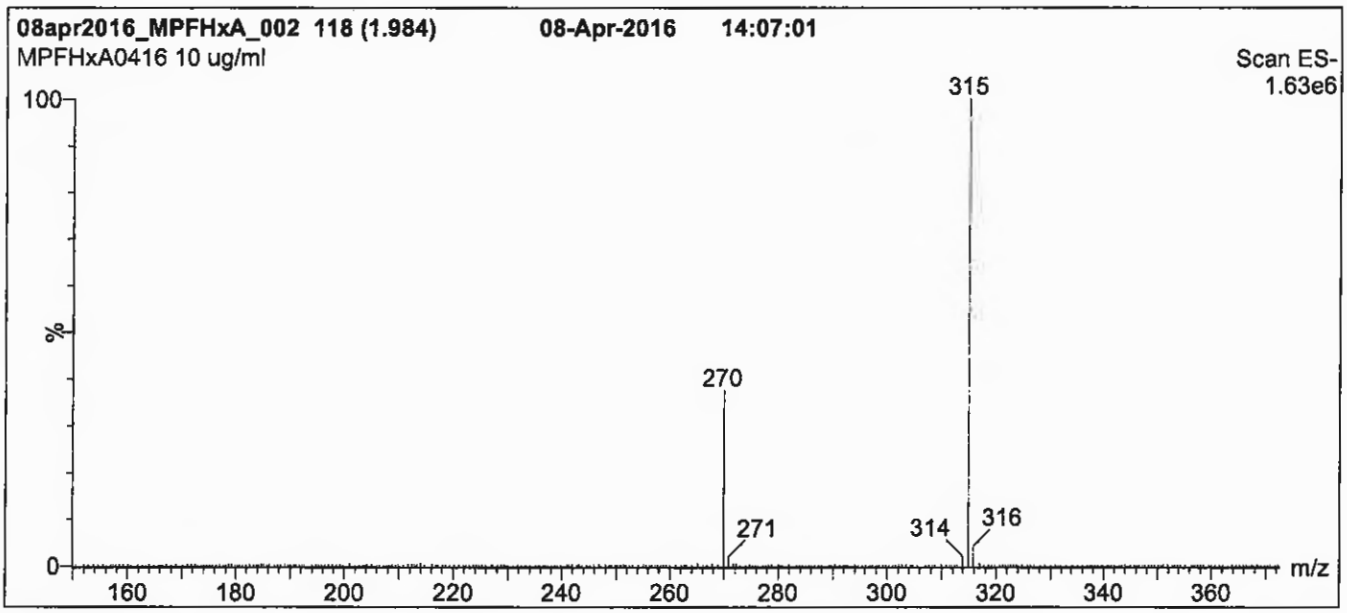
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

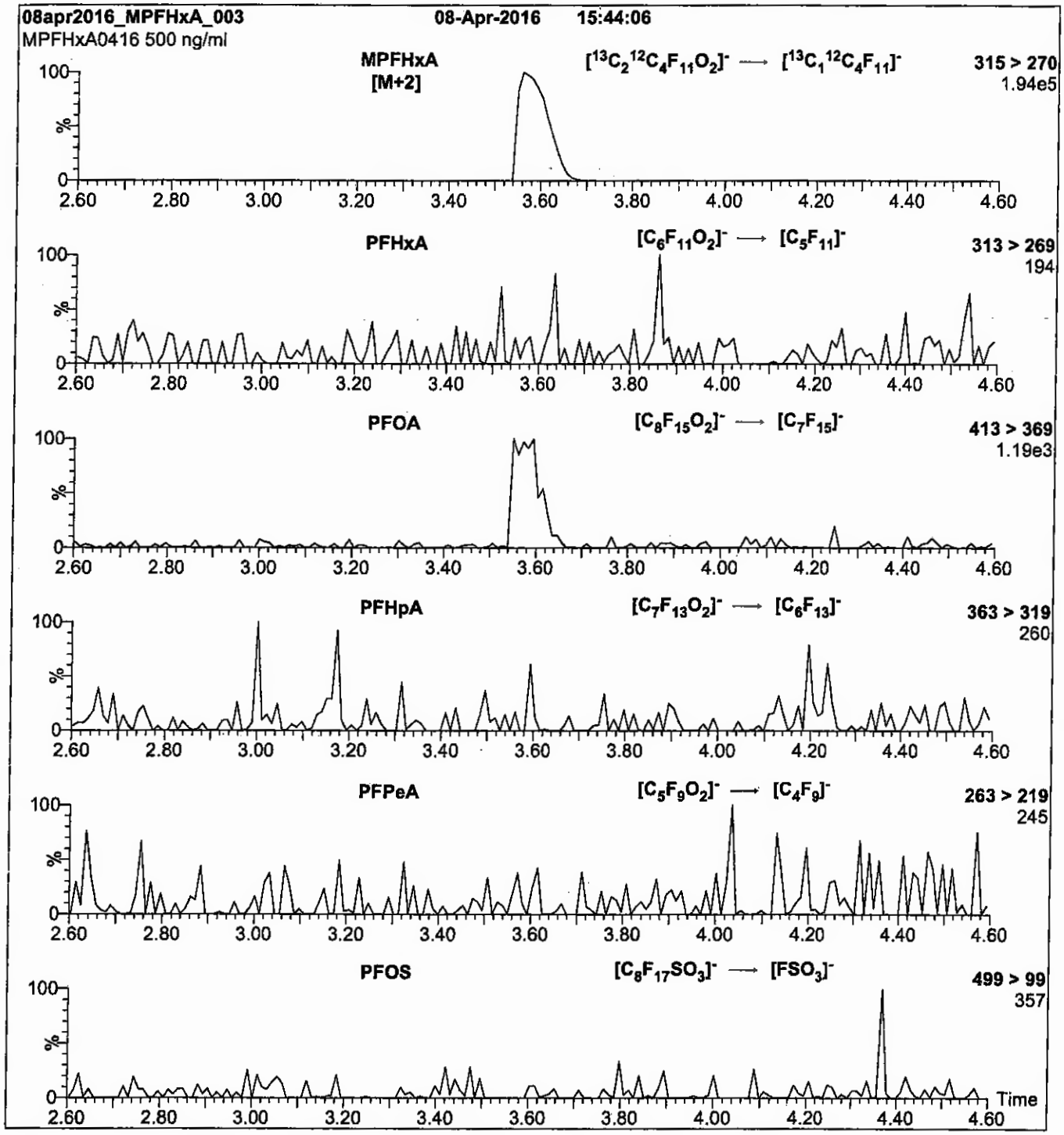
Flow: 300 µl/min

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 µl (500 ng/ml MPFHxA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxS_00008

R: SBC 9/22/16

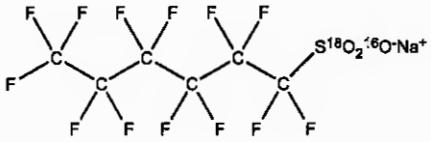
739601
ID: LCMPFHxS_00008
Exp: 10/23/20 Prpd: SBC
18O2-Perfluorohexanesulfo

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS1015
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (MPFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	10/23/2015		
EXPIRY DATE: (mm/dd/yyyy)	10/23/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/28/2015 (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

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

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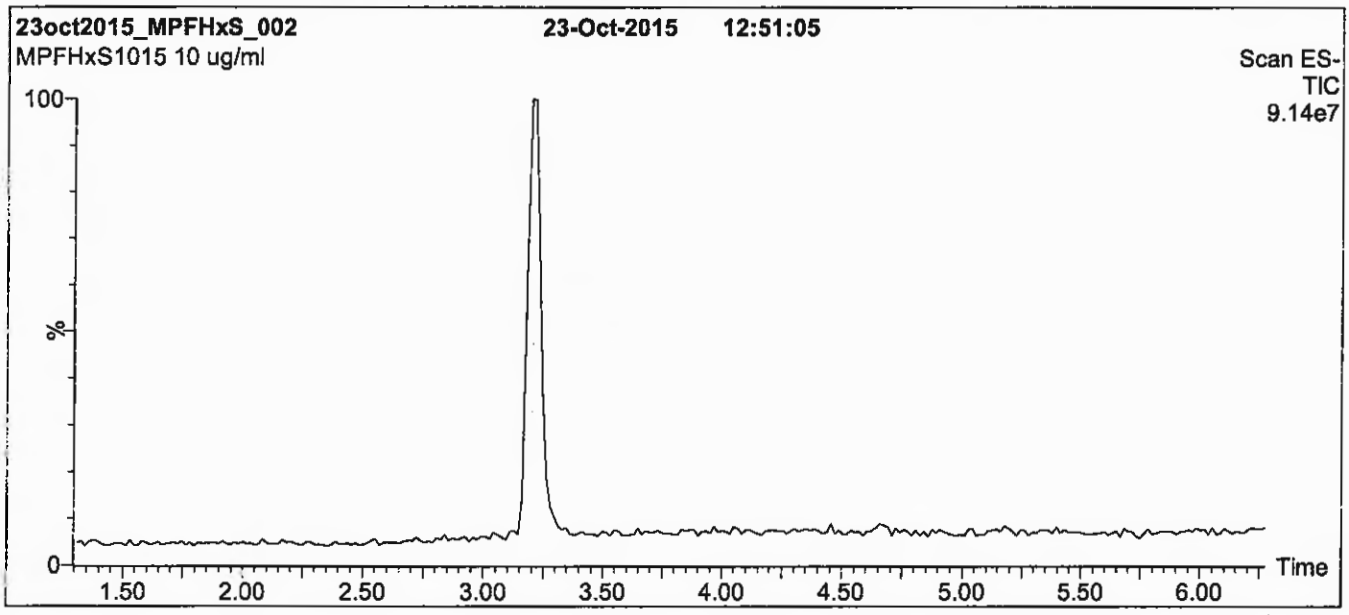
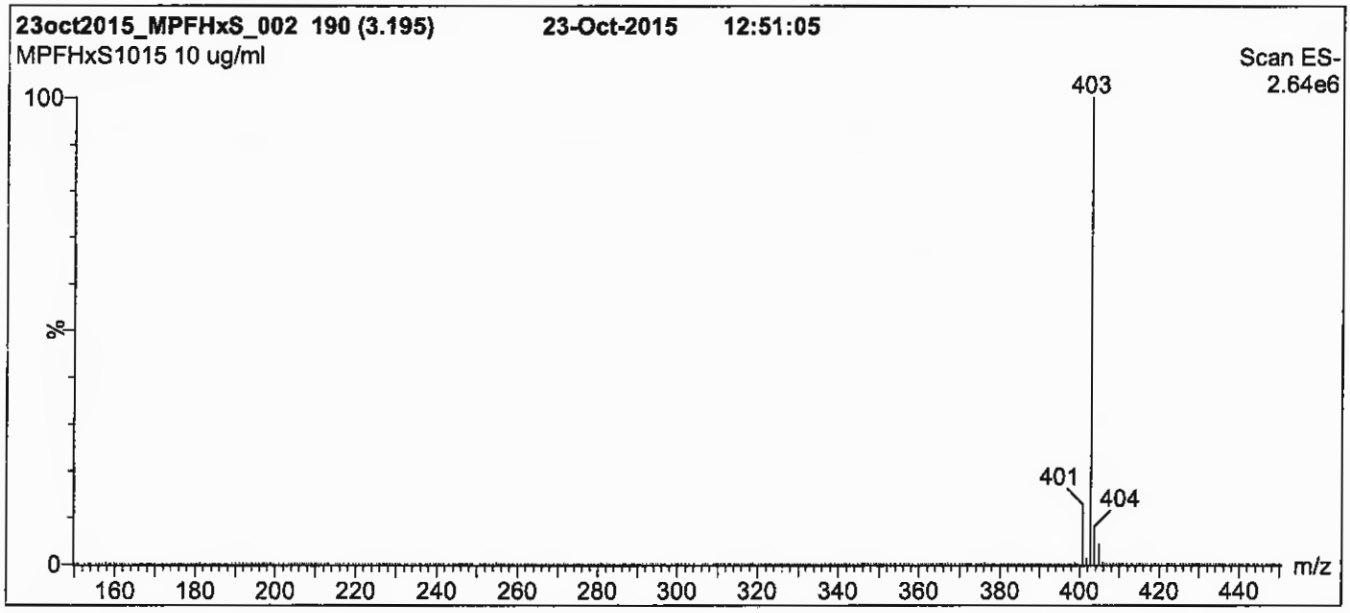
Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

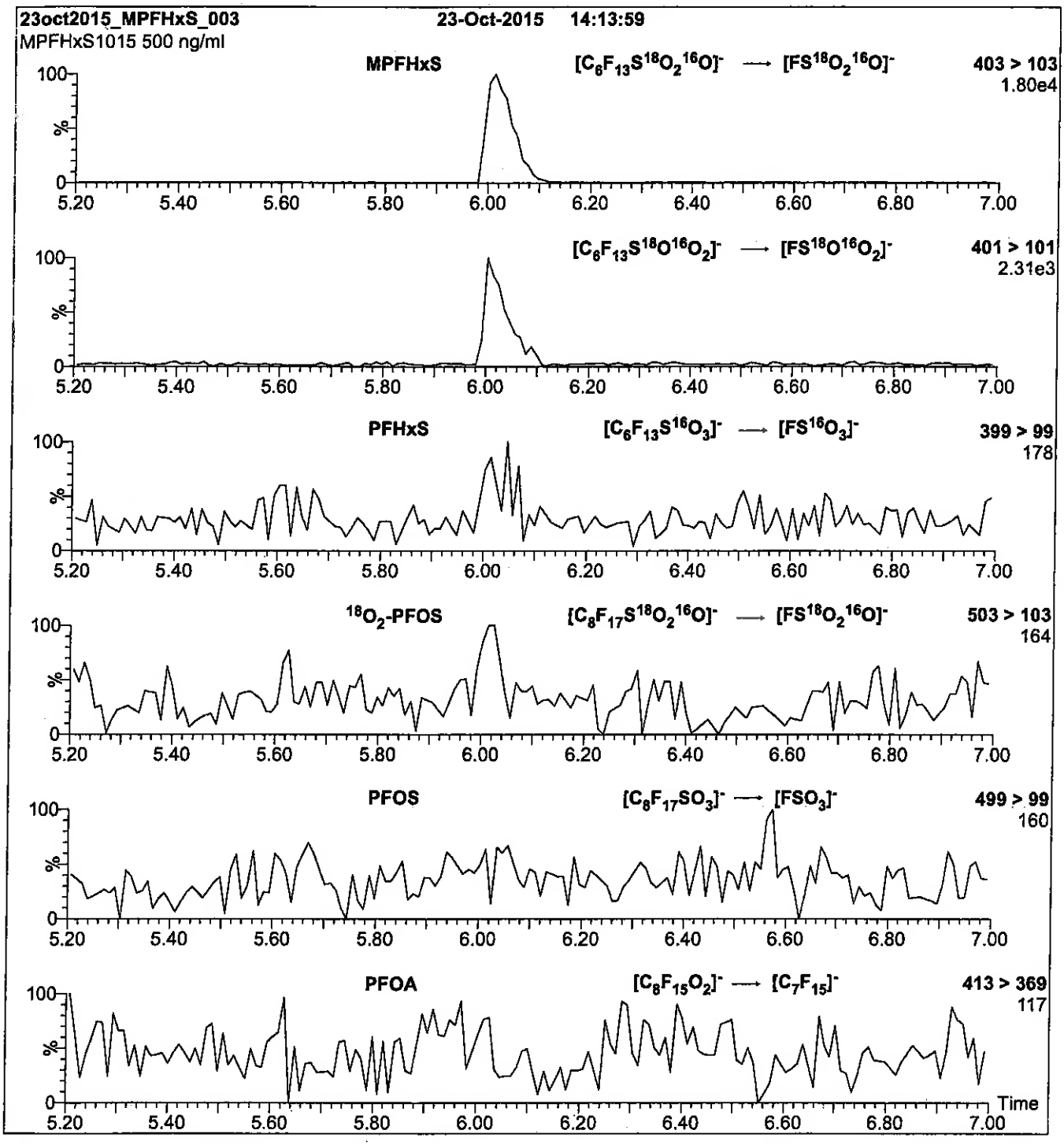
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFHxS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

LCMPFNA_00008

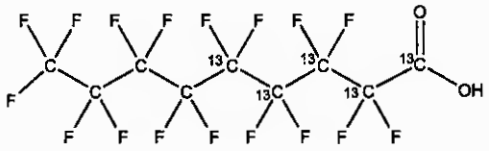
Scanned 10/14/16 R: SBC 9/22/16

739637
ID: LCMPFNA_00008
Exp: 04/13/19 Prpd: SBC
13C5-Perfluorononanoic aci

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA0414
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	04/13/2014		
EXPIRY DATE: (mm/dd/yyyy)	04/13/2019		
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:** 04/01/2015 (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 $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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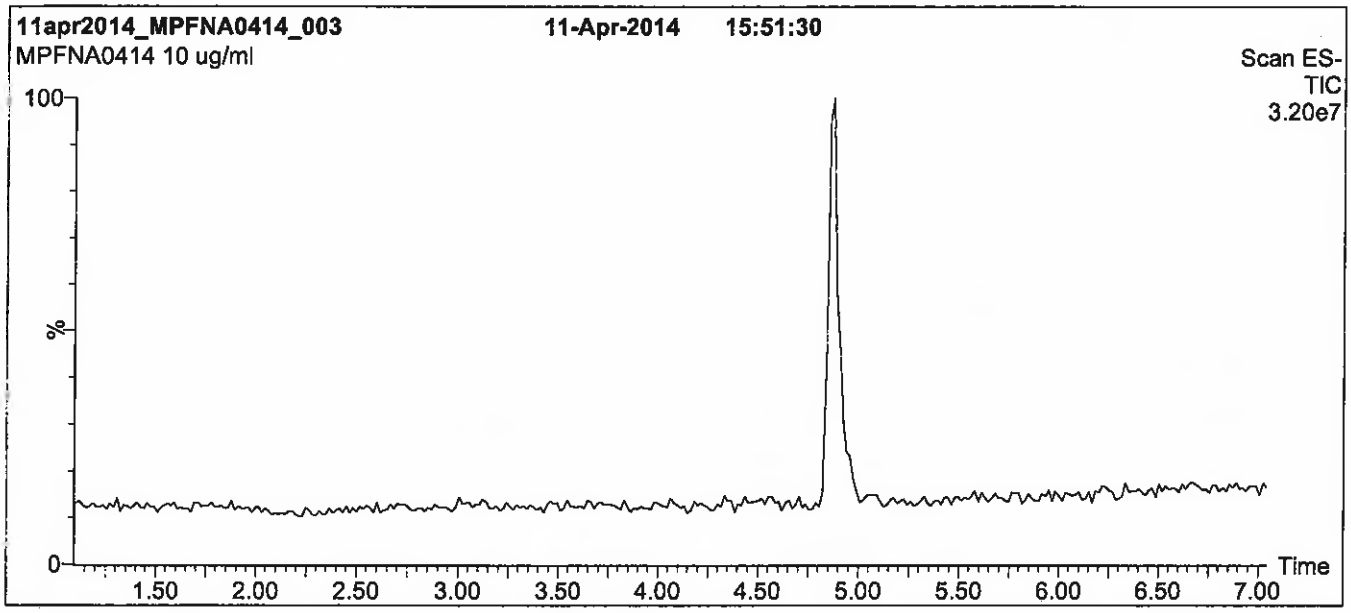
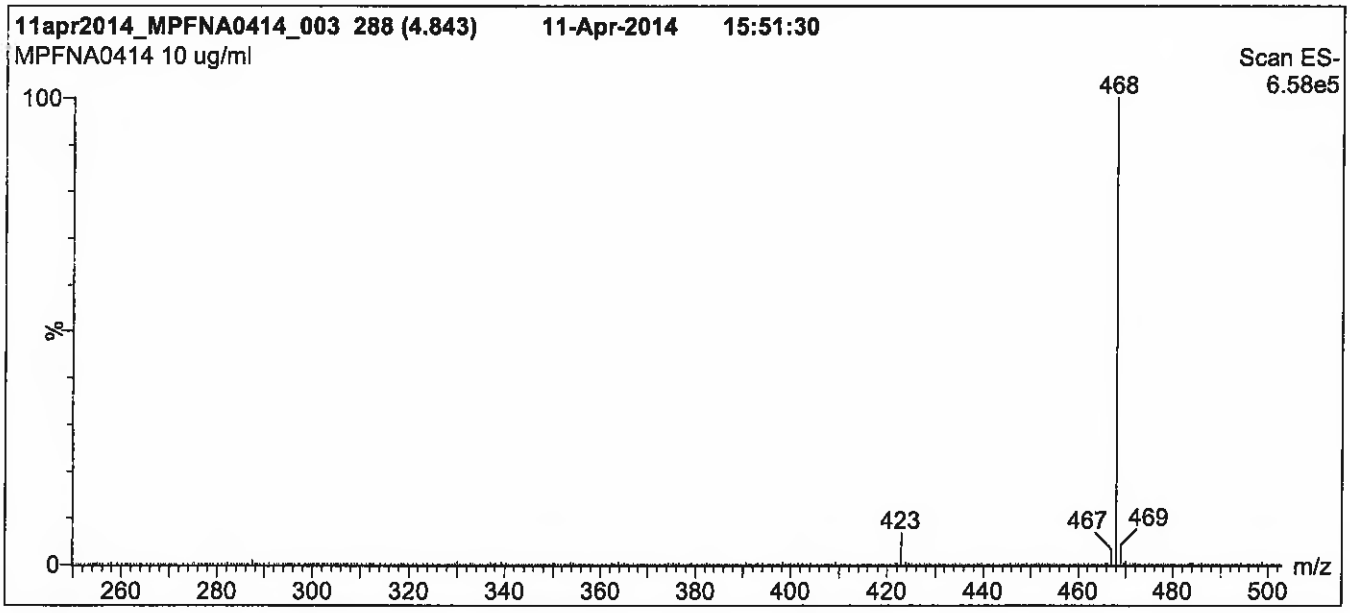
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

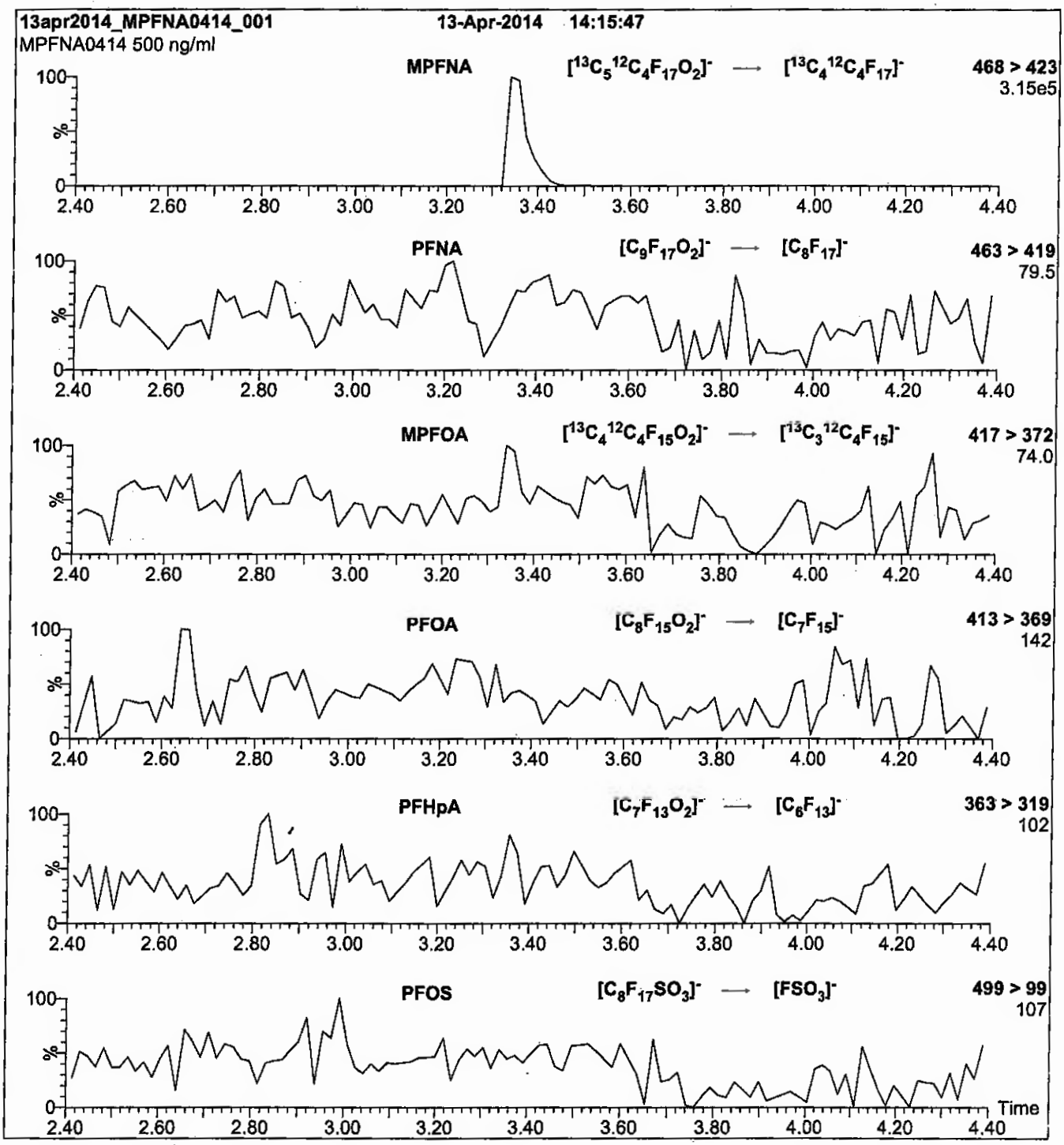
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00012

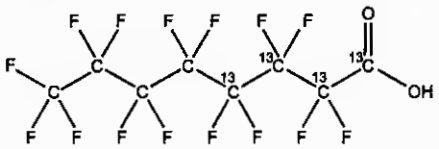
R: SBC 9/22/16

738683
ID: LCMPFOA_00012
Exp: 01/22/21 Prpd: SBC
13C4-Perfluorooctanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFOA	**LOT NUMBER:**	MPFOA0116
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{15}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	01/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- 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 **Date:** 02/01/2016 (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:

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HOMOGENEITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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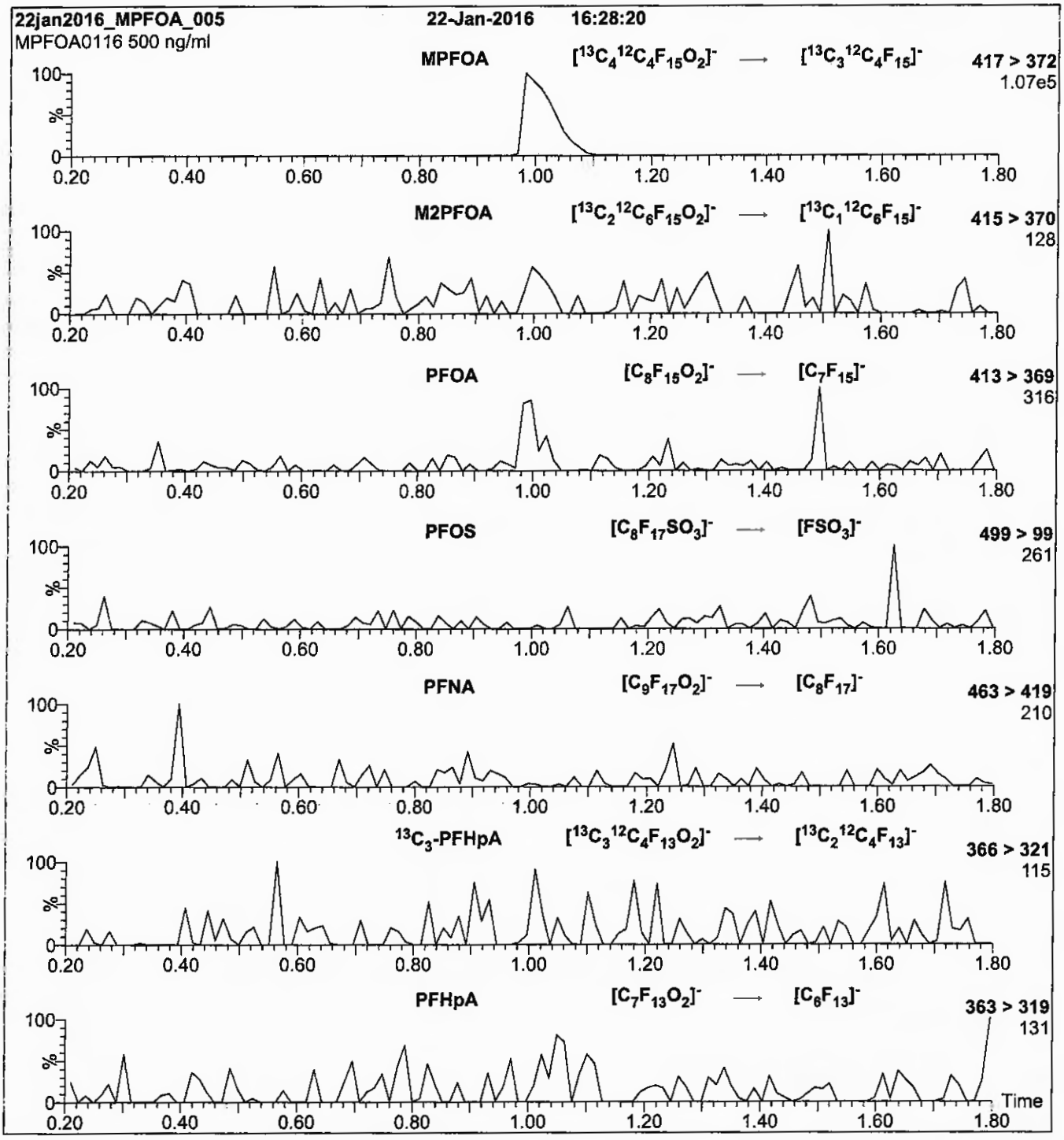
Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

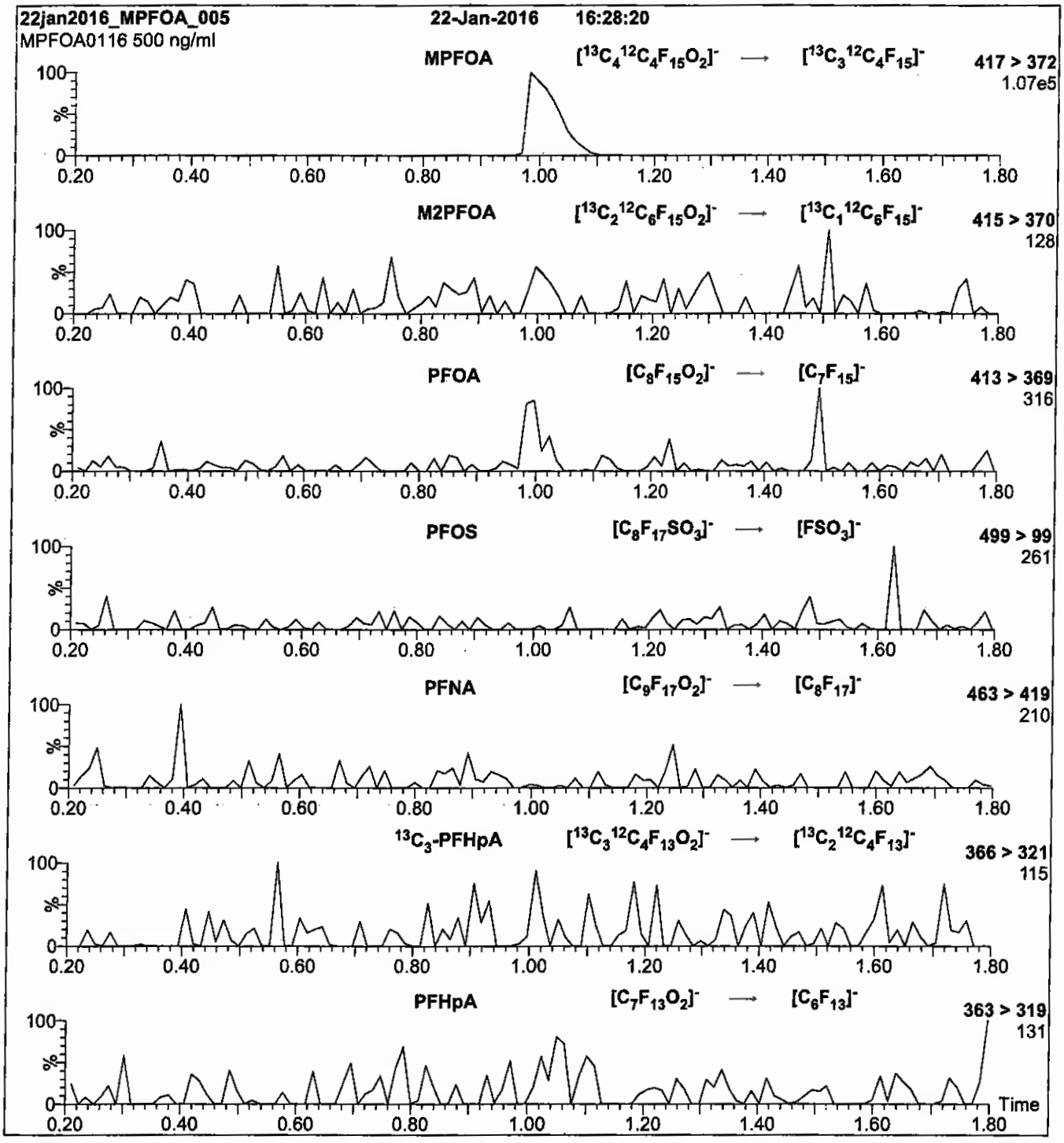
Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFOA)	**MS Parameters**	
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.58e-3 Collision Energy (eV) = 10	
Flow:	300 µl/min		

Reagent

LCMPFOS_00017

R: 9/9/16 SBC

728309
ID: LCMPFOS_00017
Exp: 08/03/21 Prpd: SBC
13C4-Perfluorooctanesulfo

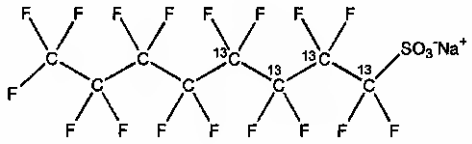
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0816

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	08/03/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/03/2021		
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 ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/05/2016 (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

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CALA

ANAB ACCREDITED

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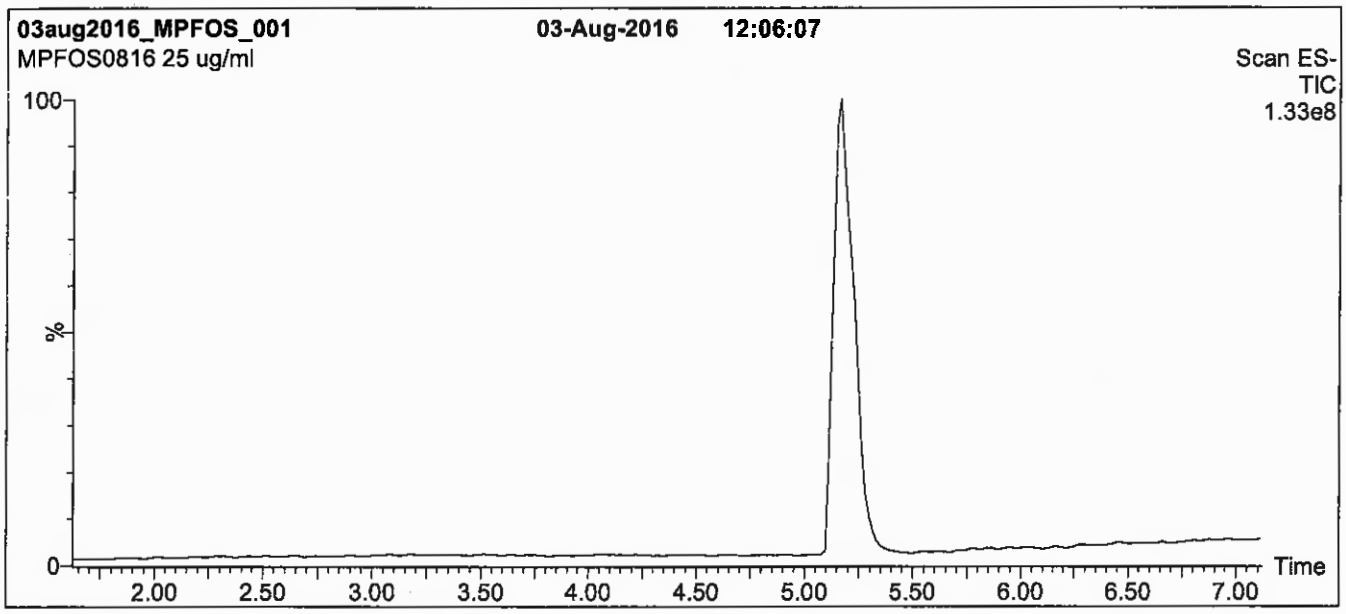
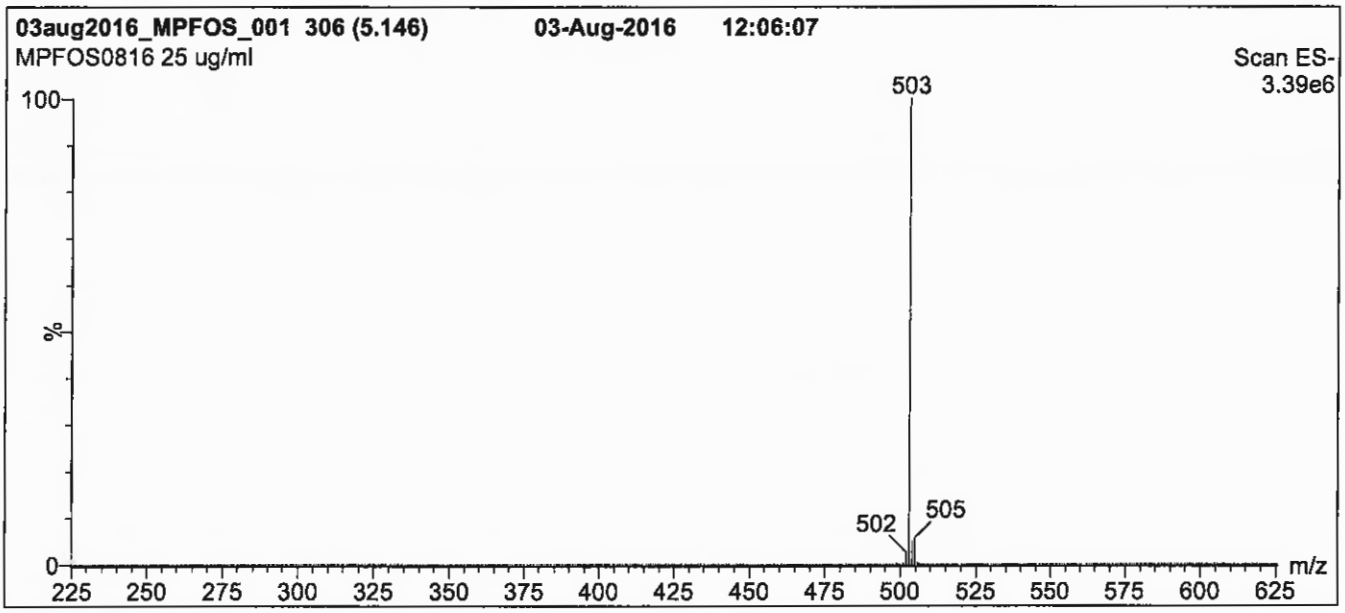
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc 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

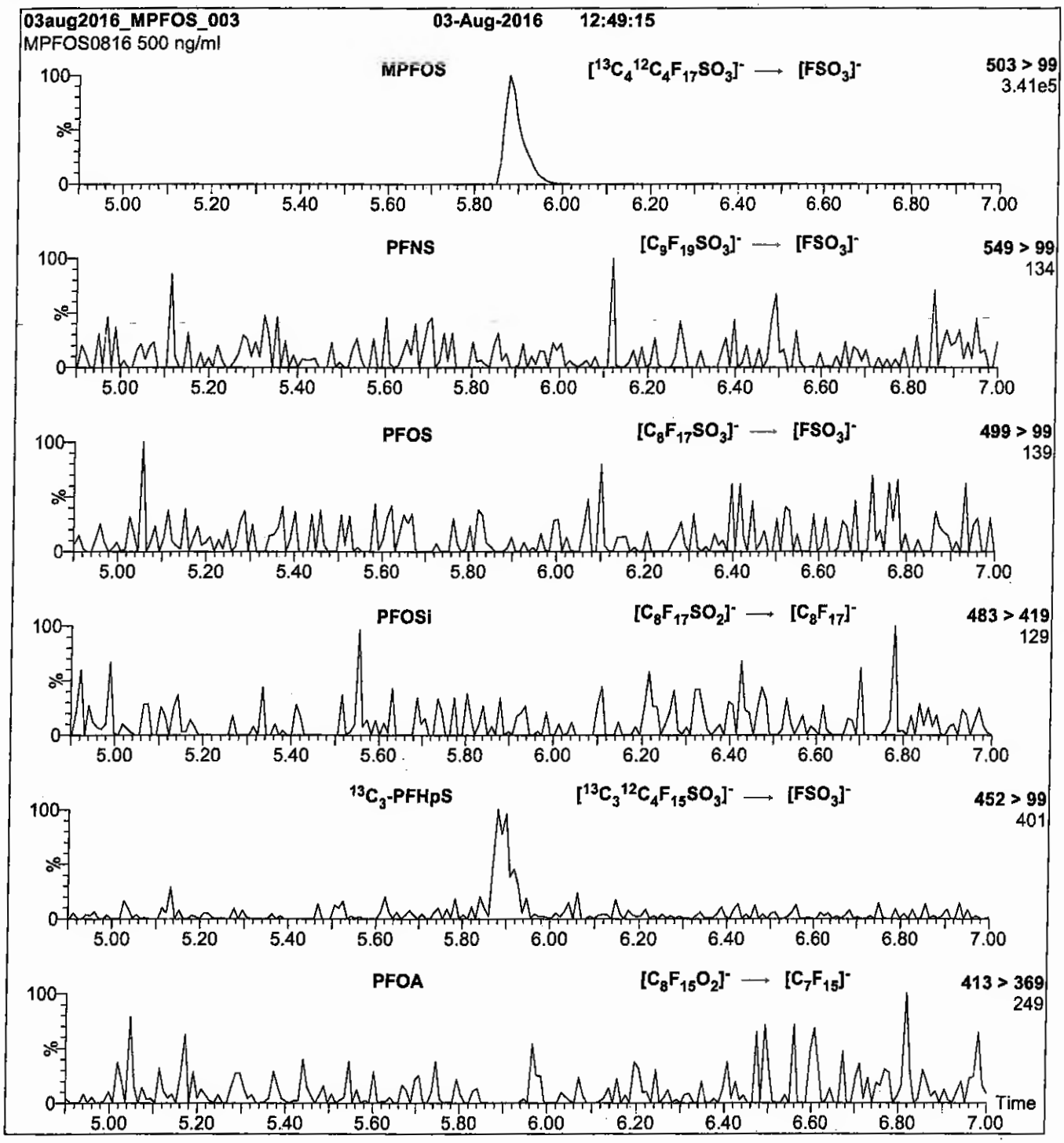
Flow: 300 µl/min

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFOS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00009

R: SBC 9/22/16

739604
ID: LCMPFUdA_00009
Exp: 02/12/21 Prpd: SBC
13C2-Perfluoroundecanoic

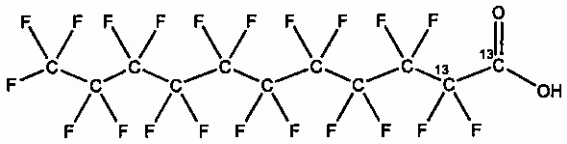
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SBC

PRODUCT CODE: MPFUdA
LOT NUMBER: MPFUdA0216
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
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.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

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.

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HOMOGENEITY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

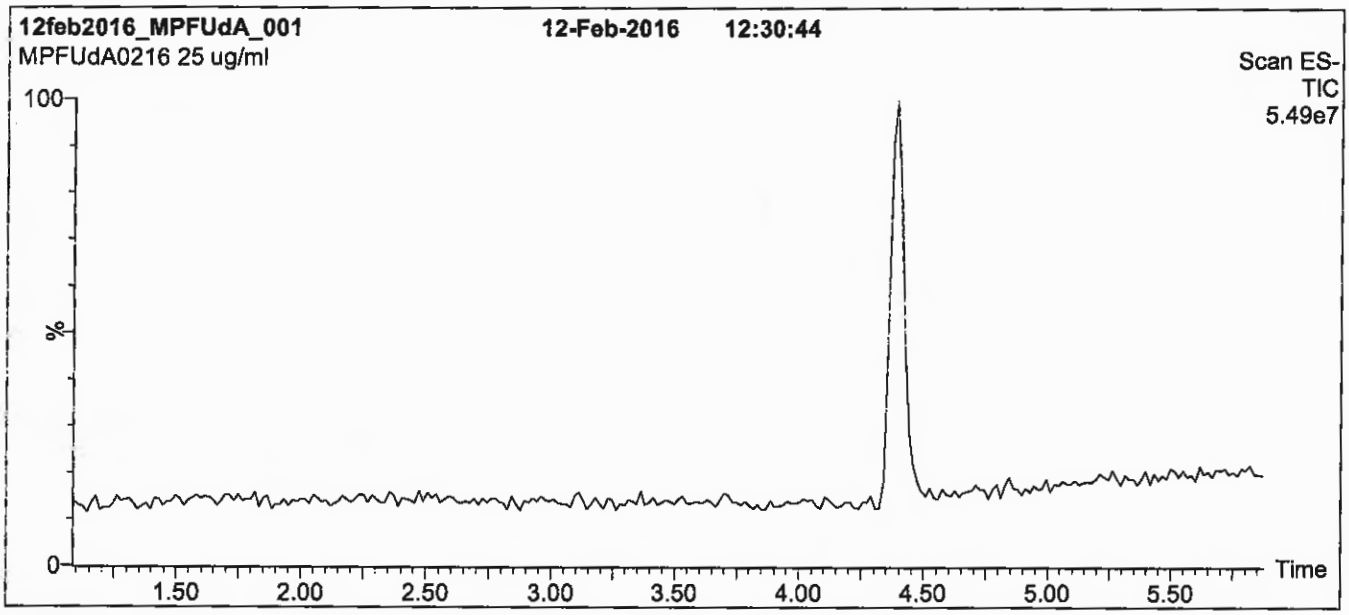
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

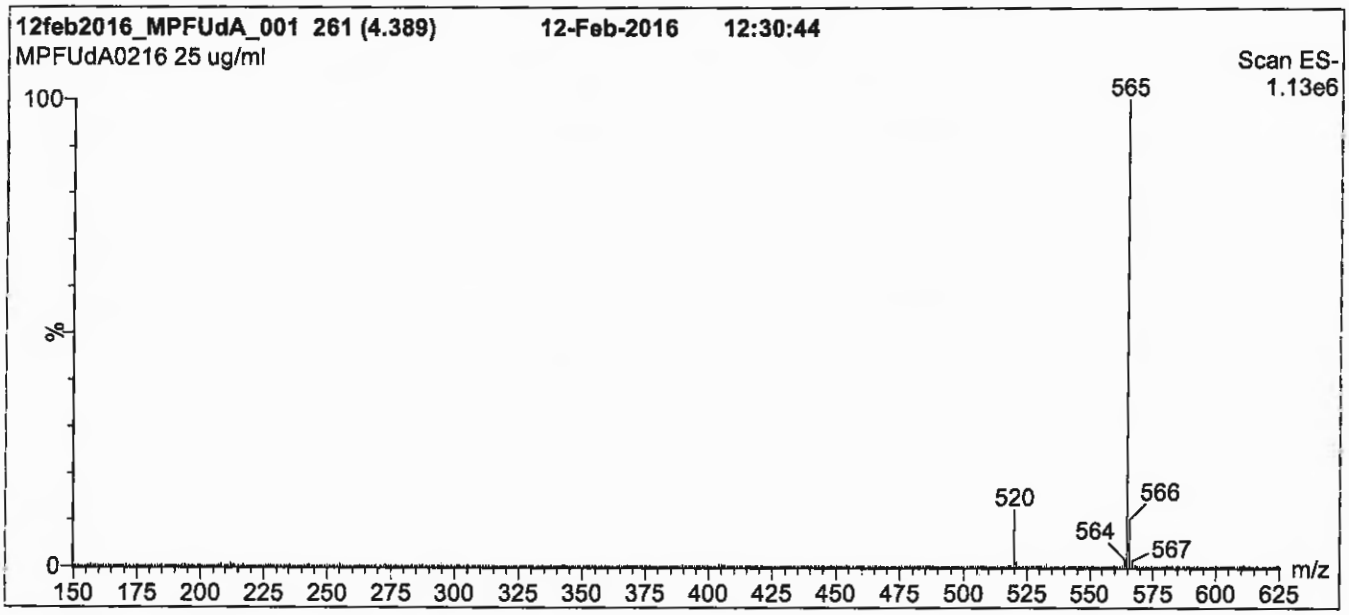
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

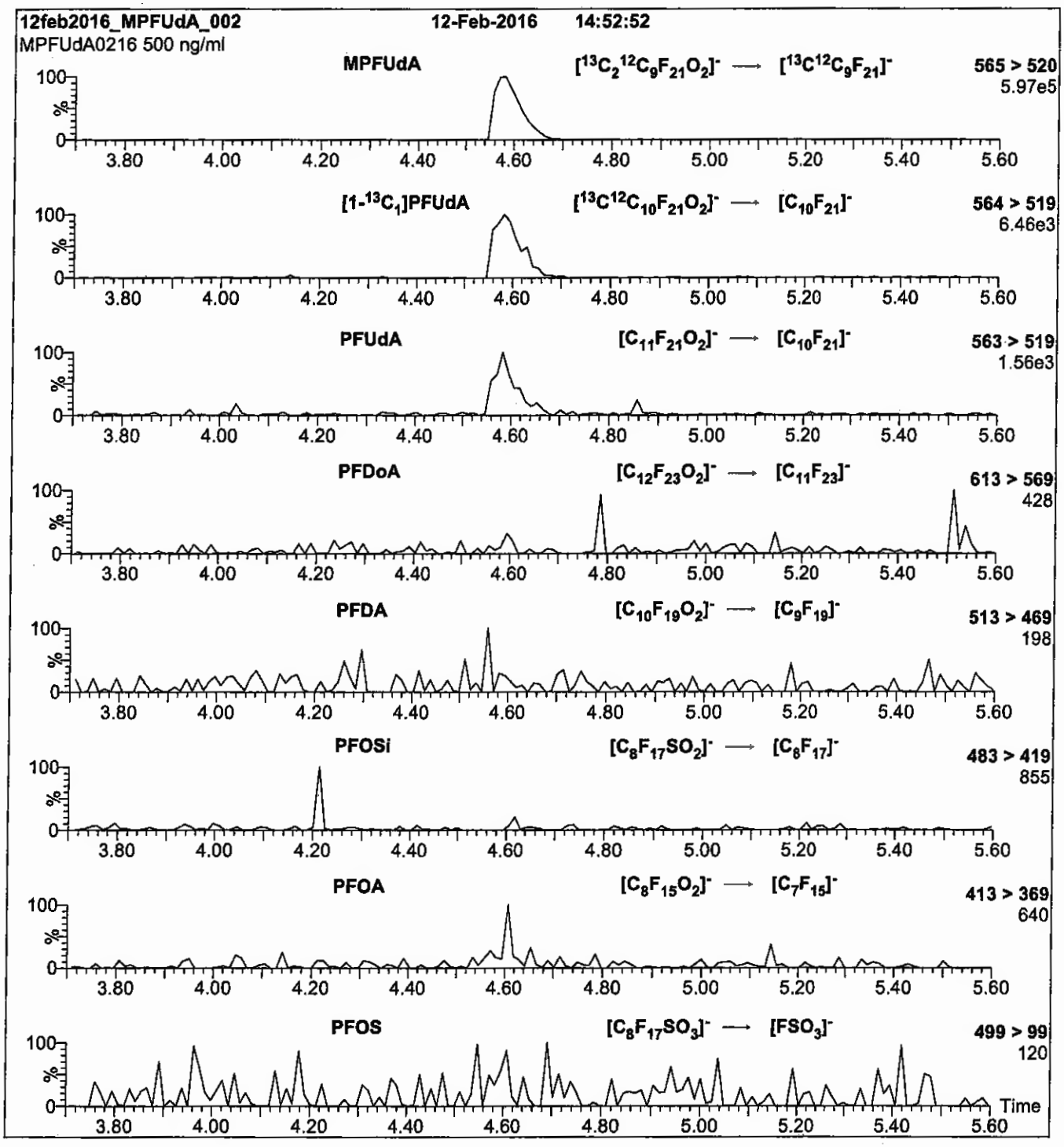
Flow: 300 µl/min

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) = 65
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCN-EtFOSA-M_00002

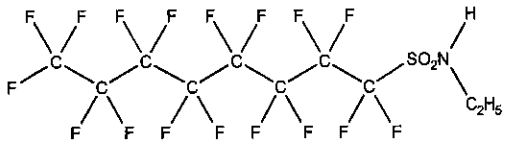
P: 7/16/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide
LOT NUMBER: NEtFOSA0714M

STRUCTURE:
CAS #: 4151-50-2



MOLECULAR FORMULA:	$C_{10}H_6F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/14/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/14/2019		
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 **Date:** 04/01/2015 (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:

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

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

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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.

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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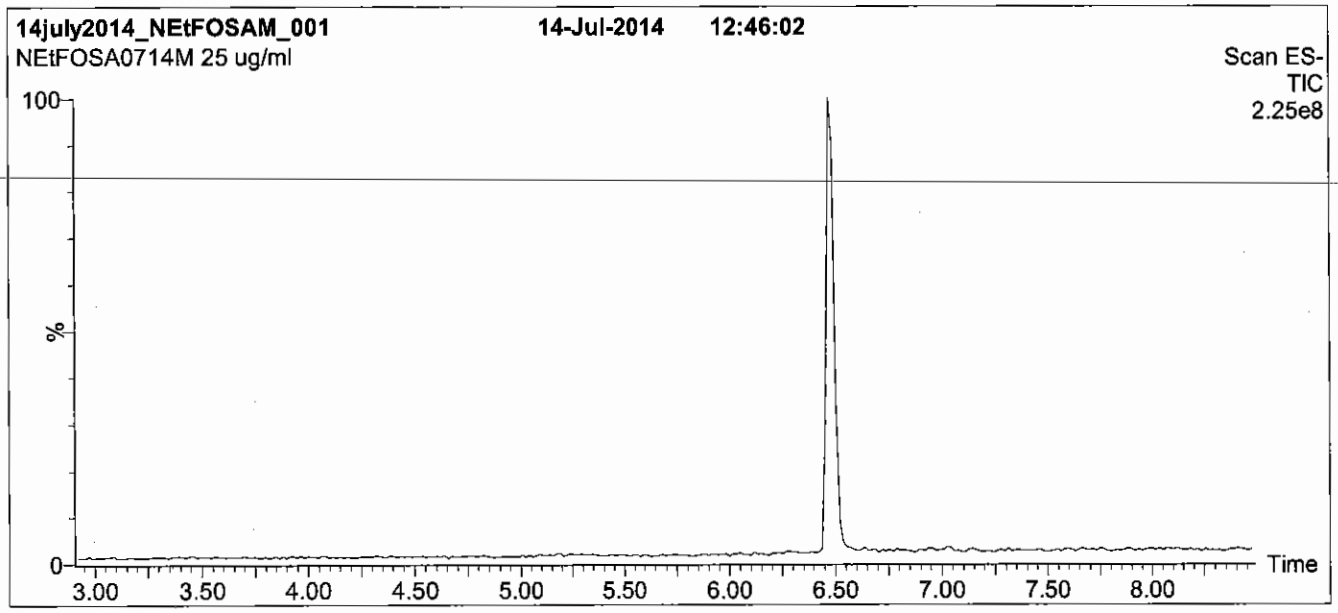
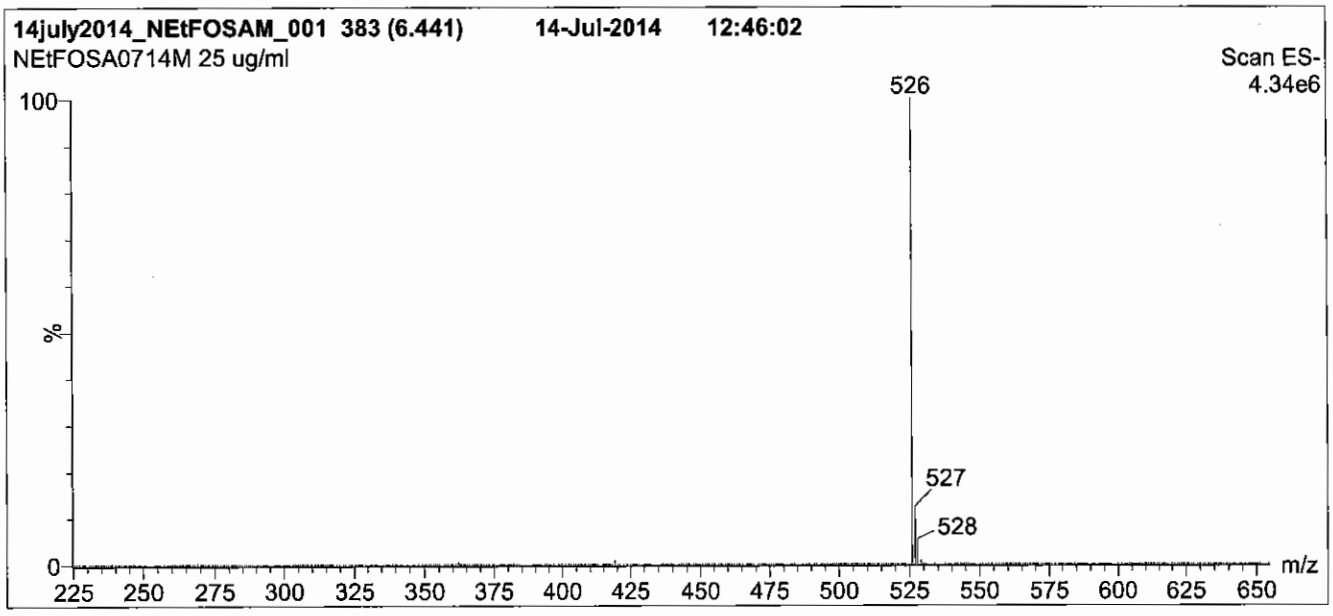
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% H_2O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc 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

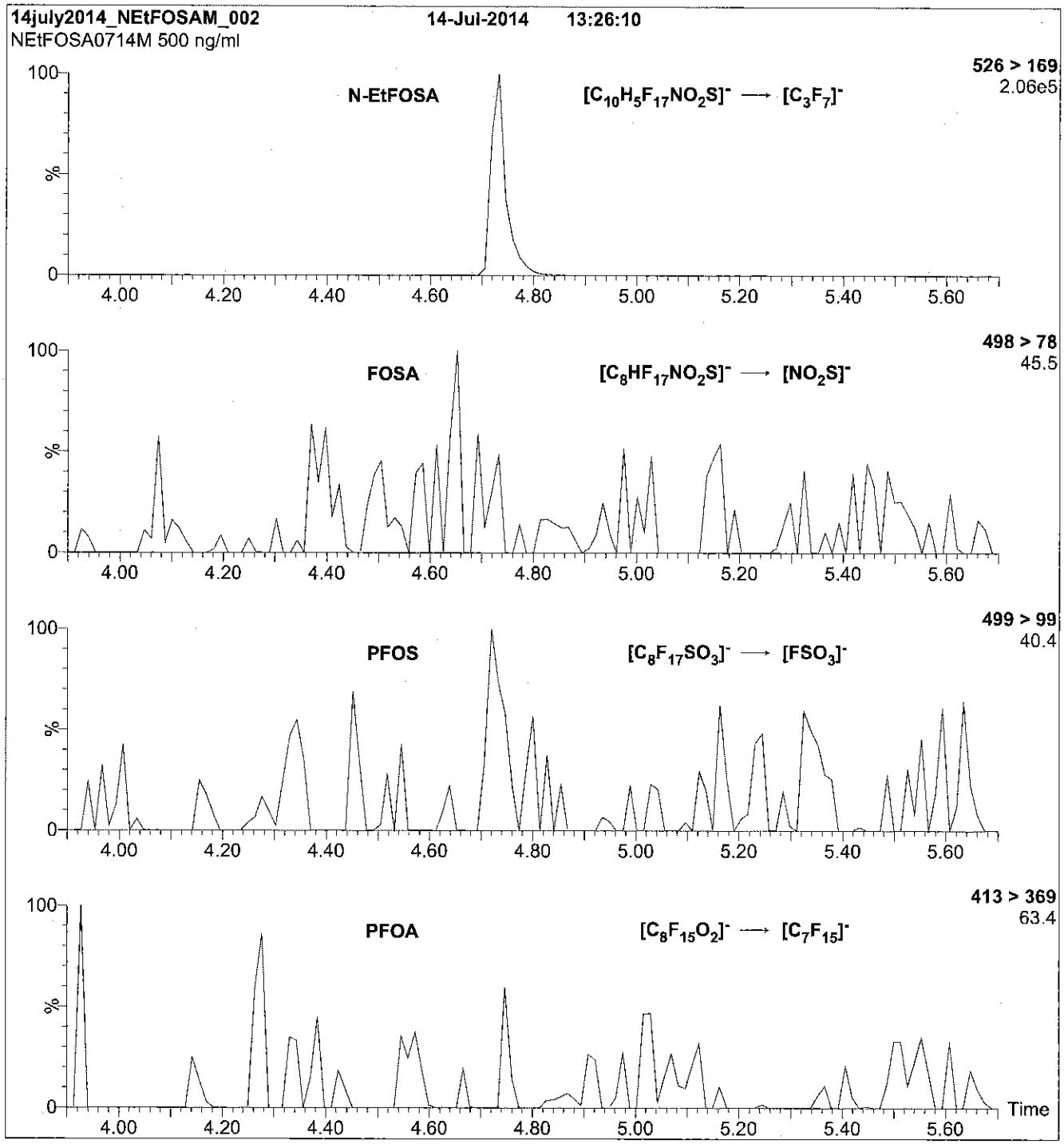
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 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: **N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml N-EtFOSA-M)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 30

Reagent

LCN-EtFOSA-M_00003

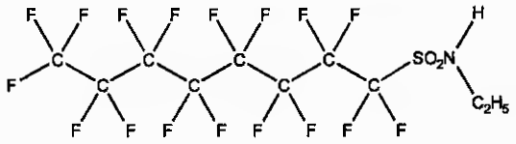
R: 8/23/16 SBC

715563
ID: LCN-EtFOSA-M_00003
Exp: 05/24/21 Prpd: SBC
N-EtFOSA-M

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSA-M	**LOT NUMBER:**	NEtFOSA0516M
COMPOUND:	N-ethylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	4151-50-2



MOLECULAR FORMULA:	$C_{10}H_8F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (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

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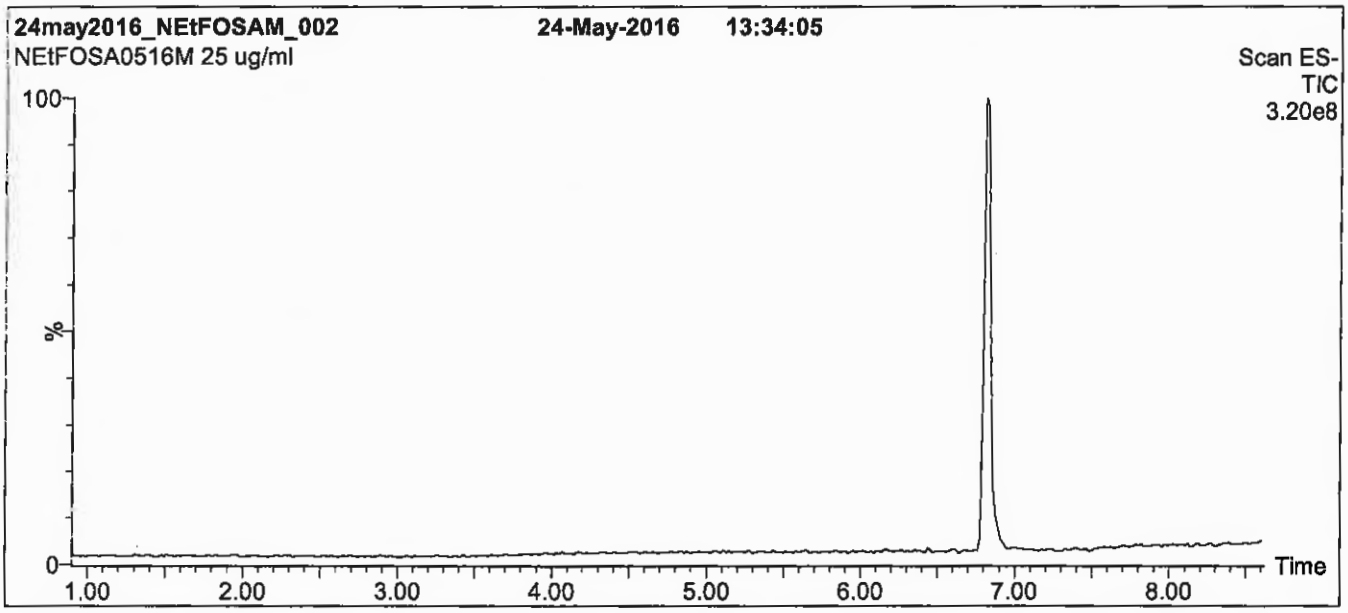
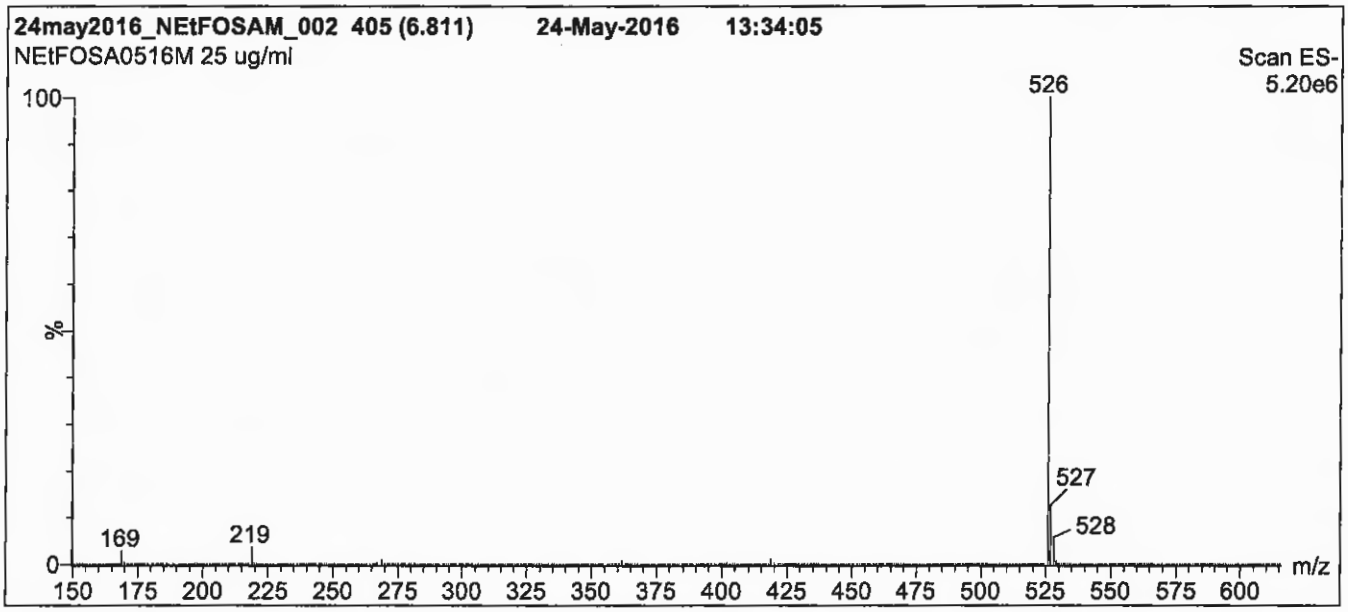
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% H_2O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc 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

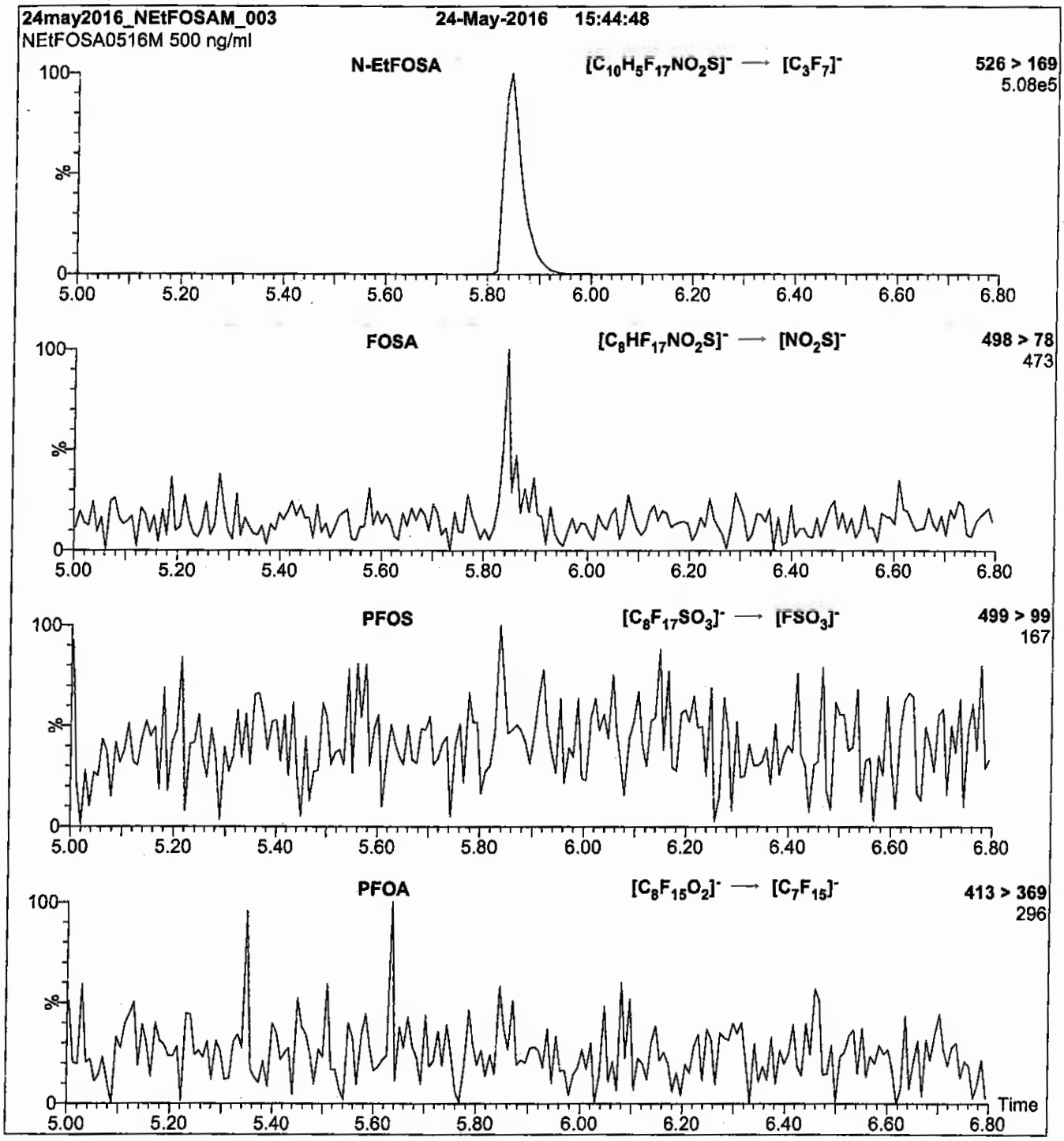
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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: **N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-EtFOSA-M)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSAA_00001

N: 7/16/15 SKV

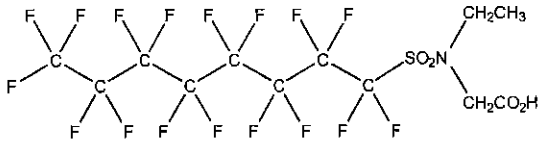
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSAA **LOT NUMBER:** NEtFOSAA0113

COMPOUND: N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2991-50-6



MOLECULAR FORMULA: $C_{12}H_8F_{17}NO_4S$ **MOLECULAR WEIGHT:** 585.23

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 01/29/2013

EXPIRY DATE: (mm/dd/yyyy) 01/29/2018

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 **Date:** 04/06/2015 (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:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

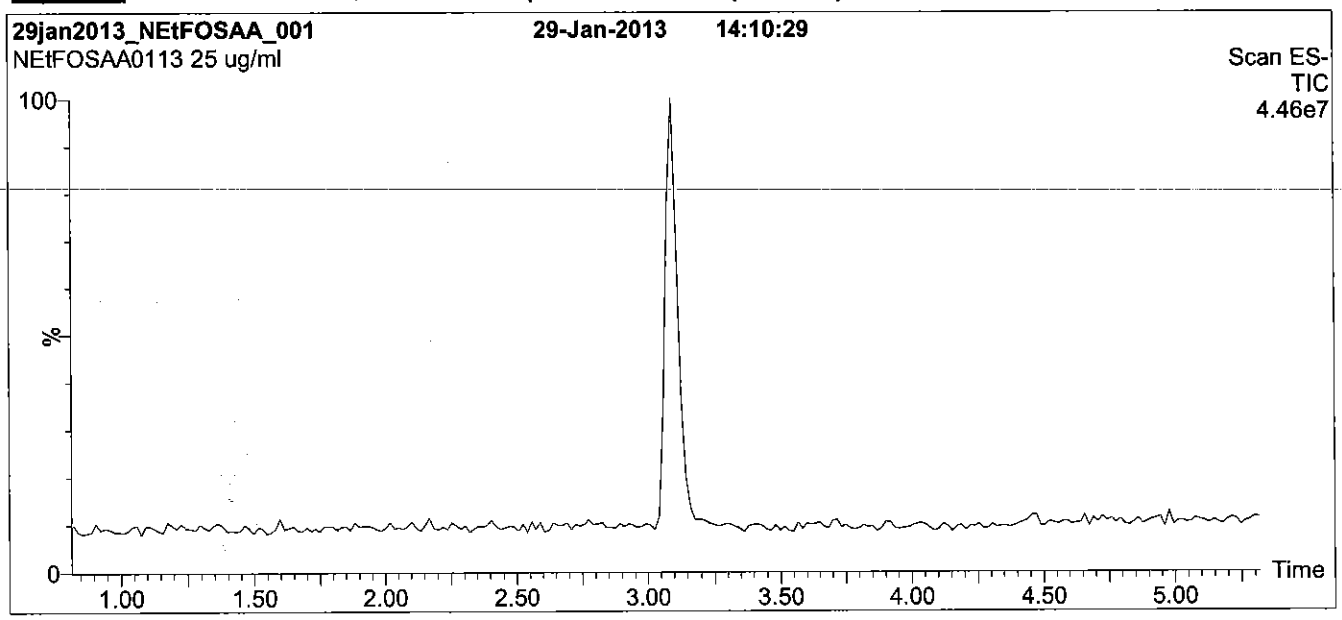
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

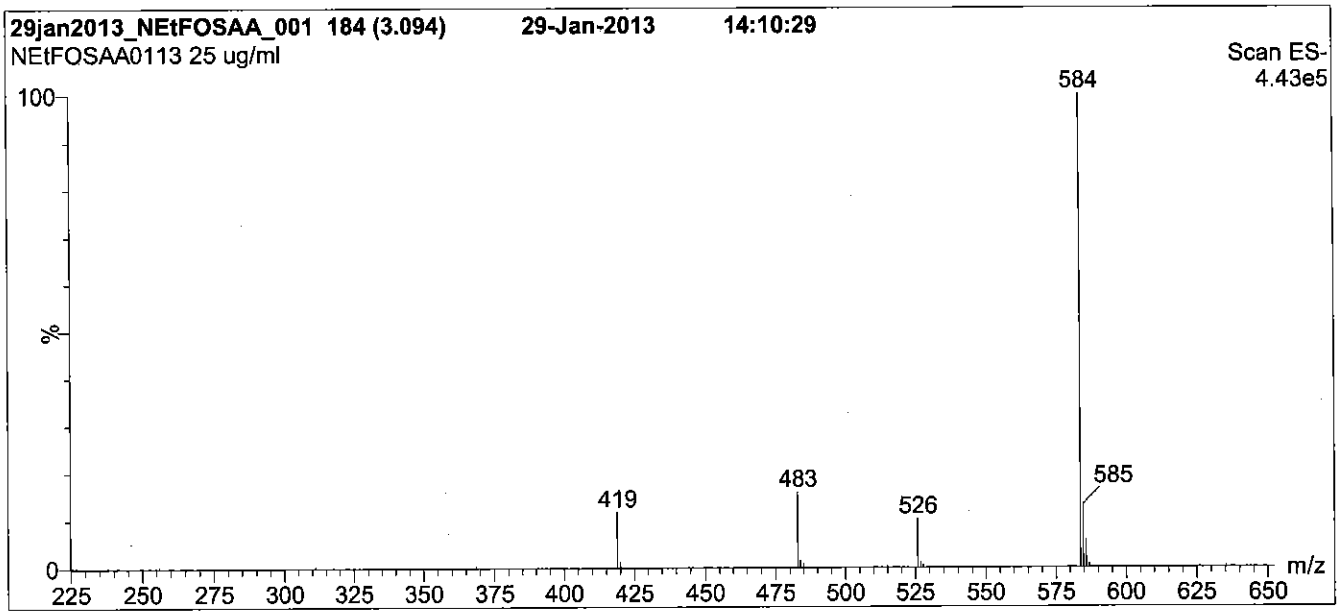
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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-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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc 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

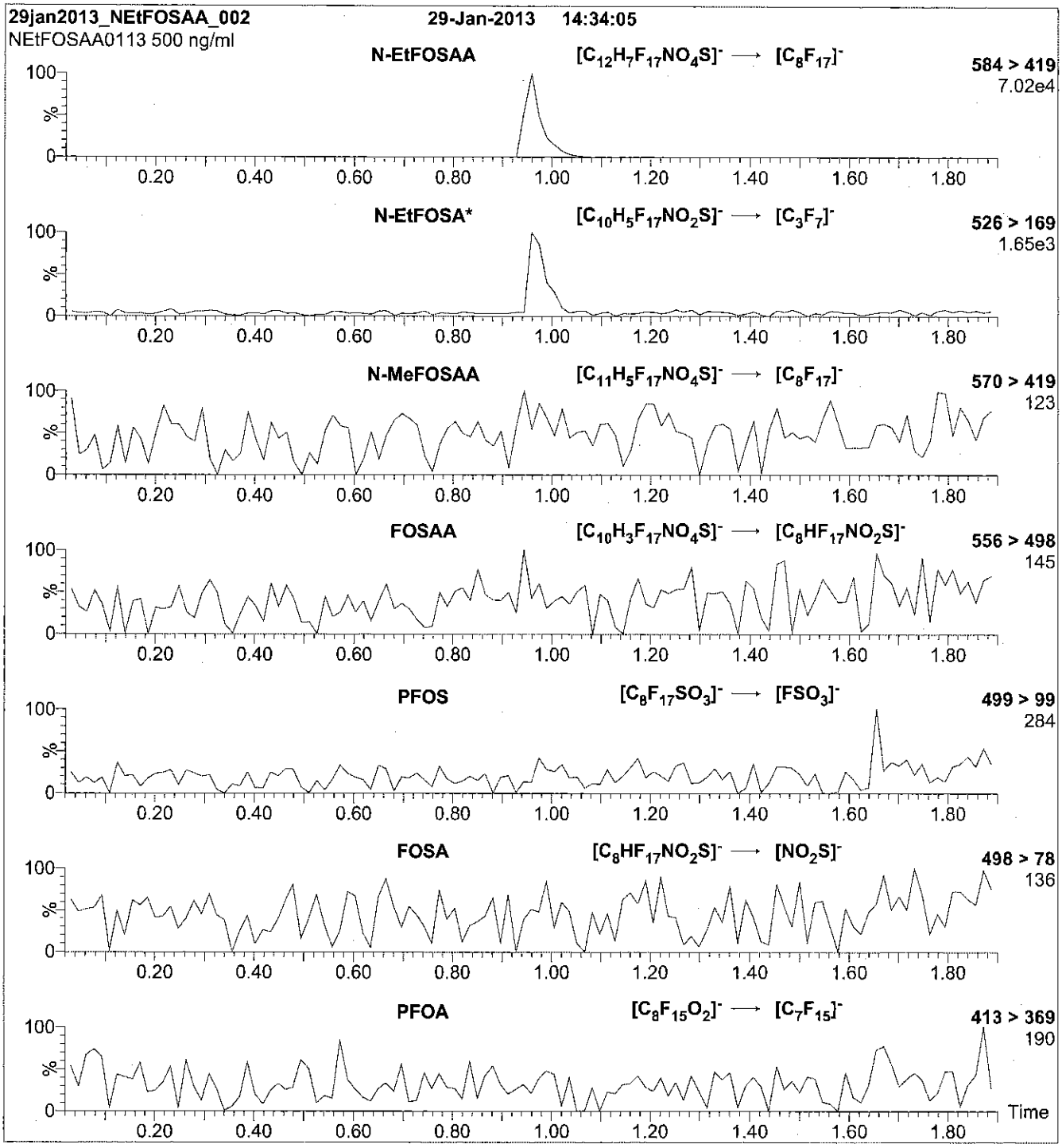
Flow: 300 µl/min

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



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-EtFOSAA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSAA_00002

R: 8/23/16 SBC

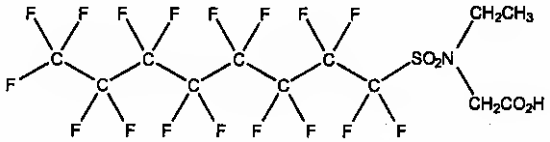
715561
ID: LCN-EtFOSAA_00002
Exp: 01/20/21 Prpd: SBC
N-EtFOSAA

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-EtFOSAA **LOT NUMBER:** NEtFOSAA0116
COMPOUND: N-ethylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2991-50-6



MOLECULAR FORMULA: $C_{12}H_8F_{17}NO_4S$ **MOLECULAR WEIGHT:** 585.23
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/20/2016
EXPIRY DATE: (mm/dd/yyyy) 01/20/2021
RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/21/2016 (mm/dd/yyyy)

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519-822-2436 • Fax: 519-822-2849 • Info@well-labs.com

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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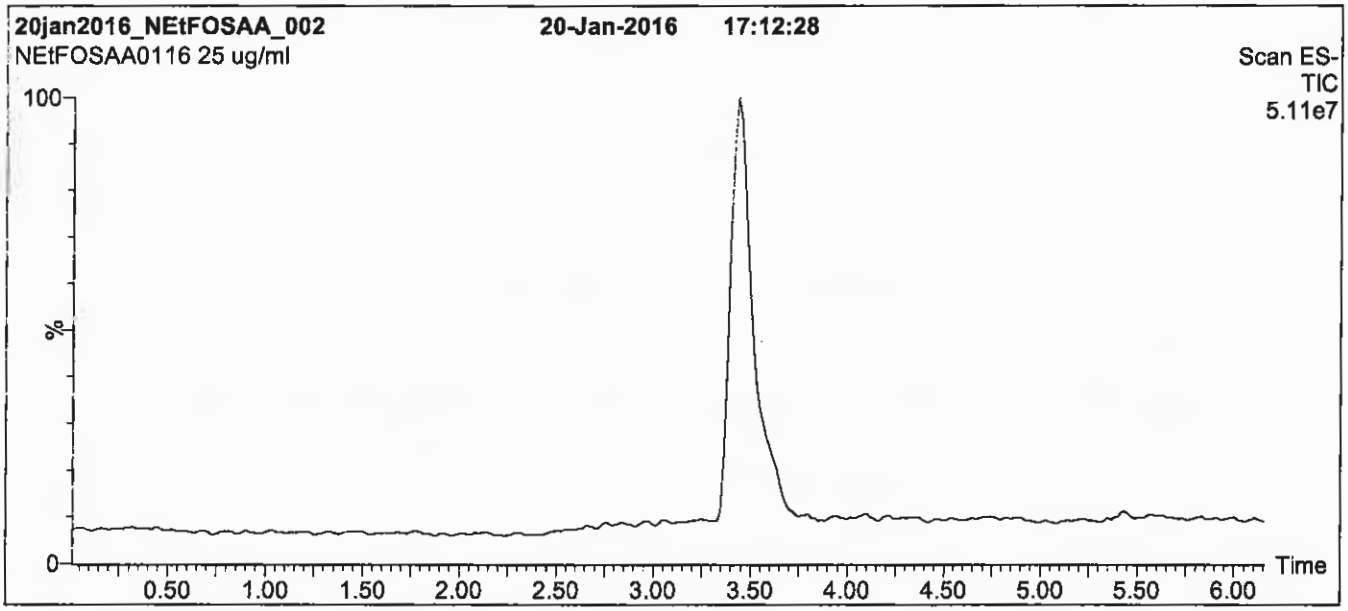
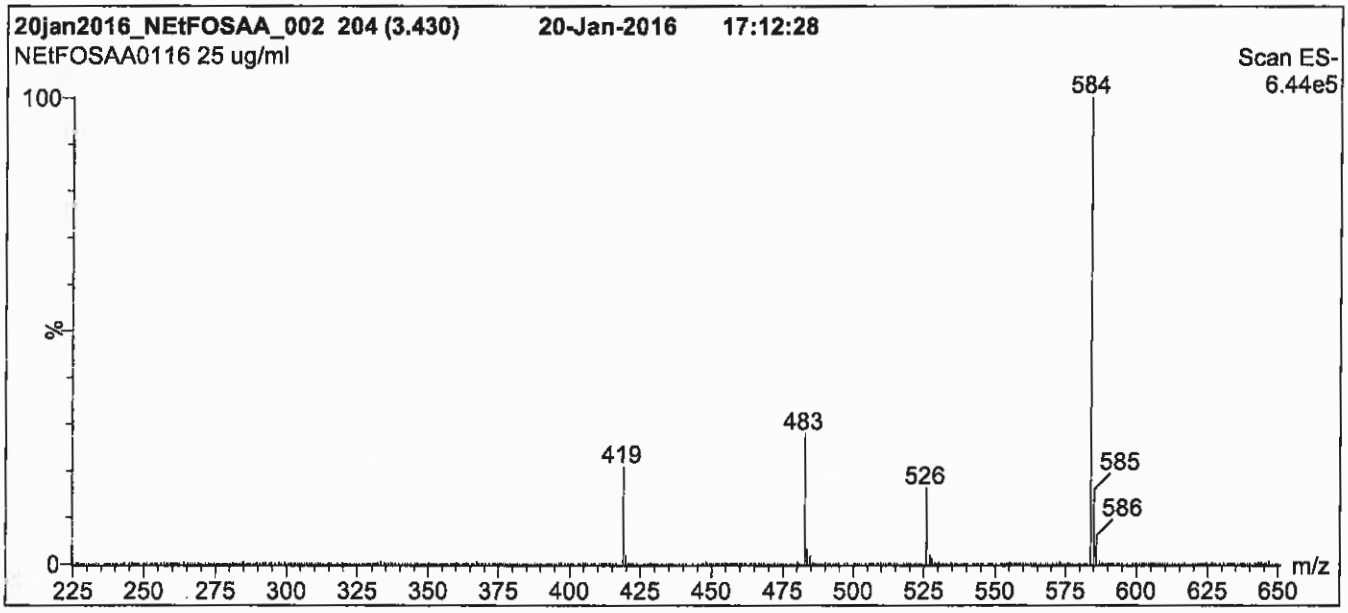
Figure 1: **N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

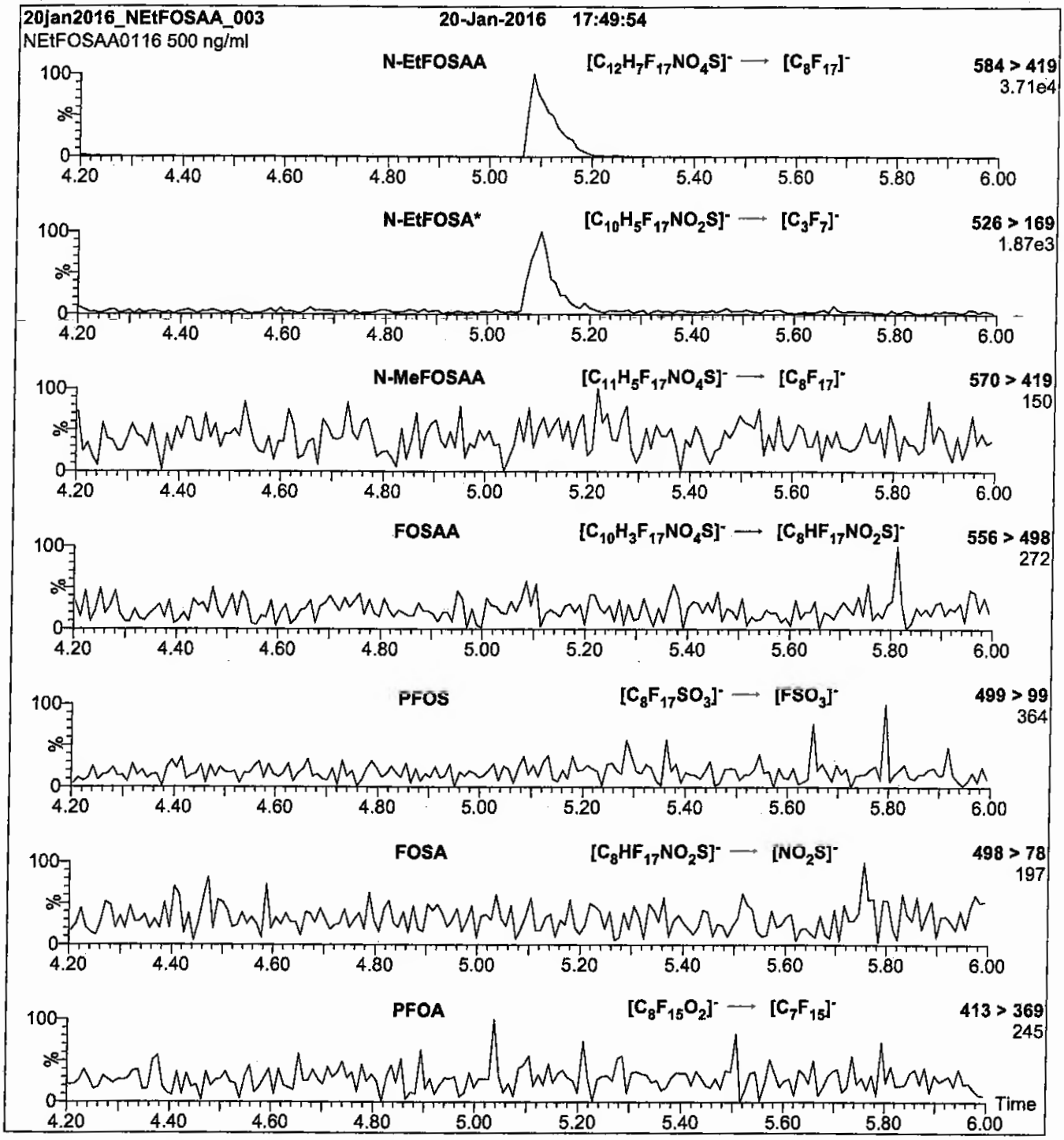
Flow: 300 µl/min

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



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.

Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-EtFOSAA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 25

Reagent

LCN-MeFOSA-M_00001

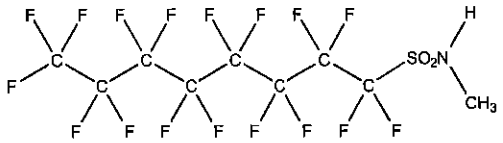
R: 7/16/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide
LOT NUMBER: NMeFOSA0714M

STRUCTURE:
CAS #: 31506-32-8



MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/15/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/15/2019		
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 **Date:** 04/01/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED Reference Material Producer

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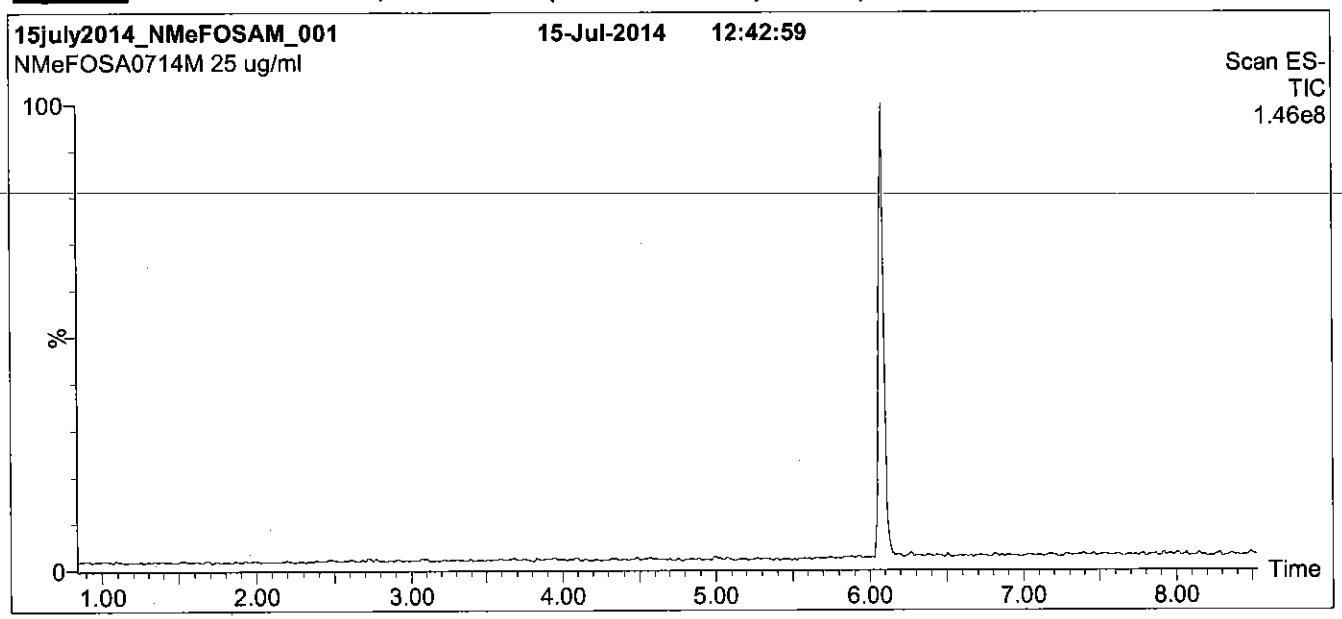
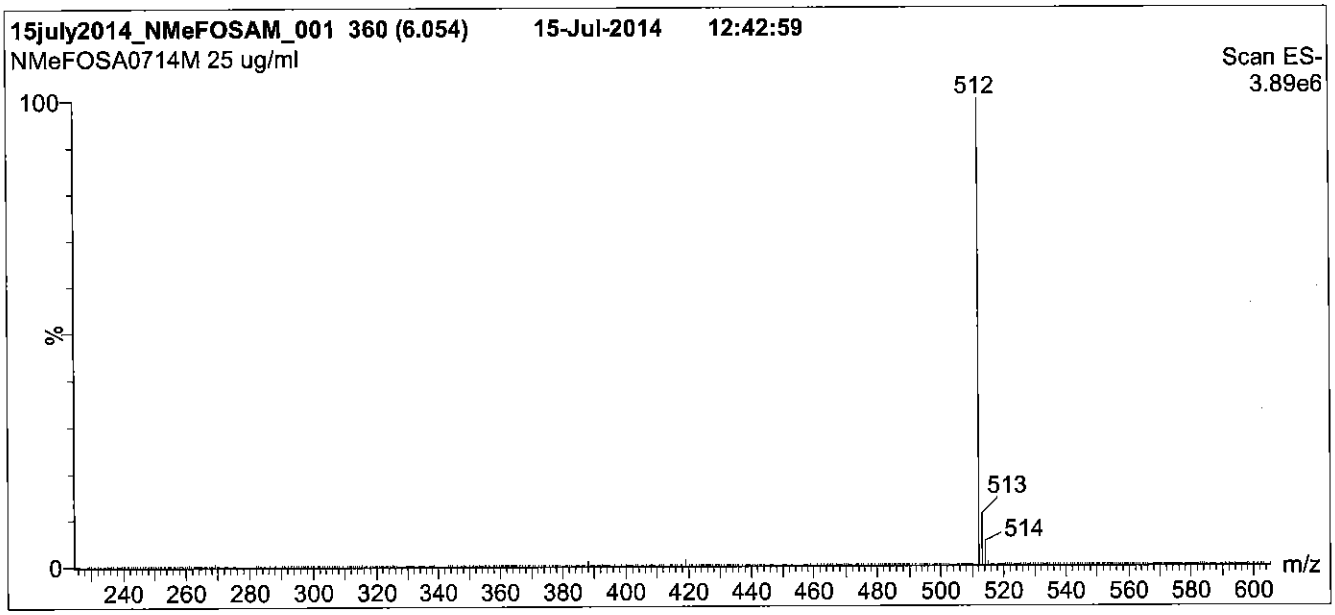
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% H_2O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc 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

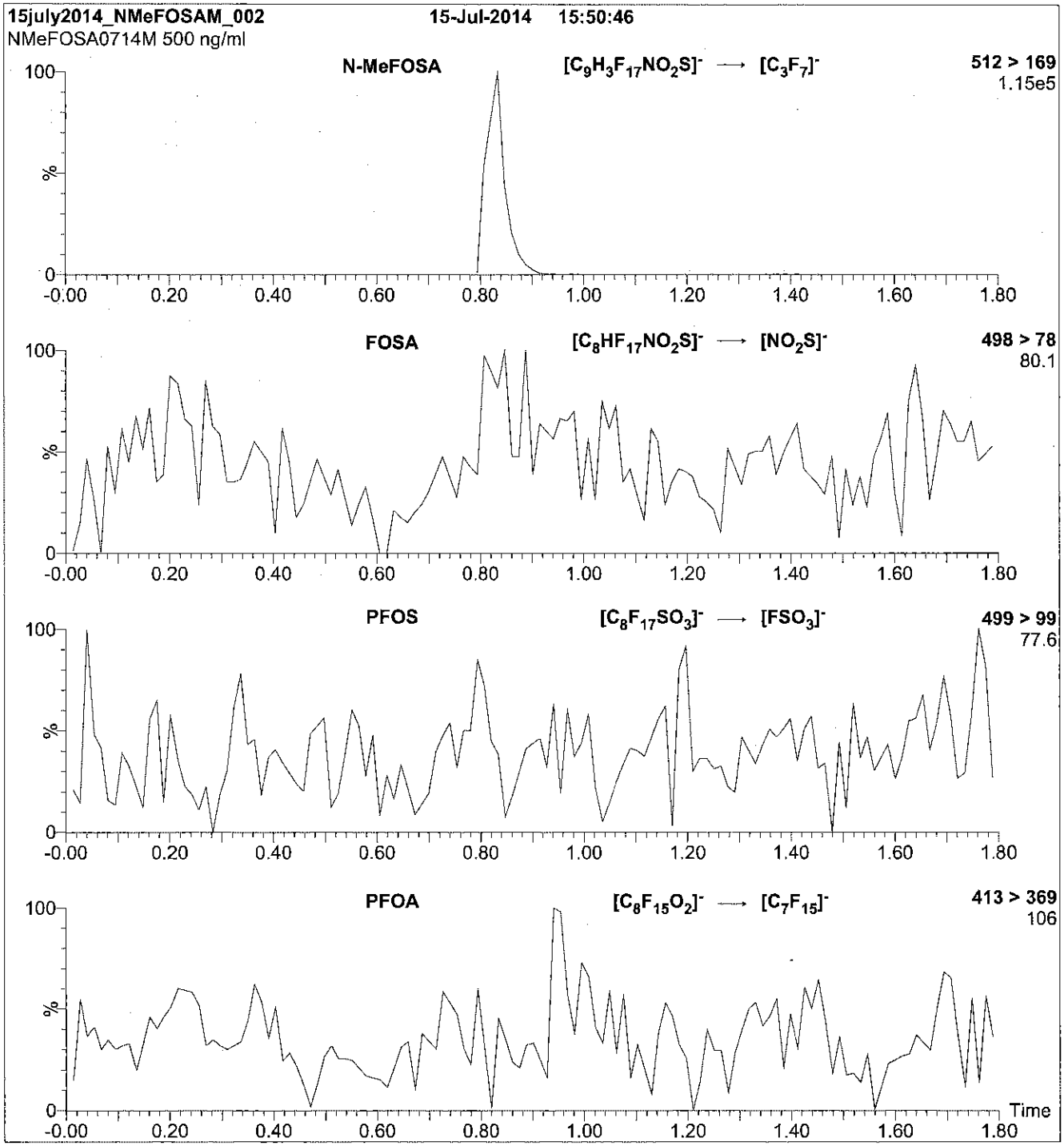
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 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: **N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml N-MeFOSA-M)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

LCN-MeFOSA-M_00002

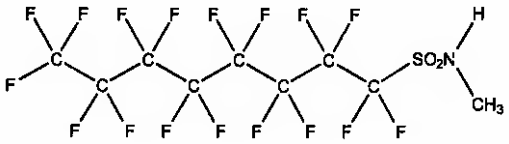
R: 8/23/16 SBC

715564
ID: LCN-MeFOSA-M_00002
Exp: 05/24/21 Prpd: SBC
N-MeFOSA-M

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	N-MeFOSA-M	**LOT NUMBER:**	NMeFOSA0516M
COMPOUND:	N-methylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	31506-32-8



MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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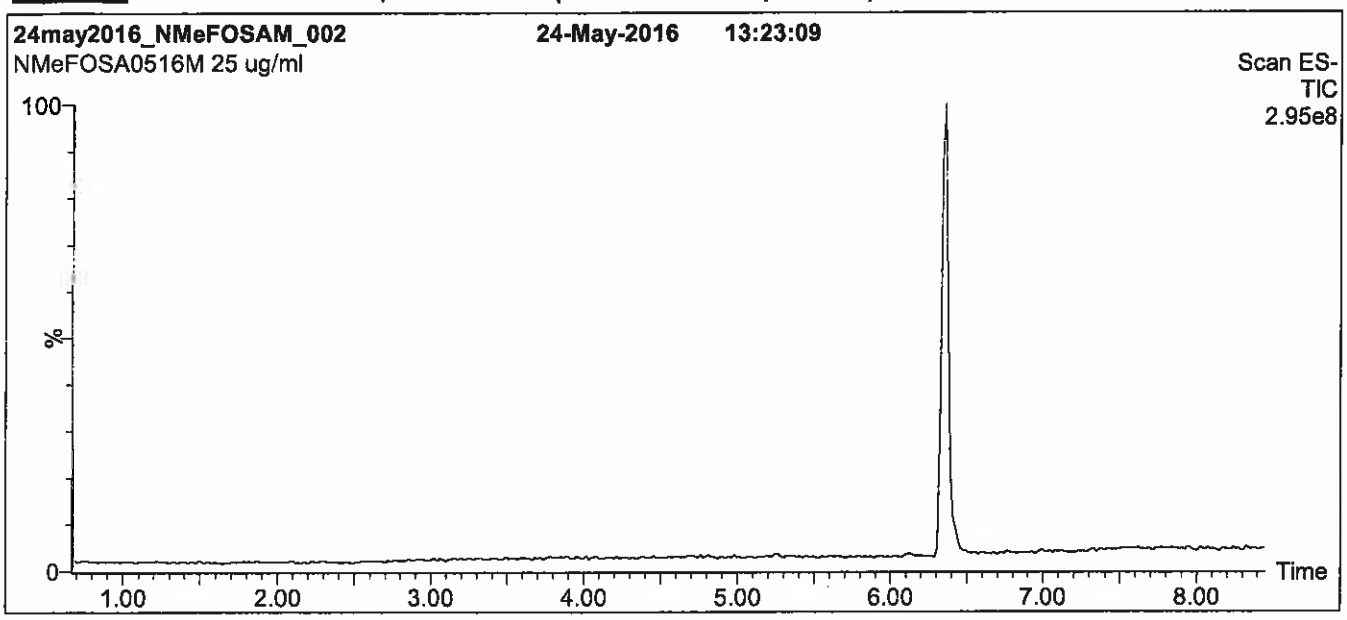
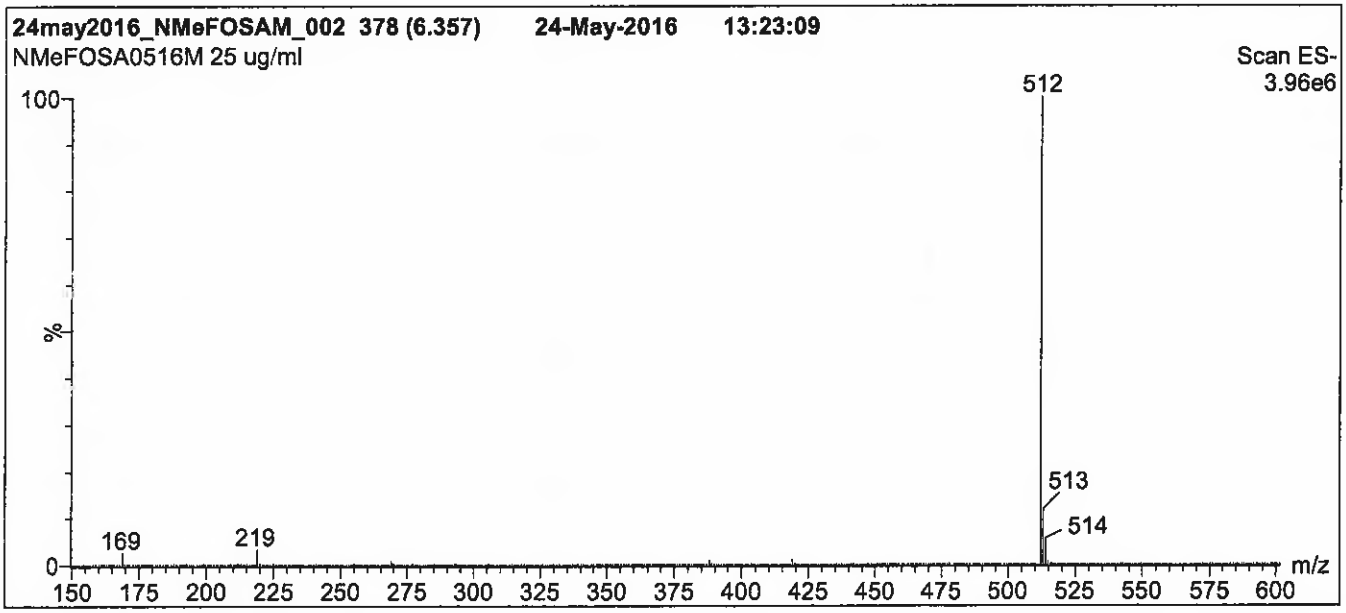
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% H_2O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc 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

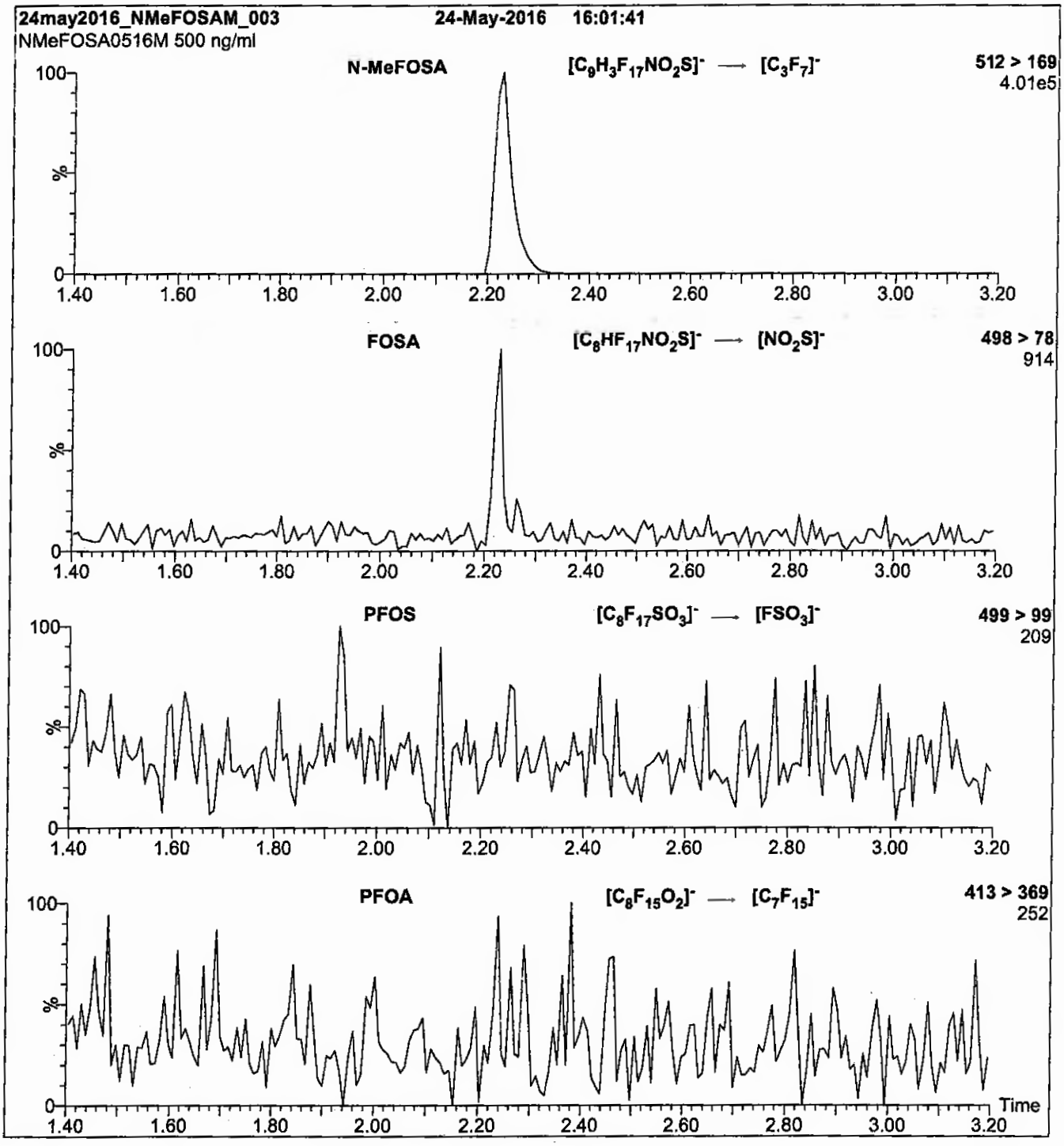
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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: **N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-MeFOSA-M)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00001

R: 7/10/15 SEU

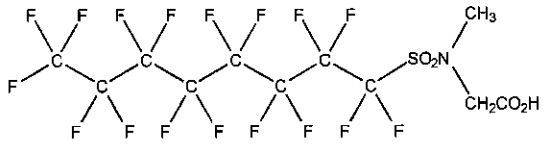
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSAA **LOT NUMBER:** NMeFOSAA1214

COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2355-31-9



MOLECULAR FORMULA: $C_{11}H_6F_{17}NO_4S$ **MOLECULAR WEIGHT:** 571.21

CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 12/09/2014

EXPIRY DATE: (mm/dd/yyyy) 12/09/2019

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.
- 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 **Date:** 04/06/2015 (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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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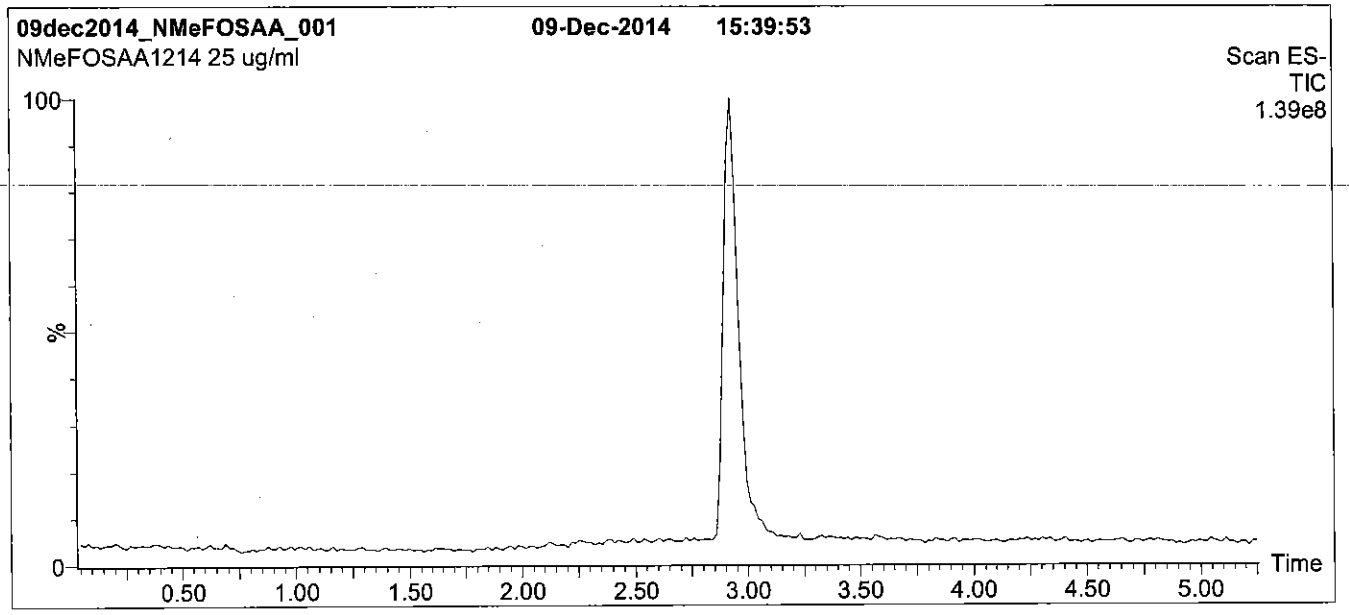
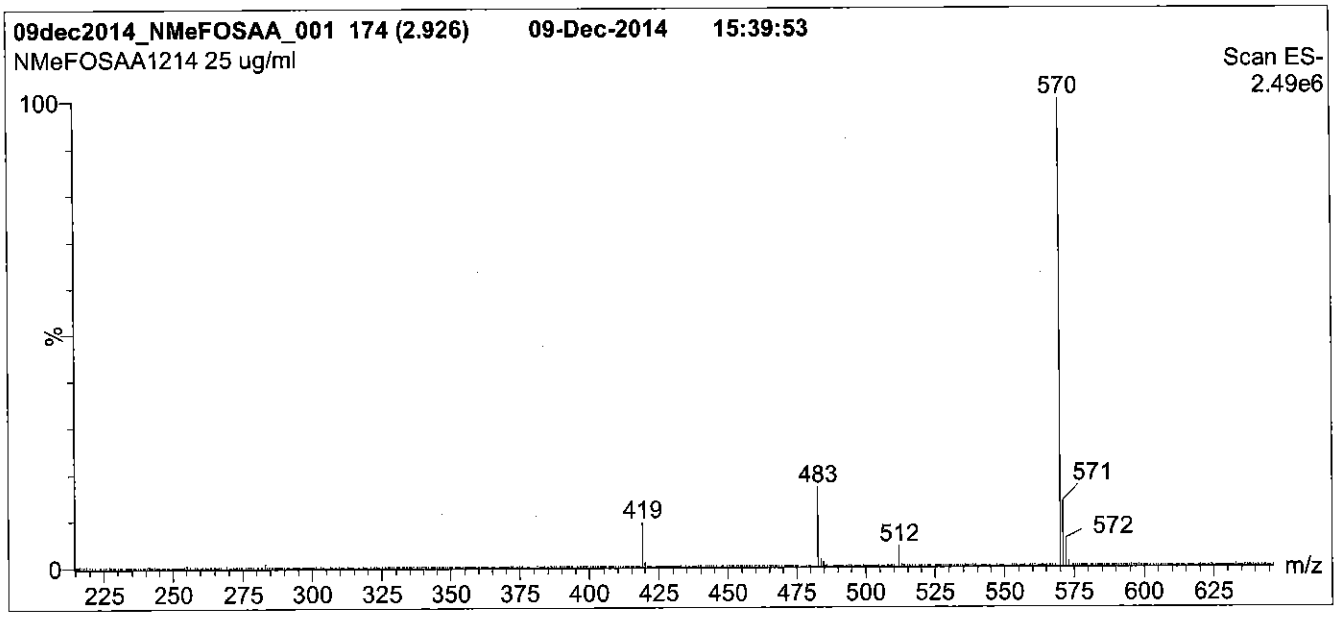
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc 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

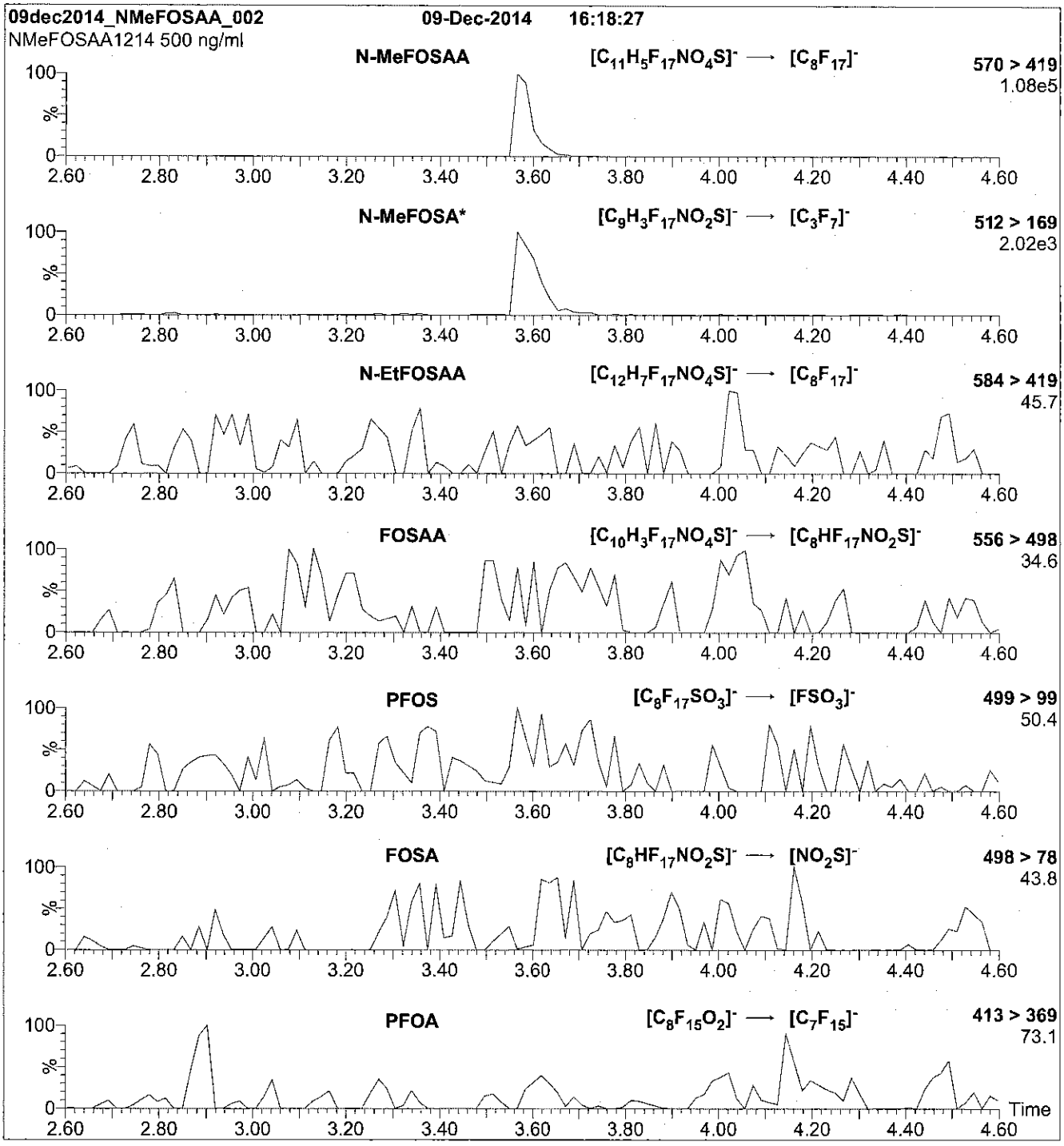
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 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: **N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



*__Note__: N-MeFOSA is formed by fragmentation of N-MeFOSAA.

Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-MeFOSAA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00003

R: 8/23/16 SBC

715562
ID: LCN-MeFOSAA_00003
Exp: 01/20/21 Prpd: SBC
N-MeFOSAA

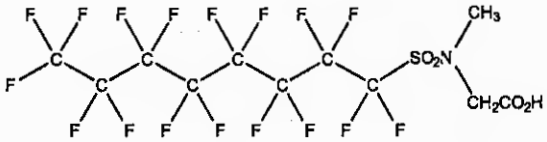
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSAA **LOT NUMBER:** NMeFOSAA0116

COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** 2355-31-9



MOLECULAR FORMULA:	$C_{11}H_6F_{17}NO_4S$	**MOLECULAR WEIGHT:**	571.21
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/20/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/20/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/21/2016 (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

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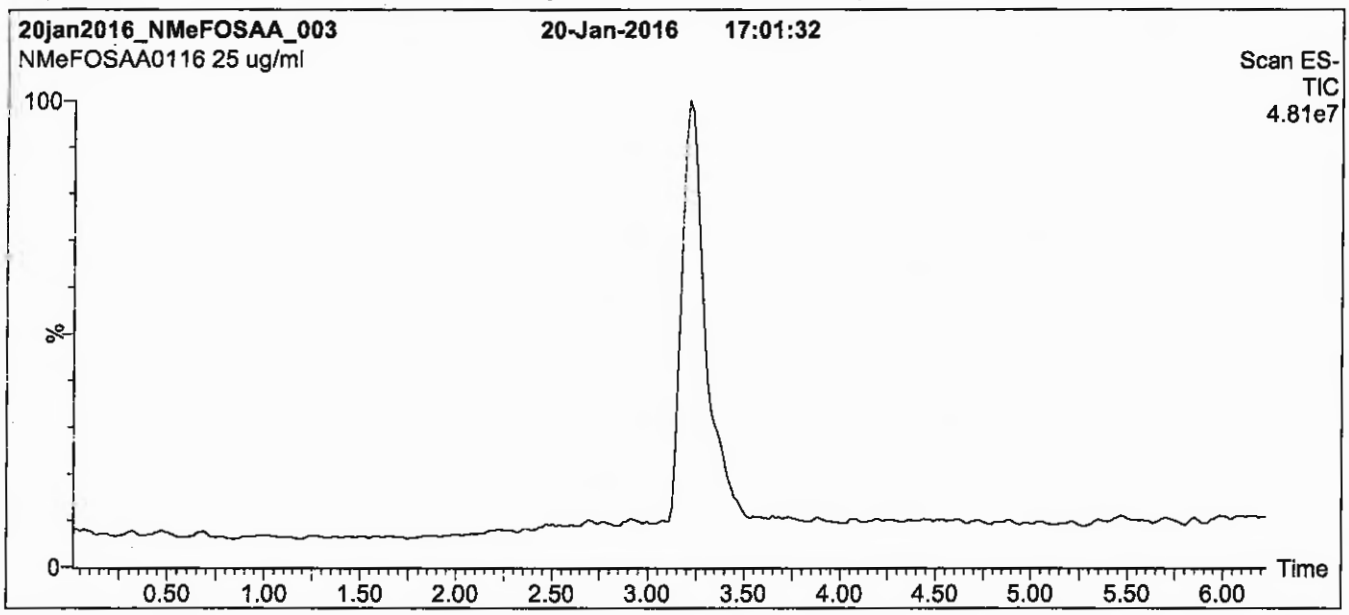
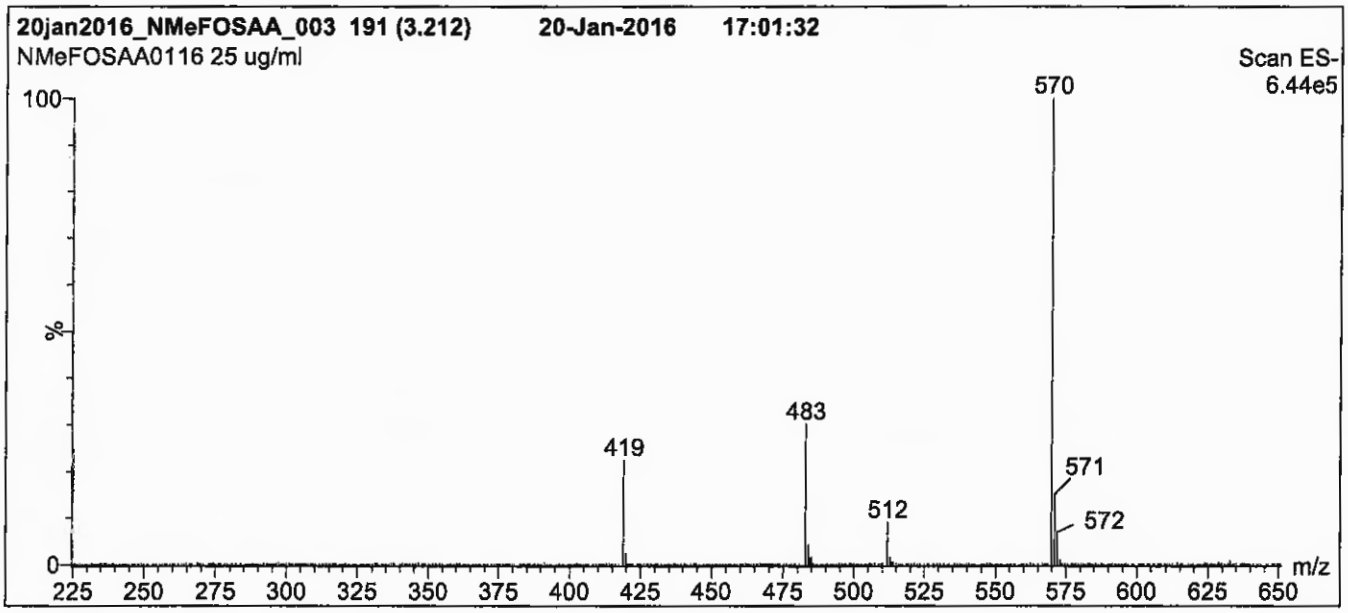
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

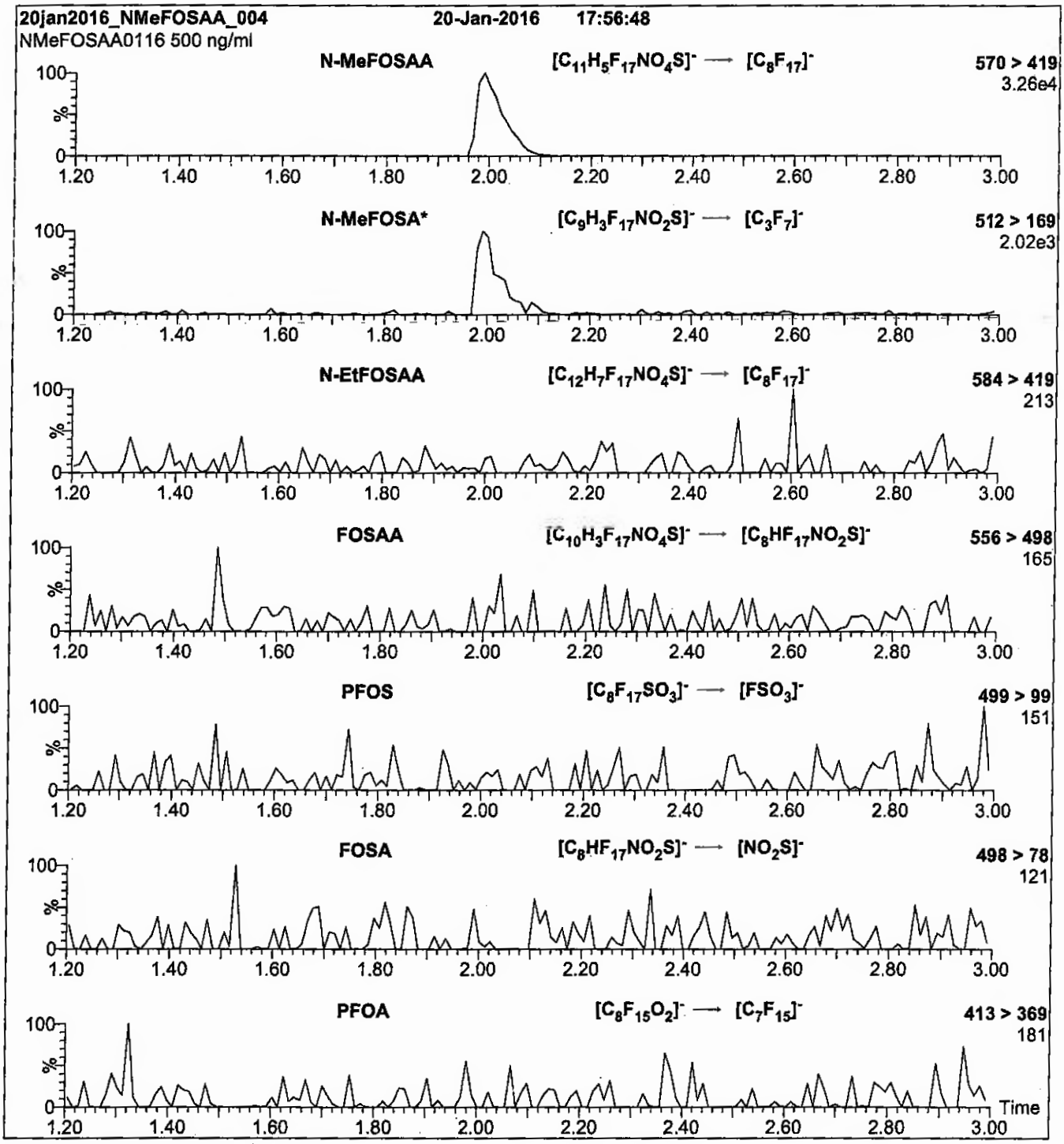
Flow: 300 µl/min

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



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

Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml N-MeFOSAA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 25

Reagent

LCPFACMXB_00007

P: 12/30/15 CW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PFAC-MXB

Solution/Mixture of Native Perfluoroalkylcarboxylic Acids and Native Perfluoroalkylsulfonates

PRODUCT CODE:	PFAC-MXB
LOT NUMBER:	PFACMXB1115
SOLVENT(S):	Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	11/04/2015
LAST TESTED: (mm/dd/yyyy)	11/06/2015
EXPIRY DATE: (mm/dd/yyyy)	11/06/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXB is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids (C_4-C_{14}, C_{16}, and C_{18}) and four native perfluoroalkylsulfonates (C_4, C_6, C_8 and C_{10}). The full name, abbreviation and concentration for each of the components are given in Table A.

The individual perfluoroalkylcarboxylic acids and perfluoroalkylsulfonates all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)
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 carboxylic acids to their respective methyl esters.

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LIMITED WARRANTY:

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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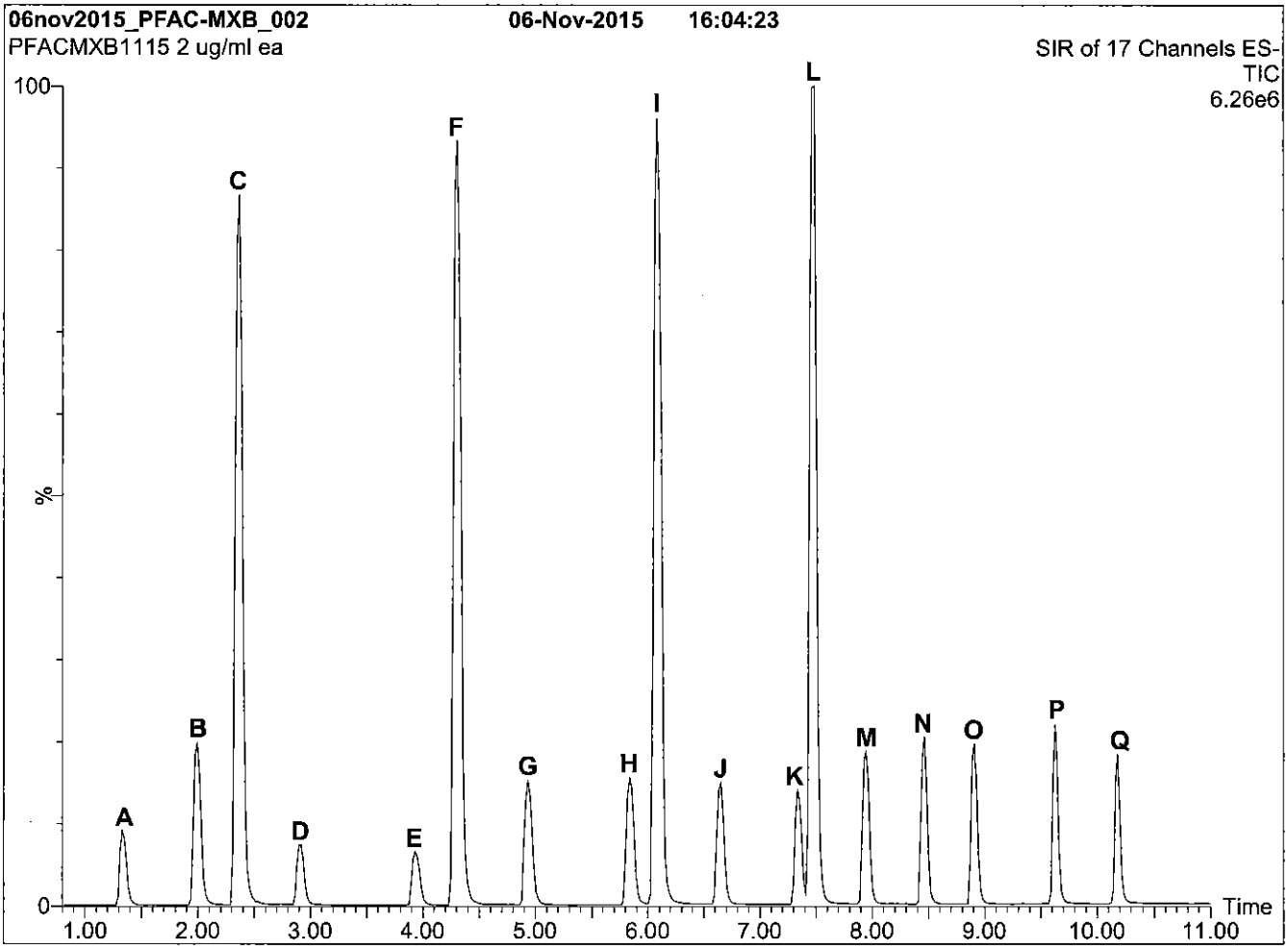
Table A: **PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))**

Name	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	D
Perfluoro-n-heptanoic acid	PFHpA	2000	E
Perfluoro-n-octanoic acid	PFOA	2000	G
Perfluoro-n-nonanoic acid	PFNA	2000	H
Perfluoro-n-decanoic acid	PFDA	2000	J
Perfluoro-n-undecanoic acid	PFUdA	2000	K
Perfluoro-n-dodecanoic acid	PFDoA	2000	M
Perfluoro-n-tridecanoic acid	PFTrDA	2000	N
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	O
Perfluoro-n-hexadecanoic acid	PFHxDA	2000	P
Perfluoro-n-octadecanoic acid	PFODA	2000	Q

Name	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-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	I
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

Certified By: B.G. Chittim **Date:** 11/11/2015 (mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% H_2O / 45% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 10 min and hold for 1 min
before returning to initial conditions in 0.5 min.

Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: SIR of 17 Channels

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (10-70)
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**

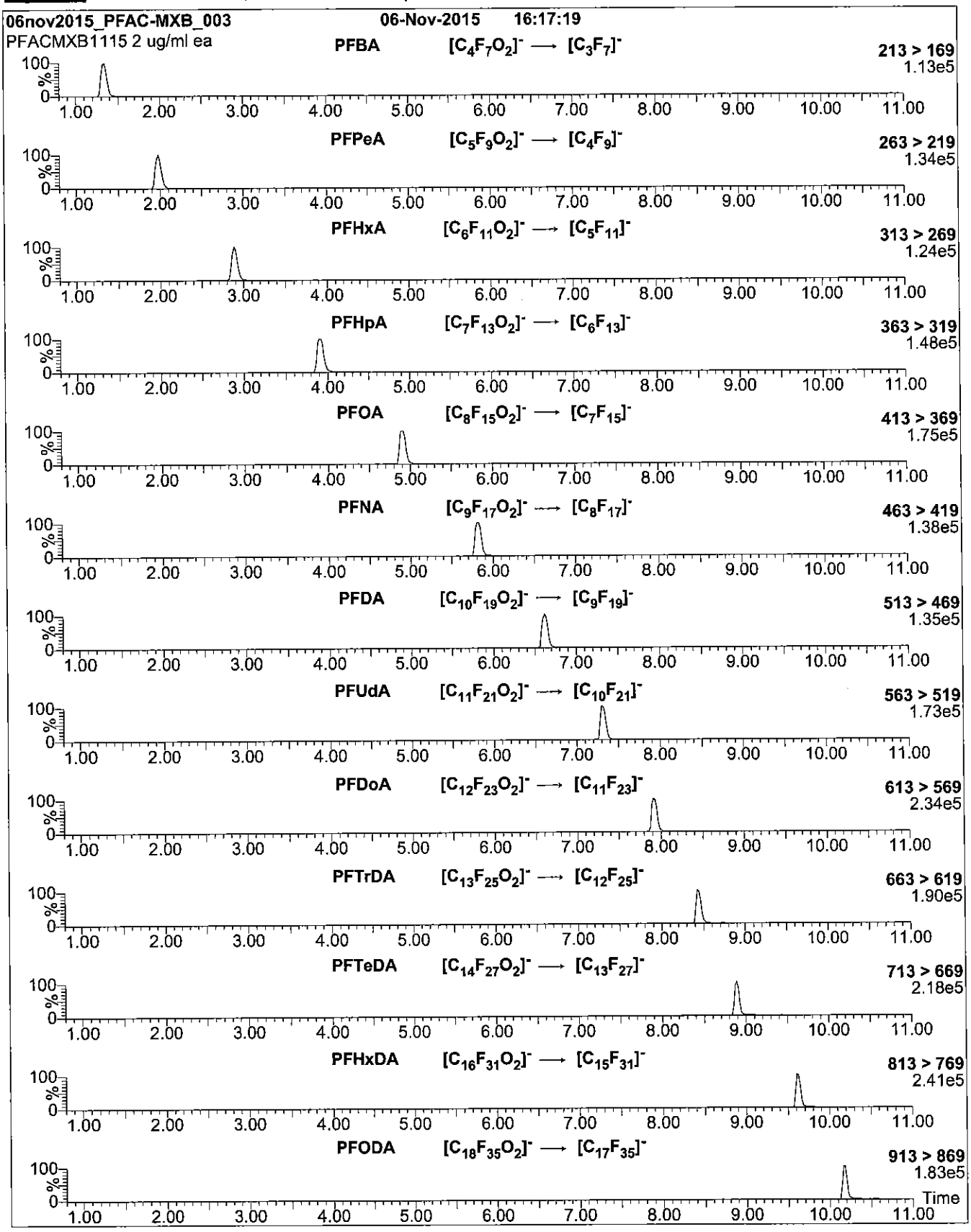
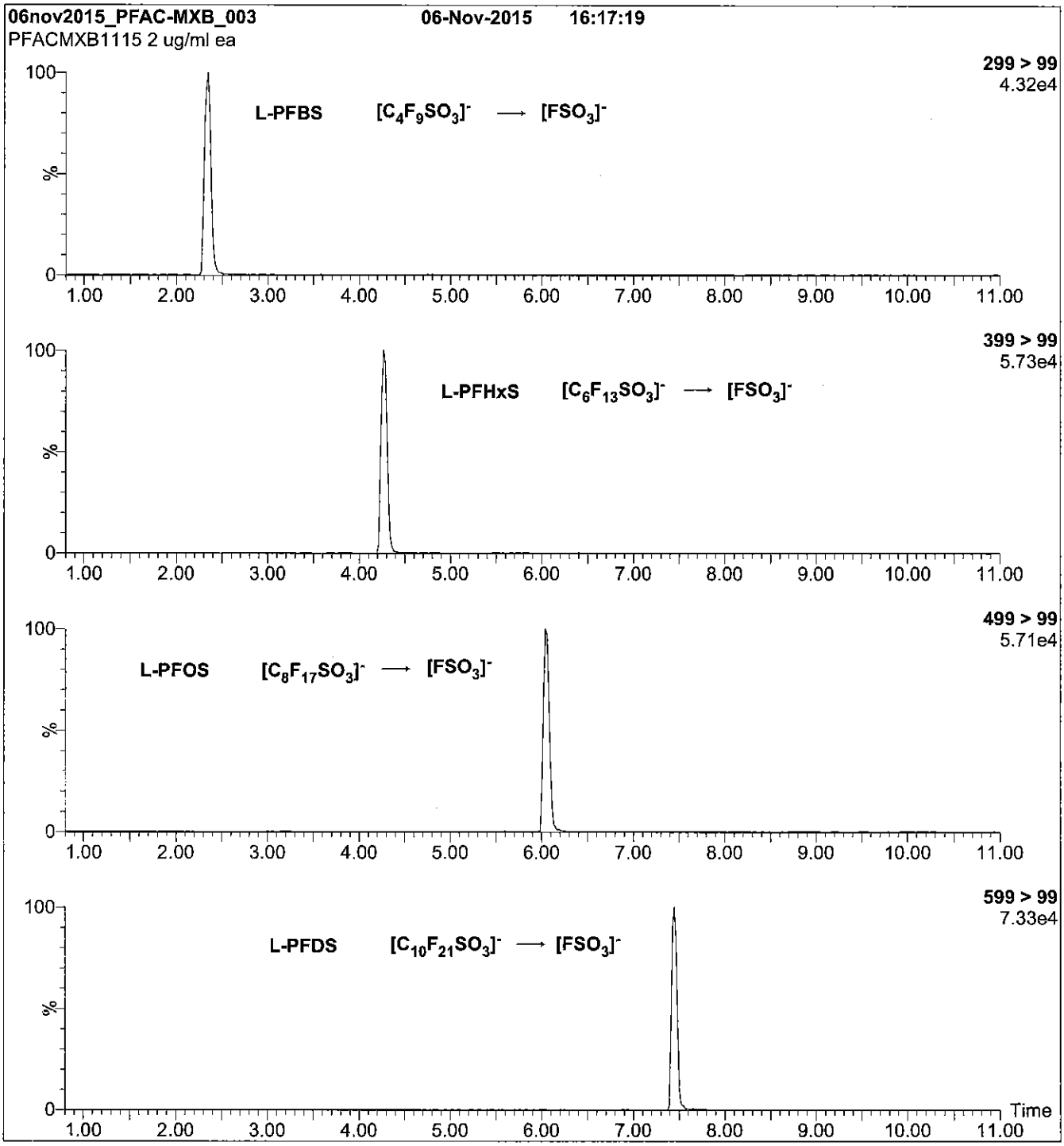


Figure 3: **PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 8-50 (variable)

Reagent

LCPFBA_00005

Scanned 10/16/14

R: SBC 9/13/16

730531
ID: LCPFBA_00005
Exp: 05/27/21 Prpd: SBC
PF-n-butanoic acid

730532
ID: LCPFBA_00006
Exp: 05/27/21 Prpd: SBC
PF-n-butanoic acid

WELLINGTON LABORATORIES

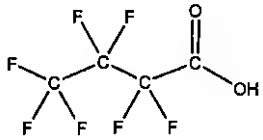
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid

LOT NUMBER: PFBA0516

STRUCTURE:

CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 214.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/27/2016
EXPIRY DATE: (mm/dd/yyyy) 05/27/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/31/2016 (mm/dd/yyyy)

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

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:

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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.

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2,...x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

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CALA

ANAB ACCREDITED

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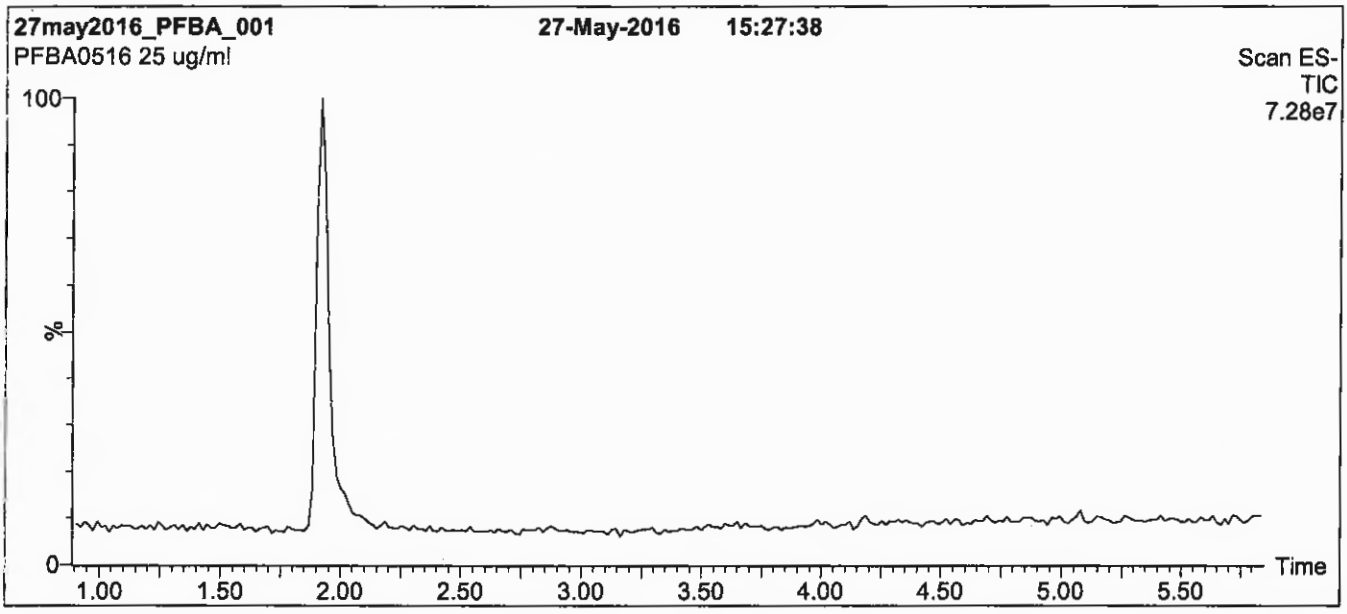
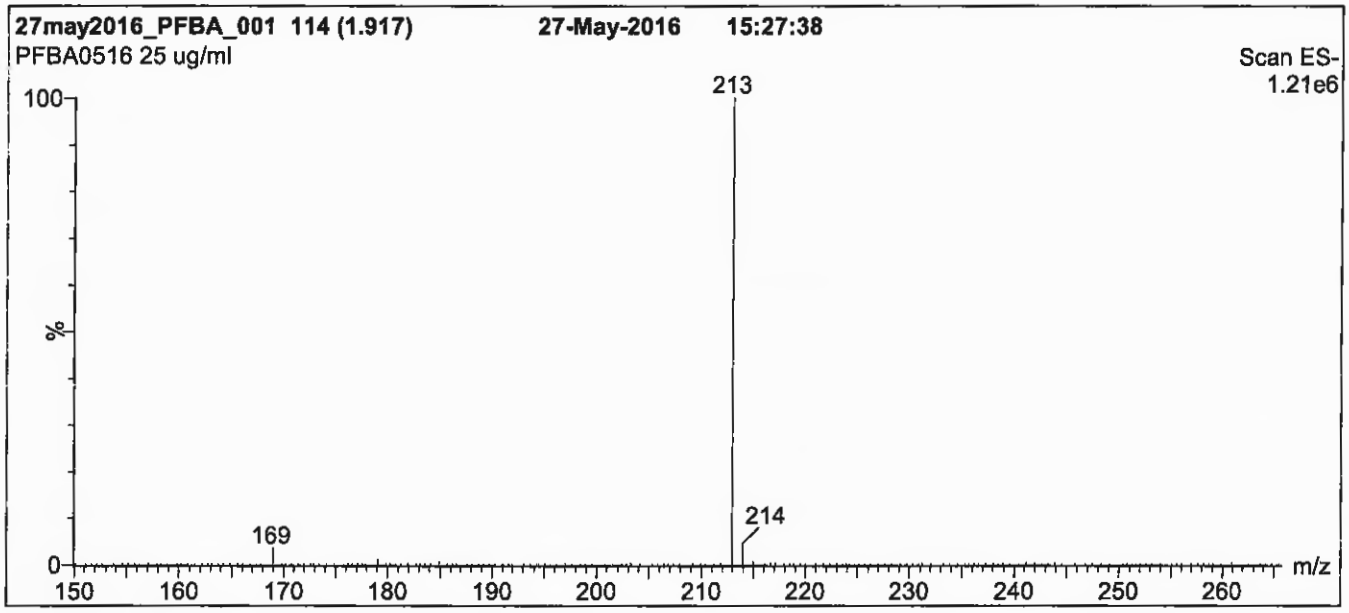
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc 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

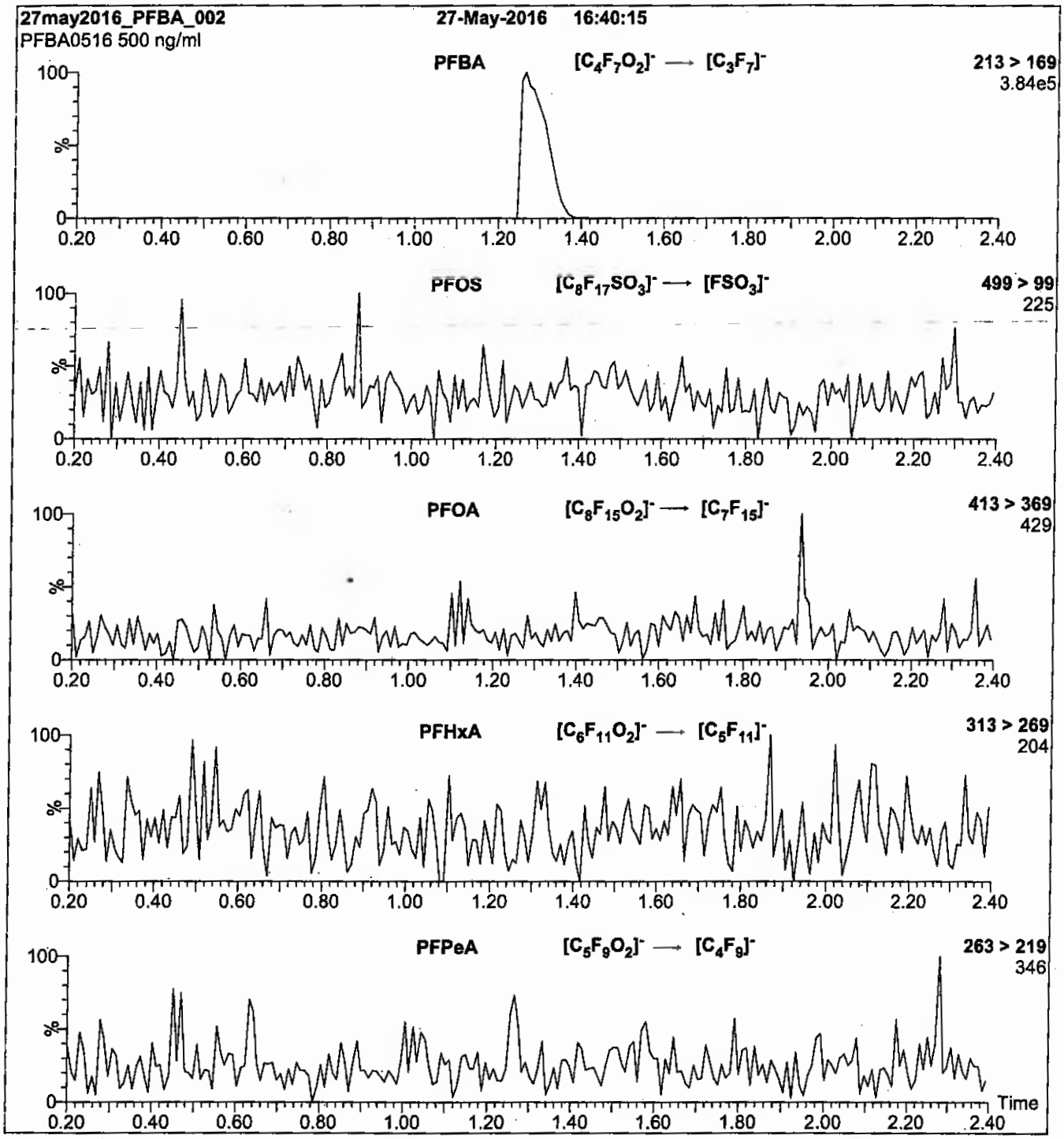
Flow: 300 µl/min

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 µl (500 ng/ml PFBA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00005

R: 9/9/16 SBC

728306
ID: LCM2-8:2FTS_00003
Exp: 01/08/21 Prpd: SBC
M2-8:2FTS

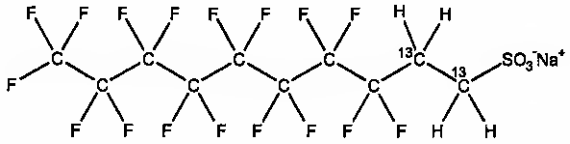
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0116

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/08/2021		
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.
- The native 8:2FTS contains 4.22% of ^{34}S (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 **Date:** 01/18/2016 (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:

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

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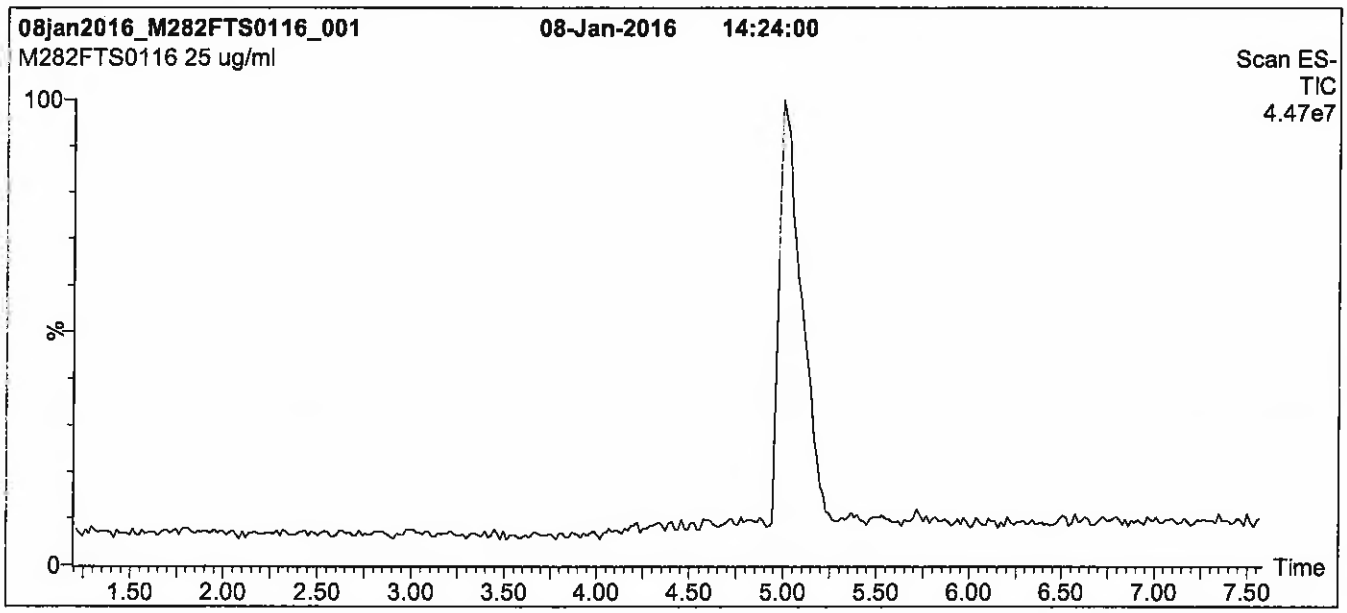
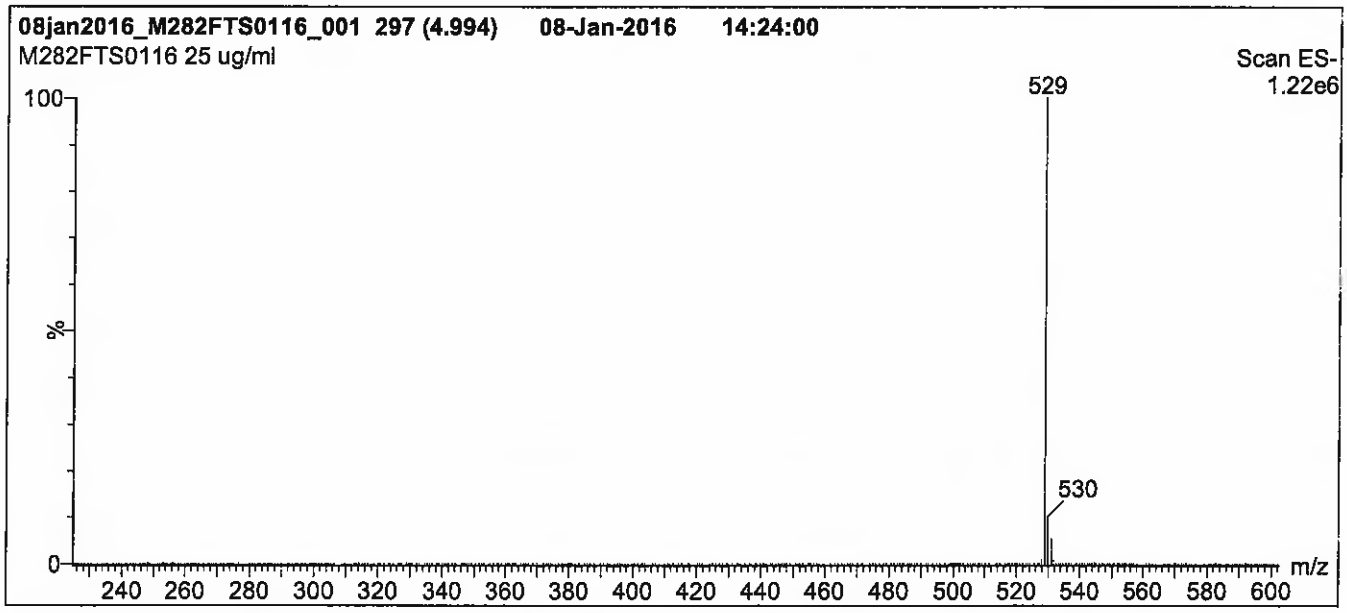
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

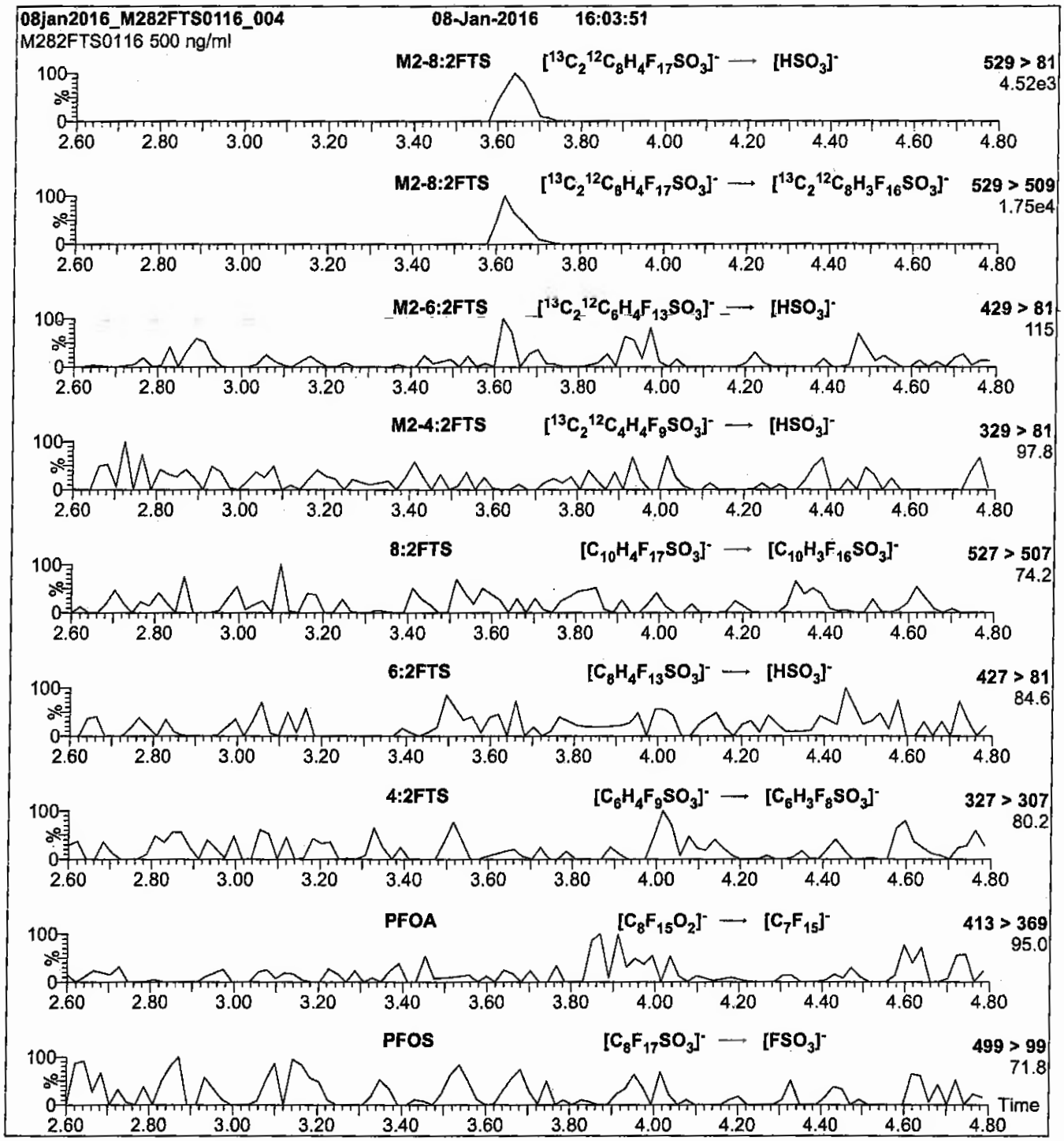
Flow: 300 µl/min

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 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

R: SBC 9/13/16

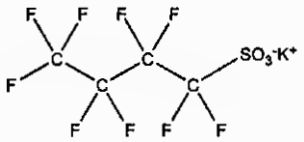
730511
ID: LCPFBS_00005
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

730512
ID: LCPFBS_00006
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFBS	**LOT NUMBER:**	LPFBS0316
COMPOUND:	Potassium perfluoro-1-butanesulfonate		
STRUCTURE:		**CAS #:**	29420-49-3



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**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)	03/15/2016		
EXPIRY DATE: (mm/dd/yyyy)	03/15/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/21/2016 (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

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

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

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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:

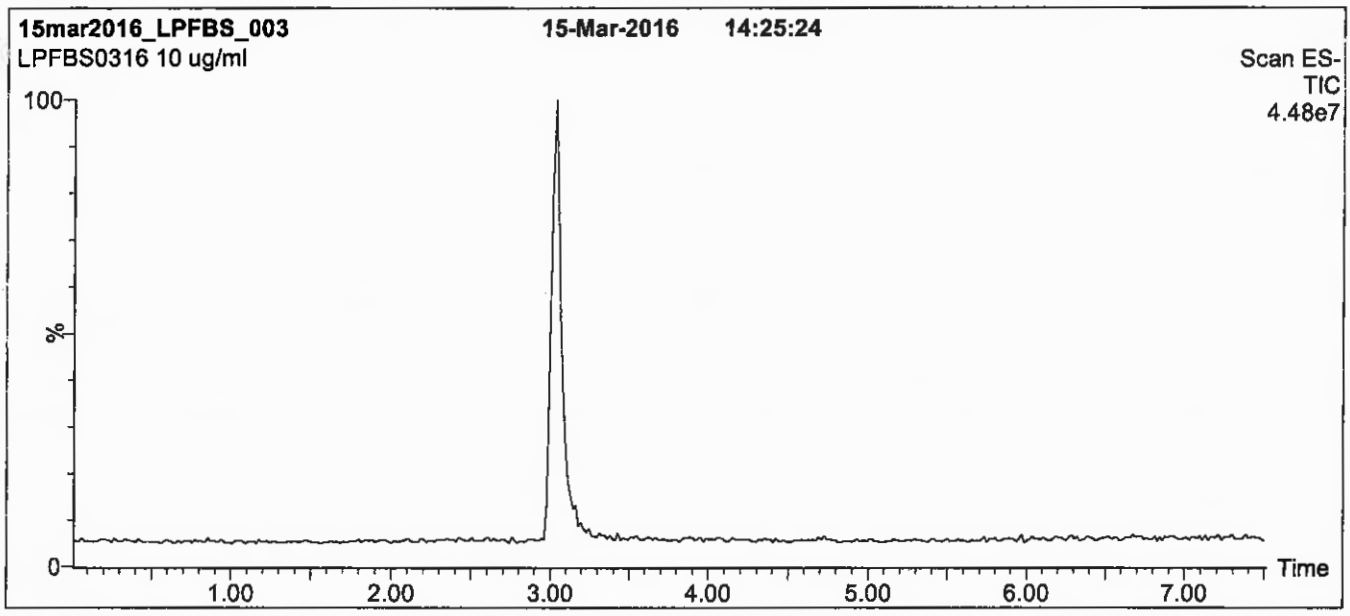
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

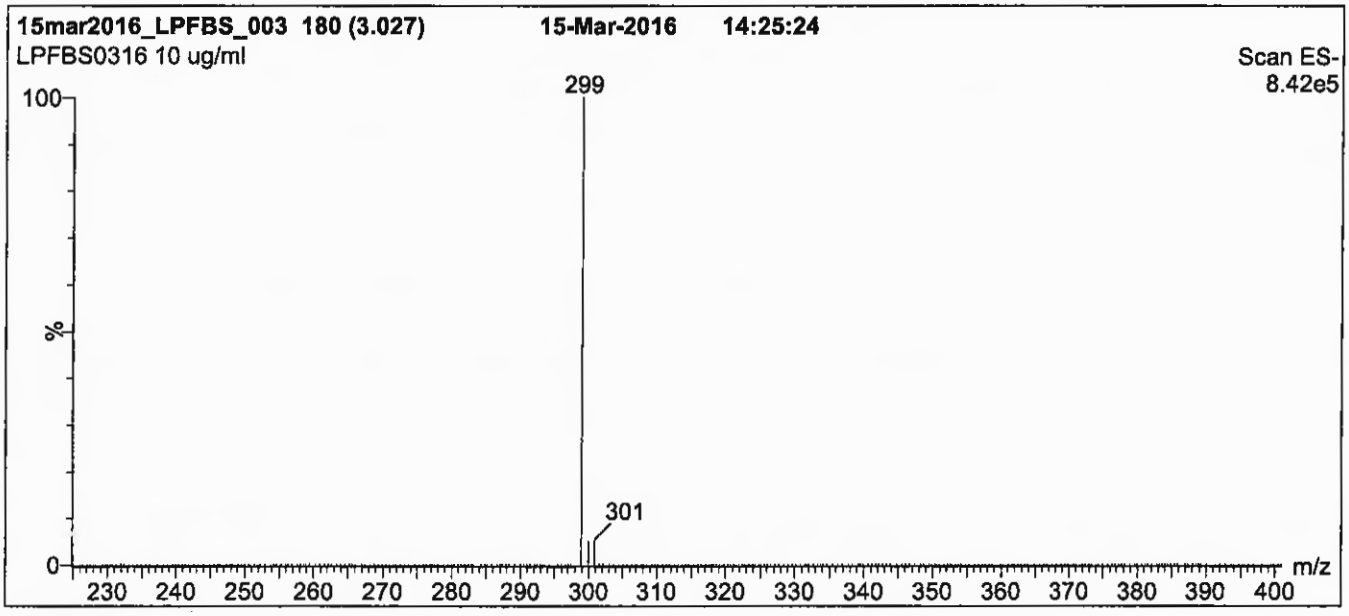
CALA Testing Accredited to ISO/IEC 17025 No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc 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

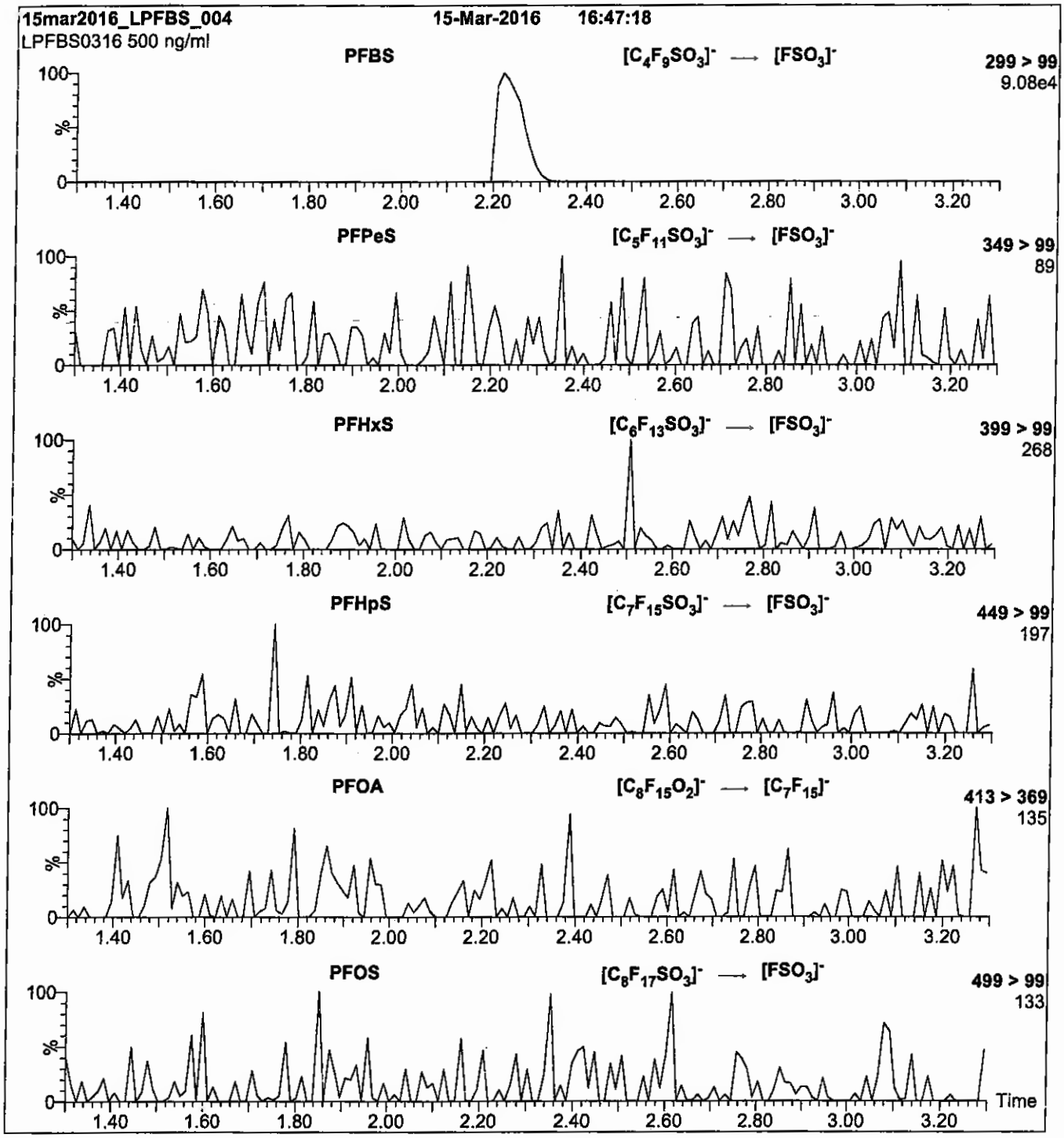
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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 µl (500 ng/ml L-PFBS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00005

R: 7/6/16 CBW

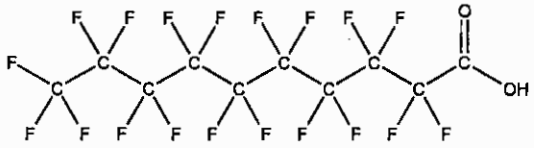
671576
ID: LCPFDA_00005
Exp: 07/02/20 Prpd: CBW
PF-n-decanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid
LOT NUMBER: PFDA0615

STRUCTURE:
CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
MOLECULAR WEIGHT: 514.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/02/2015
EXPIRY DATE: (mm/dd/yyyy) 07/02/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.6% PFNA and ~ 0.3% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/24/2015 (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:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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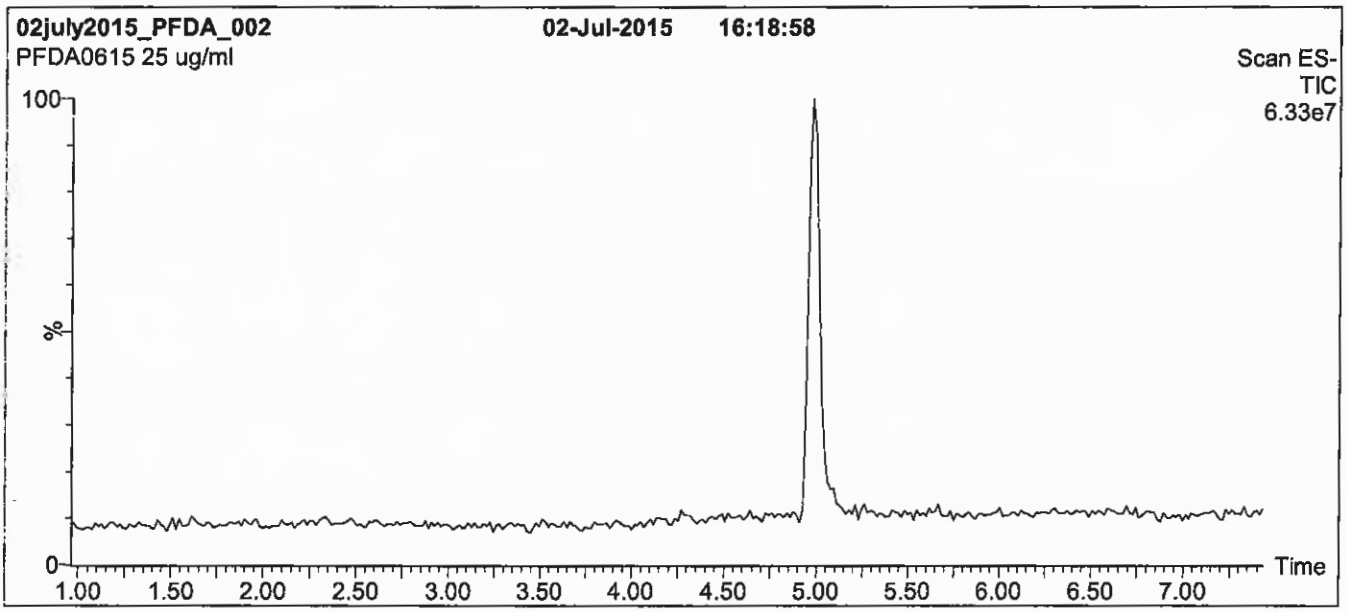
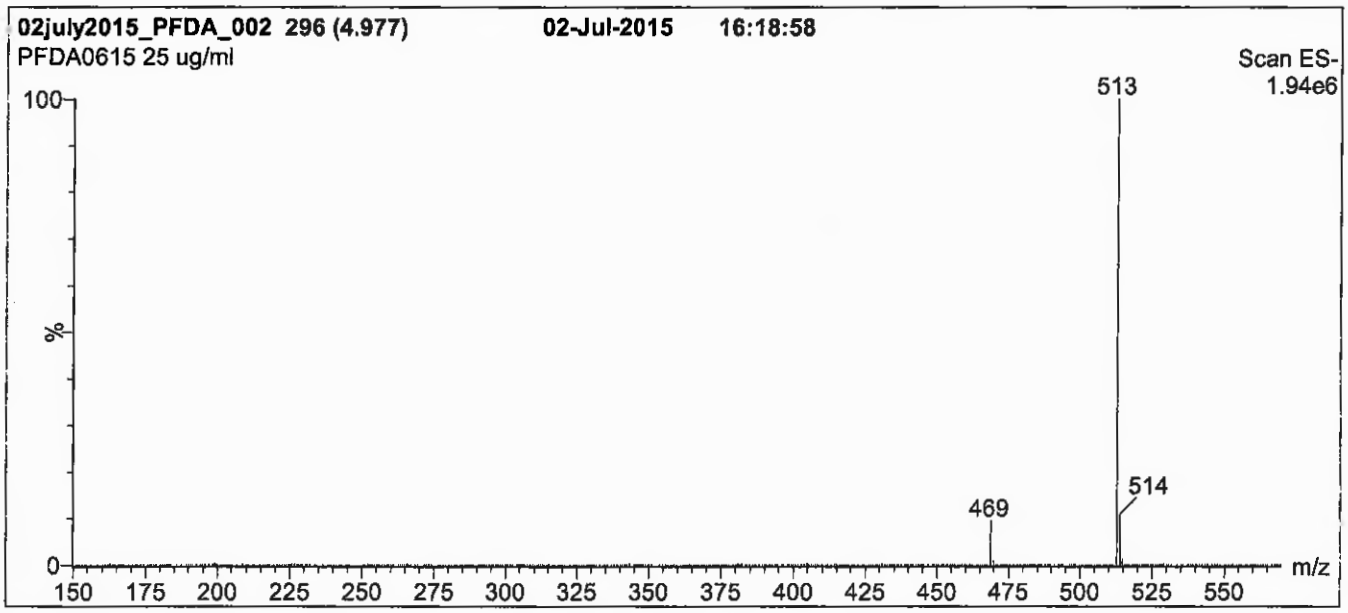
Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

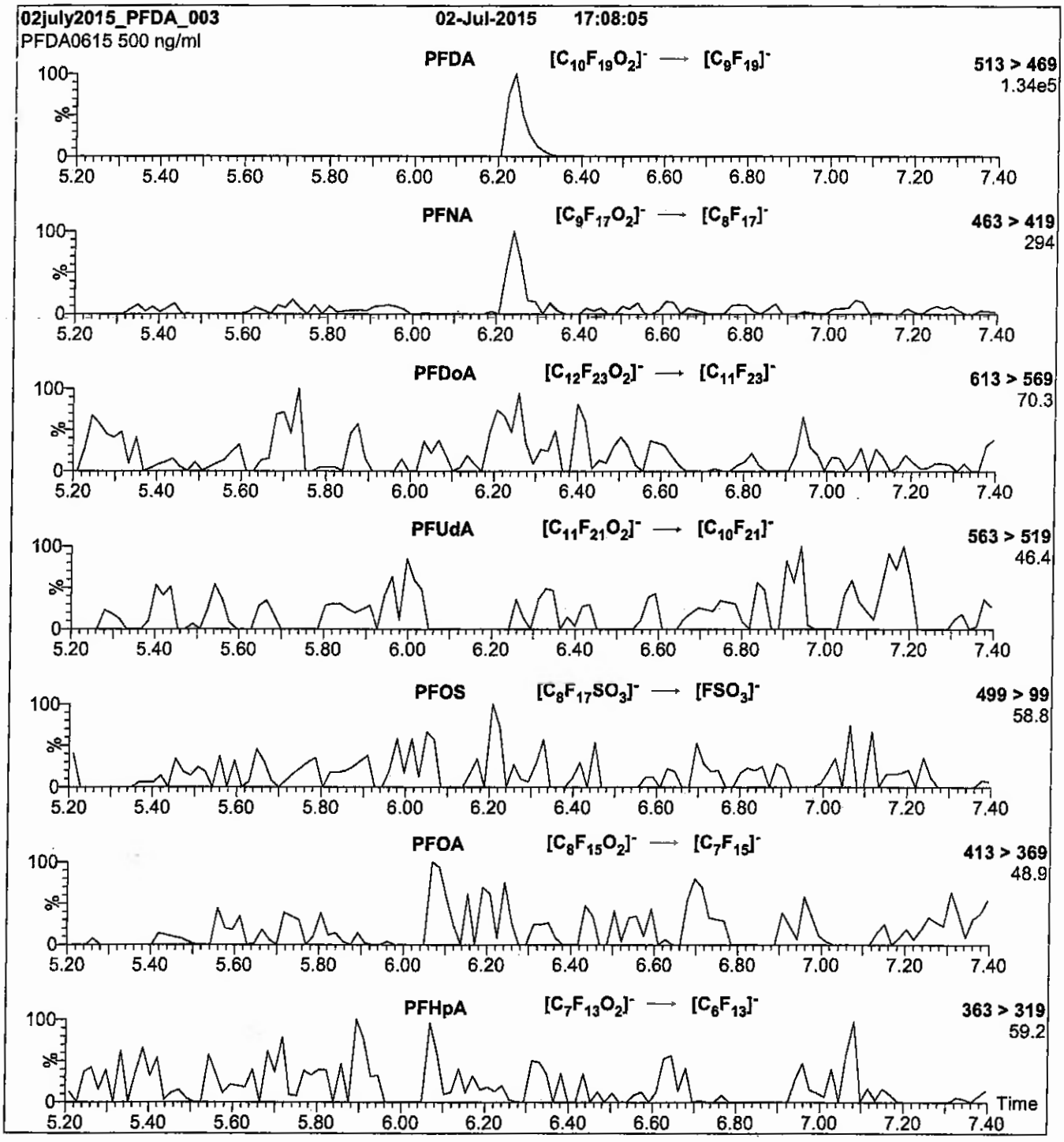
Flow: 300 µl/min

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00005

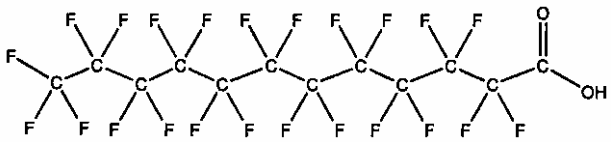
R: 7/6/16 ca

671601
ID: LCPFDoA_00005
Exp: 01/30/20 Prpd: CBW
PF-n-dodecanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0115
COMPOUND:	Perfluoro-n-dodecanoic acid		
STRUCTURE:		**CAS #:**	307-55-1



MOLECULAR FORMULA:	$C_{12}HF_{23}O_2$	**MOLECULAR WEIGHT:**	614.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/30/2015		
EXPIRY DATE: (mm/dd/yyyy)	01/30/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (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:

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HAZARDS:

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HOMOGENEITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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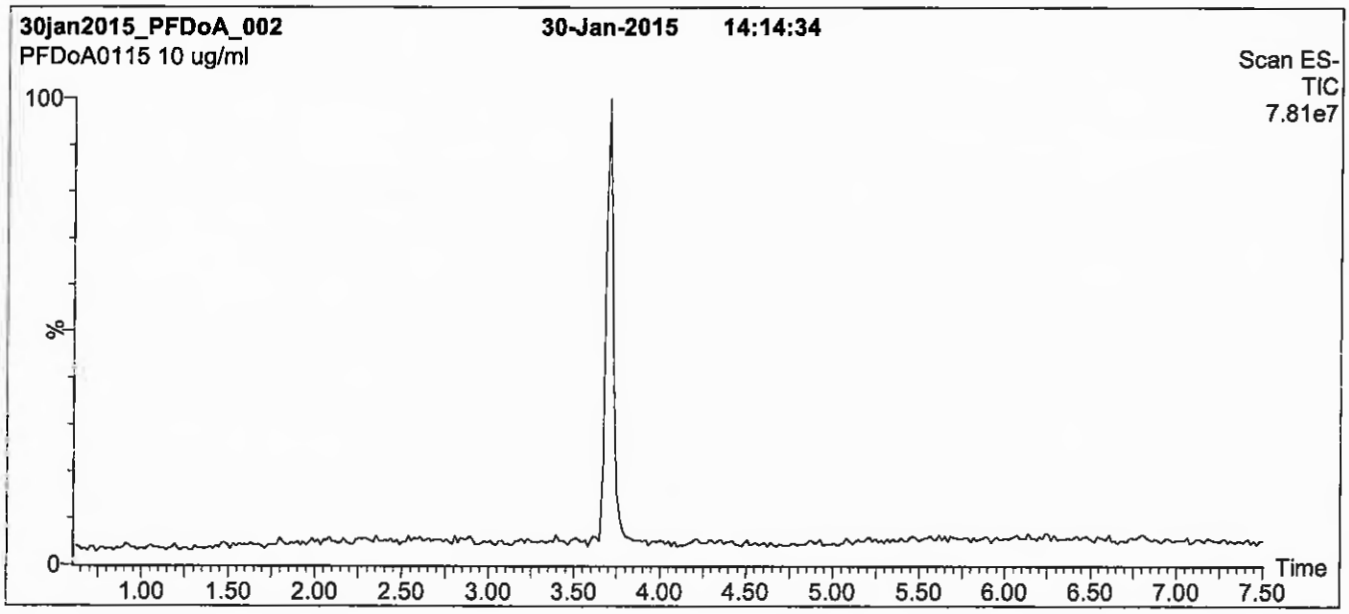
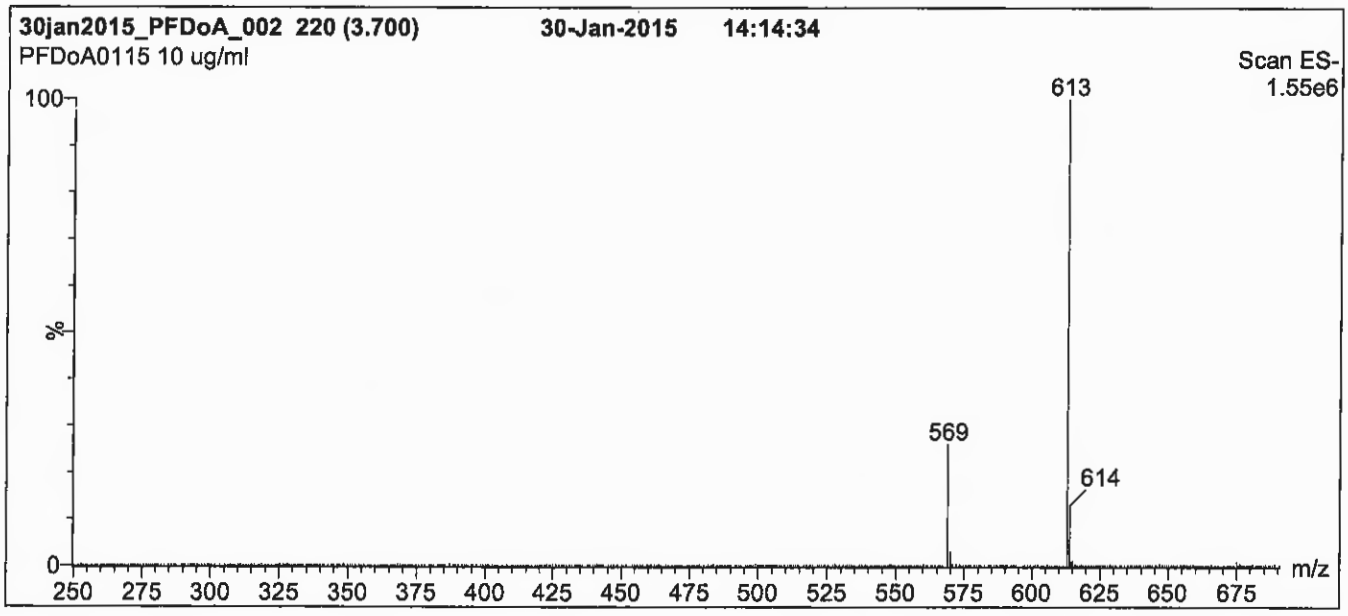
Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

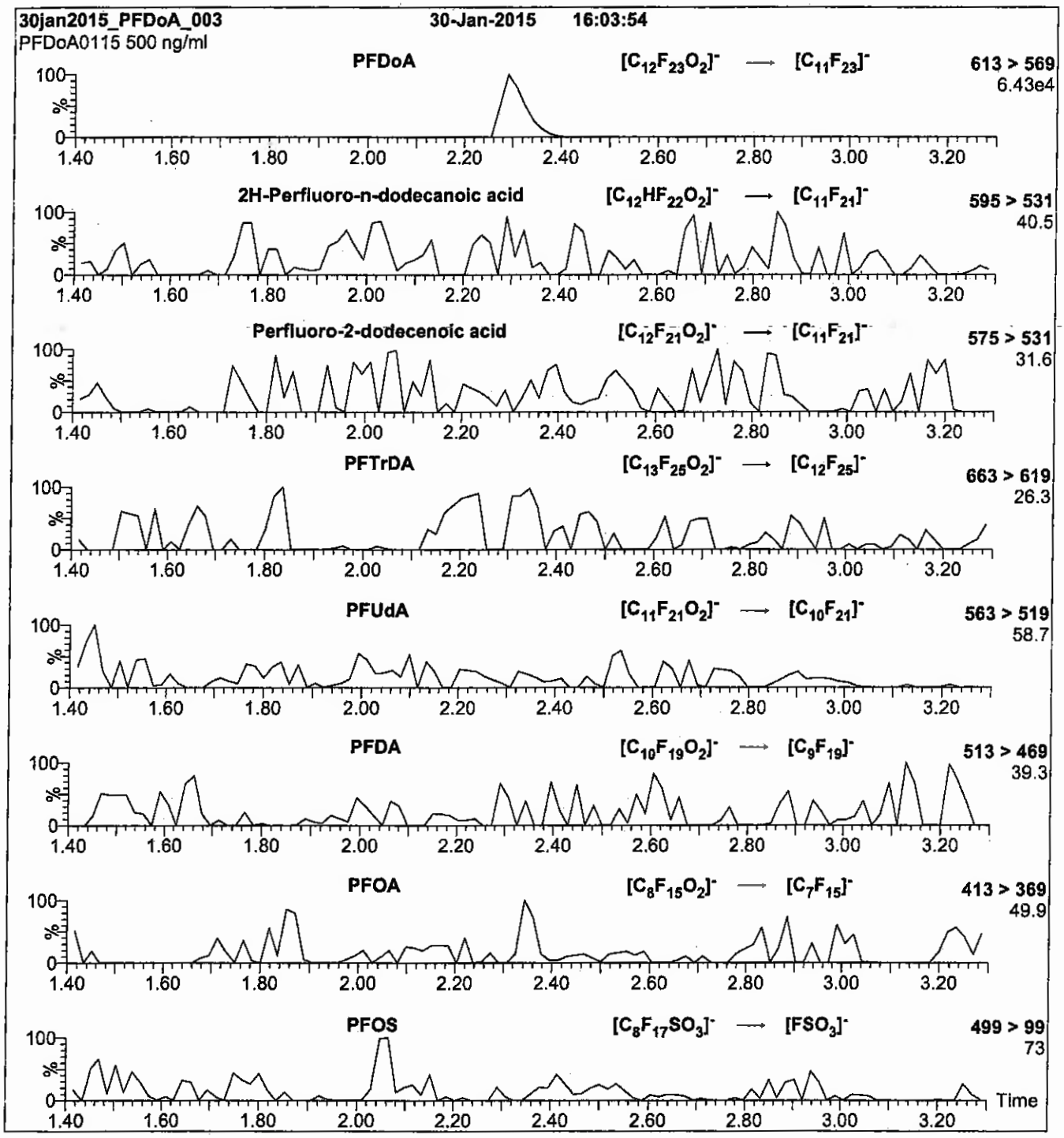
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 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: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFDoA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 13
Flow:	300 µl/min	

Reagent

LCPFHpA_00005

609699
ID: LCPFHpA_00005
Exp: 01/22/21 Prpd: CBW
PF-n-heptanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

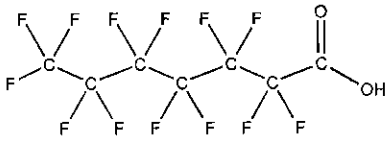
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 364.06
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/02/2016 (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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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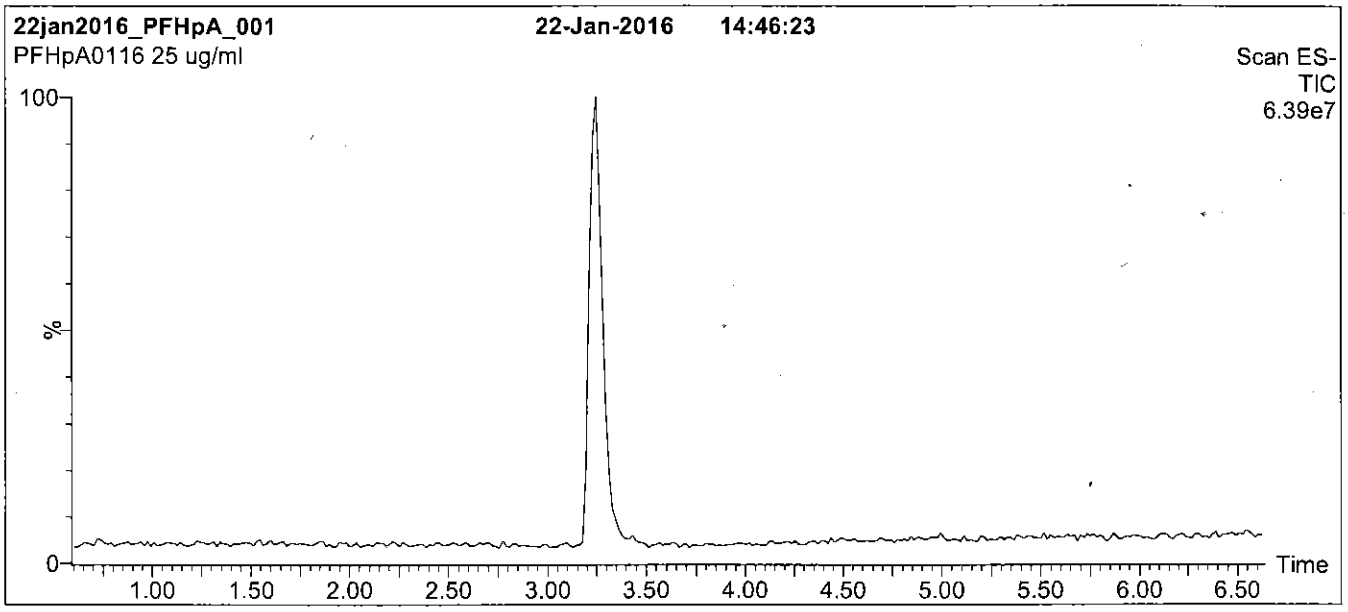
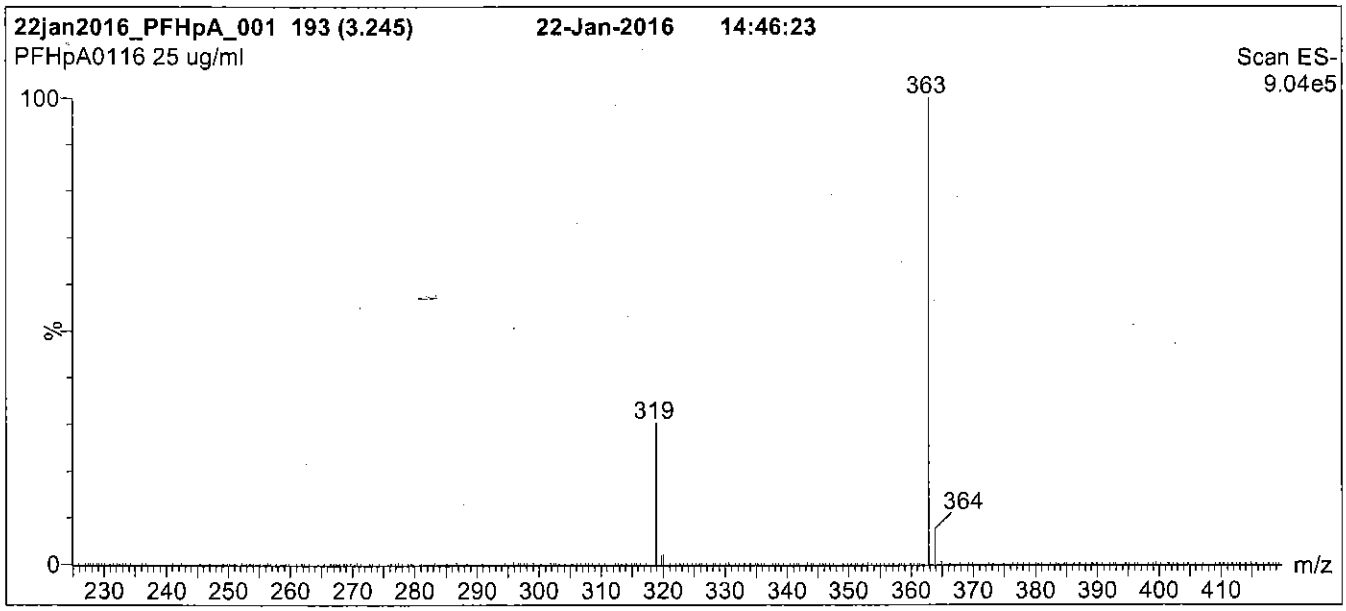
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc 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

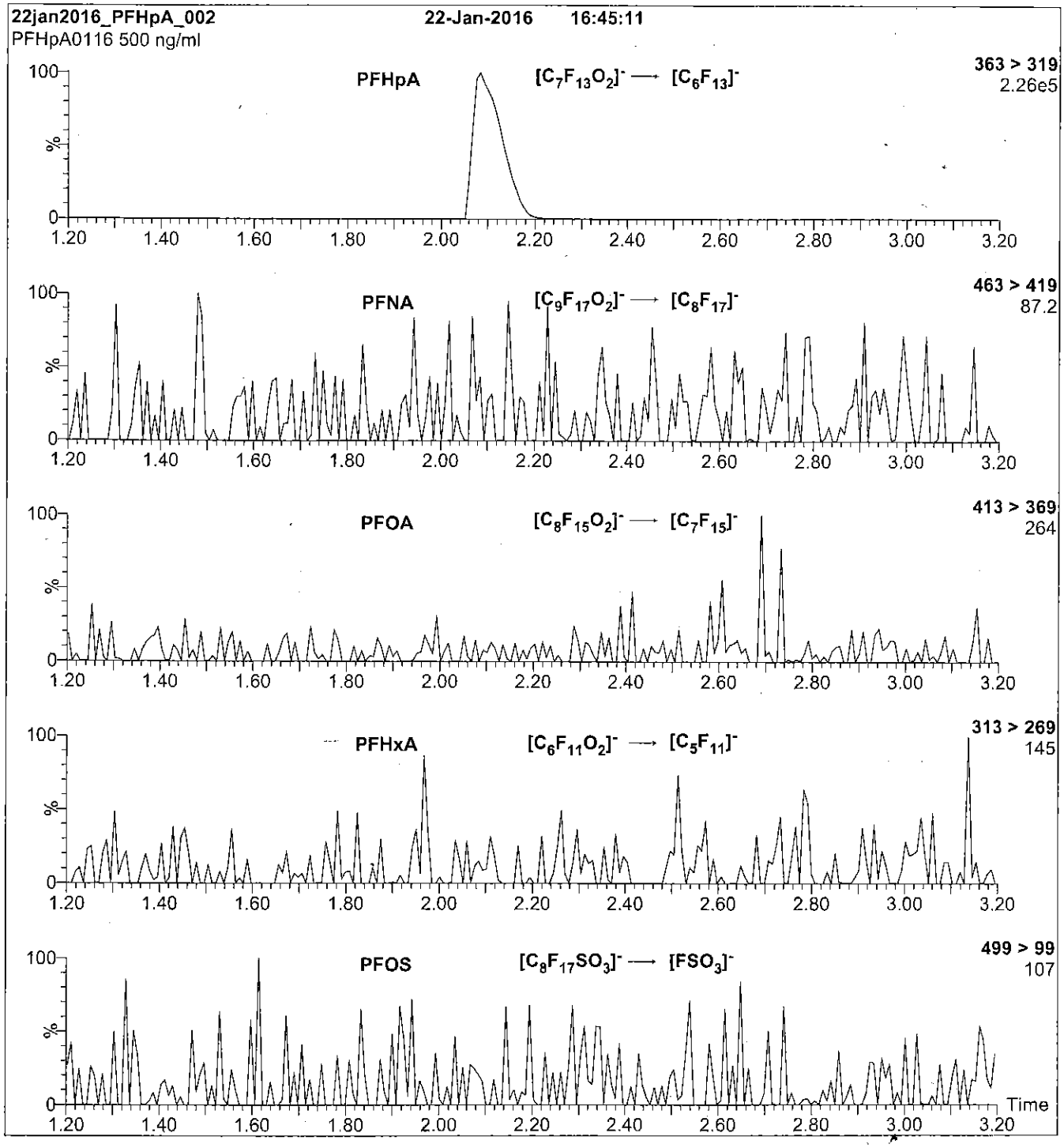
Flow: 300 µl/min

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 µl (500 ng/ml PFHpA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFHpA_00006

Scanned 10/14/16 SM R: SBC 9/13/16

730517
ID: LCPFHpA_00006
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid

730518
ID: LCPFHpA_00007
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid

WELLINGTON LABORATORIES

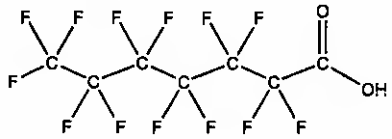
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 364.06
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/02/2016 (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 $x_1, x_2,...x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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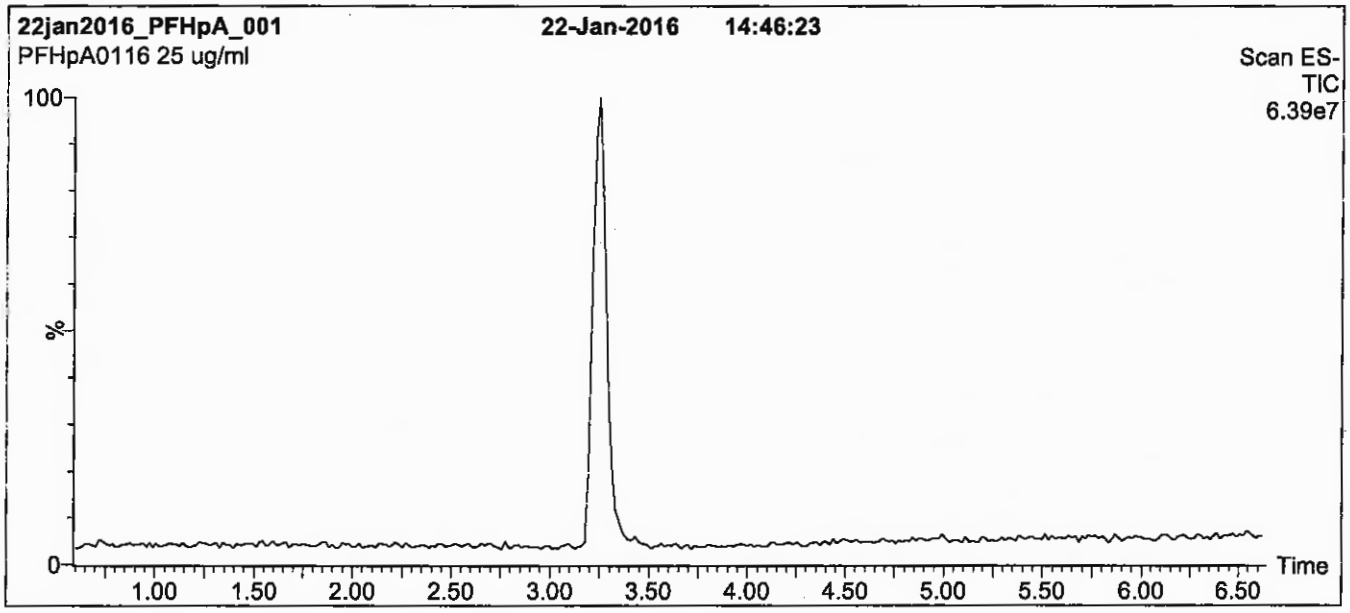
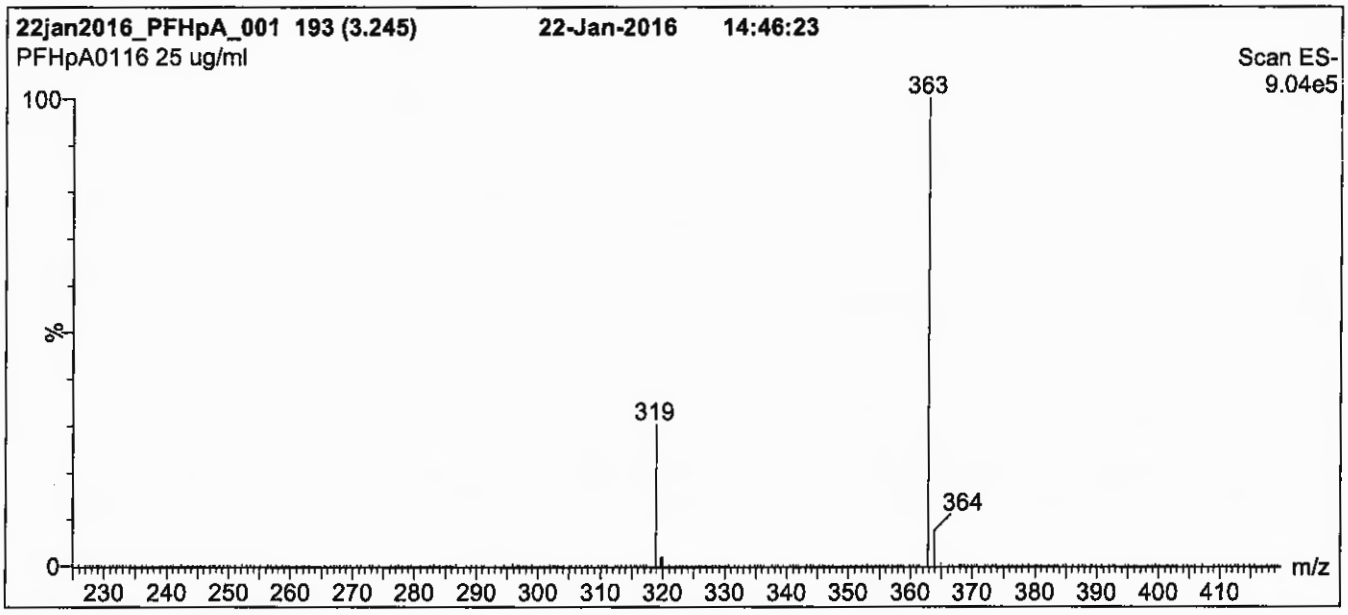
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc 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

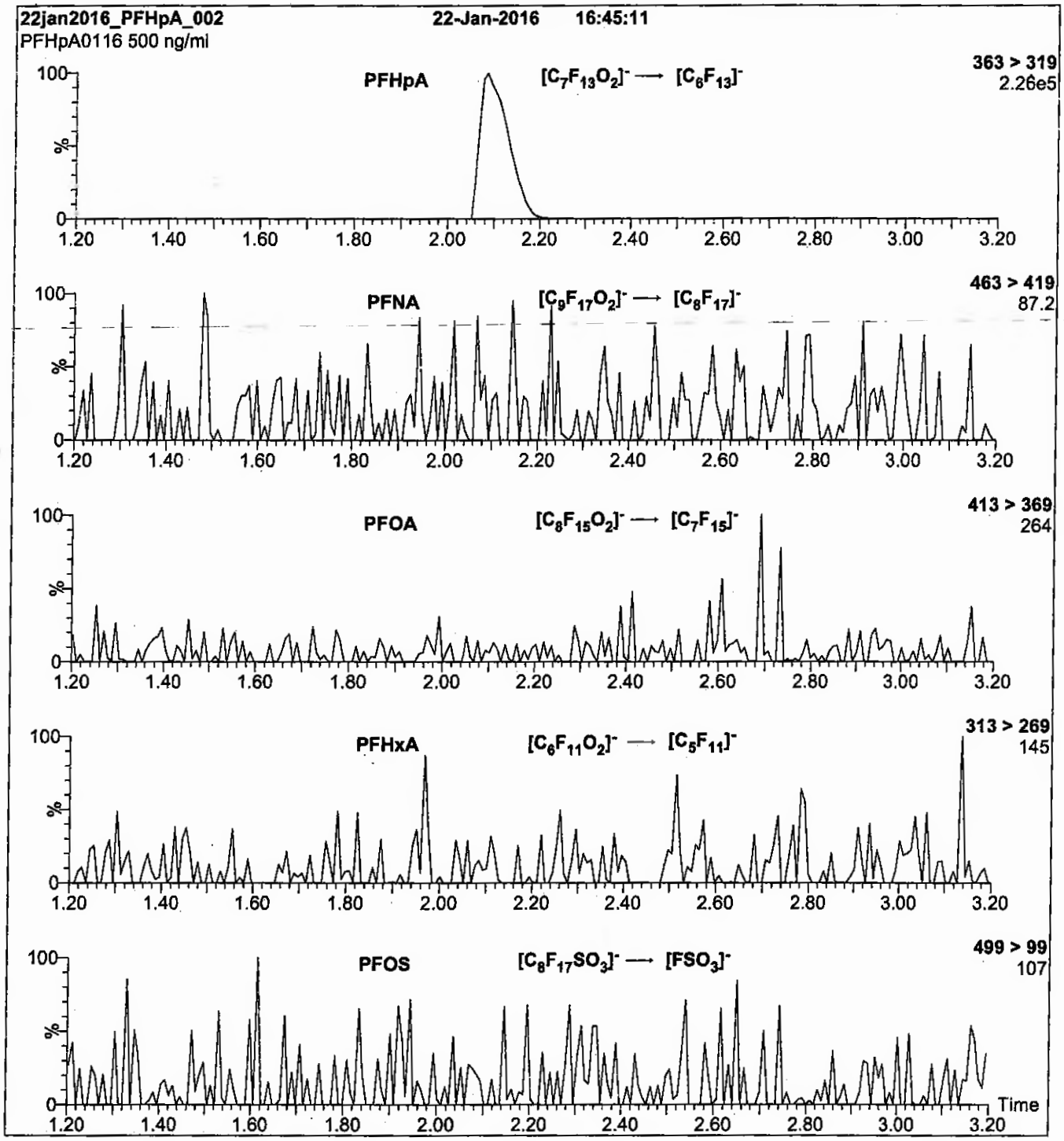
Flow: 300 µl/min

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 µl (500 ng/ml PFHpA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFHpS_00009

Scanned 10/14/16 SP R: SBC 9/13/16

730635
ID: LCPFHpS_00009
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/mL

730639
ID: LCPFHpS_00010
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/mL

WELLINGTON LABORATORIES

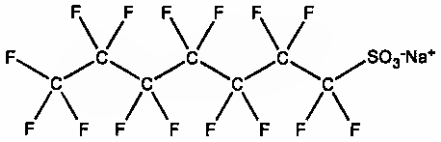
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate

LOT NUMBER: LPFHpS1115

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/06/2015		
EXPIRY DATE: (mm/dd/yyyy)	11/06/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.1% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.2% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/09/2015 (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:

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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.

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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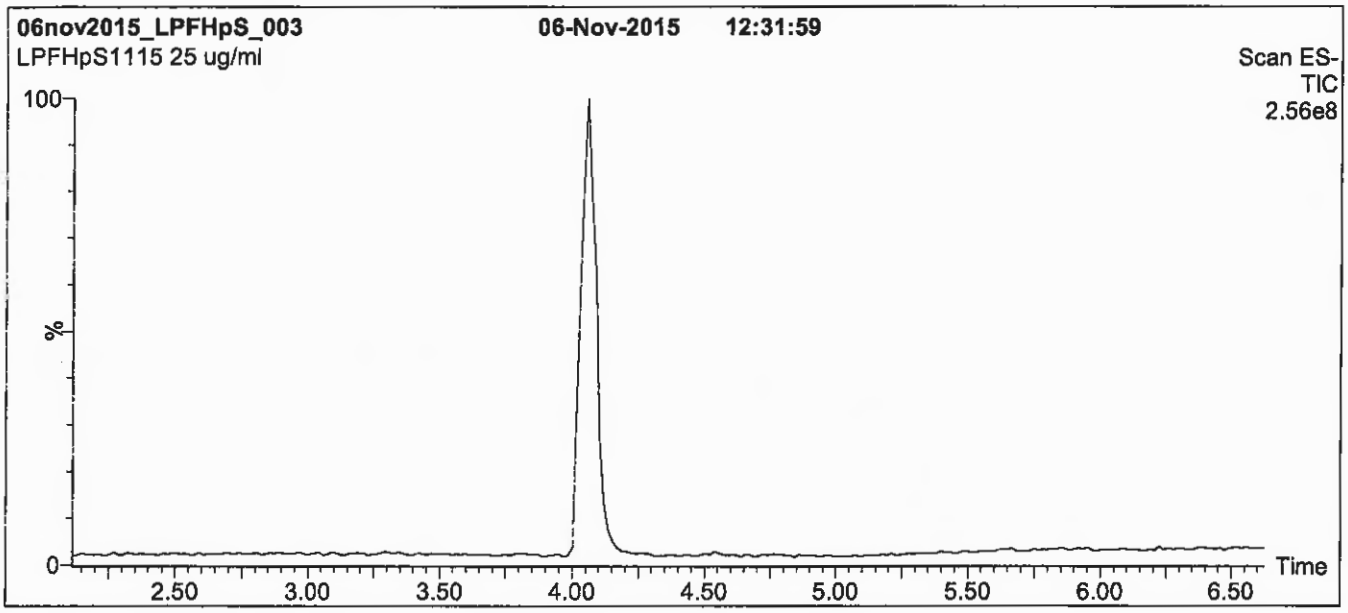
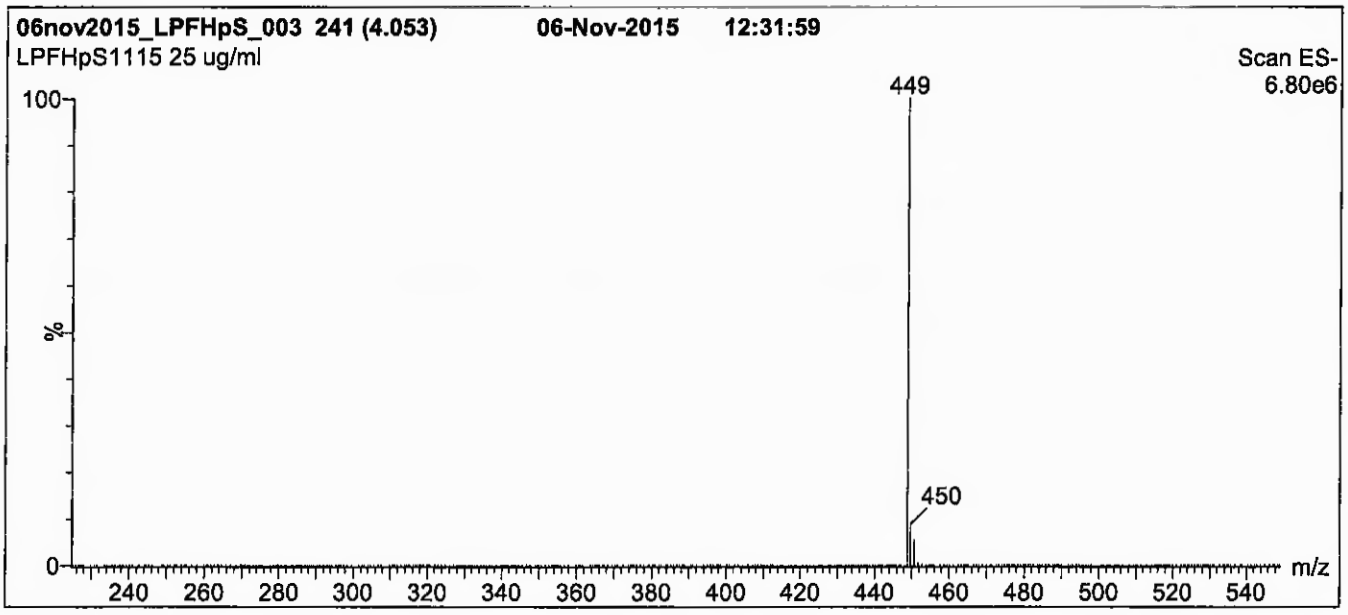
Figure 1: **L-PFHpS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

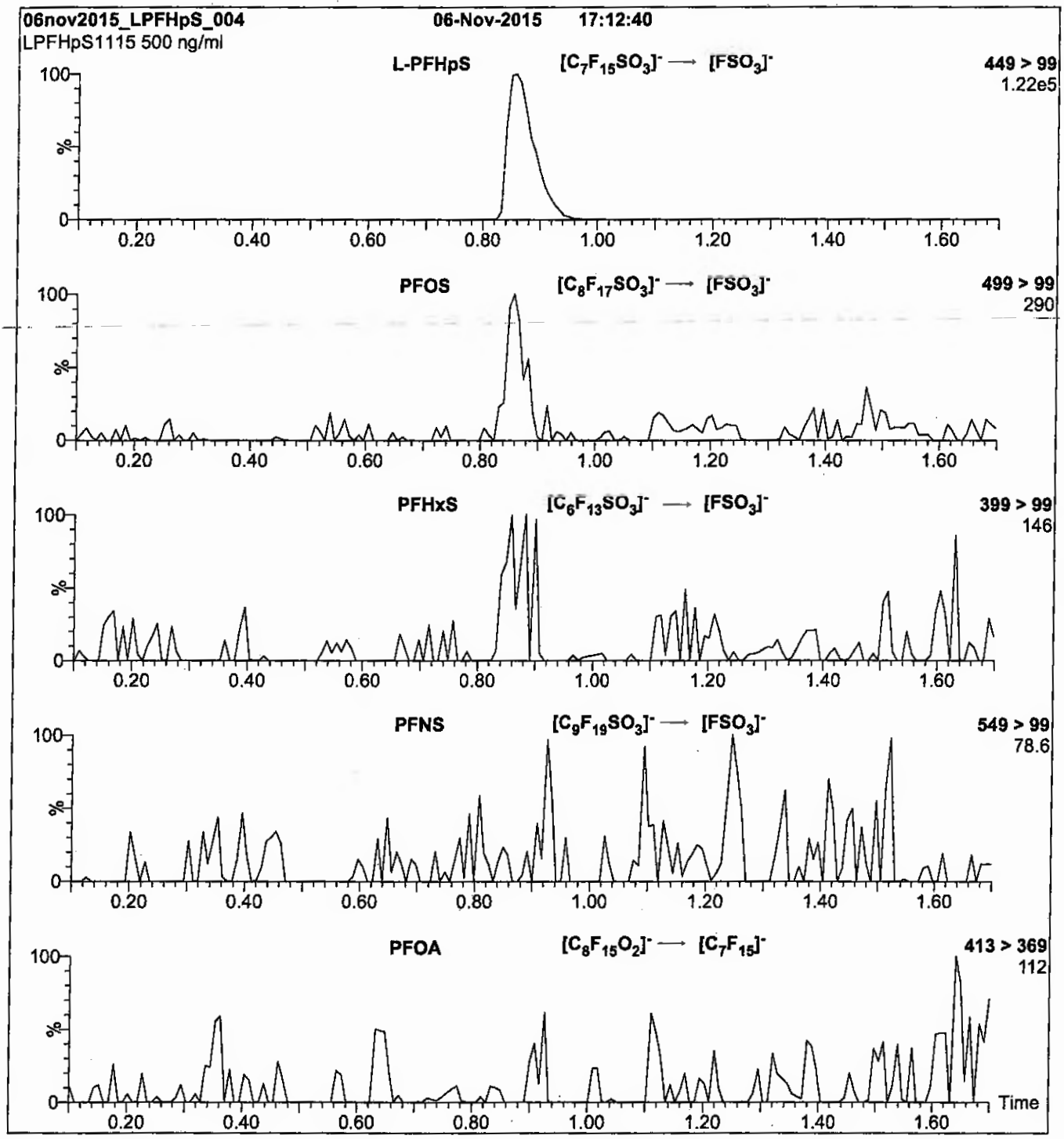
Flow: 300 µl/min

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 µl (500 ng/ml L-PFHpS)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00004

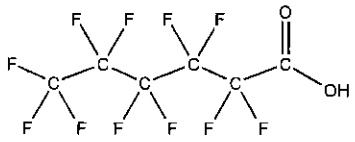
609702
ID: LCPFHxA_00004
Exp: 12/22/20 Prpd: CBW
PF-n-hexanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxA	**LOT NUMBER:**	PFHxA1215
COMPOUND:	Perfluoro-n-hexanoic acid		
STRUCTURE:		**CAS #:**	307-24-4



MOLECULAR FORMULA:	$C_6HF_{11}O_2$	**MOLECULAR WEIGHT:**	314.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 12/23/2015 (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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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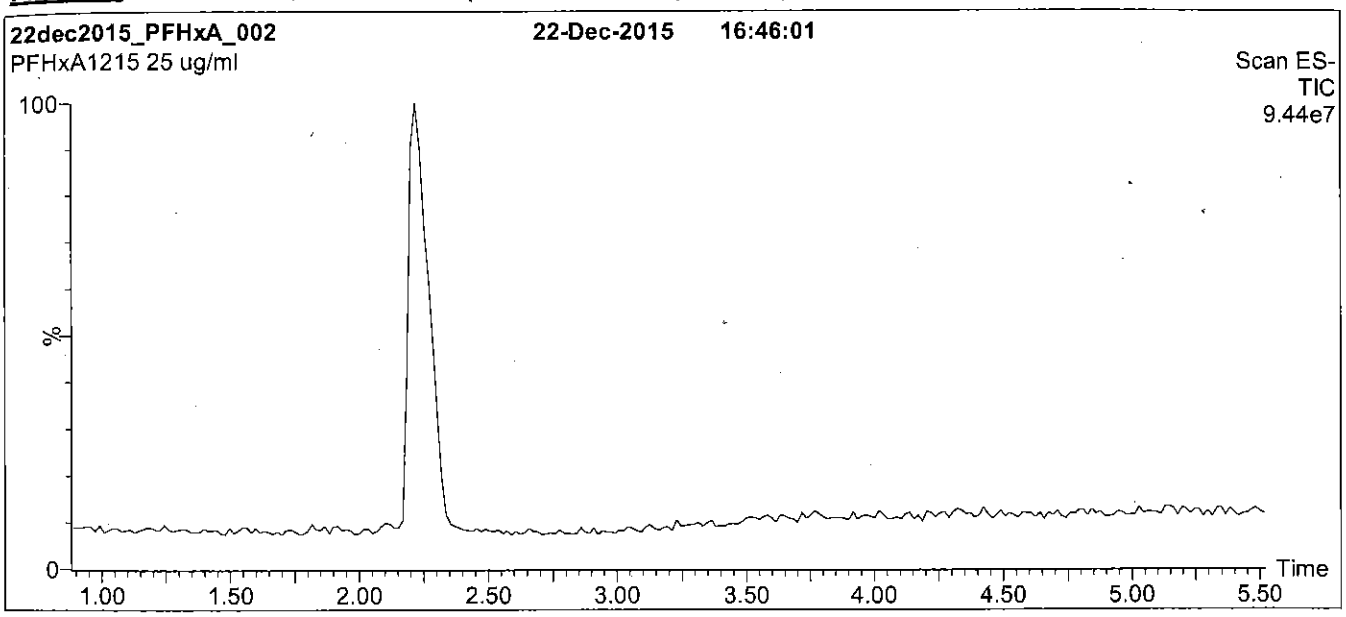
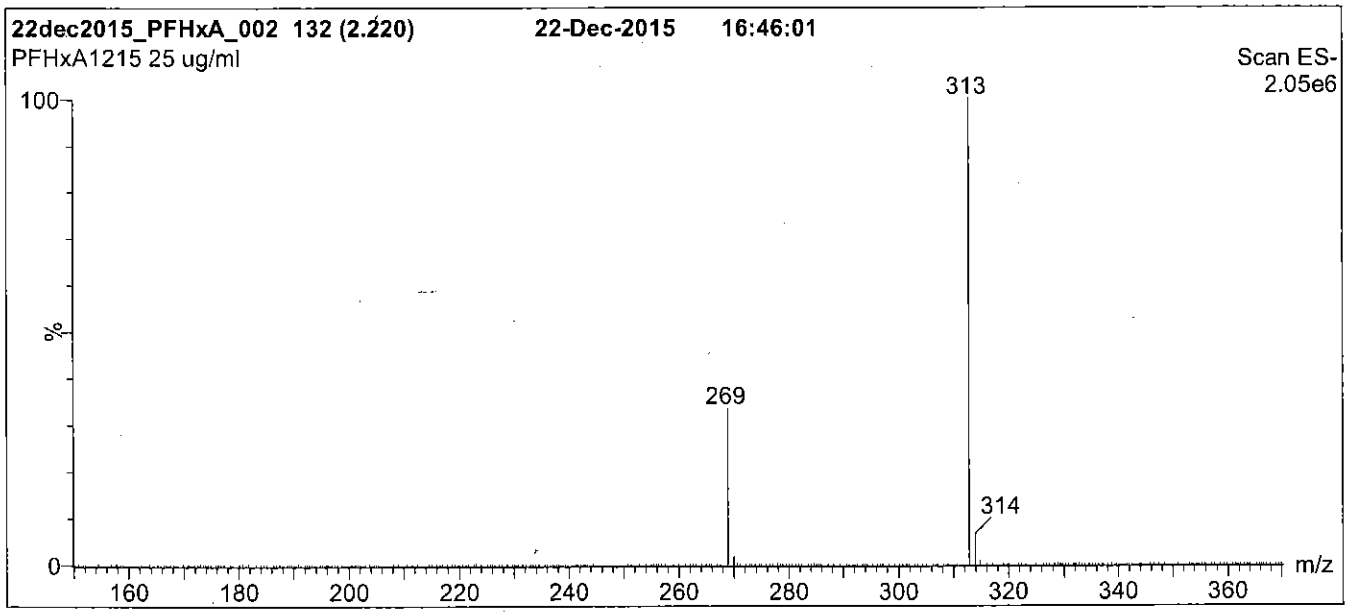
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

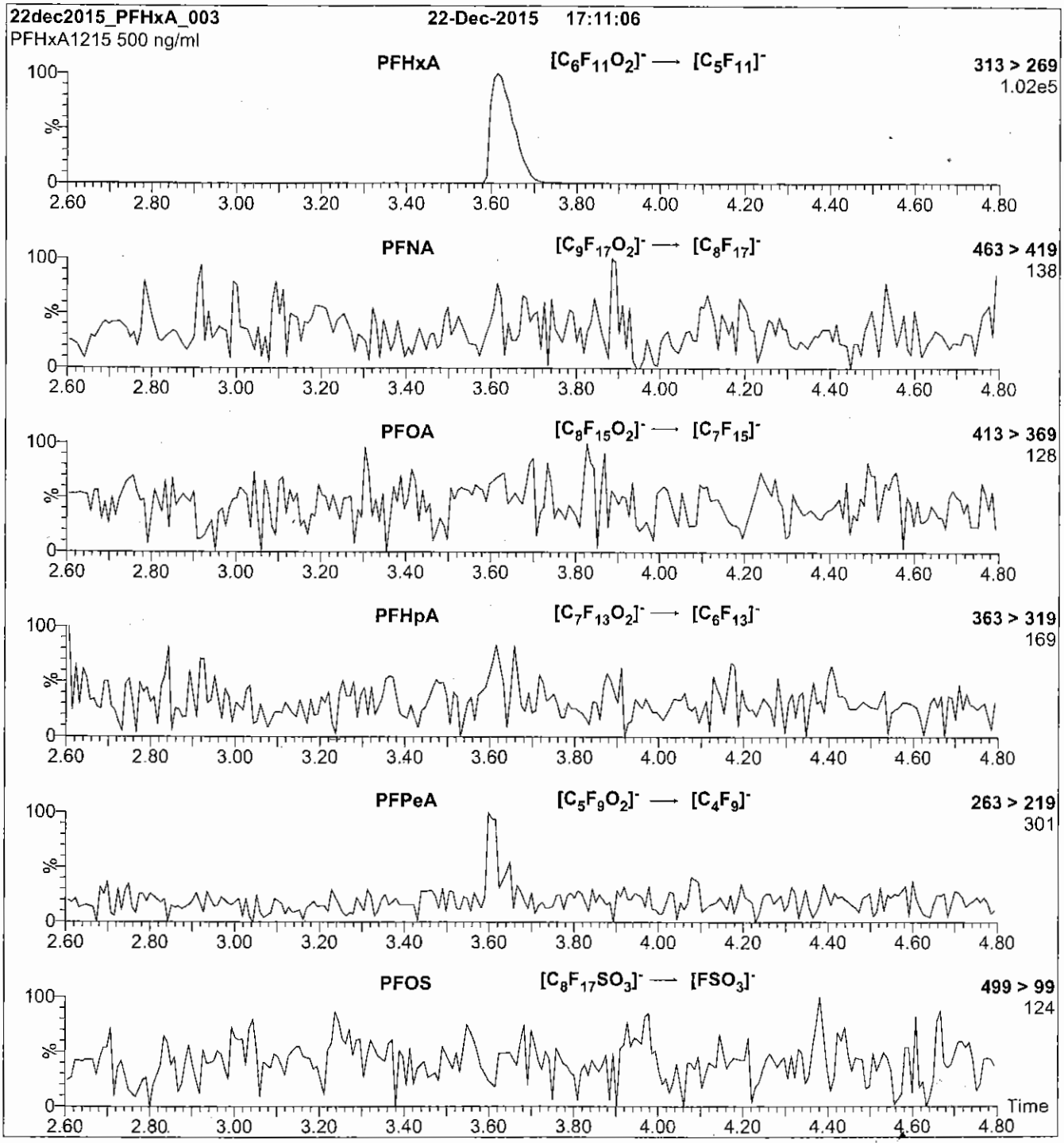
Flow: 300 µl/min

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: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxA_00005

R: SBC 9/13/16

730551
ID: LCPFHxA_00005
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

730552
ID: LCPFHxA_00006
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

WELLINGTON LABORATORIES

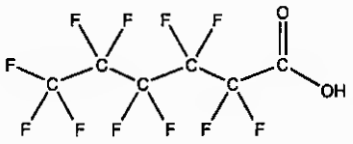
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA1215

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/23/2015 (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:

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HOMOGENEITY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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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).

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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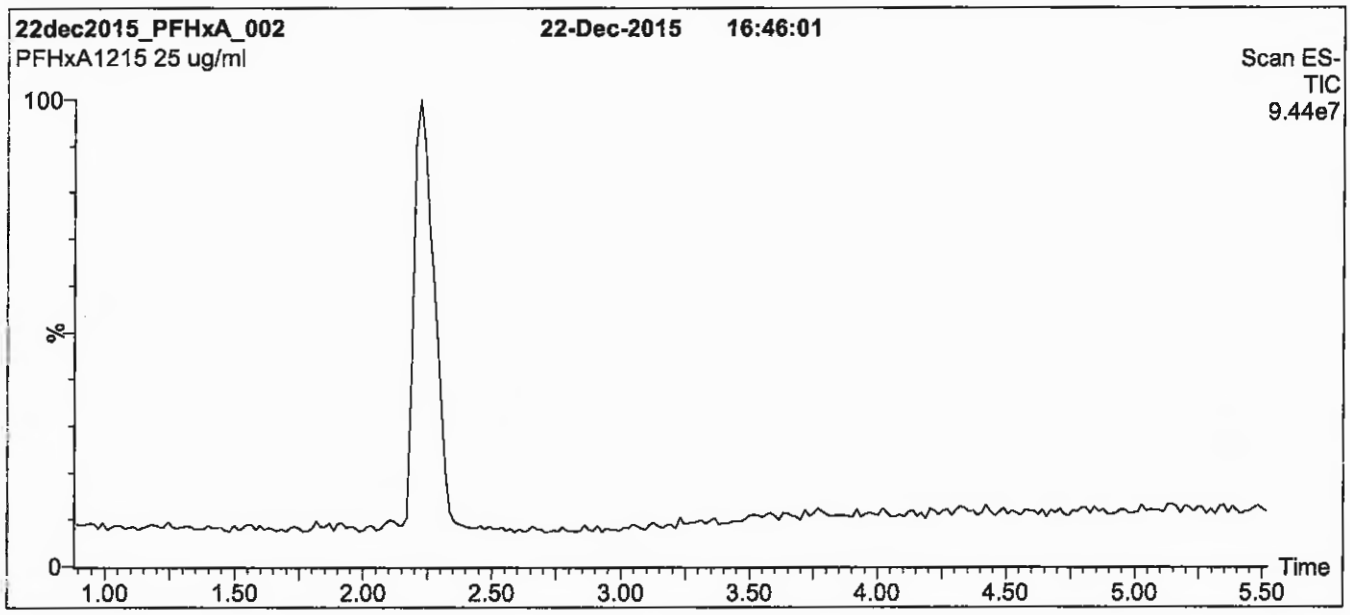
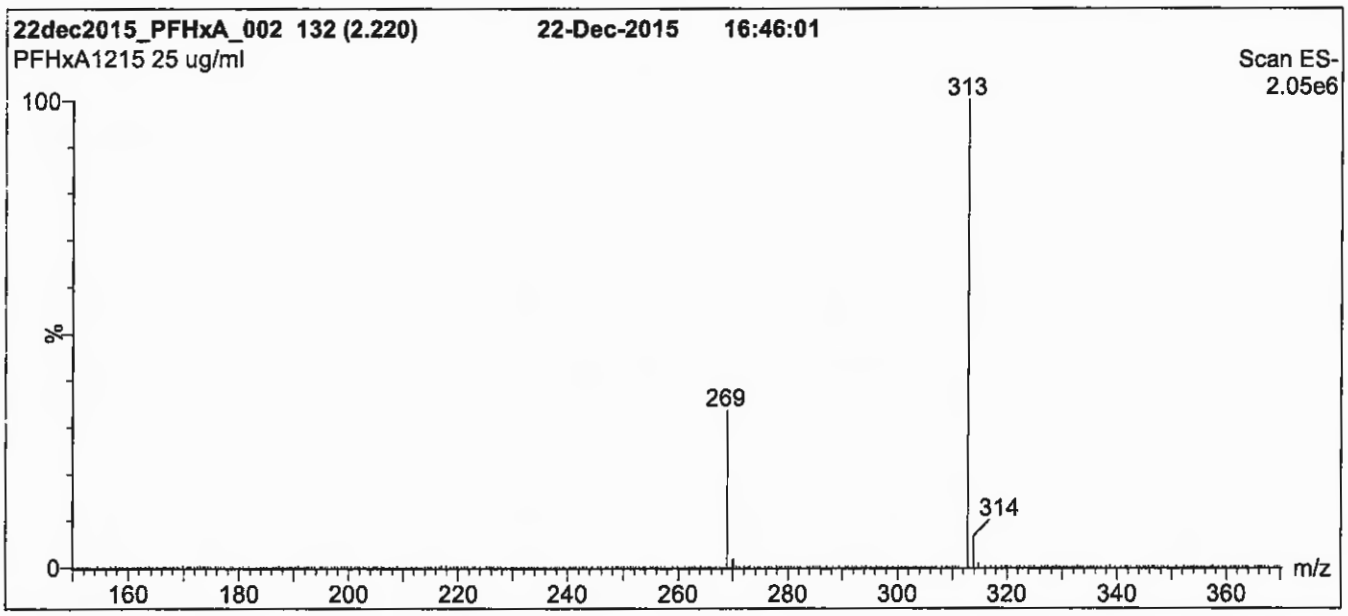
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

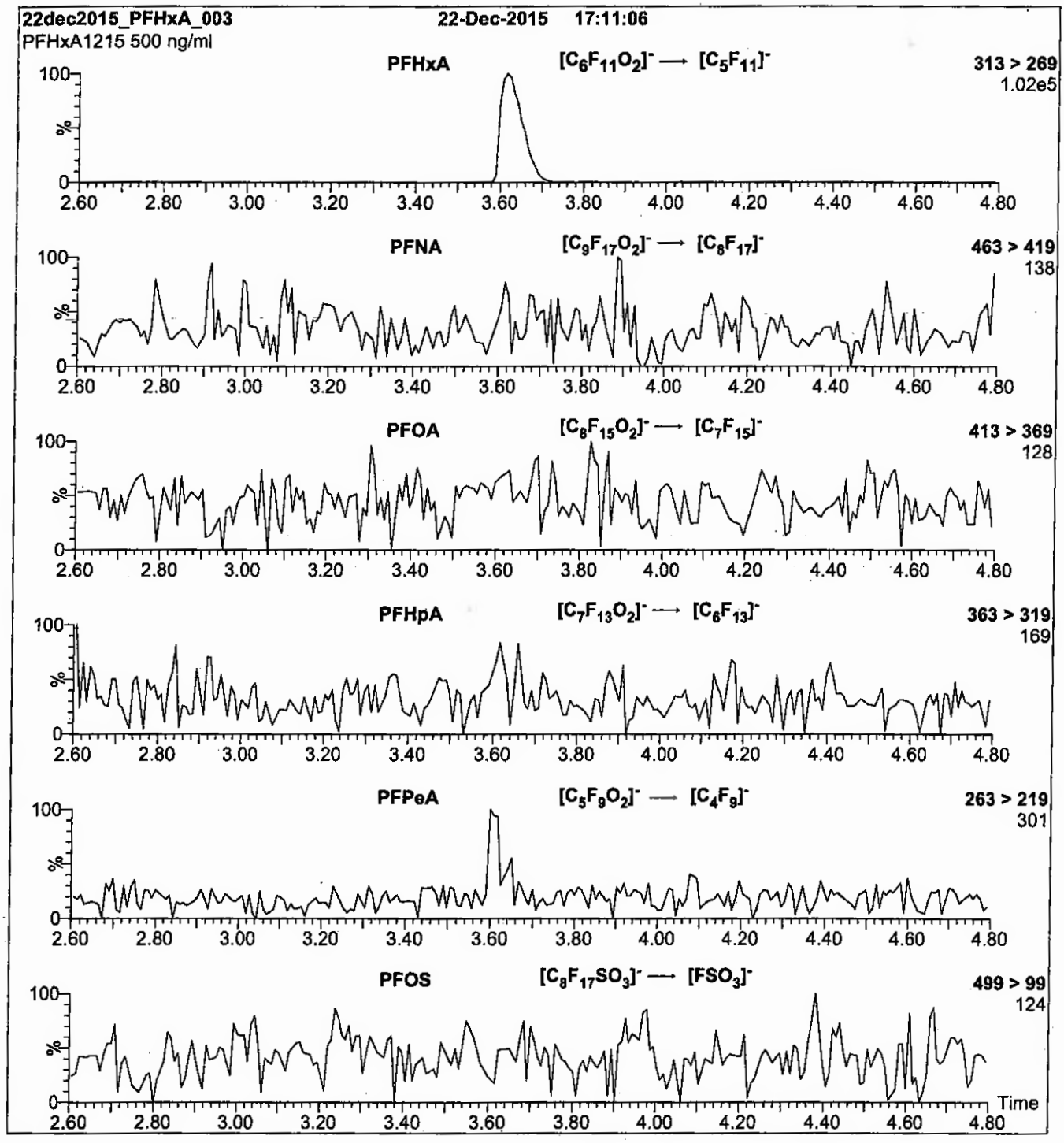
Flow: 300 µl/min

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: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxDA_00006

R: SBC 9/13/16
Scanned 10/14/16 SBC

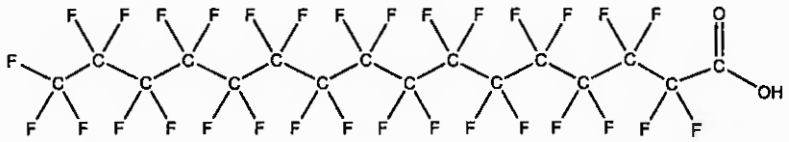
730630
ID: LCPFHxDA_00006
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

730631
ID: LCPFHxDA_00007
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxDA	**LOT NUMBER:**	PFHxDA0516
COMPOUND:	Perfluoro-n-hexadecanoic acid		
STRUCTURE:		**CAS #:**	67905-19-5



MOLECULAR FORMULA:	$C_{16}HF_{31}O_2$	**MOLECULAR WEIGHT:**	814.13
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/25/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/25/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (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:

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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:

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QUALITY MANAGEMENT:

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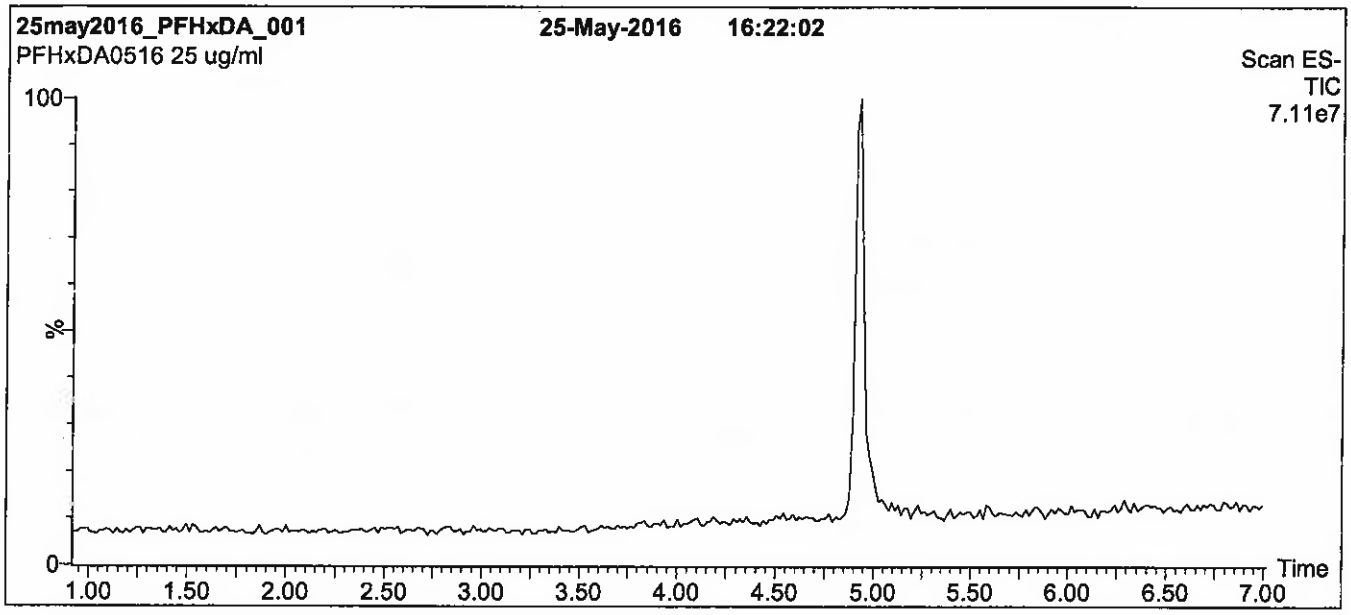
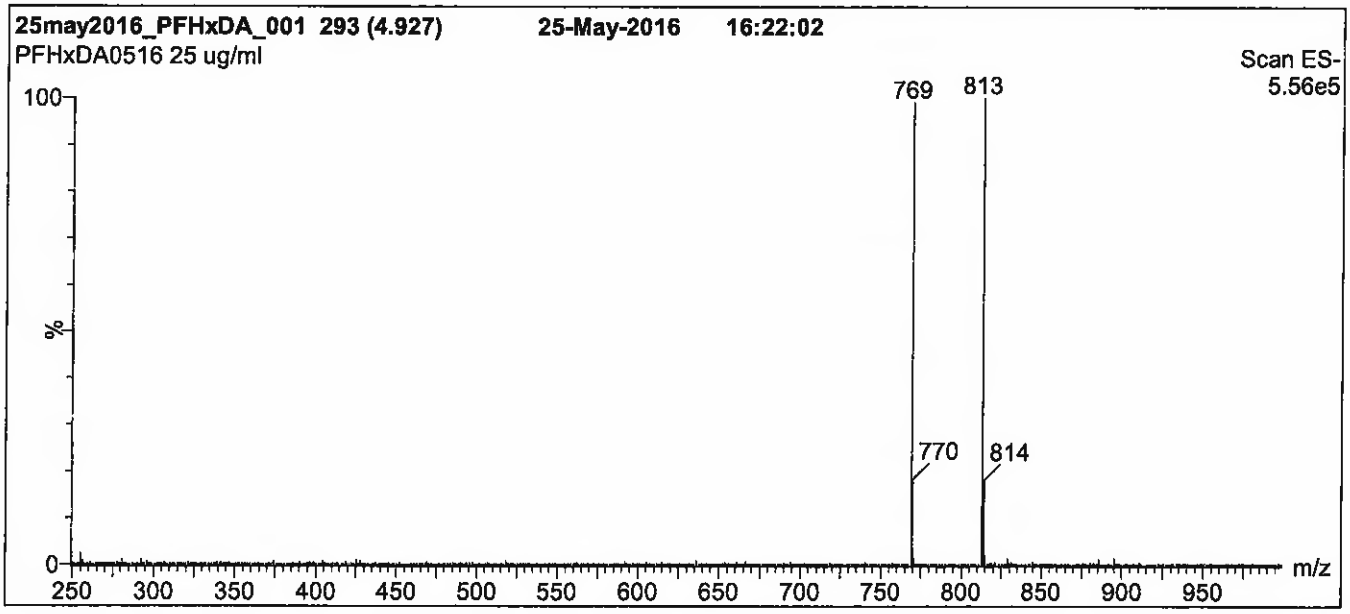
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc 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

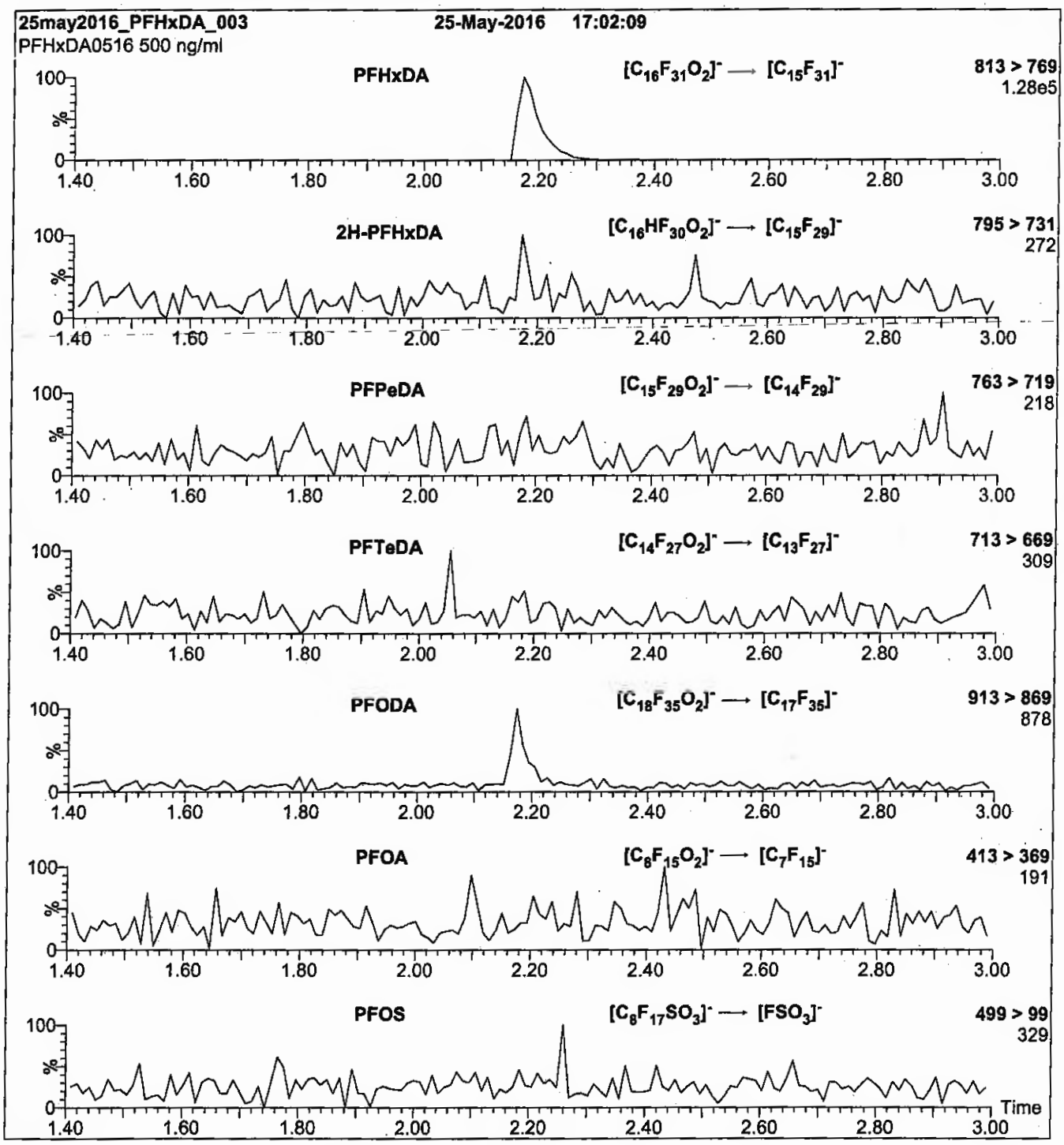
Flow: 300 µl/min

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 µl (500 ng/ml PFHxDA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00002

SBC
R: 9/13/16

730513
ID: LCPFHxS-br_00002
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane

730514
ID: LCPFHxS-br_00003
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0615
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)	06/29/2015
LAST TESTED: (mm/dd/yyyy)	07/03/2015
EXPIRY DATE: (mm/dd/yyyy)	07/03/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥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 ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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

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

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

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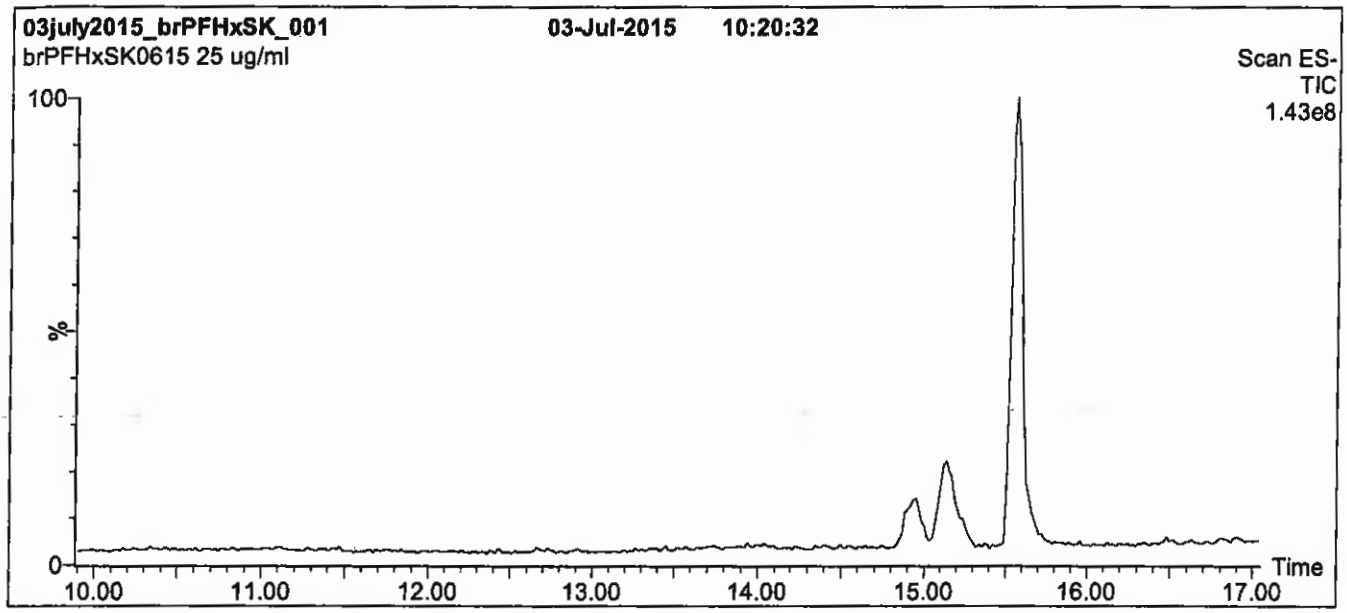
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

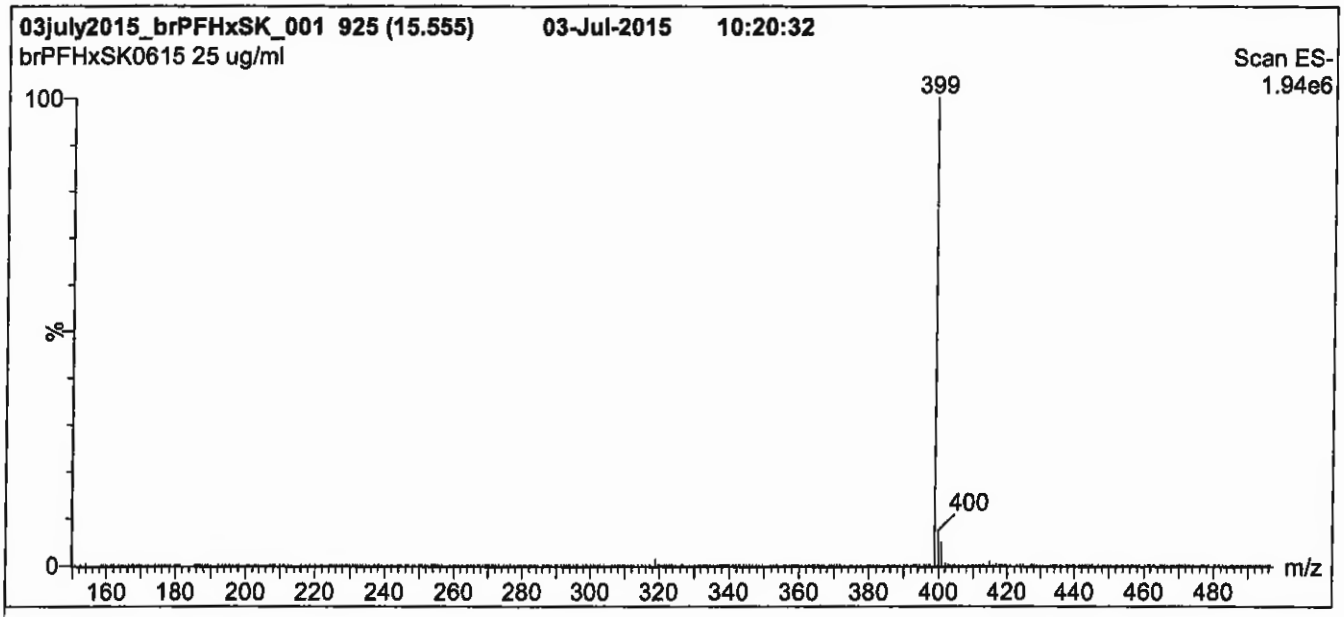
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	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:** 07/15/2015 (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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

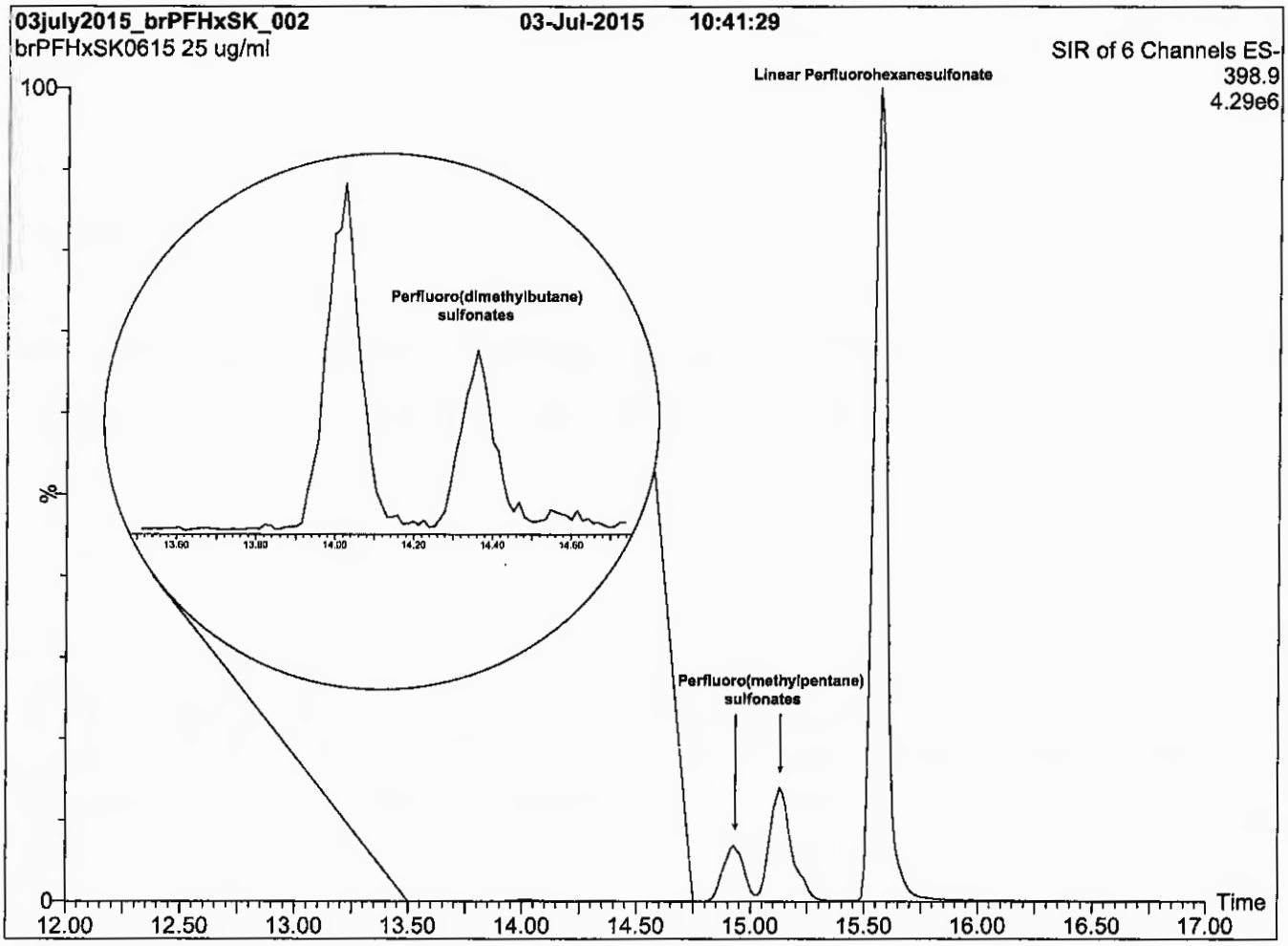
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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**



Conditions for Figure 2:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

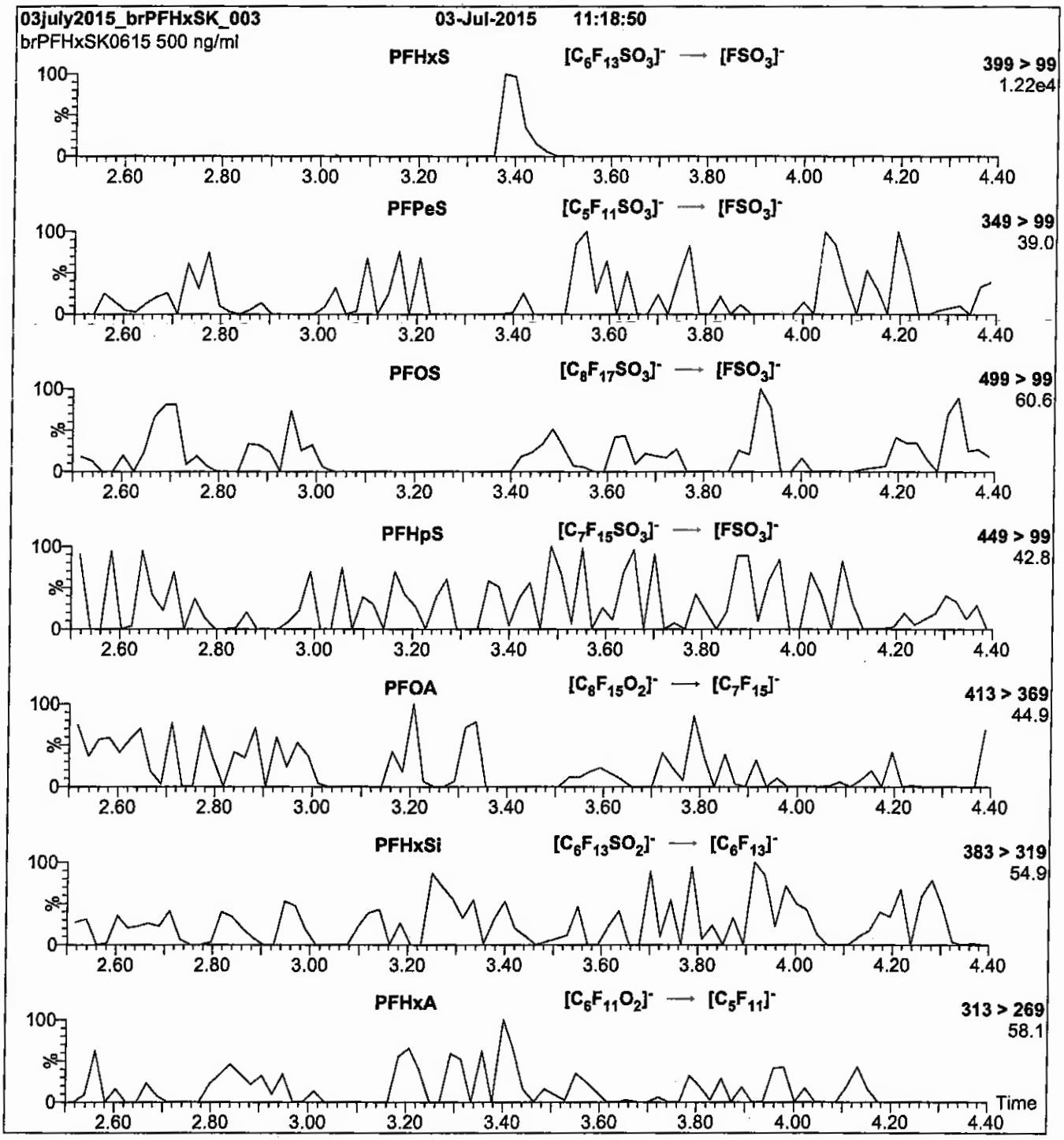
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFNA_00005

609703
ID: LCPFNA_00005
Exp: 10/23/20 Prpd: CBW
PF-n-nonanoic acid

R 4/7/16 CBW

WELLINGTON LABORATORIES

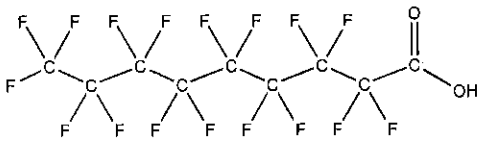
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA1015

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/23/2015
EXPIRY DATE: (mm/dd/yyyy) 10/23/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/30/2015 (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:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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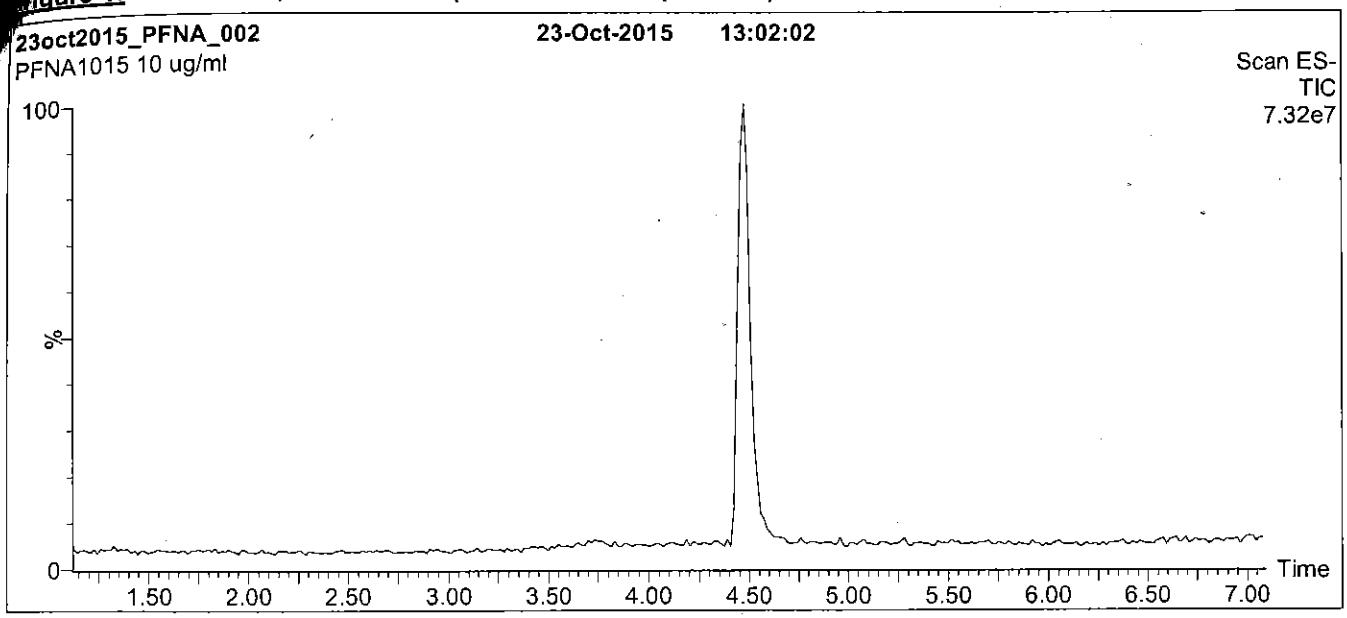
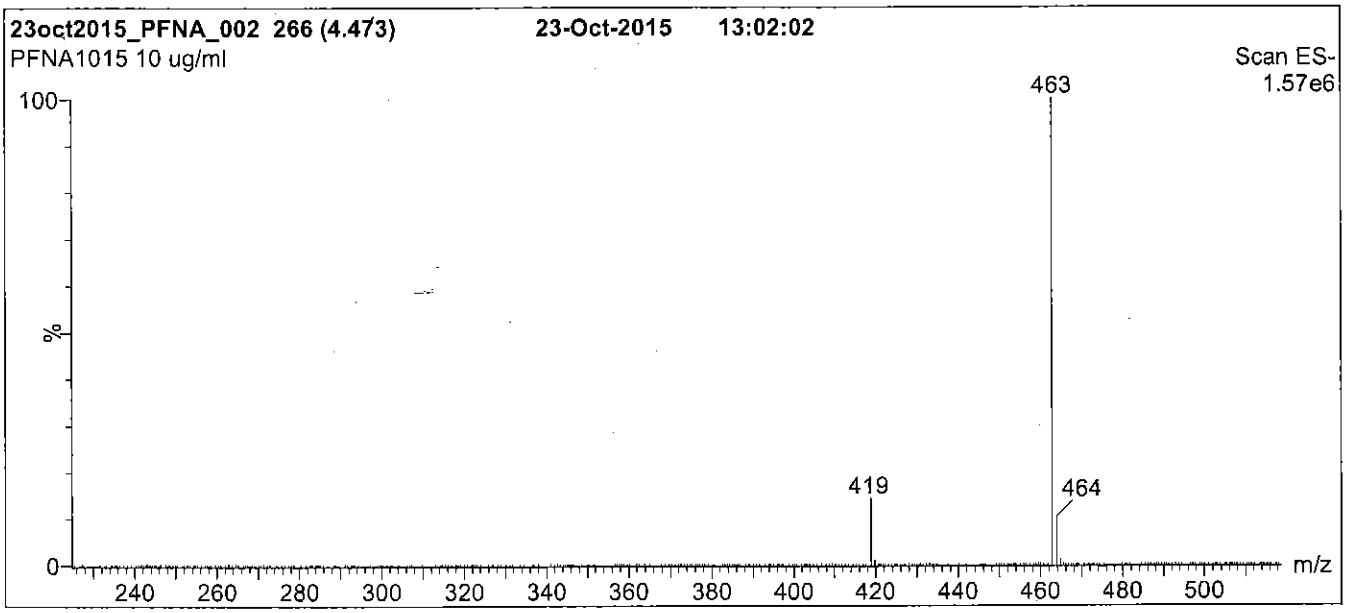
Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

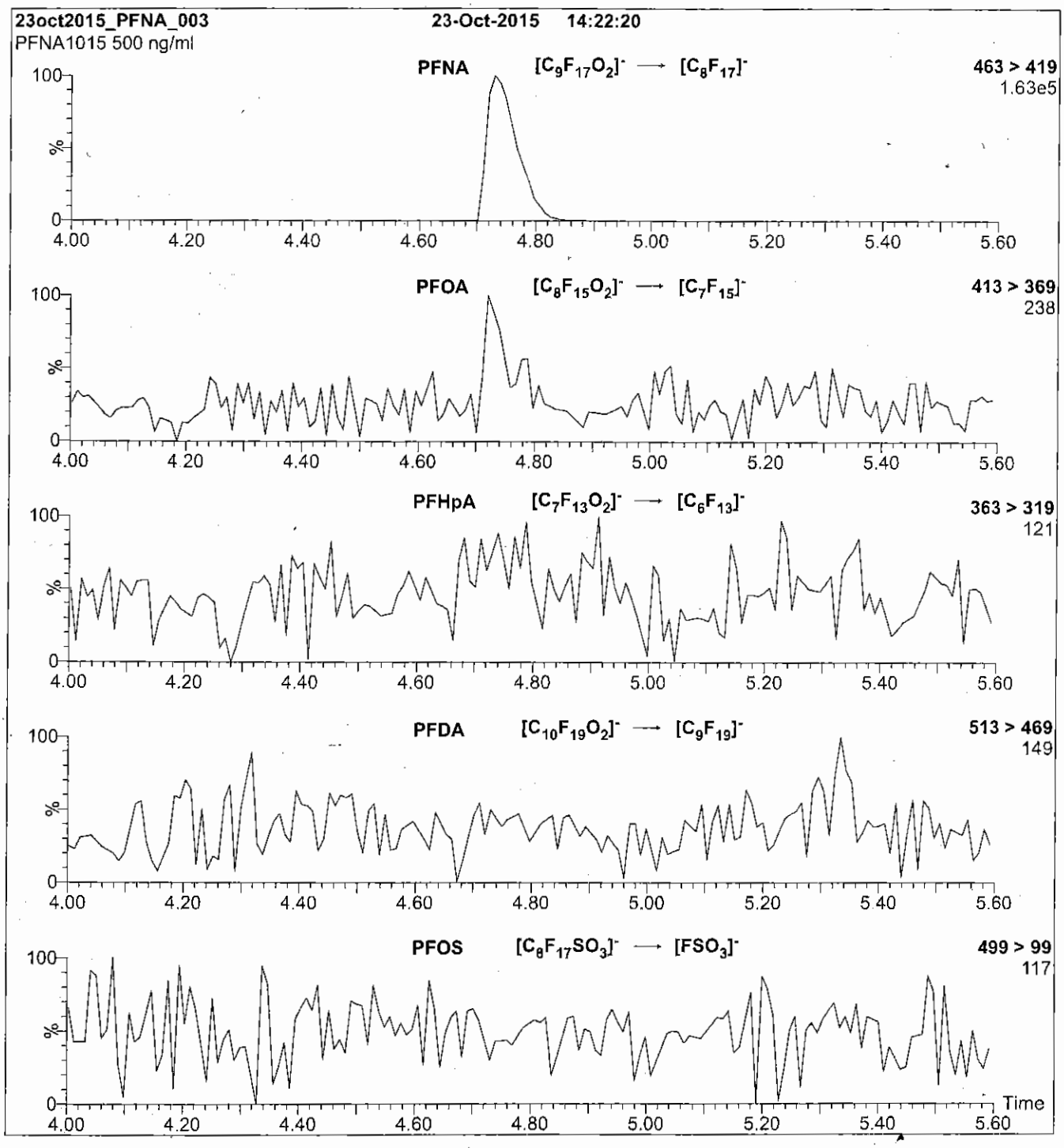
Flow: 300 µl/min

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 µl (500 ng/ml PFNA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFNA_00006

R: SBC 9/13/16
Scanned 10/14/16

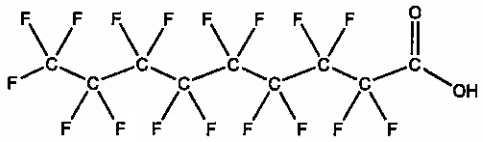
730559
ID: LCPFNA_00006
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

730560
ID: LCPFNA_00007
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA1015
COMPOUND:	Perfluoro-n-nonanoic acid		
STRUCTURE:		**CAS #:**	375-95-1



MOLECULAR FORMULA:	$C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	464.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/23/2015		
EXPIRY DATE: (mm/dd/yyyy)	10/23/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

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Certified By: B.G. Chittim **Date:** 10/30/2015 (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

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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:

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QUALITY MANAGEMENT:

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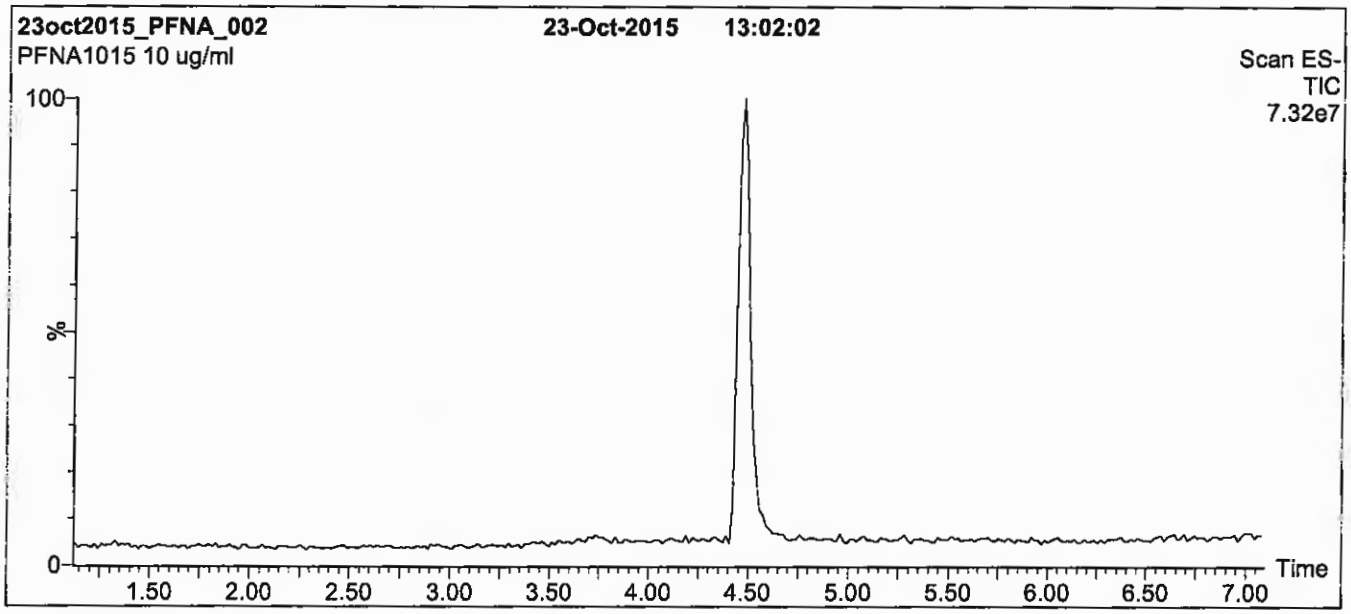
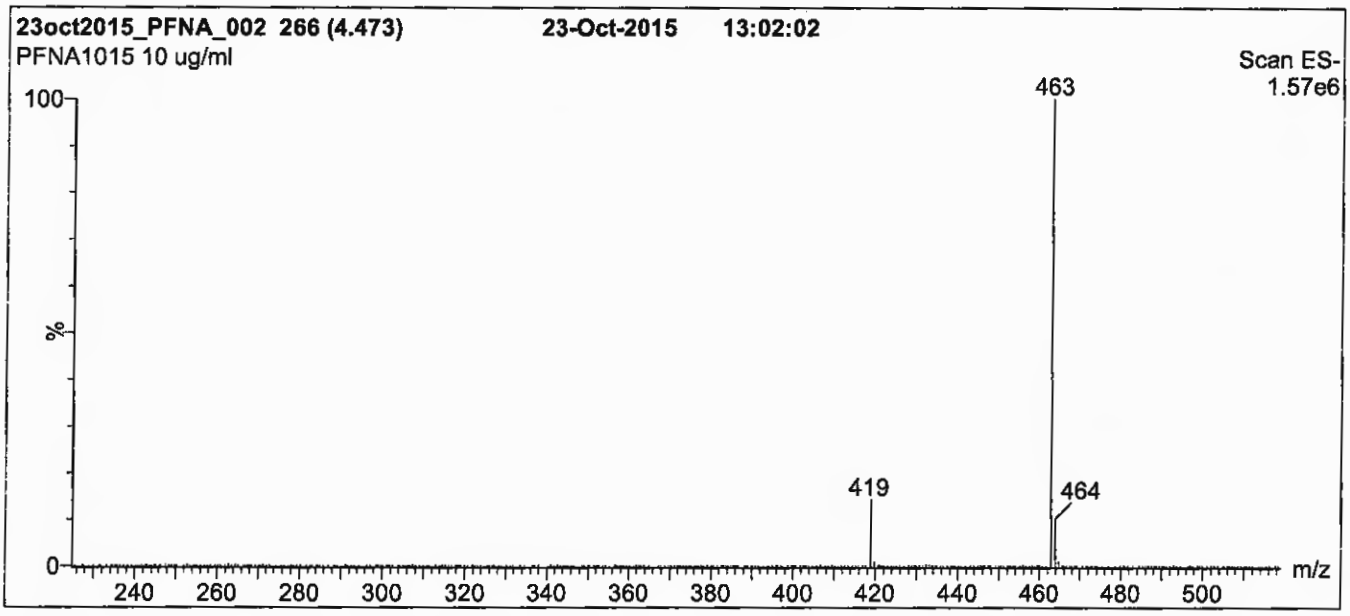
Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

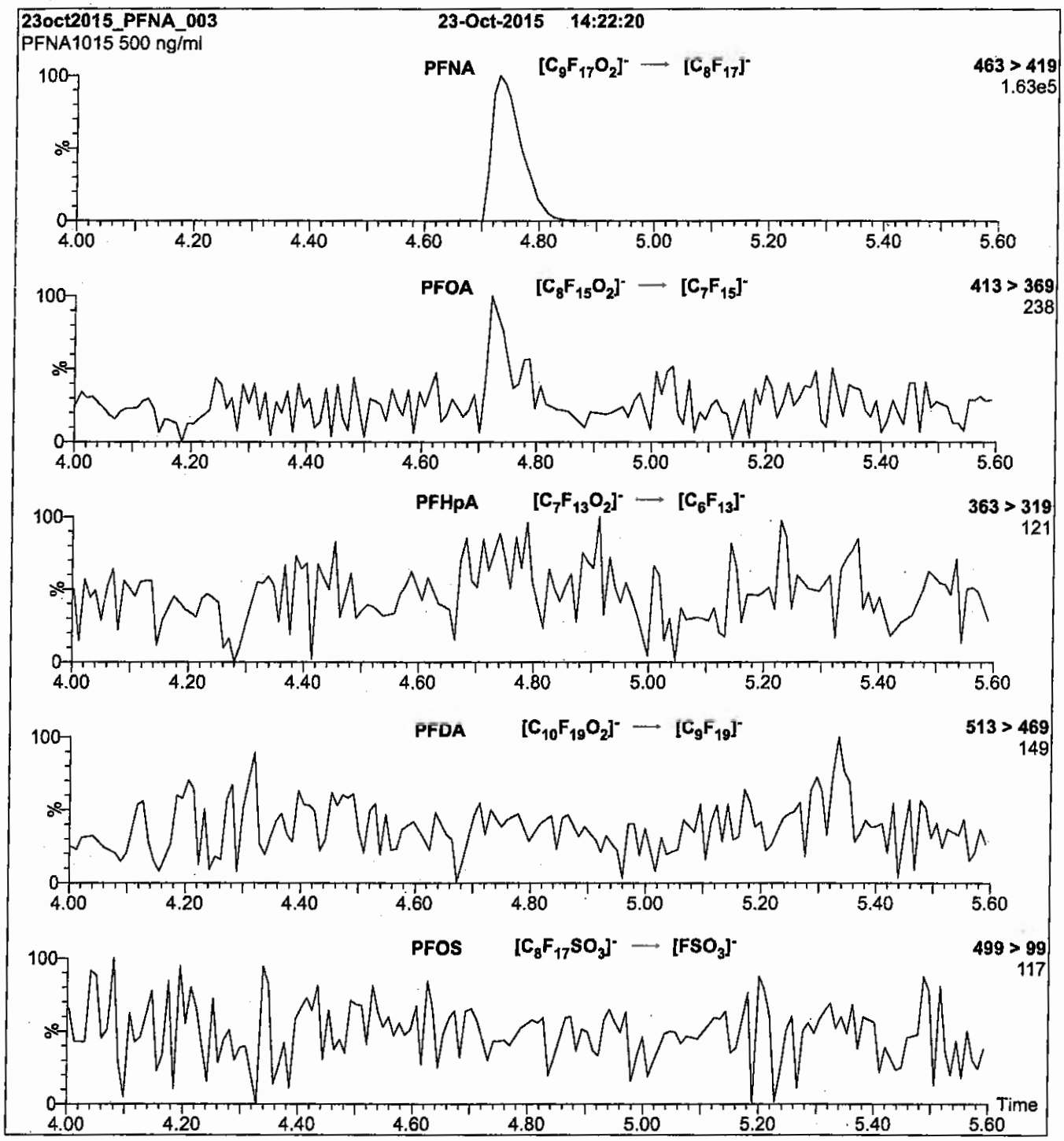
Flow: 300 µl/min

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 µl (500 ng/ml PFNA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFOA_00006

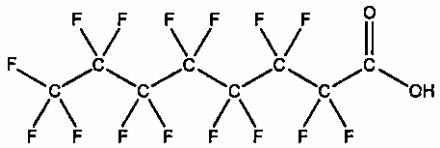
R-7/6/16 CBW

671577
ID: LCPFOA_00006
Exp: 11/06/20 Prpd: CBW
PF-n-octanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFOA	**LOT NUMBER:**	PFOA1115
COMPOUND:	Perfluoro-n-octanoic acid		
STRUCTURE:		**CAS #:**	335-67-1



MOLECULAR FORMULA:	$C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	414.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/06/2015		
EXPIRY DATE: (mm/dd/yyyy)	11/06/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/11/2015 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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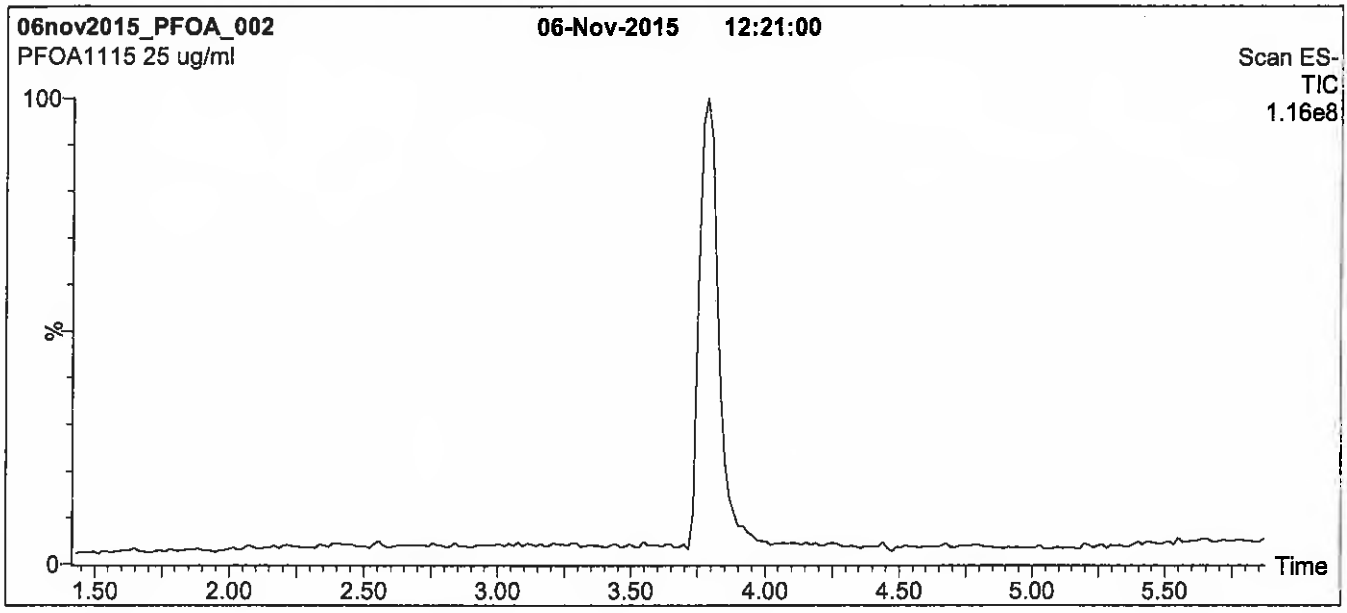
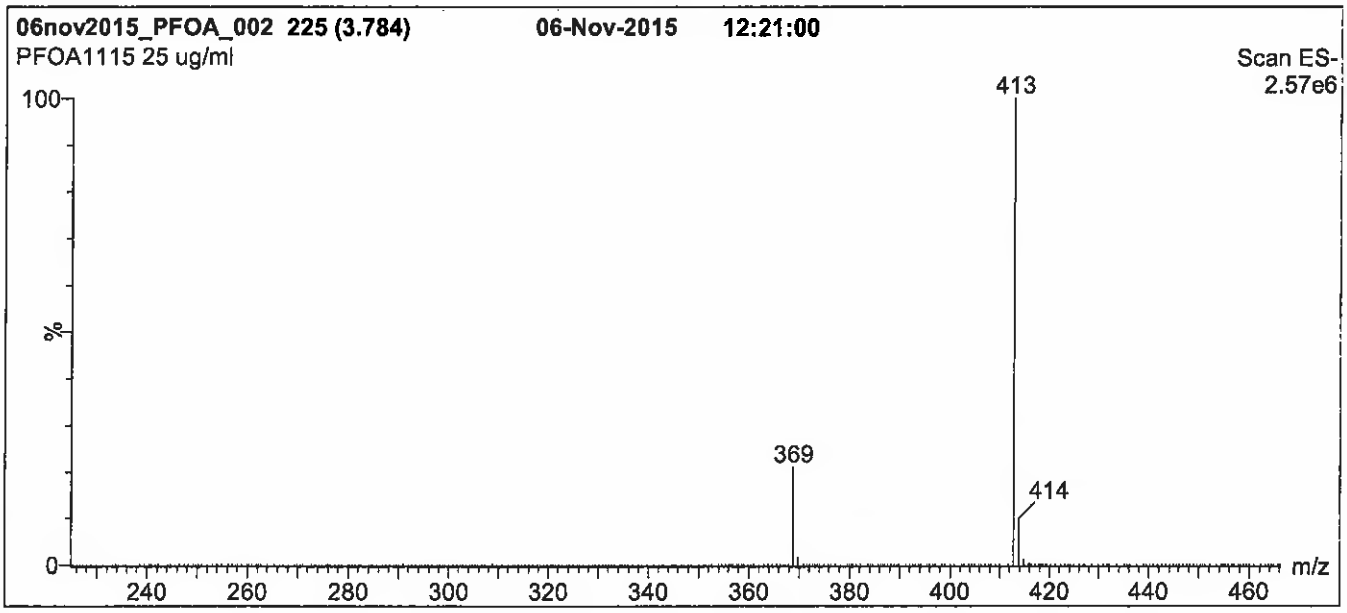
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

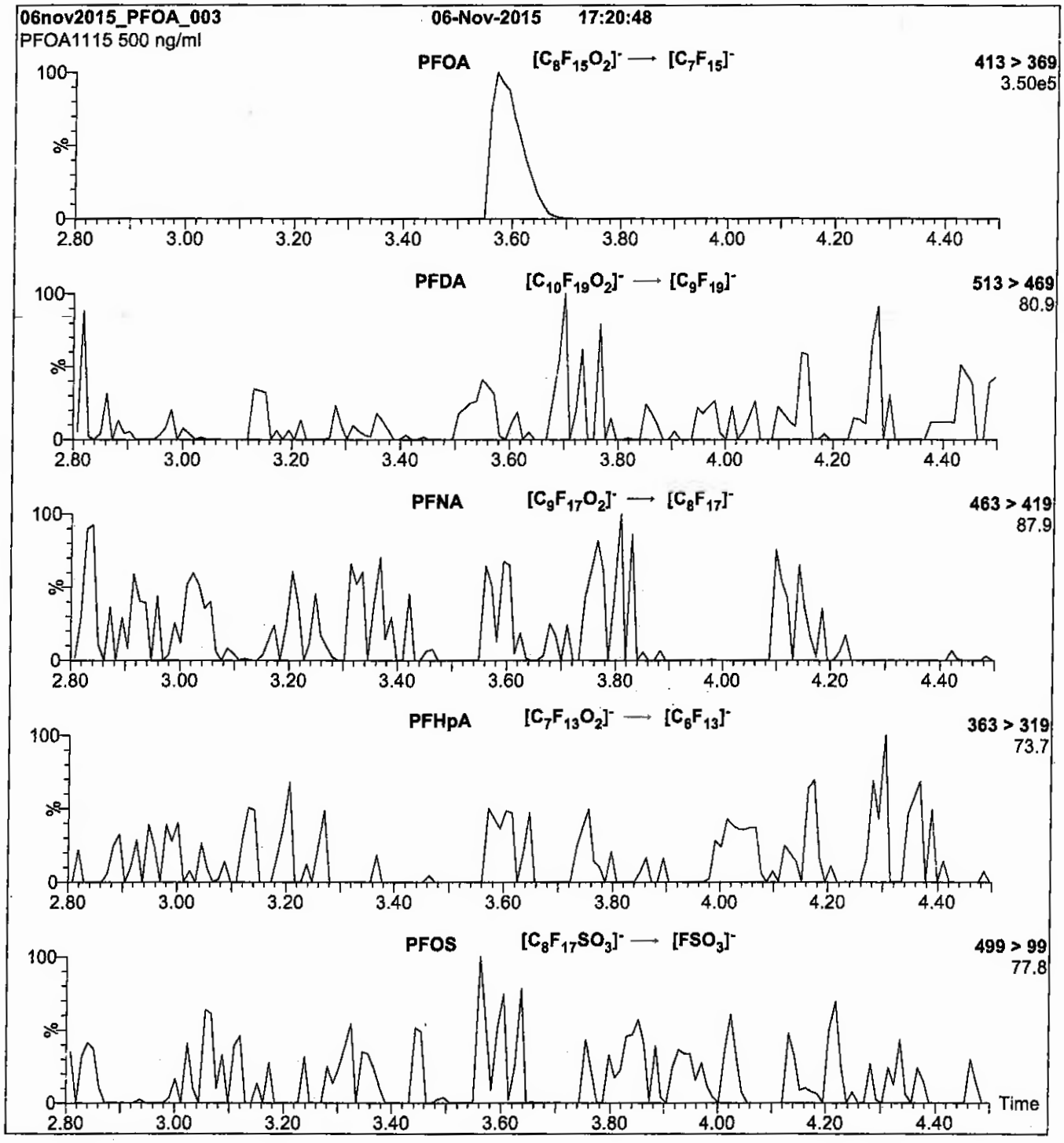
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (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 µl (500 ng/ml PFOA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00005

605234
ID: LCPFODA_00005
Exp: 01/30/20 Prpd: CBW
PFODA stock 50ug/mL

Rec. 3/29/16 JRB

WELLINGTON LABORATORIES

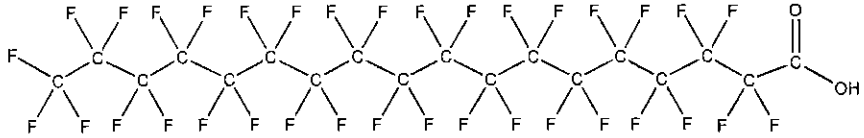
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid

LOT NUMBER: PFODA0115

STRUCTURE:

CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 914.14
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (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:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

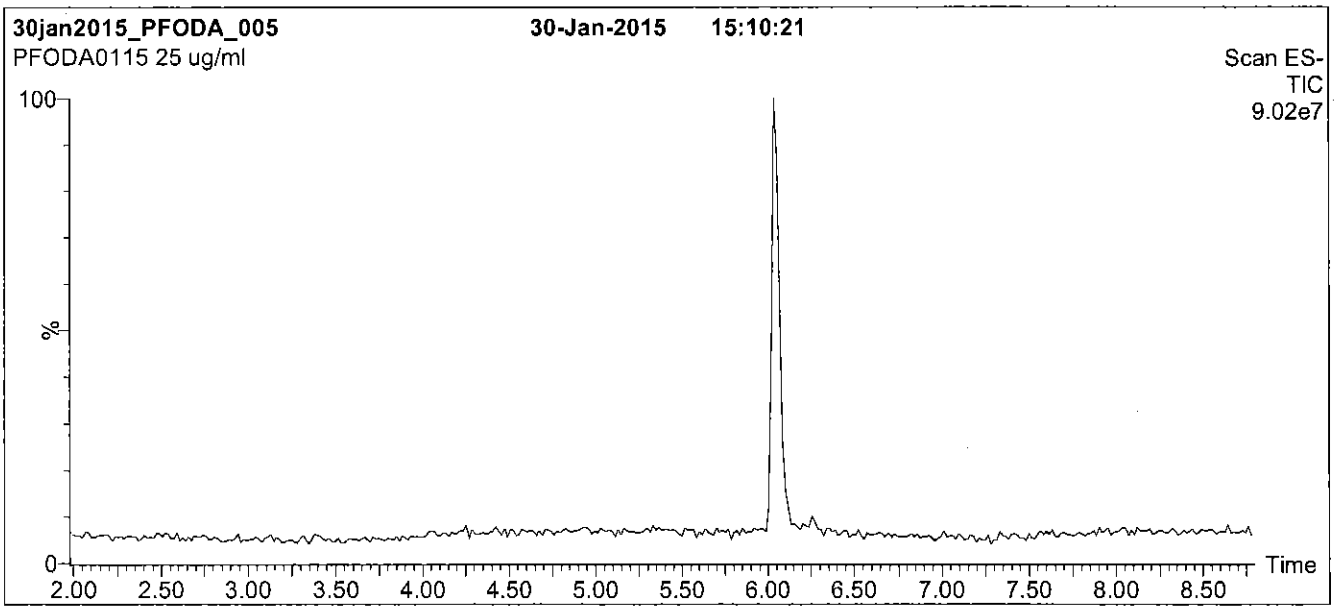
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

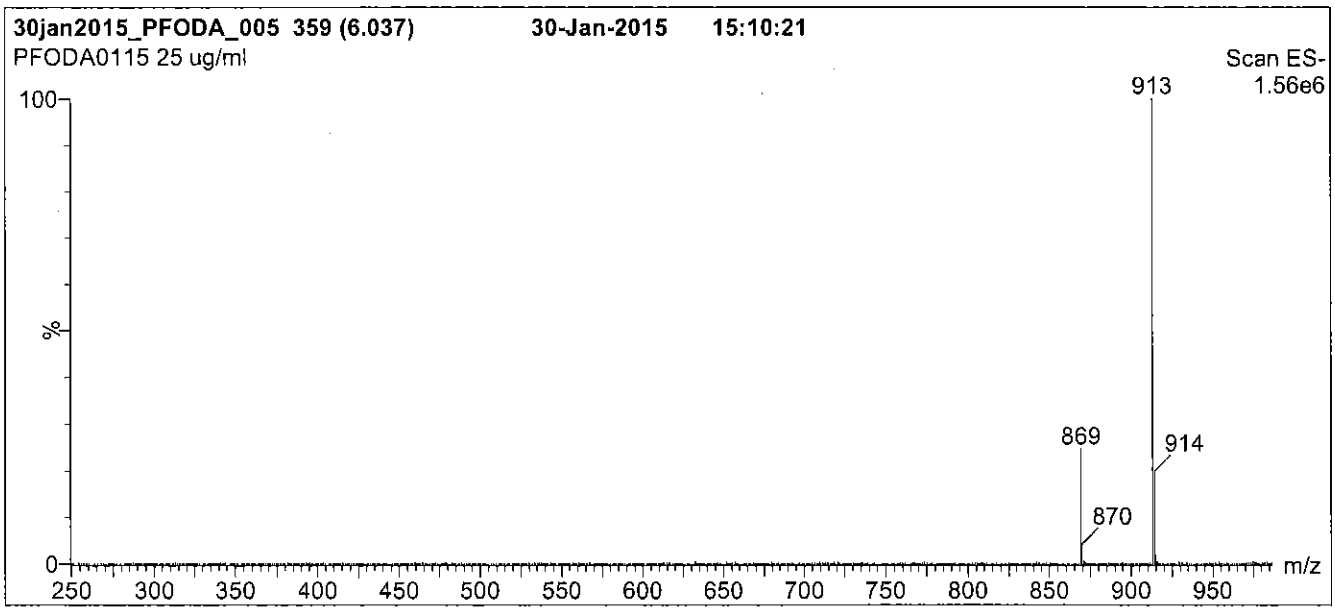
CALA Testing Accreditation No. A1226

ANAB ACCREDITED Reference Material Producer

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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

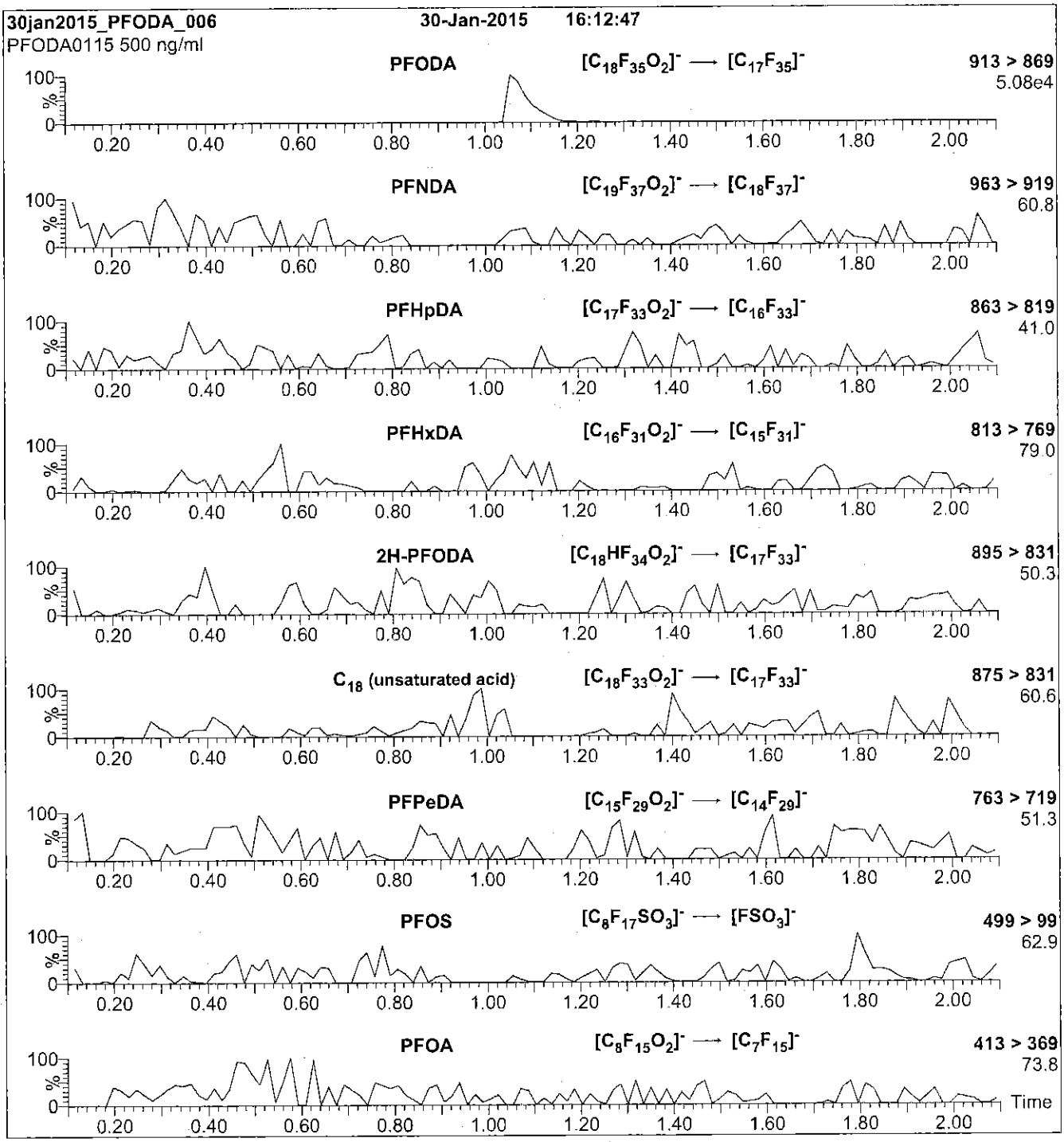
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
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 µl (500 ng/ml PFODA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFODA_00006

Scanned 10/14/16

R: SBC 9/13/16

730632
ID: LCPFODA_00006
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

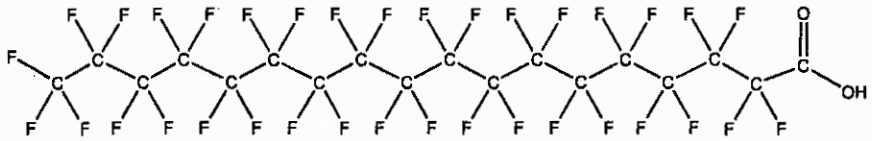
730633
ID: LCPFODA_00007
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFODA
LOT NUMBER: PFODA0416
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/29/2016
EXPIRY DATE: (mm/dd/yyyy) 04/29/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/20/2016 (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

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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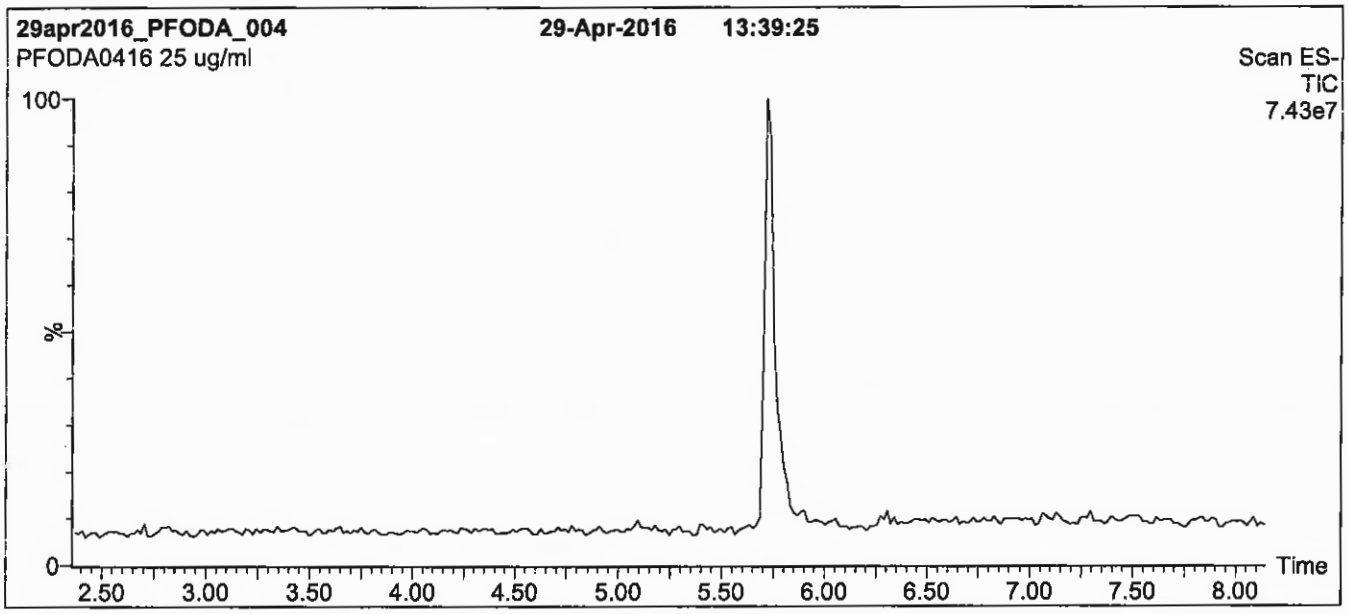
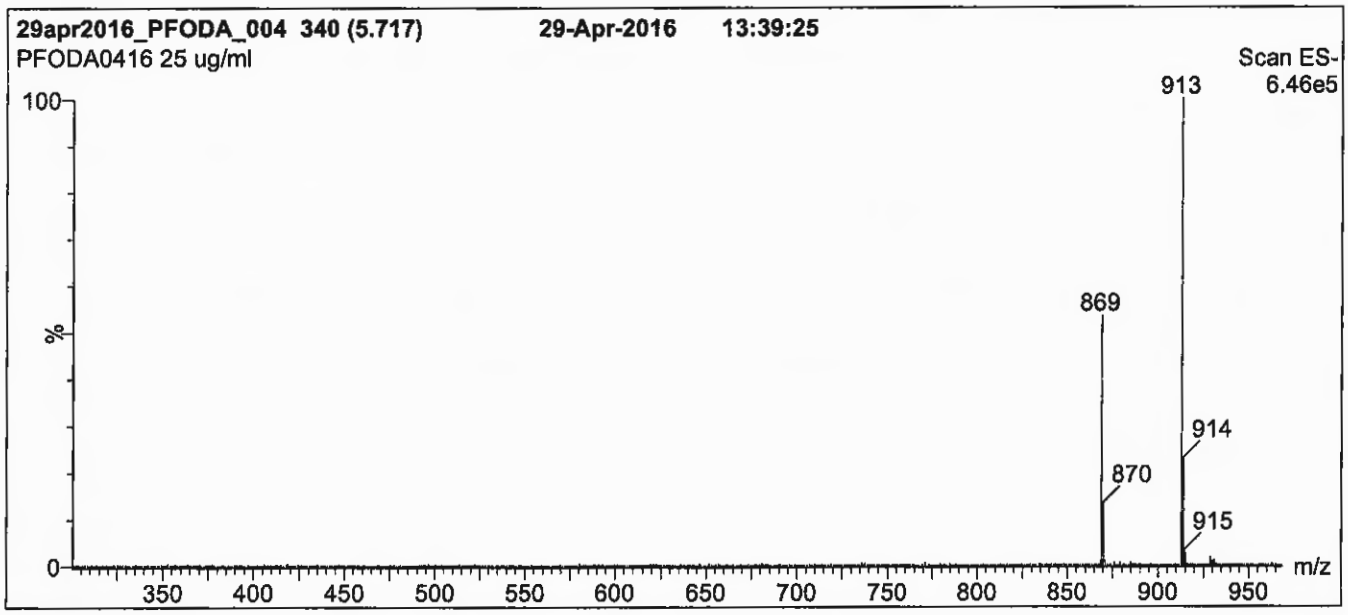




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc 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

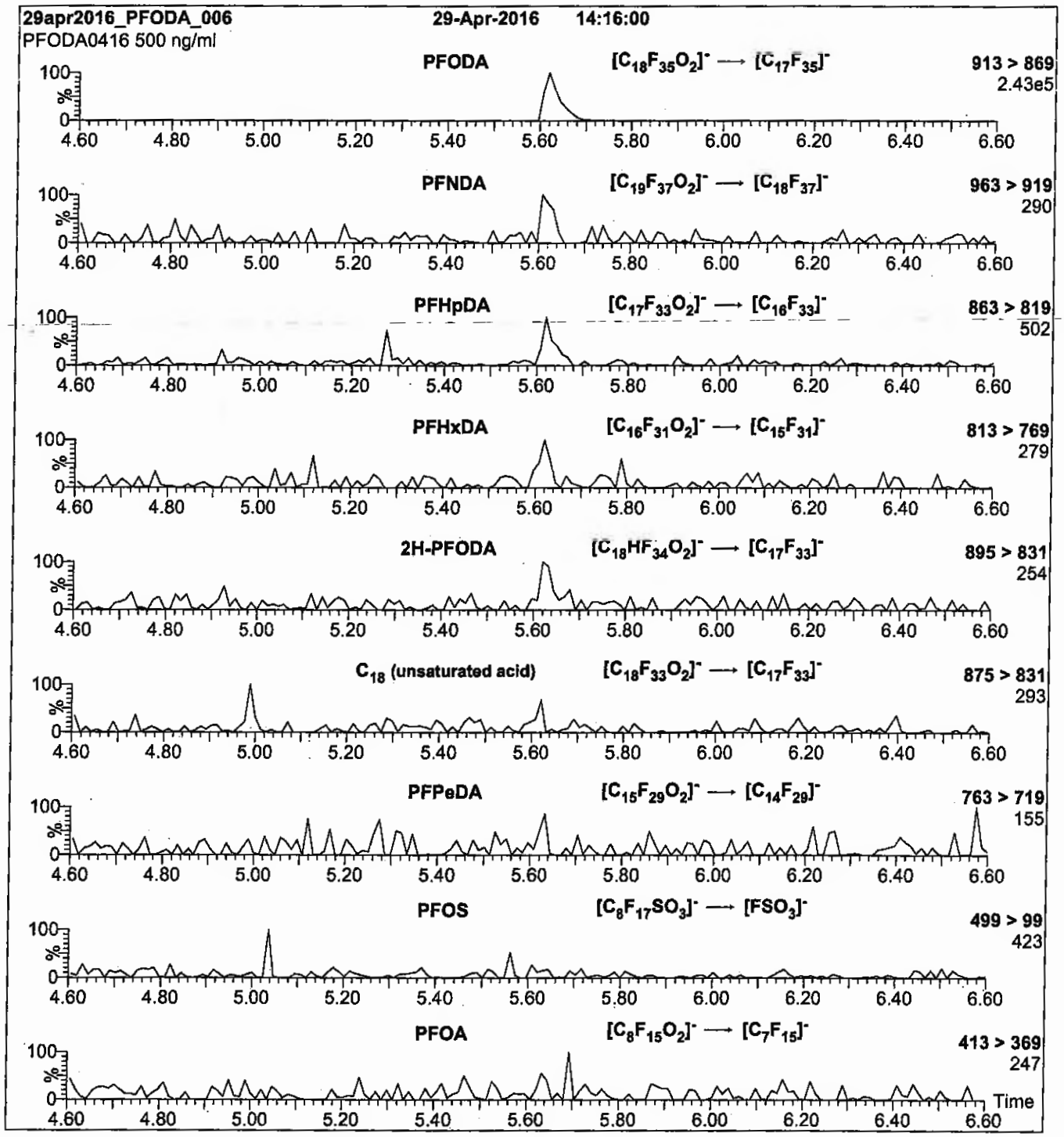
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
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 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00002

Scanned 10/14/16 S.R

R: SBC 9/13/16

730515
ID: LCPFOS-br_00002
Exp: 10/14/20 Prpd: SBC
Potassium Perfluorooctane

730516
ID: LCPFOS-br_00003
Exp: 10/14/20 Prpd: SBC
Potassium Perfluorooctane

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate
Solution/Mixture of Linear and
Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-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).

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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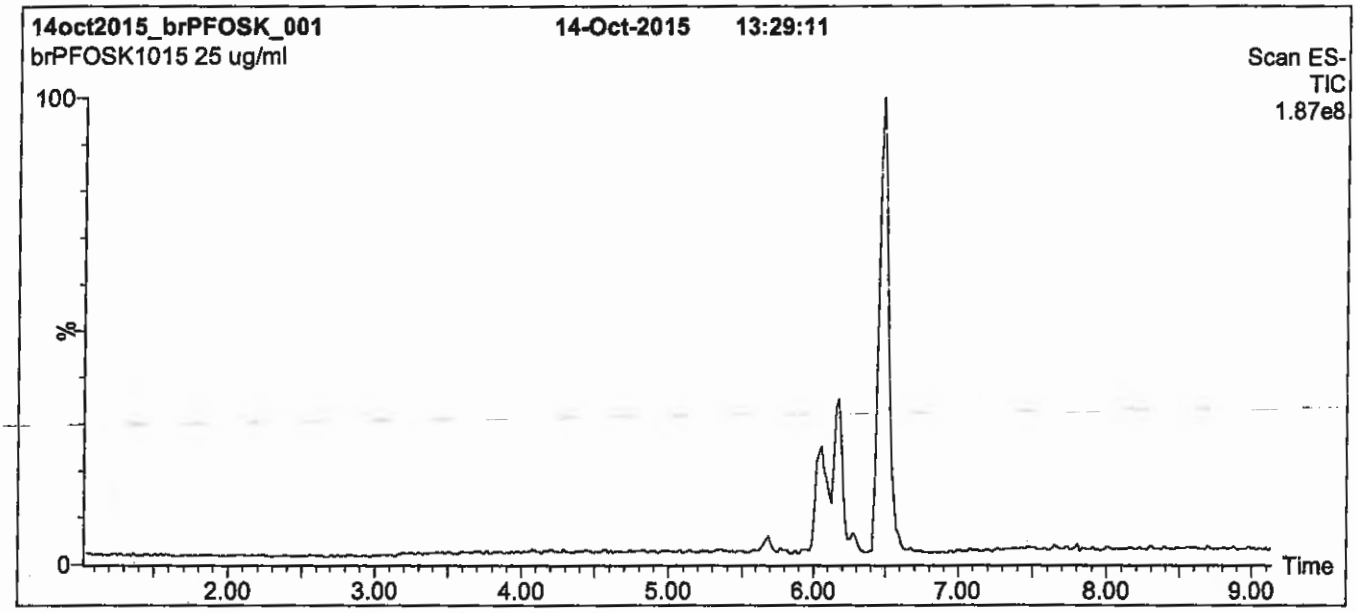
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

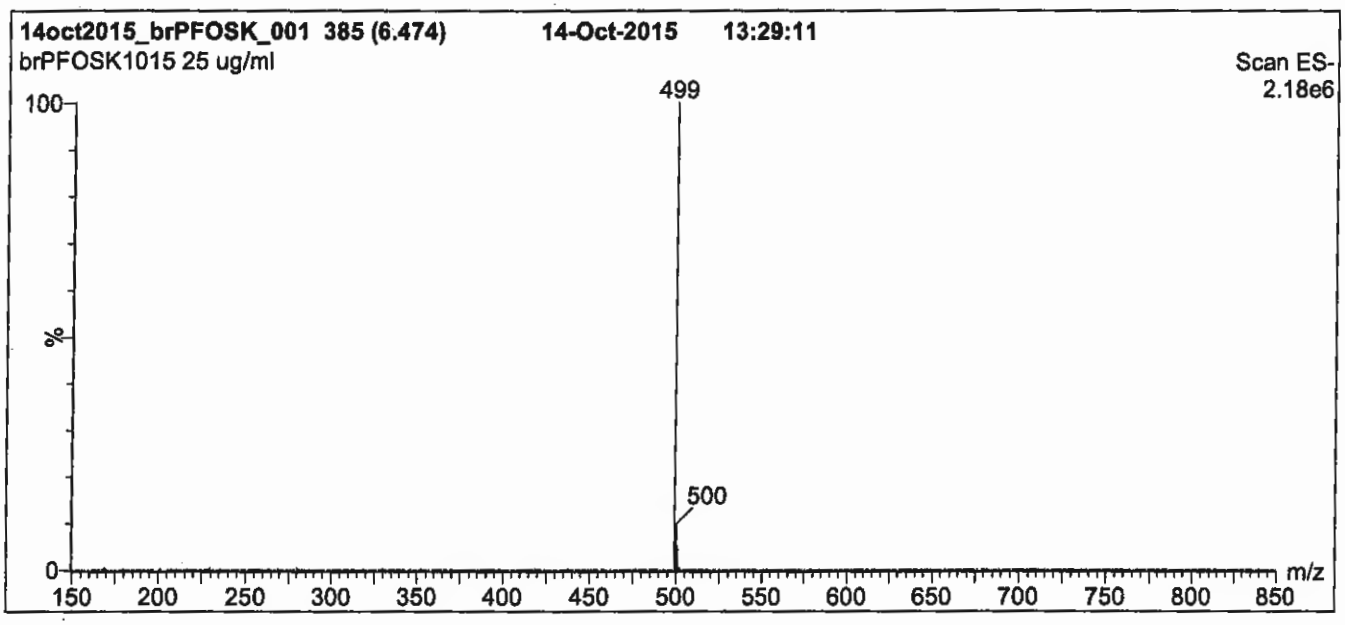
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CFSO_3^-K^+$ (CF$_3$ branch)	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CFCF_2SO_3^-K^+$ (CF$_3$ branch)	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CFCF_2CF_2SO_3^-K^+$ (CF$_3$ branch)	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CFCF_2CF_2CF_2SO_3^-K^+$ (CF$_3$ branch)	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CFCF_2CF_2CF_2CF_2SO_3^-K^+$ (CF$_3$ branch)	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CFCF_2CF_2CF_2CF_2CF_2SO_3^-K^+$ (CF$_3$ branch)	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 10/15/2015
B.G. Chittim (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 RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

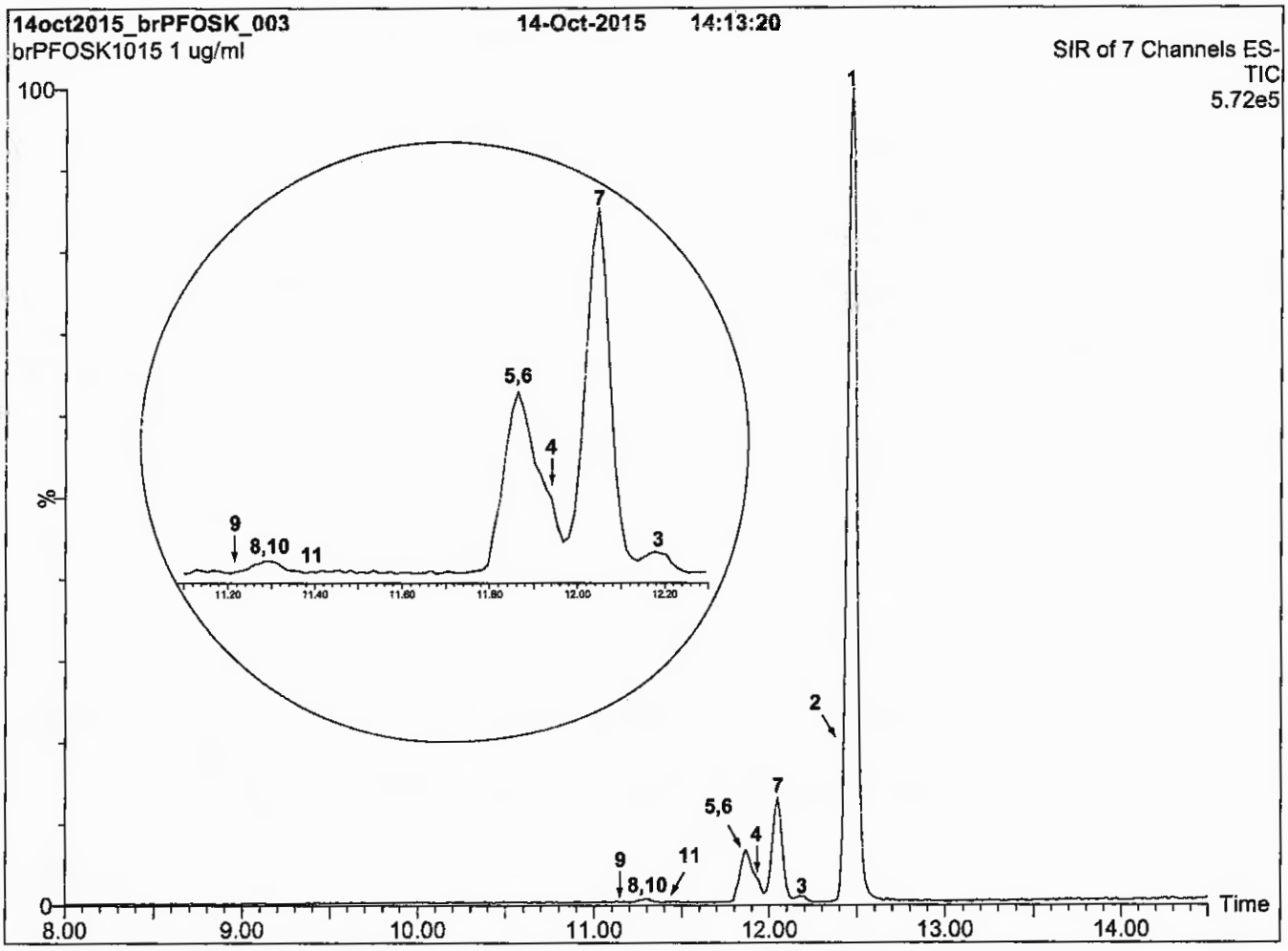
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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 RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

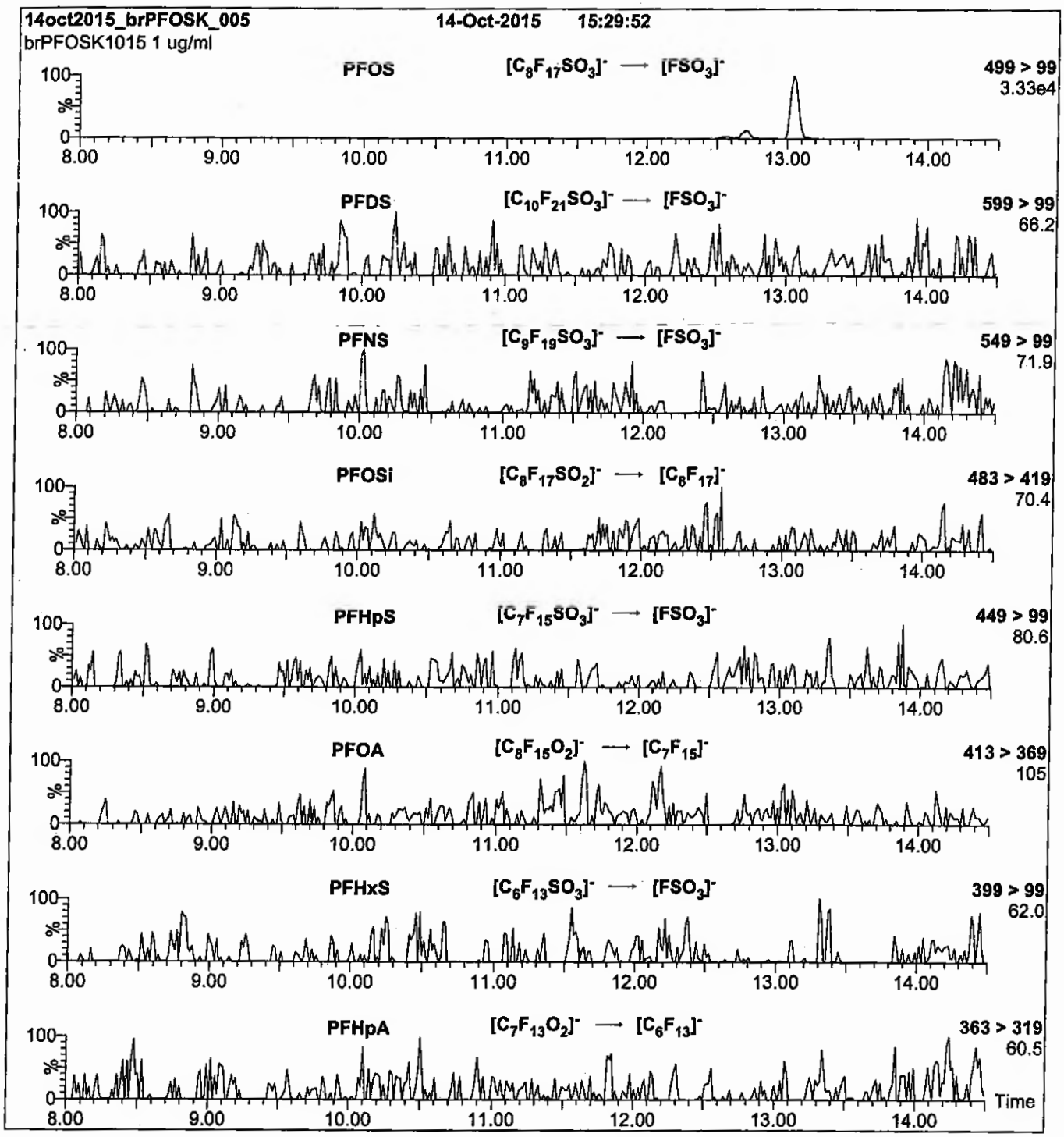
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

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



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00006

Rec 12/30/15 CW

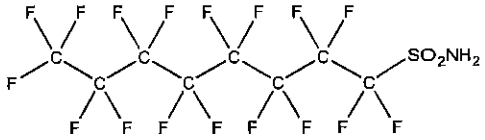
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide
LOT NUMBER: FOSA0815I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
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:** 09/11/2015 (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:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 AR REFERENCE MATERIAL PRODUCER

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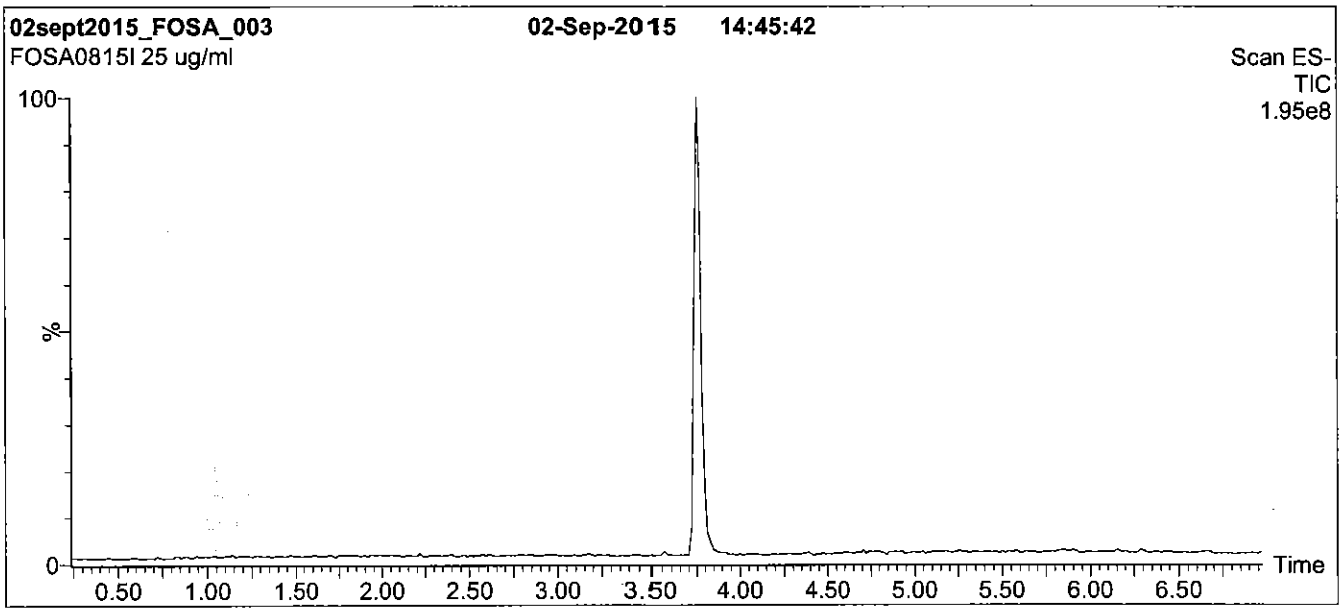
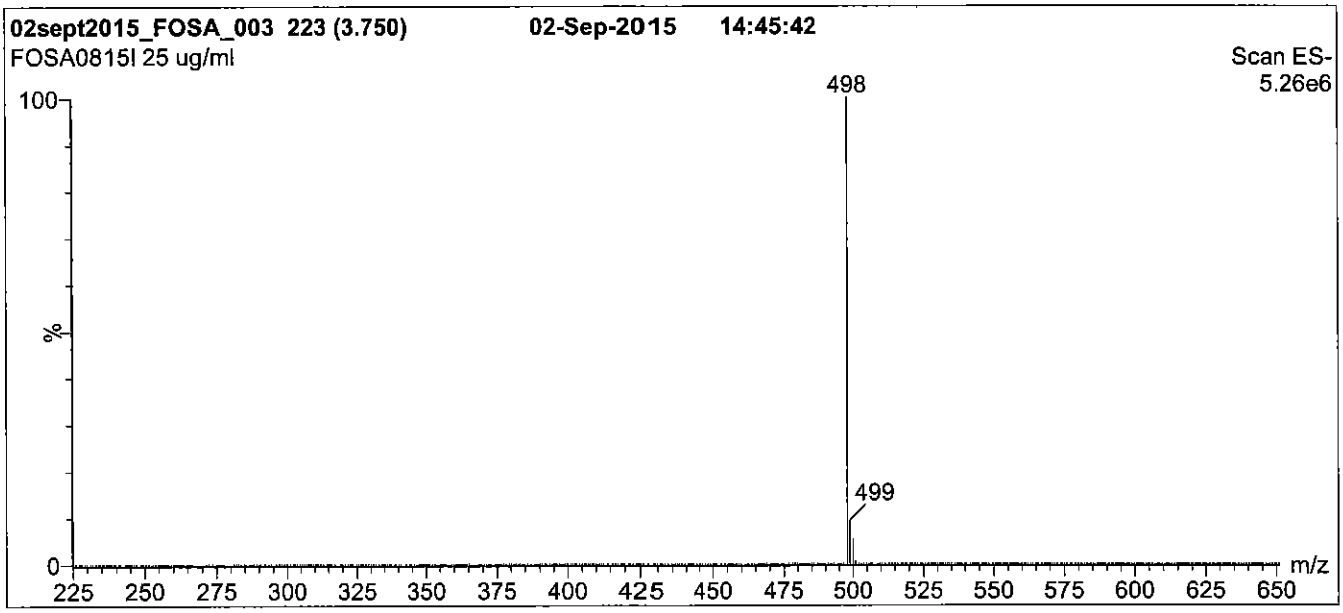
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

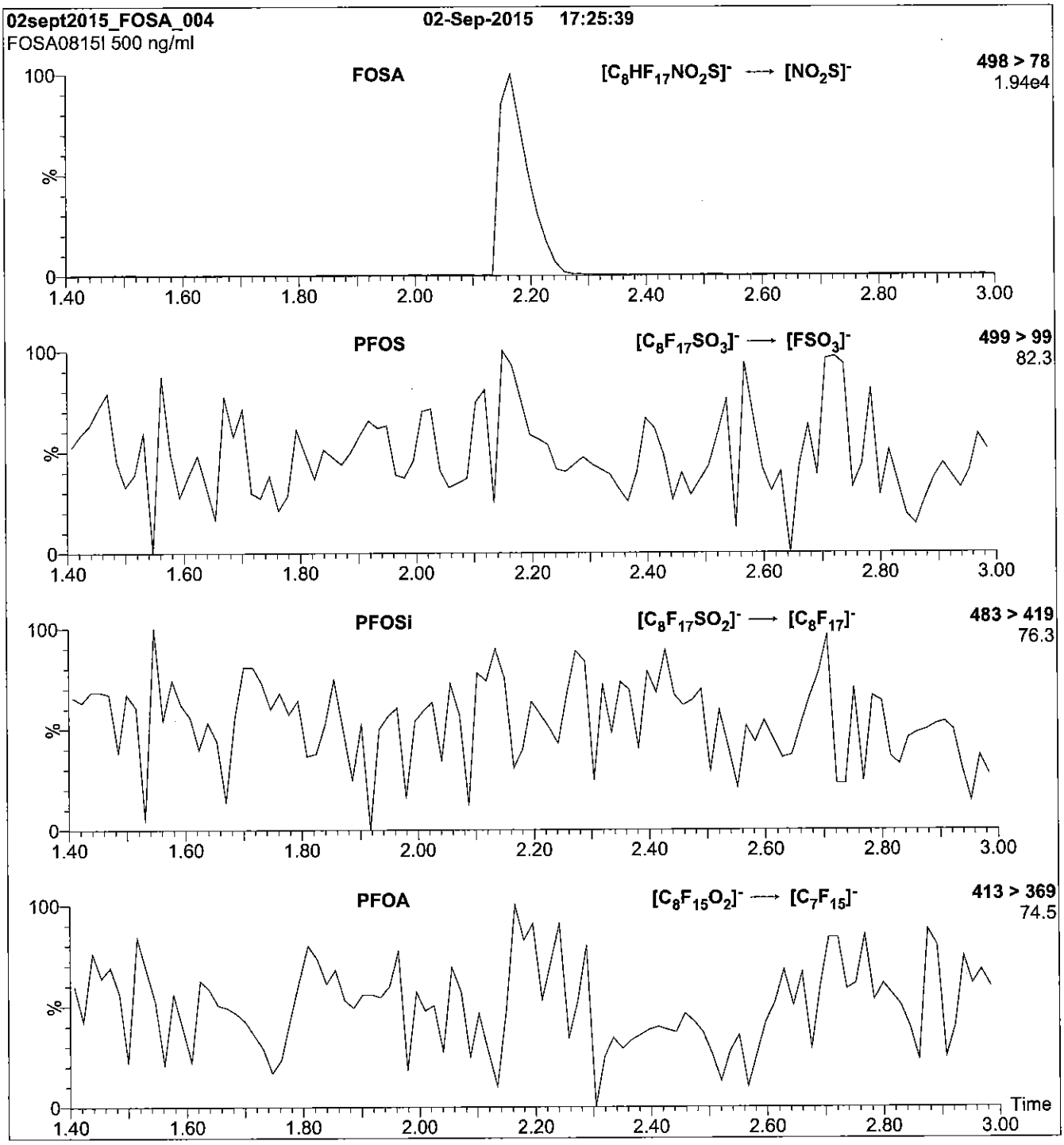
Flow: 300 µl/min

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 µl (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 µl/min

MS Parameters

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

Reagent

LCPFOSA_00008

Scanned 10/14/16

R: SBC 9/13/16

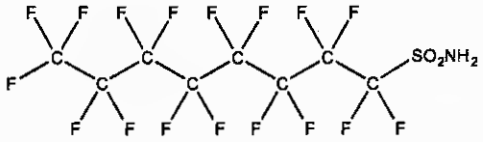
730534
ID: LCPFOSA_00009
Exp: 09/02/17 Prpd: SBC
PF-1-octanesulfonamide

730533
ID: LCPFOSA_00008
Exp: 09/02/17 Prpd: SBC
PF-1-octanesulfonamide

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0815I
COMPOUND:	Perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
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.

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Certified By: B.G. Chittim **Date:** 09/11/2015 (mm/dd/yyyy)

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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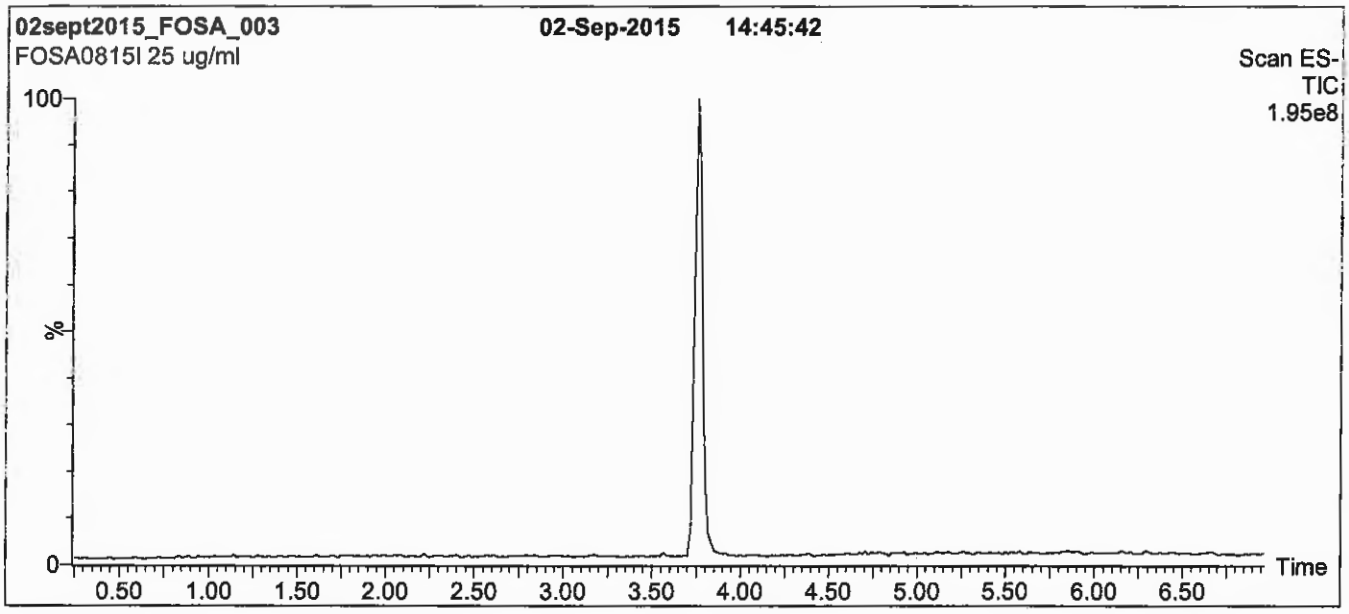
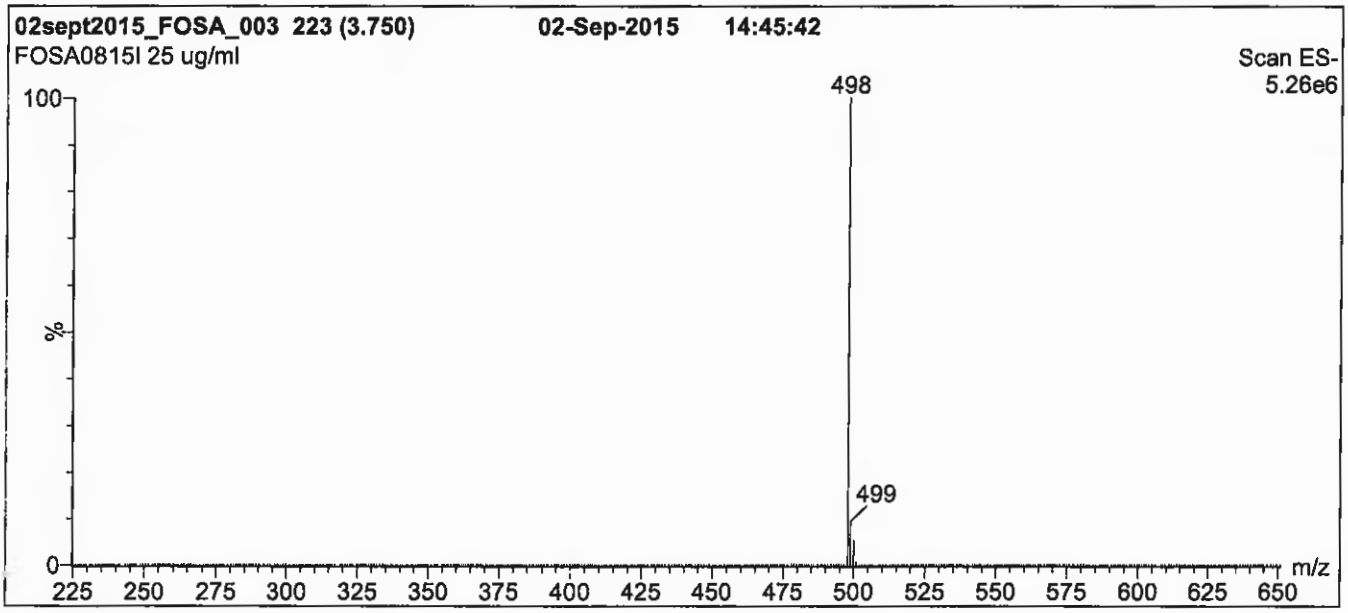
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

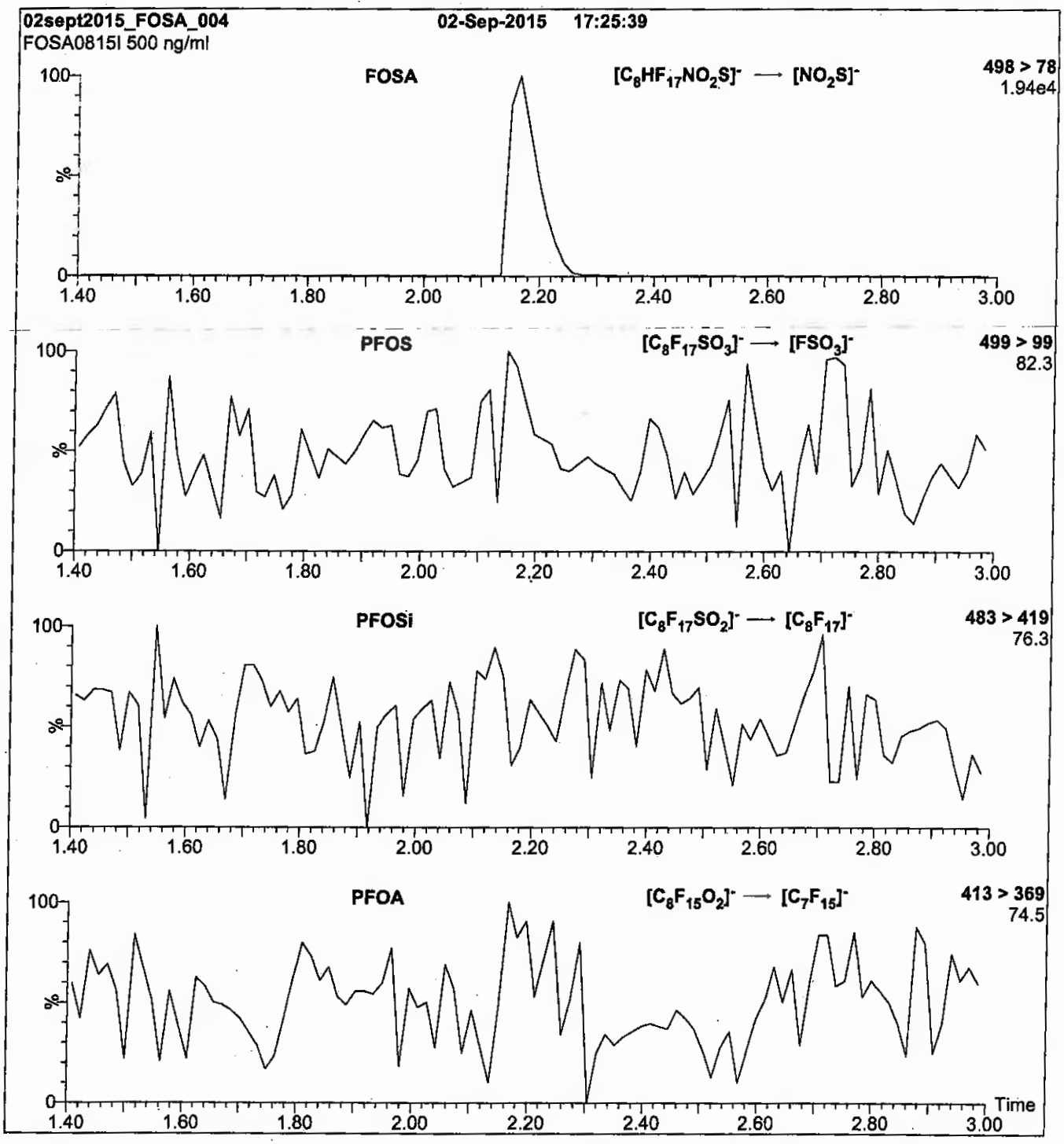
Flow: 300 µl/min

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 µl (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 µl/min

MS Parameters

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

Reagent

LCPFPeA_00005

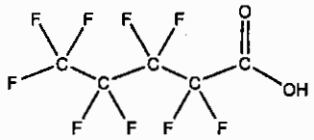
R: 7/6/16 CBW

671579
ID: LCPFPeA_00005
Exp: 01/30/20 Prpd: CBW
PF-n-pentanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0115
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_9O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/30/2015		
EXPIRY DATE: (mm/dd/yyyy)	01/30/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% 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 **Date:** 03/26/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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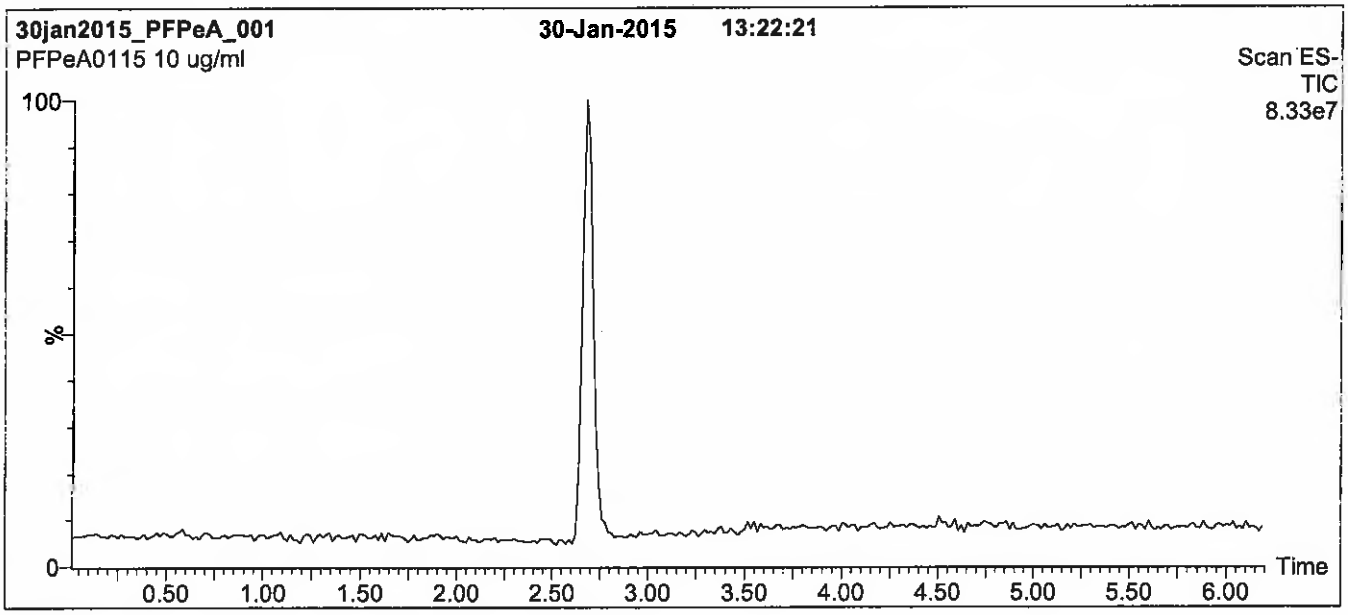
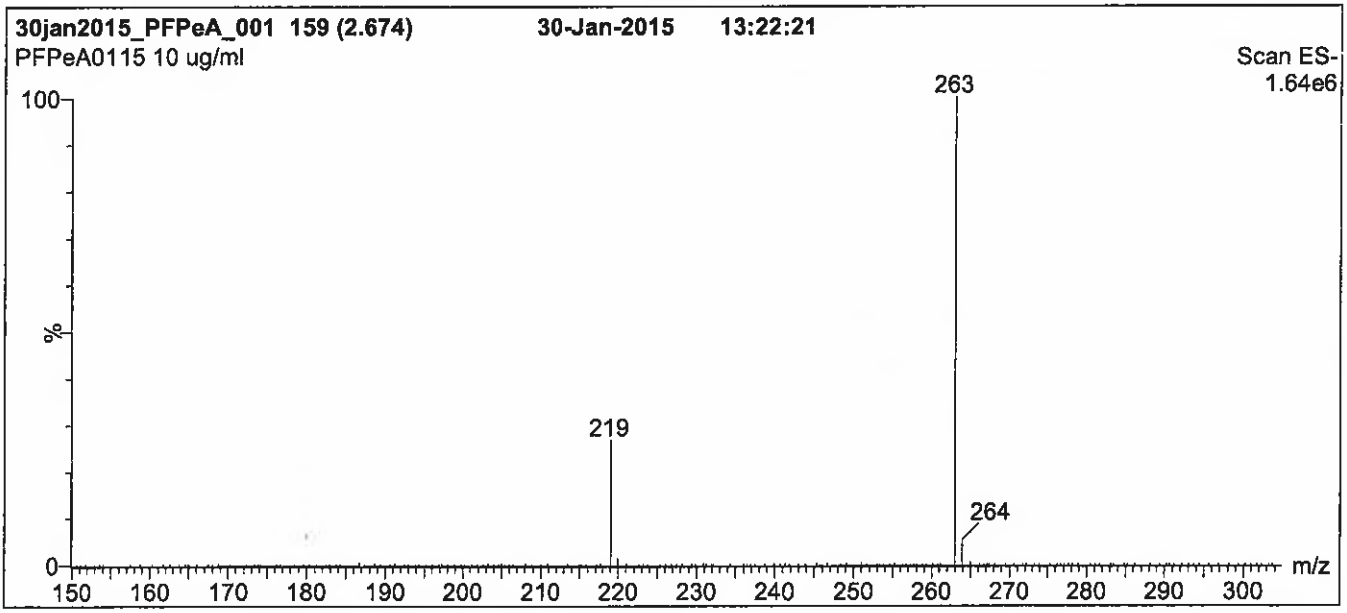
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

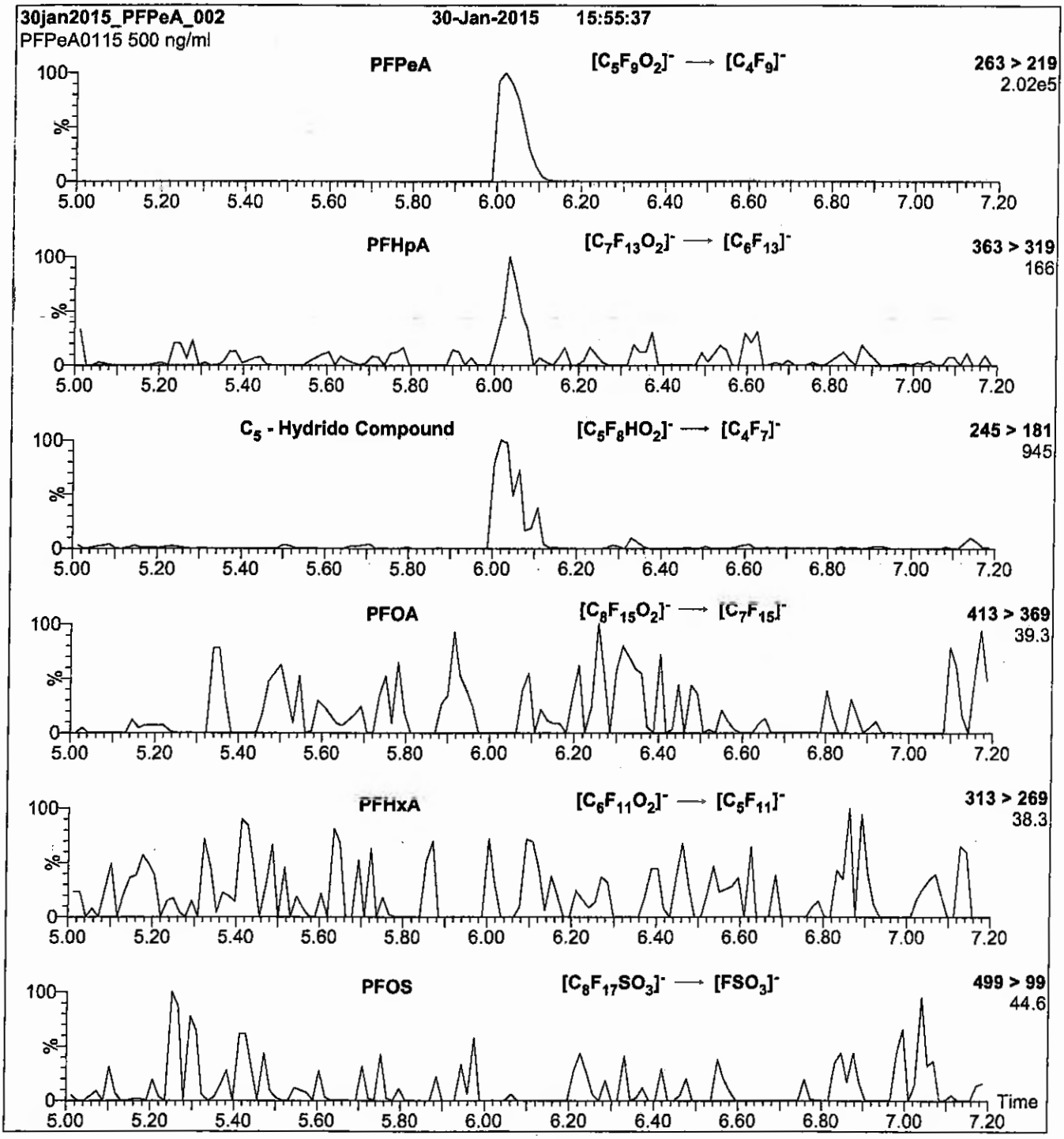
Flow: 300 µl/min

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 µl (500 ng/ml PFPeA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCPFTeDA_00004

609696
ID: LCPFTeDA_00004
Exp: 12/09/20 Prpd: CBW
PF-n-tetradecanoic acid

R: 4/7/16 CBW

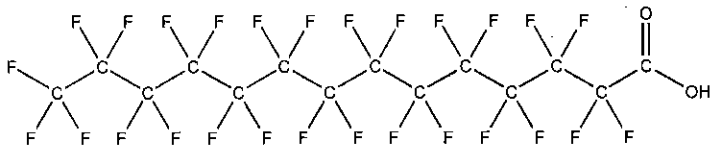
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid
LOT NUMBER: PFTeDA1215

STRUCTURE:

CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (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:

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HOMOGENEITY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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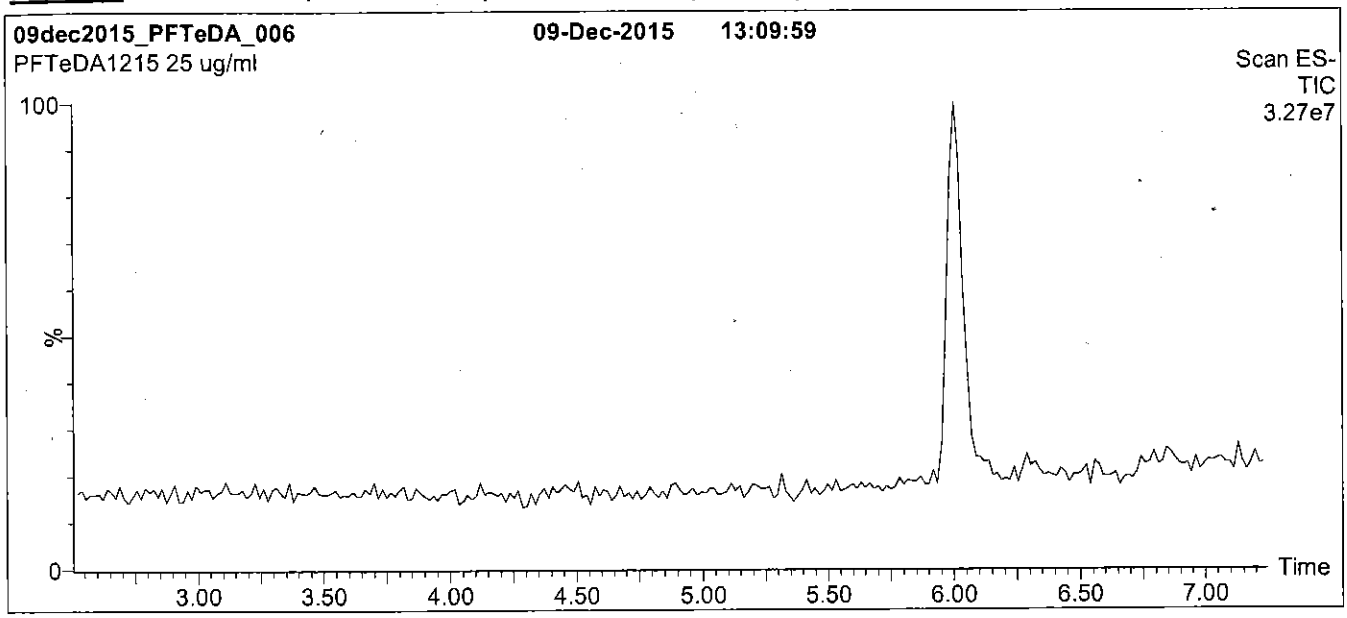
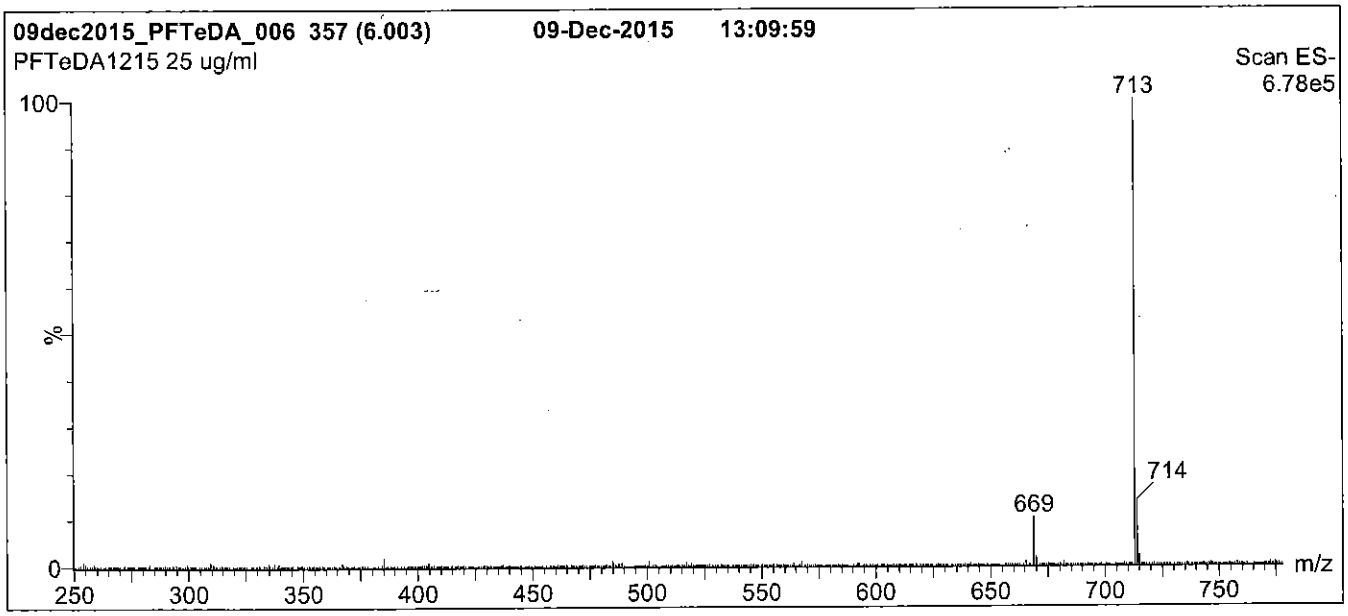
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc 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

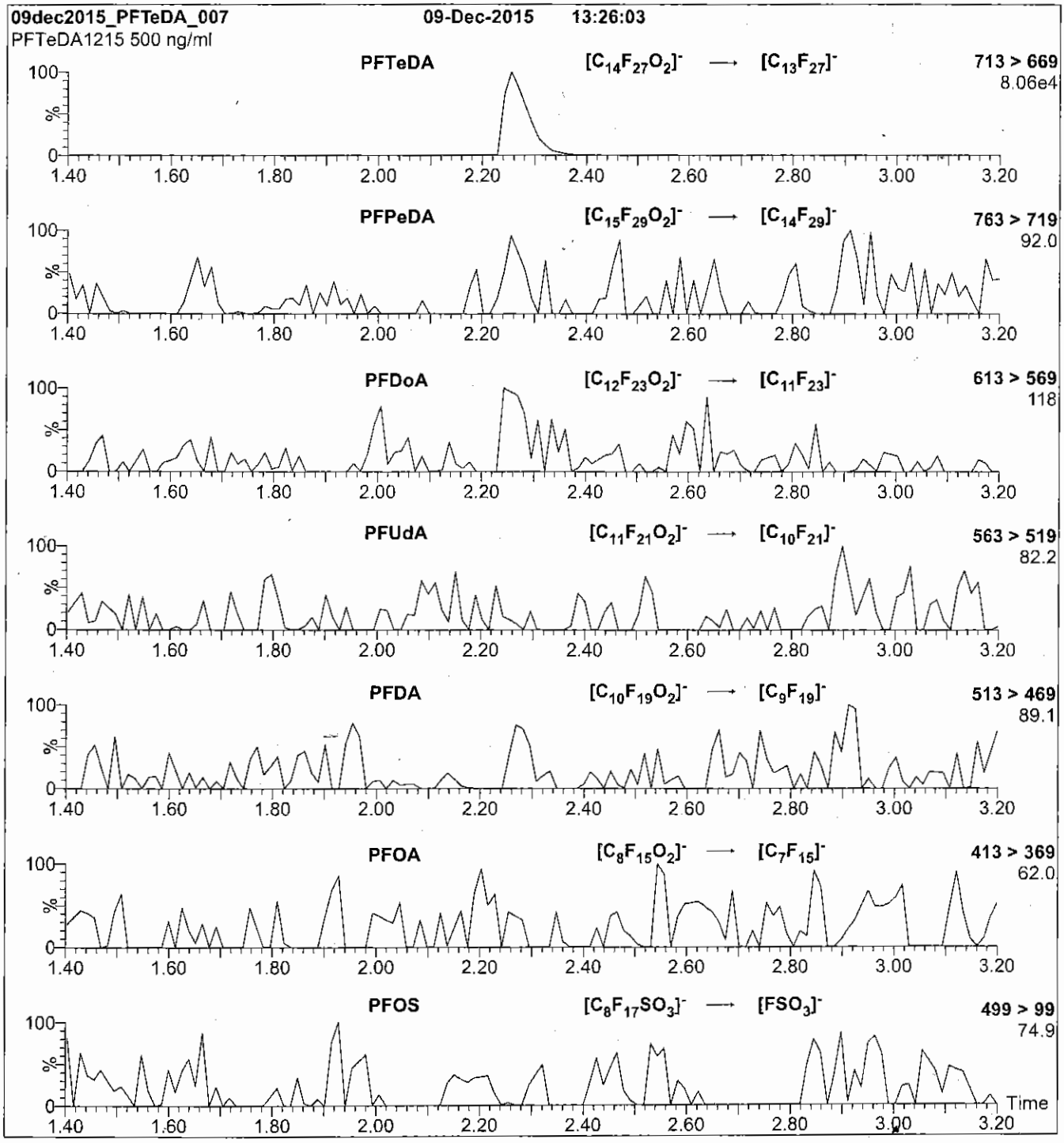
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 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 µl (500 ng/ml PFTeDA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTeDA_00005

R: SBG 9/13/16

730645
ID: LCPFTeDA_00005
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

730659
ID: LCPFTeDA_00006
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

WELLINGTON LABORATORIES

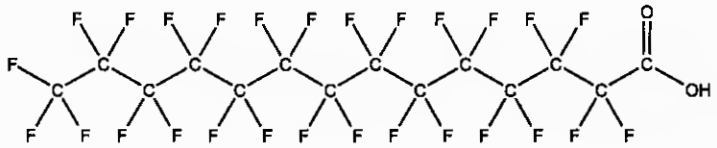
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid

LOT NUMBER: PFTeDA1215

STRUCTURE:

CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 714.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (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

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EXPIRY DATE / PERIOD OF VALIDITY:

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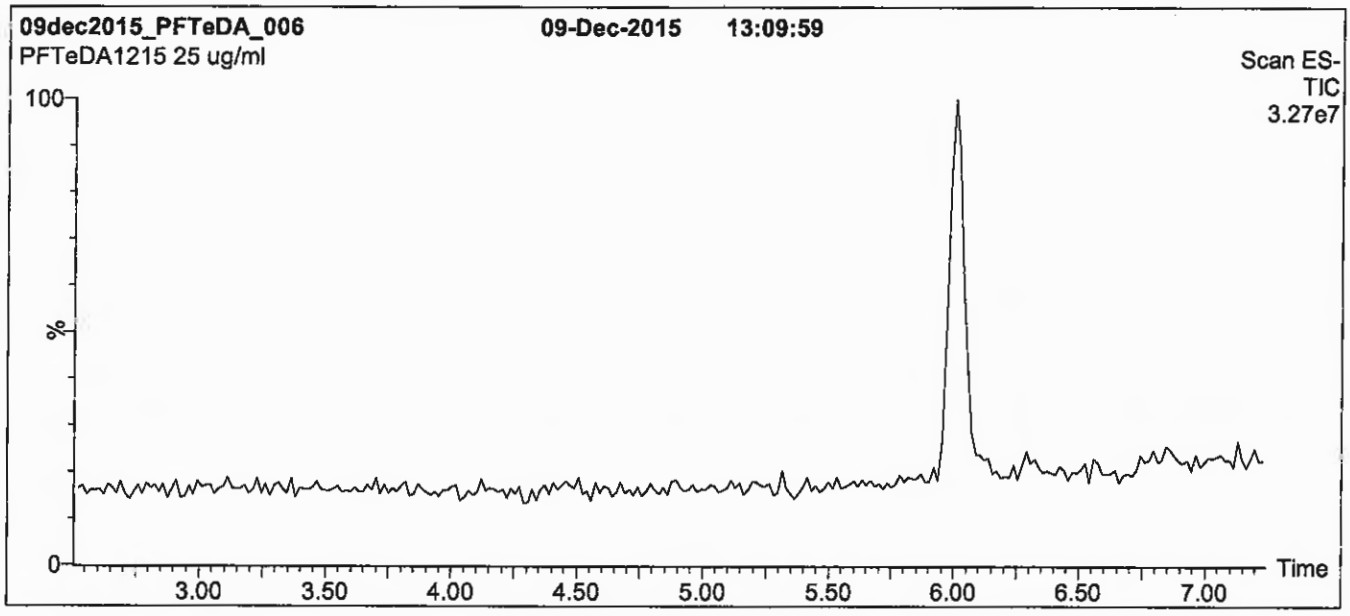
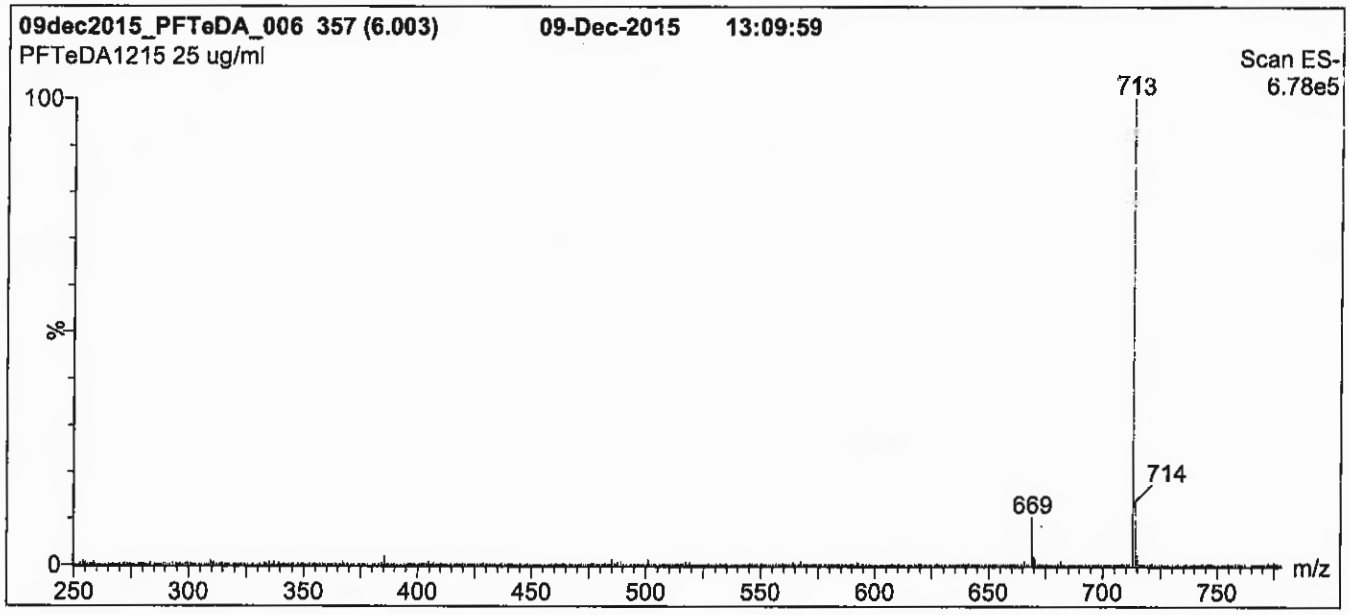




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc 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

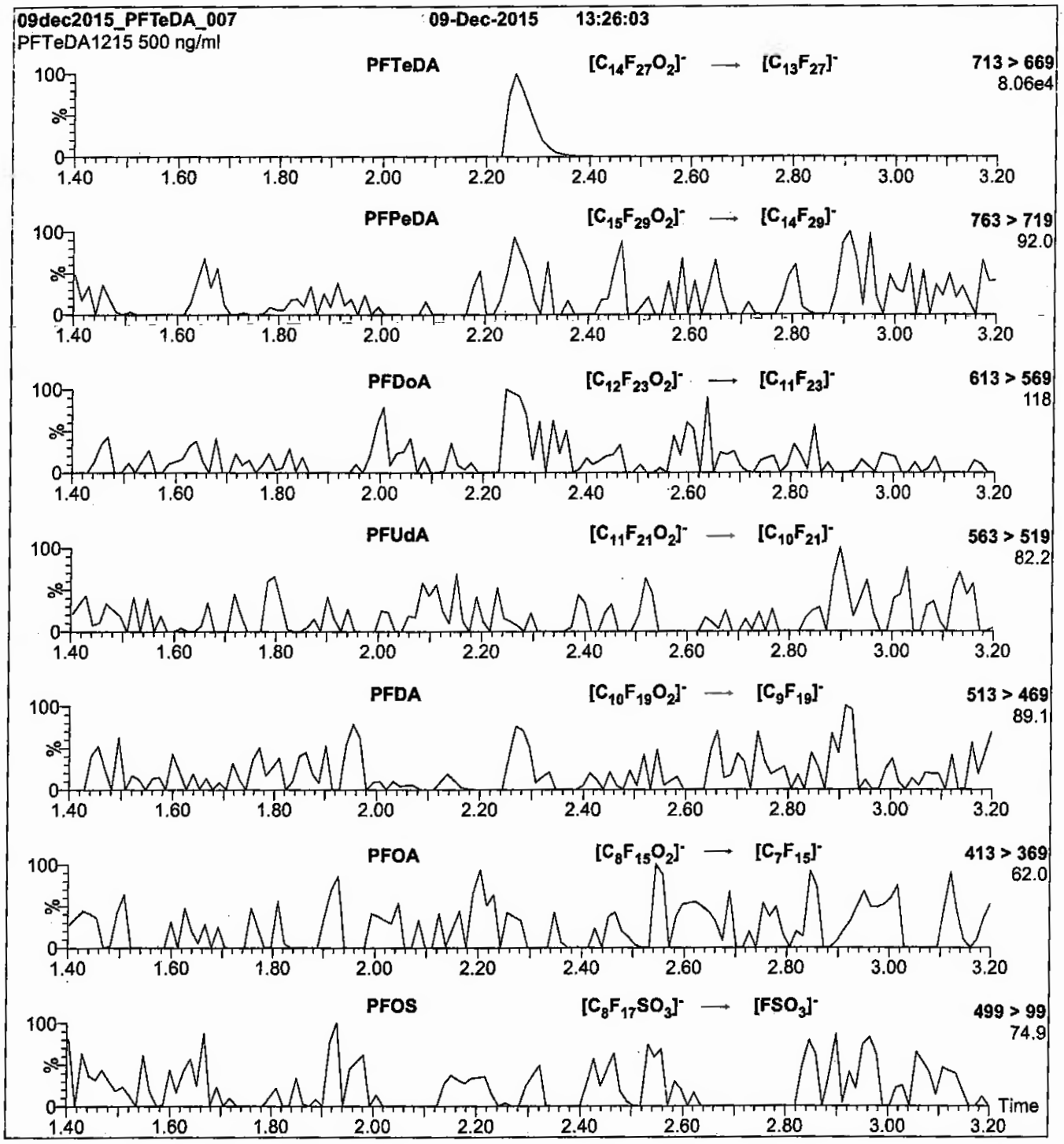
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 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 µl (500 ng/ml PFTeDA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00004

609697
ID: LCPFTrDA_00004
Exp: 12/10/18 Prpd: CBW
PF-n-tridecanoic acid

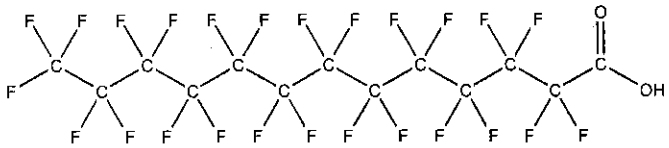
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA1213
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/10/2013
EXPIRY DATE: (mm/dd/yyyy) 12/10/2018
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 **Date:** 03/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON 'N1G 3M5 CANADA
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CALA Technical Accreditation No: A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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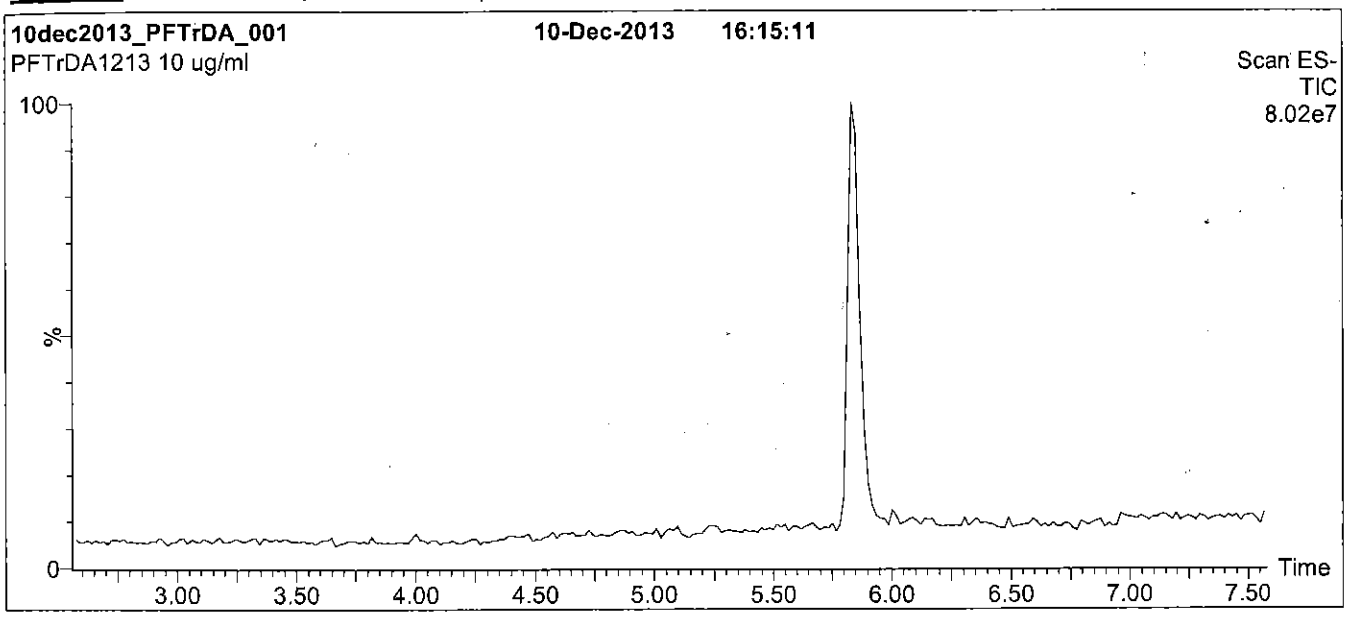
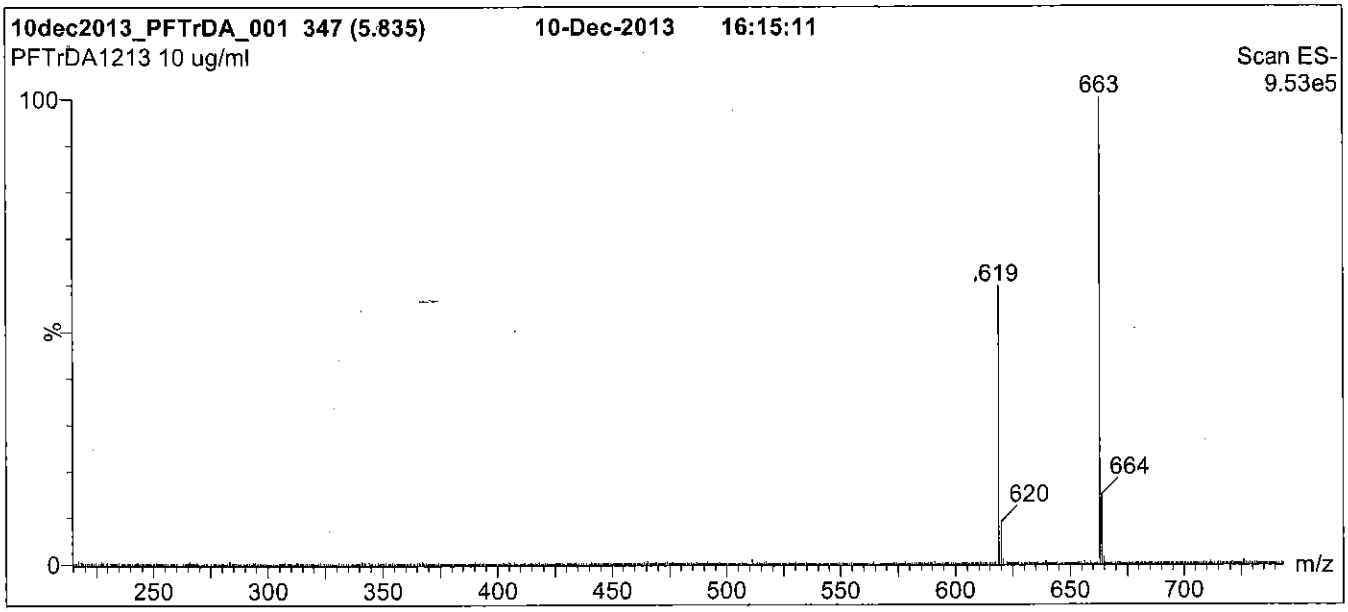
Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

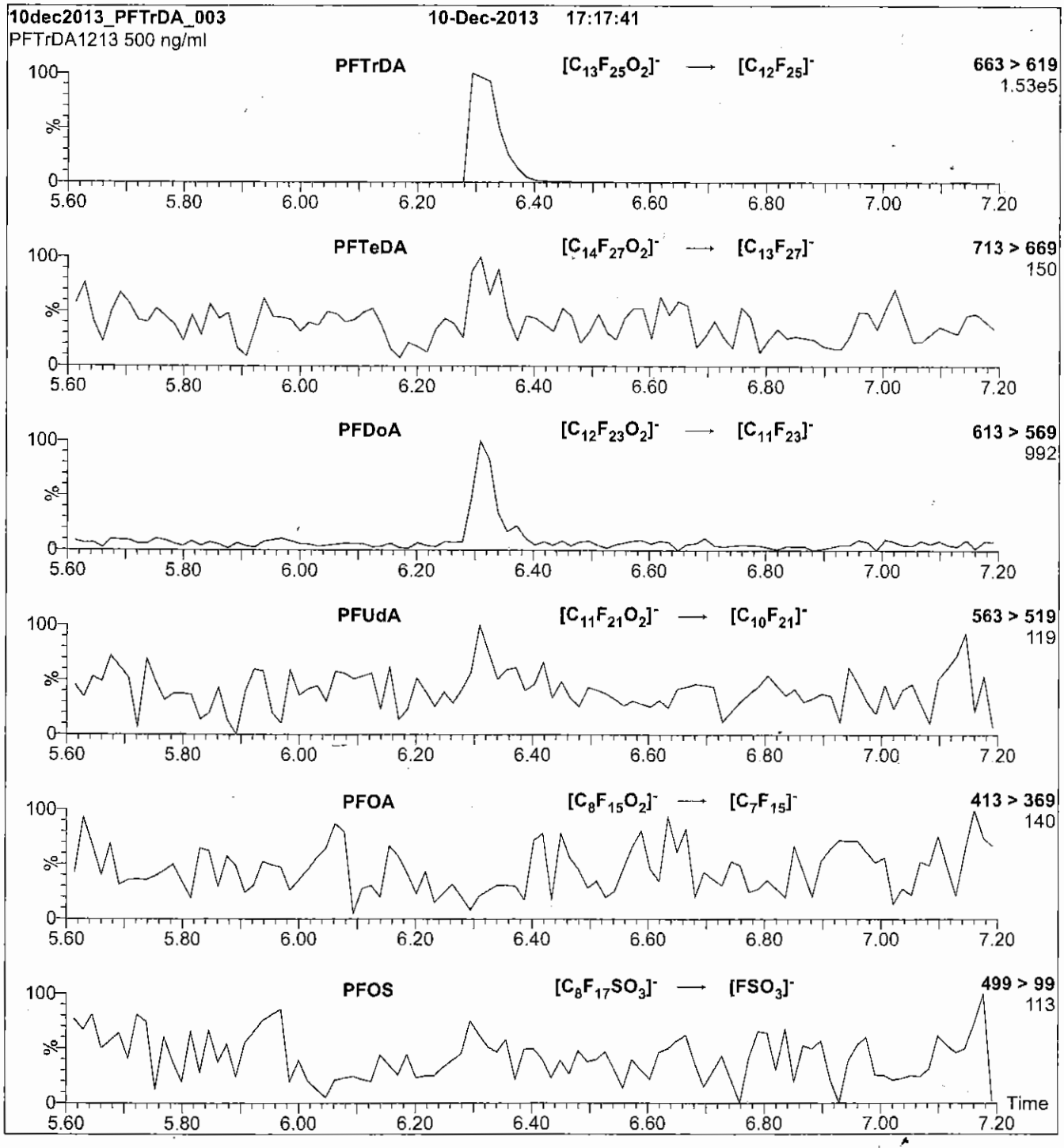
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 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 µl (500 ng/ml PFTrDA)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFTrDA_00005

R: SBC 9/13/16

730665
ID: LCPFTrDA_00005
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

730666
ID: LCPFTrDA_00006
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

WELLINGTON LABORATORIES

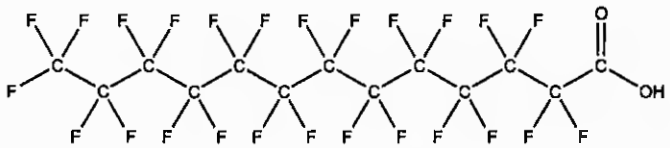
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid

LOT NUMBER: PFTrDA0216

STRUCTURE:

CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 664.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 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 **Date:** 02/16/2016 (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 $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

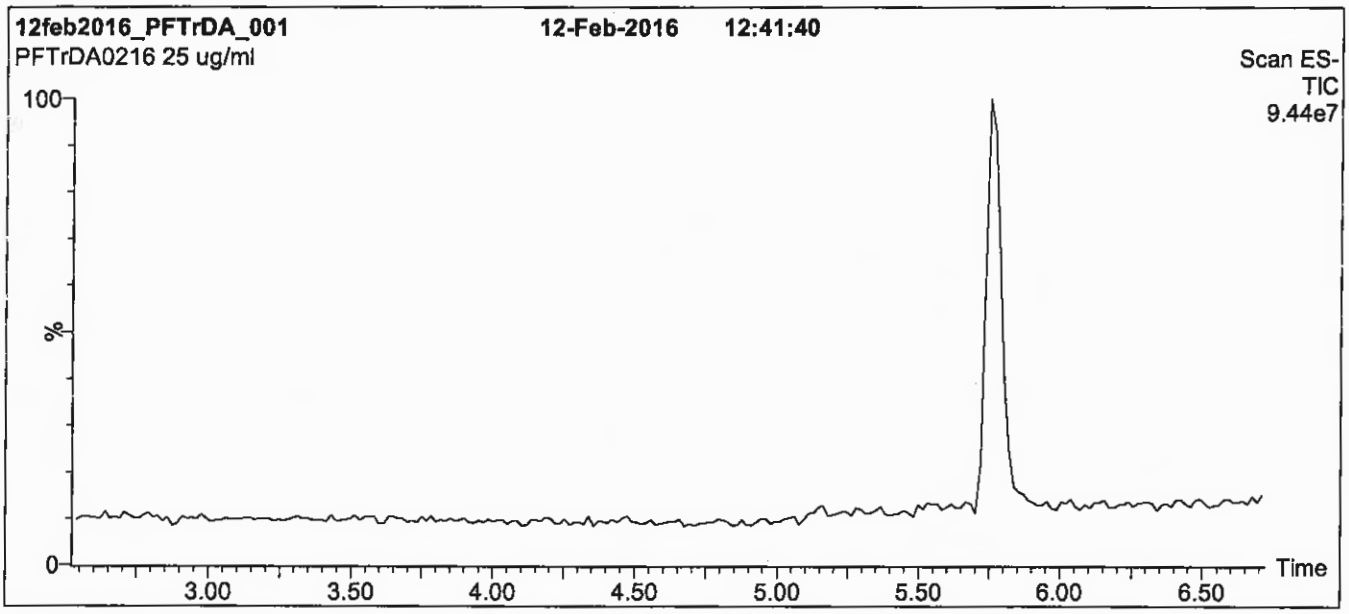
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

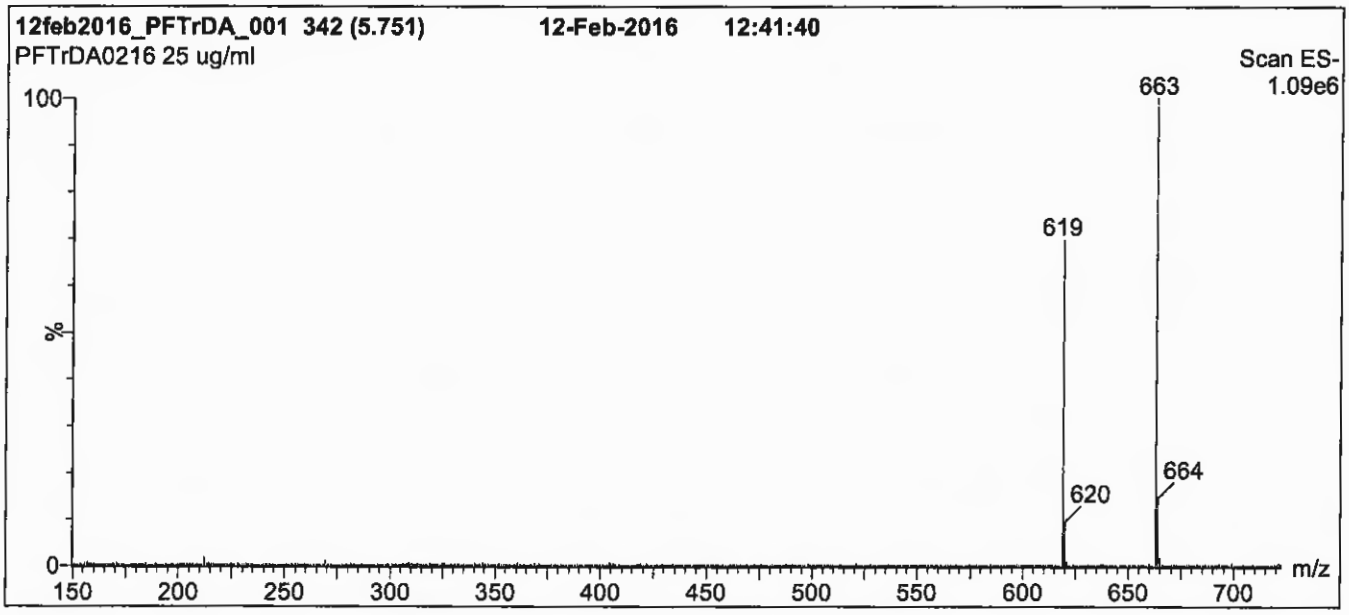
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc 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

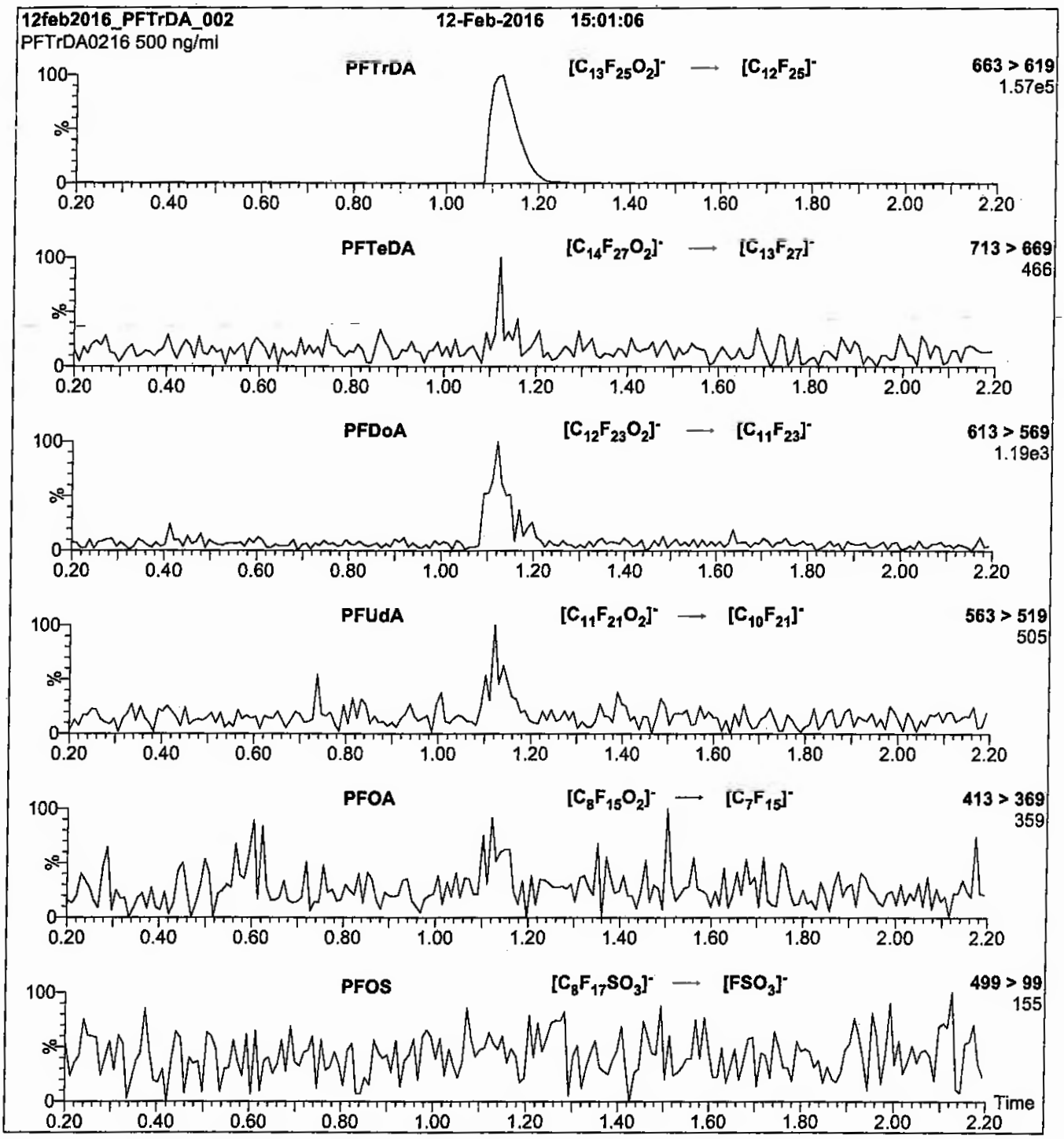
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 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 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00005

Scanned 10/14/16 R: SBC 9/13/16

730535
ID: LCPFUdA_00005
Exp: 08/19/20 Prpd: SBC
PF-n-undecanoic acid

730536
ID: LCPFUdA_00006
Exp: 08/19/20 Prpd: SBC
PF-n-undecanoic acid

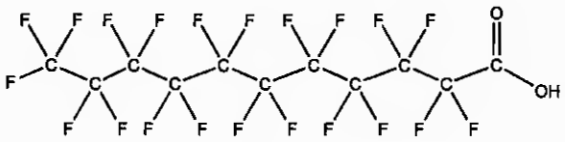
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFUdA
LOT NUMBER: PFUdA0815
COMPOUND: Perfluoro-n-undecanoic acid

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
MOLECULAR WEIGHT: 564.09
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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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.

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Certified By: B.G. Chittim **Date:** 08/21/2015 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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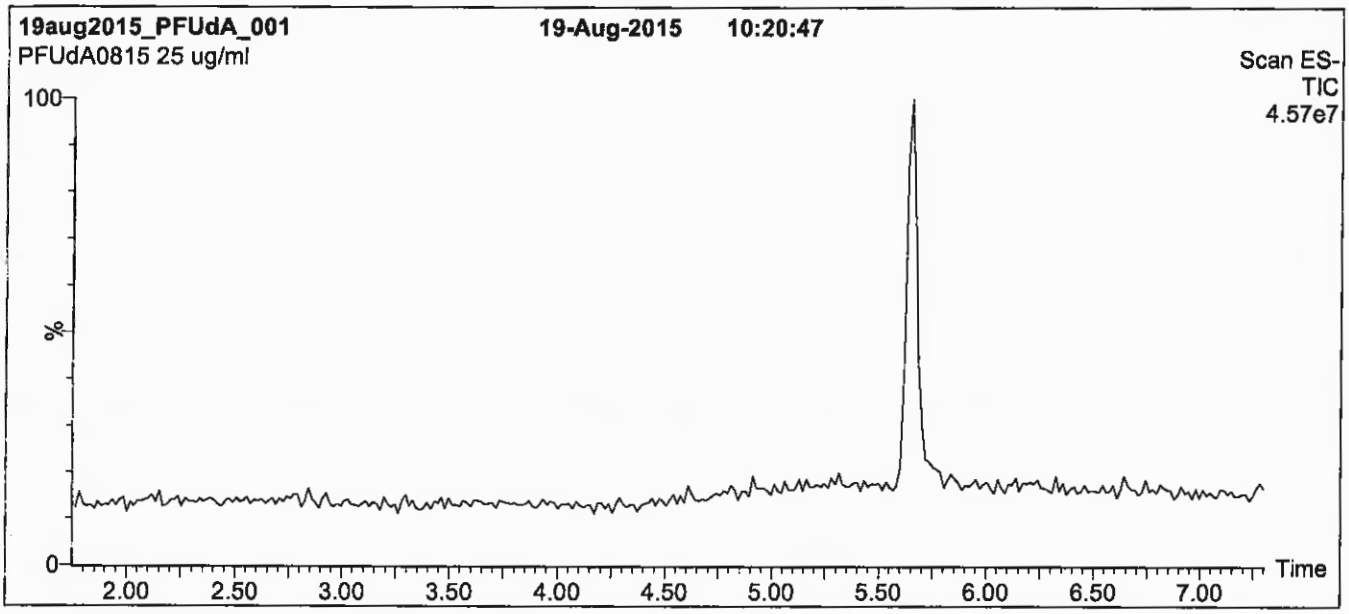
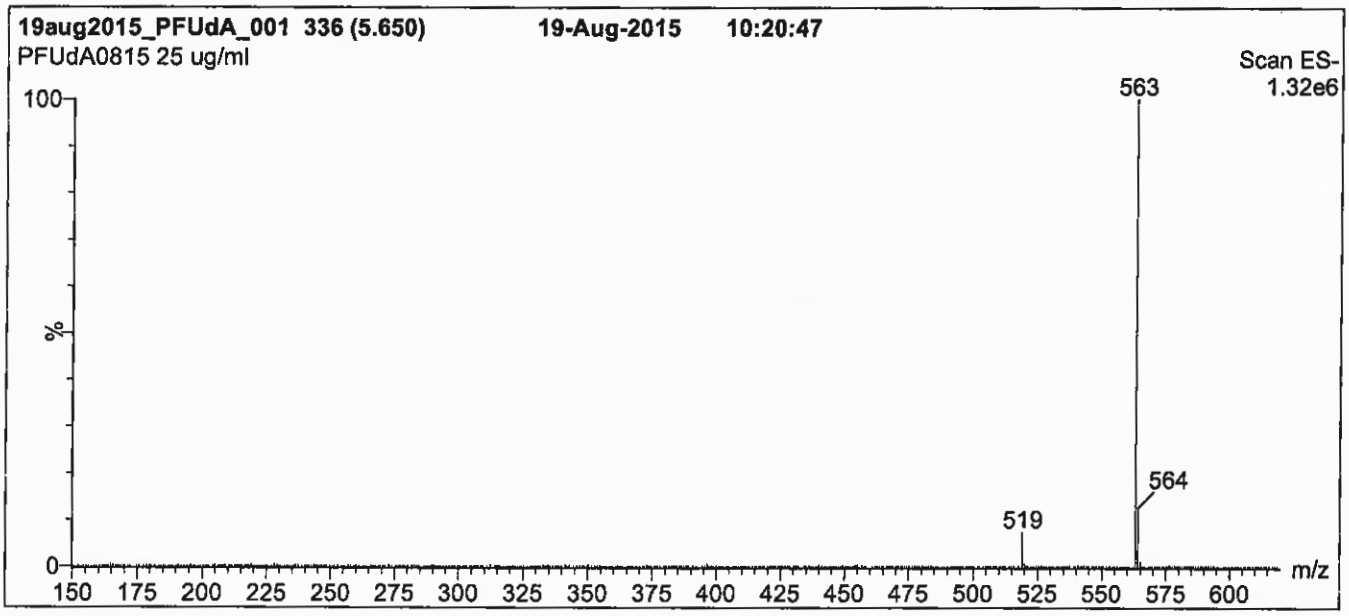
Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc 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

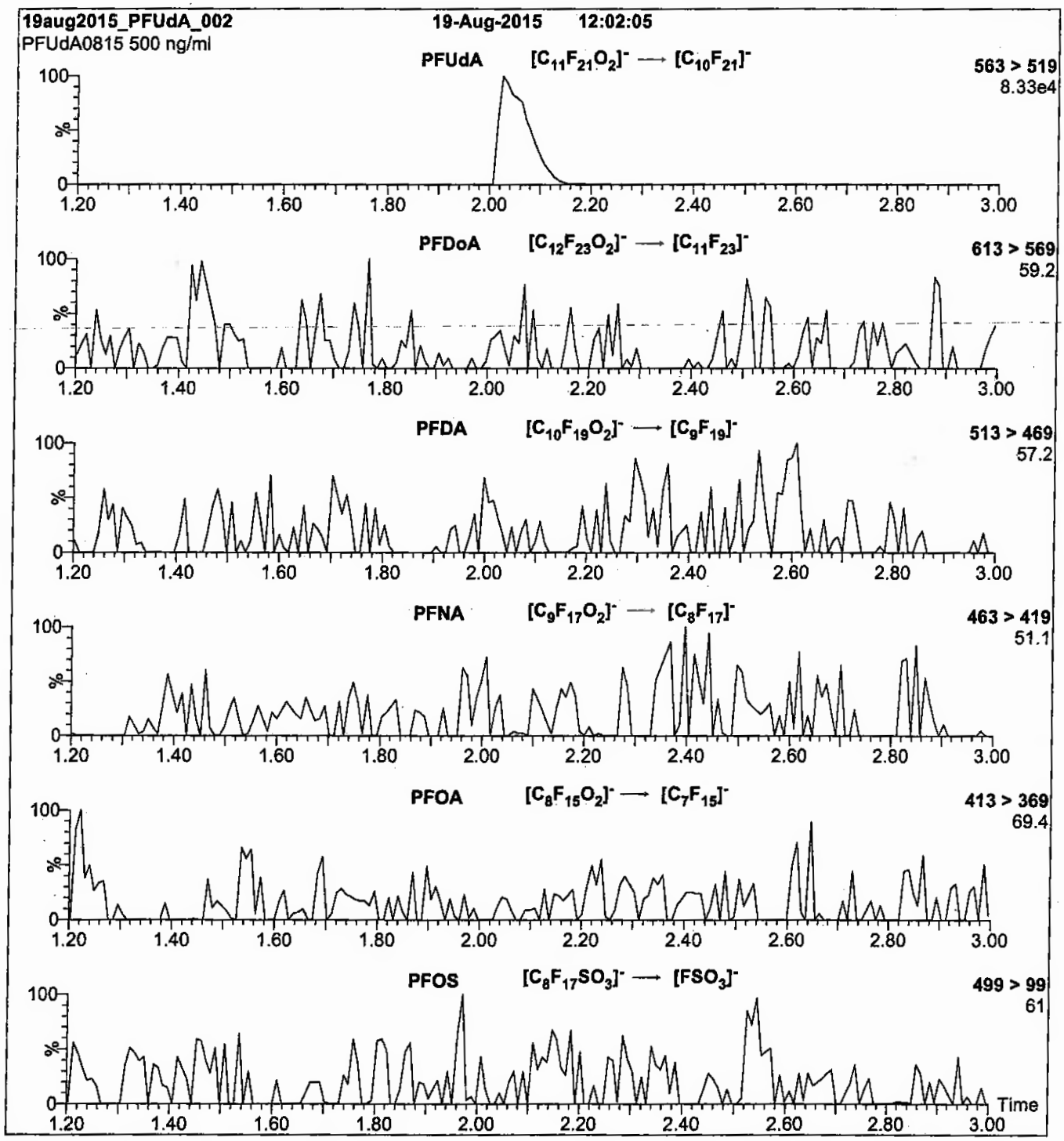
Flow: 300 µl/min

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) = 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 µl (500 ng/ml PFUdA)

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFBA #	13CPeA #	PFHxA #	13CHpA #	PFHxS #	PFOA #	PFNA #	13C8FOS #	
FSS5TMW-1216	320-24149-2	45	79	87	76	91	90	65	4	Q
EBWC120616	320-24149-4	126	132	122	126	126	129	124	55	

	QC LIMITS
PFBA = 13C4 PFBA	25-150
13CPeA = 13C5-PFPeA	25-150
PFHxA = 13C2 PFHxA	25-150
13CHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150
13C8FOS = 13C8 FOSA	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFDA #	PFUnA #	PFDoA #
FSS5TMW-1216	320-24149-2	97	98	98
EBWC120616	320-24149-4	127	122	118

	QC LIMITS
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFBA #	13CPeA #	PFHxA #	13CHpA #	PFHxS #	PFOA #	PFNA #	PFOS #
FSS4TMW-1216	320-24149-1	29	22 Q	17 Q	5 Q	13 Q	7 Q	5 Q	4 Q
FSS4TMW-1216 DL	320-24149-1 DL	142	134	143	65	206 Q	88	58	57
FSS5TMW-1216 DL	320-24149-2 DL	96	116	102	100	121	96	96	112
EBGW120616	320-24149-3	131	131	118	120	122	126	122	127
	MB 320-142967/1-A	131	137	131	132	130	133	126	126
	LCS 320-142967/2-A	131	132	126	128	128	127	123	128

	QC LIMITS
PFBA = 13C4 PFBA	25-150
13CPeA = 13C5-PFPeA	25-150
PFHxA = 13C2 PFHxA	25-150
13CHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150
PFOS = 13C4 PFOS	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	13C8FOS #	PFDA #	PFUnA #	PFDoA #
FSS4TMW-1216	320-24149-1	61	73	110	102
FSS4TMW-1216 DL	320-24149-1 DL	128	153 Q	146	160 Q
FSS5TMW-1216 DL	320-24149-2 DL	4 Q	88	86	91
EBGW120616	320-24149-3	42	135	133	132
	MB 320-142967/1-A	64	130	127	112
	LCS 320-142967/2-A	62	127	119	114

	QC LIMITS
13C8FOS = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFOS #
FSS4TMW-1216 DL2	320-24149-1 DL2	117
EBWC120616 RA	320-24149-4 RA	116
	MB 320-142967/1-A RA	113
	LCS 320-142967/2-A RA	126

	QC LIMITS
PFOS = 13C4 PFOS	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 28DEC2016C_004.d

Lab ID: LCS 320-142967/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	0.0400	0.0441	110	60-140	
Perfluoropentanoic acid (PFPeA)	0.0400	0.0422	105	60-140	
Perfluorohexanoic acid (PFHxA)	0.0400	0.0413	103	60-140	
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0418	104	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0406	101	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0384	96	60-140	
Perfluorodecanoic acid (PFDA)	0.0400	0.0399	100	60-140	
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0382	95	60-140	
Perfluorododecanoic acid (PFDoA)	0.0400	0.0386	96	60-140	
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0384	96	50-150	
Perfluorotetradecanoic acid (PFTeA)	0.0400	0.0478	120	50-150	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0432	122	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0397	109	60-140	
Perfluorodecanesulfonic acid (PFDS)	0.0386	0.0385	100	50-150	
Perfluorooctane Sulfonamide (FOSA)	0.0400	0.0384	96	60-140	
13C8 FOSA	0.100	0.0621	62	25-150	
13C4 PFBA	0.100	0.131	131	25-150	
13C5-PFPeA	0.100	0.132	132	25-150	
13C2 PFHxA	0.100	0.126	126	25-150	
13C4-PFHpA	0.100	0.128	128	25-150	
13C4 PFOA	0.100	0.127	127	25-150	
13C5 PFNA	0.100	0.123	123	25-150	
13C2 PFDA	0.100	0.127	127	25-150	
13C2 PFUnA	0.100	0.119	119	25-150	
13C2 PFDoA	0.100	0.114	114	25-150	
18O2 PFHxS	0.0946	0.121	128	25-150	
13C4 PFOS	0.0956	0.123	128	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 30DEC2016B_033.d

Lab ID: LCS 320-142967/2-A RA Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0511	138	60-140	
13C4 PFOS	0.0956	0.121	126	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab File ID: 28DEC2016C_003.d Lab Sample ID: MB 320-142967/1-A

Matrix: Water Date Extracted: 12/19/2016 14:38

Instrument ID: A8_N Date Analyzed: 12/29/2016 00:06

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-142967/2-A	28DEC2016C_004.d	12/29/2016 00:14
FSS4TMW-1216	320-24149-1	28DEC2016C_005.d	12/29/2016 00:21
FSS5TMW-1216	320-24149-2	28DEC2016C_006.d	12/29/2016 00:29
EBWC120616	320-24149-4	28DEC2016C_008.d	12/29/2016 00:44
FSS4TMW-1216 DL	320-24149-1 DL	30DEC2016B_003.d	12/30/2016 12:33

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab File ID: 30DEC2016B_032.d Lab Sample ID: MB 320-142967/1-A

Matrix: Water Date Extracted: 12/19/2016 14:38

Instrument ID: A8_N Date Analyzed: 12/30/2016 16:11

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
FSS5TMW-1216 DL	320-24149-2 DL	30DEC2016B_007.d	12/30/2016 13:03
EBGW120616	320-24149-3	30DEC2016B_010.d	12/30/2016 13:26
	LCS 320-142967/2-A RA	30DEC2016B_033.d	12/30/2016 16:19
EBWC120616 RA	320-24149-4 RA	30DEC2016B_034.d	12/30/2016 16:26
FSS4TMW-1216 DL2	320-24149-1 DL2	04JAN2017A_044.d	01/04/2017 21:25

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS4TMW-1216 | Lab Sample ID: 320-24149-1

Matrix: Water | Lab File ID: 28DEC2016C_005.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 12:20

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 281.4(mL) | Date Analyzed: 12/29/2016 00:21

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*1.7*	*E*	*0.0022*	0.00089	*0.00041*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*1.2*	*E*	*0.0022*	0.0018	*0.00088*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*2.3*	*E B*	*0.0022*	0.0018	*0.00070*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*5.5*	*E*	*0.0022*	0.0018	*0.00071*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*13*	*E*	*0.0022*	0.0018	*0.00066*
375-95-1	Perfluorononanoic acid (PFNA)	0.18		0.0022	0.0018	0.00058
335-76-2	Perfluorodecanoic acid (PFDA)	0.026		0.0022	0.00089	0.00039
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0022	0.0018	0.00066
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0022	0.0018	0.00052
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0022	0.0018	0.00049
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00046	J	0.0022	0.00089	0.00036
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*2.2*	*E M*	*0.0022*	0.0018	*0.00082*
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*4.8*	*E*	*0.0022*	0.0018	*0.00077*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*41*	*E Q*	*0.0036*	0.0027	*0.0011*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.11		0.0036	0.0027	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.012	M	0.0022	0.0018	0.00057

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS4TMW-1216 | Lab Sample ID: 320-24149-1

Matrix: Water | Lab File ID: 28DEC2016C_005.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 12:20

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 281.4(mL) | Date Analyzed: 12/29/2016 00:21

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	61		25-150
STL00992	13C4 PFBA	29		25-150
STL01893	13C5-PFPeA	22	Q	25-150
STL00993	13C2 PFHxA	17	Q	25-150
STL01892	13C4-PFHpA	5	Q	25-150
STL00990	13C4 PFOA	7	Q	25-150
STL00995	13C5 PFNA	5	Q	25-150
STL00996	13C2 PFDA	73		25-150
STL00997	13C2 PFUnA	110		25-150
STL00998	13C2 PFDoA	102		25-150
STL00994	18O2 PFHxS	13	Q	25-150
STL00991	13C4 PFOS	4	Q	25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_005.d
Lims ID: 320-24149-A-1-A
Client ID: FSS4TMW-1216
Sample Type: Client
Inject. Date: 29-Dec-2016 00:21:58 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24149-a-1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jan-2017 09:10:18 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: phomsophat Date: 06-Jan-2017 09:06:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.526	1.534	-0.008		5028521	14.5		28.9	309837	
1 Perfluorobutyric acid										E
212.90 > 169.00	1.550	1.534	0.016	1.000	82856967	965.1			116466	E
D 4 13C5-PFPeA										
267.90 > 223.00	1.801	1.810	-0.009		2958516	11.1		22.2	90858	
3 Perfluoropentanoic acid										E
262.90 > 219.00	1.830	1.810	0.020	1.000	40314085	690.4			2072	E
5 Perfluorobutanesulfonic acid										EM
298.90 > 80.00	1.878	1.849	0.029	1.000	74144361	1239.6				EM
298.90 > 99.00	1.820	1.849	-0.029	0.969	76957241		0.96(0.00-0.00)			M
D 6 13C2 PFHxA										
315.00 > 270.00	2.085	2.097	-0.012		2073038	8.46		16.9	115168	
7 Perfluorohexanoic acid										E
313.00 > 269.00	2.116	2.097	0.019	1.000	50347422	1307.4			1408	E
D 11 13C4-PFHpA										
367.00 > 322.00	2.348	2.429	-0.081		540244	2.39		4.8	108609	
12 Perfluoroheptanoic acid										E
363.00 > 319.00	2.348	2.429	-0.081	1.000	32827517	3104.0			136232	E
9 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.461	2.422	0.039	1.000	116251008	2673.9				E
D 10 18O2 PFHxS										
403.00 > 84.00	2.374	2.452	-0.078		1996617	6.11		12.9	122843	
D 14 13C4 PFOA										
417.00 > 372.00	2.746	2.790	-0.044		816182	3.54		7.1	50810	
15 Perfluorooctanoic acid										E
413.00 > 369.00	2.669	2.790	-0.121	1.000	115399969	7047.3			22531	E
413.00 > 169.00	2.765	2.790	-0.025	1.036	132714277		0.87(0.90-1.10)		100524	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.198	3.134	0.064	1.000	220548751	23253			539	E
499.00 > 99.00	2.912	3.134	-0.222	0.911	293714368		0.75(0.90-1.10)		9195	
D 17 13C4 PFOS										
503.00 > 80.00	3.087	3.158	-0.071		455909	1.83		3.8	1067	
20 Perfluorononanoic acid										
463.00 > 419.00	3.067	3.158	-0.091	1.000	920026	99.6			2508	
D 19 13C5 PFNA										
468.00 > 423.00	3.067	3.166	-0.099		485387	2.73		5.5	17261	
D 21 13C8 FOSA										
506.00 > 78.00	3.469	3.481	-0.012		11703161	30.5		60.9	314440	
22 Perfluorooctane Sulfonamide										M
498.00 > 78.00	3.477	3.481	-0.004	1.000	1432759	6.56			883	M
24 Perfluorodecanoic acid										
513.00 > 469.00	3.511	3.523	-0.012	1.000	1571818	14.4			3944	
D 23 13C2 PFDA										
515.00 > 470.00	3.511	3.523	-0.012		5764290	36.6		73.3	166313	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.818	3.834	-0.016	1.000	329853	59.2				
D 27 13C2 PFUnA										
565.00 > 520.00	3.837	3.851	-0.014		6422571	54.8		110	348342	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.837	3.851	-0.014	1.000	30199	0.2458			343	
D 30 13C2 PFDoA										
615.00 > 570.00	4.130	4.134	-0.004		5677378	51.2		102	225571	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.402	4.404	-0.002	1.000	5273	0.0512			167	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.641	4.652	-0.011	1.000	46774	0.2599			619	
713.00 > 169.00	4.631	4.652	-0.021	0.998	8750		5.35(0.00-0.00)		1674	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 06-Jan-2017 09:10:18 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_005.d

Injection Date: 29-Dec-2016 00:21:58 Instrument ID: A8_N

Lims ID: 320-24149-A-1-A Lab Sample ID: 320-24149-1

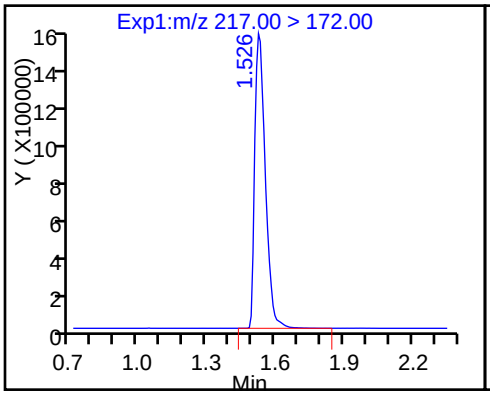
Client ID: FSS4TMW-1216

Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 5

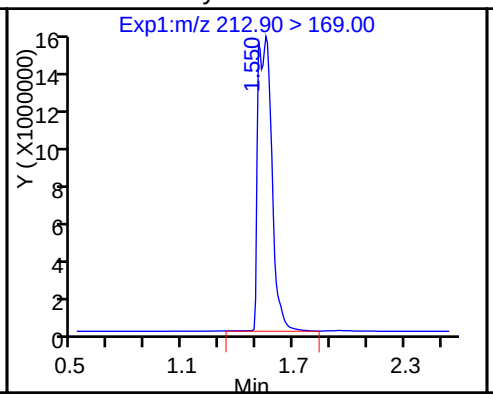
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

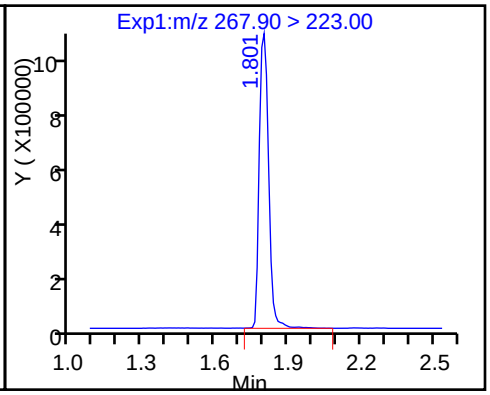
D 2 13C4 PFBA



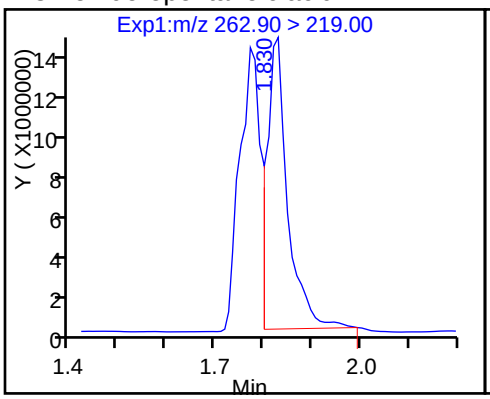
1 Perfluorobutyric acid



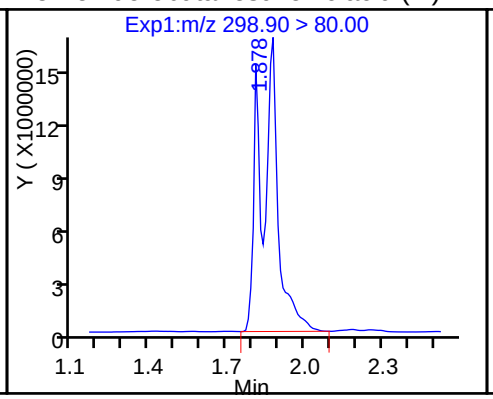
D 4 13C5-PFPeA



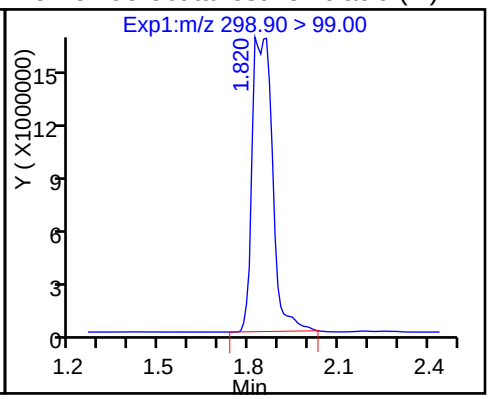
3 Perfluoropentanoic acid



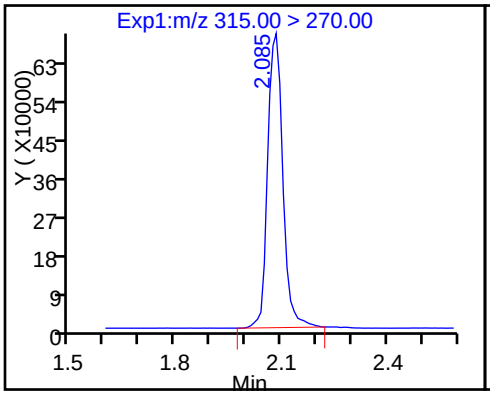
5 Perfluorobutanesulfonic acid (M)



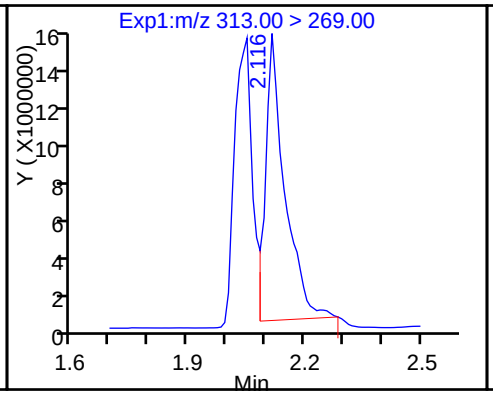
5 Perfluorobutanesulfonic acid (M)



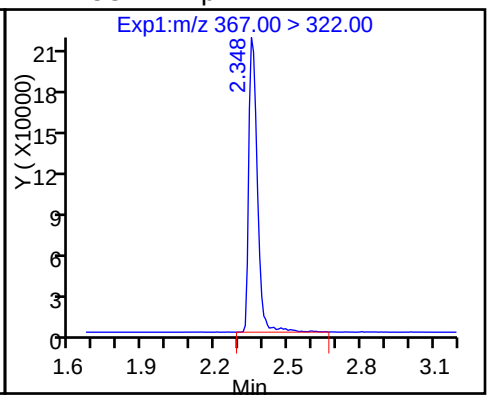
D 6 13C2 PFHxA



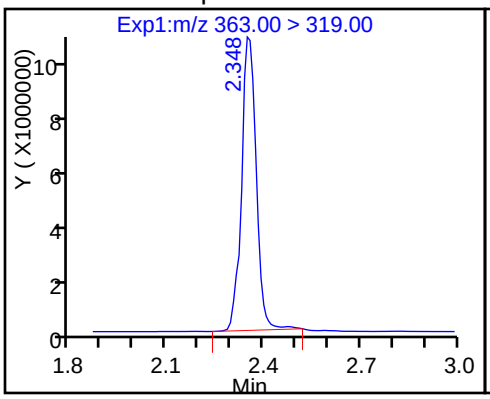
7 Perfluorohexanoic acid



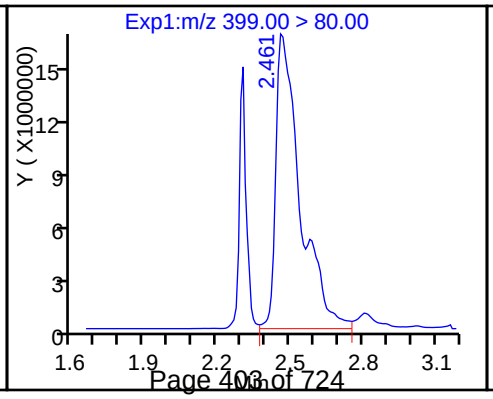
D 11 13C4-PFHpA



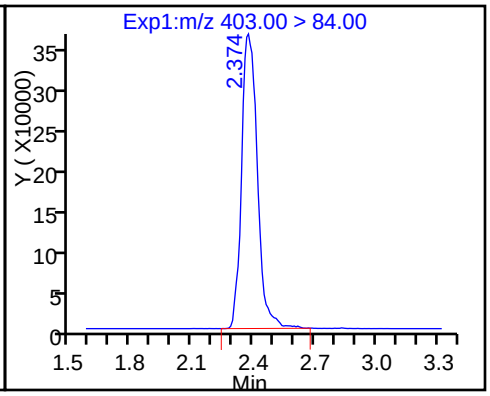
12 Perfluoroheptanoic acid



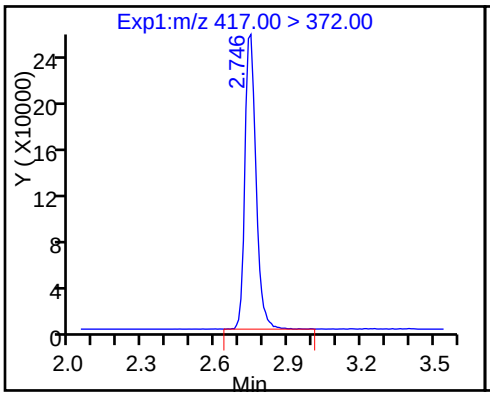
9 Perfluorohexanesulfonic acid



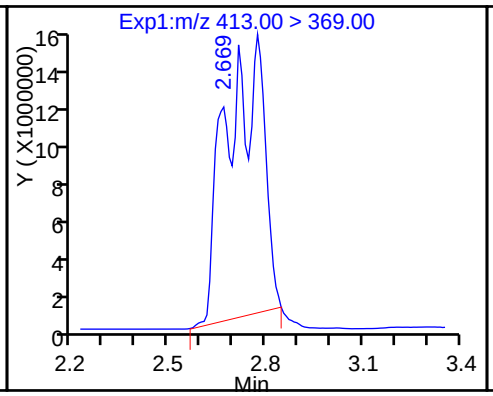
D 10 18O2 PFHxS



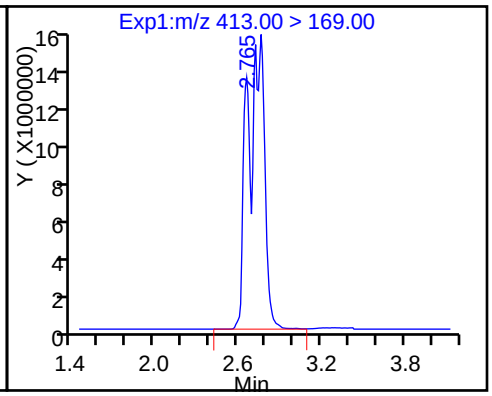
D 14 13C4 PFOA



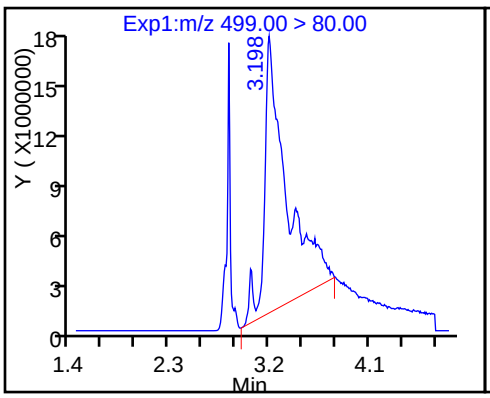
15 Perfluorooctanoic acid



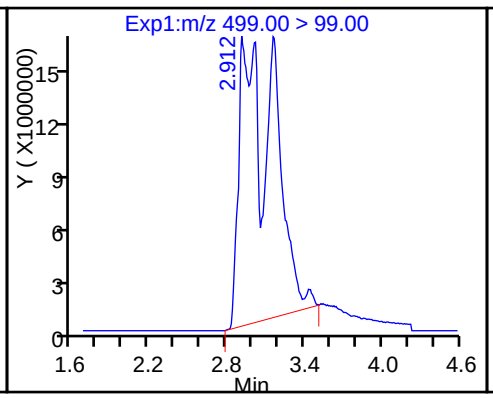
15 Perfluorooctanoic acid



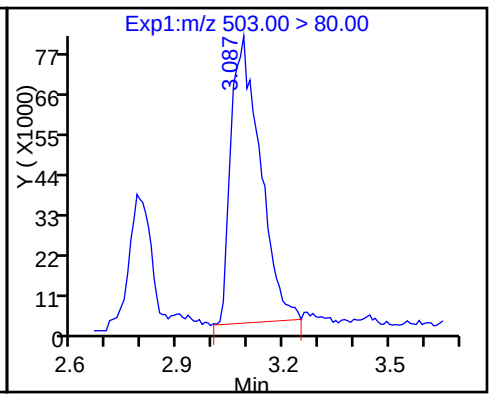
18 Perfluorooctane sulfonic acid



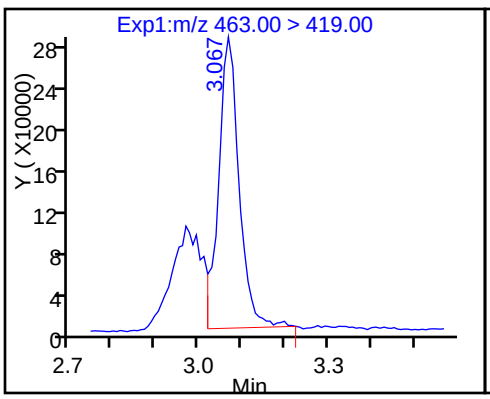
18 Perfluorooctane sulfonic acid



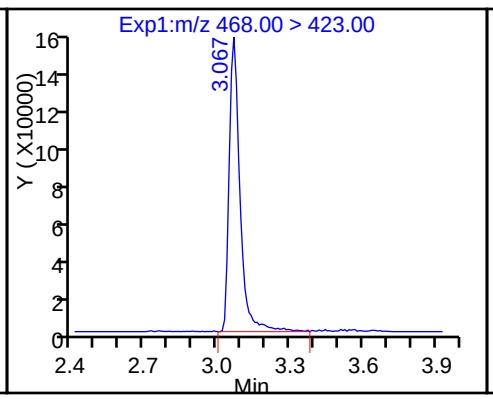
D 17 13C4 PFOS



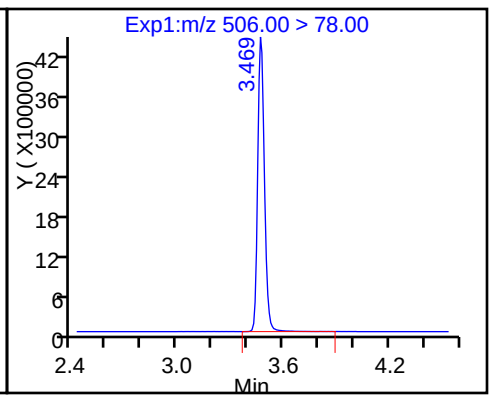
20 Perfluorononanoic acid



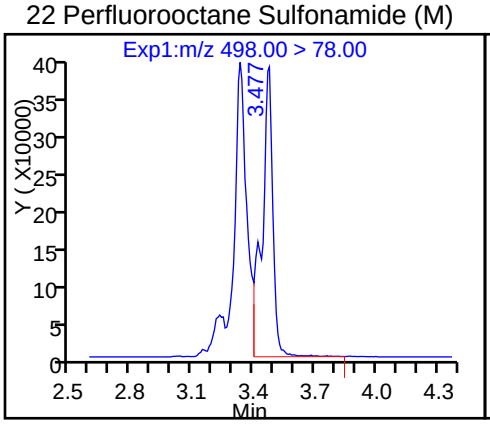
D 19 13C5 PFNA



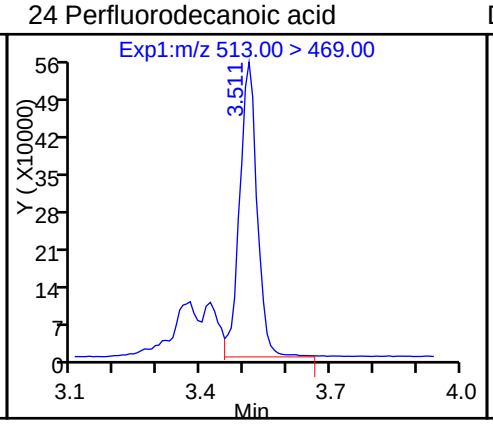
D 21 13C8 FOSA



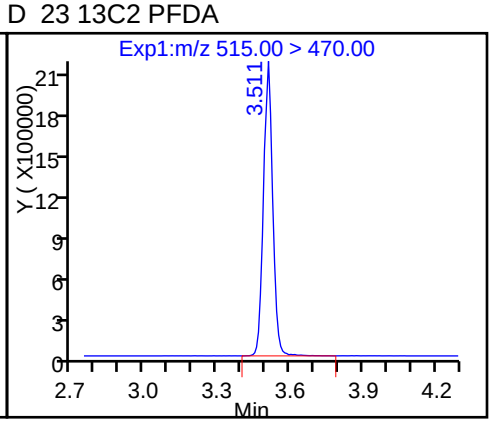
22 Perfluorooctane Sulfonamide (M)



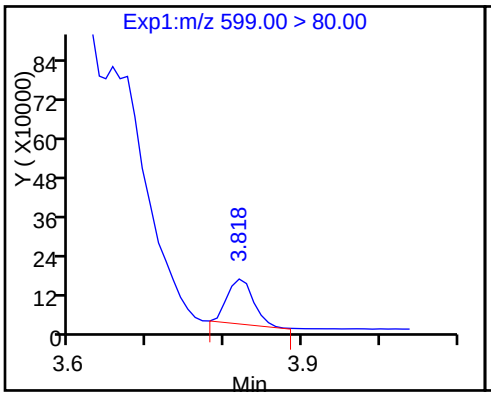
24 Perfluorodecanoic acid



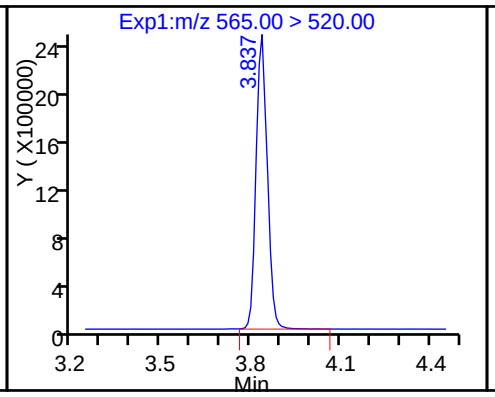
D 23 13C2 PFDA



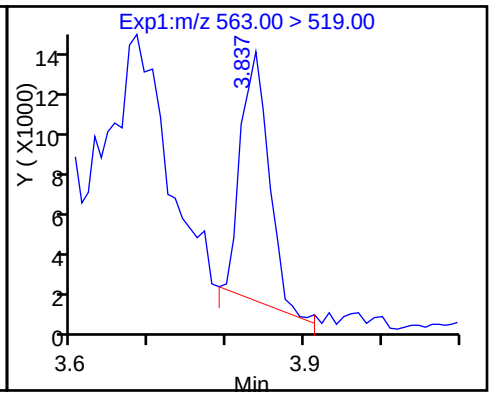
26 Perfluorodecane Sulfonic acid



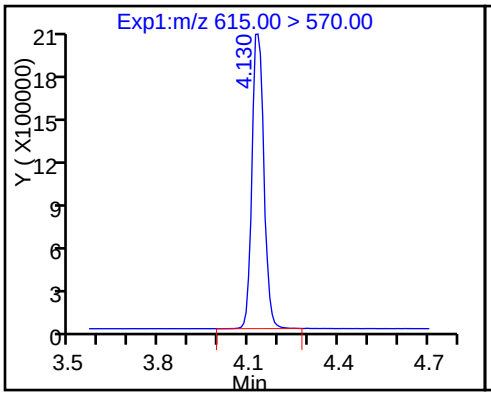
D 27 13C2 PFUnA



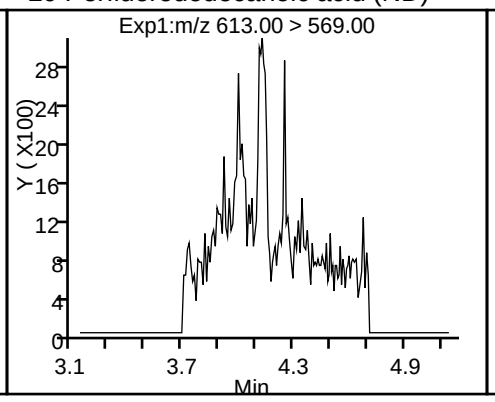
28 Perfluoroundecanoic acid



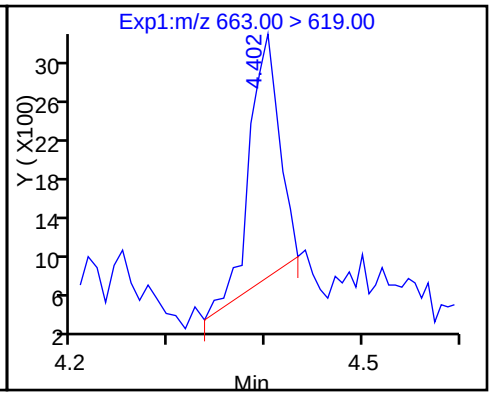
D 30 13C2 PFDoA



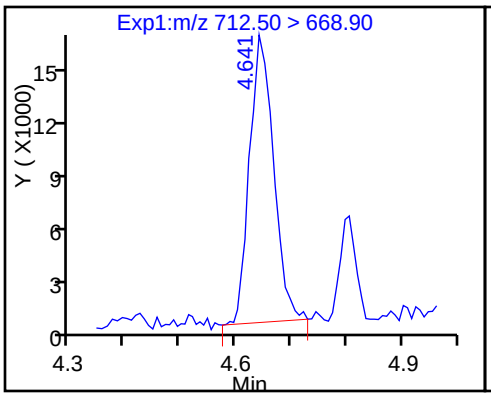
29 Perfluorododecanoic acid (ND)



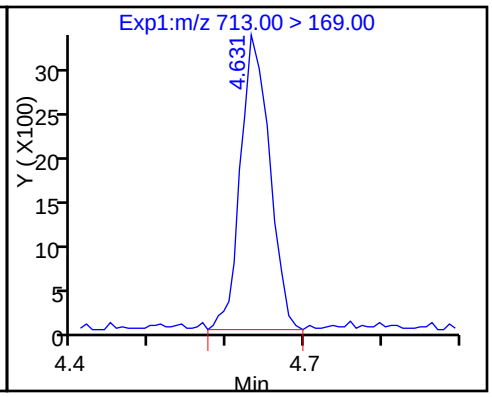
31 Perfluorotridecanoic acid



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

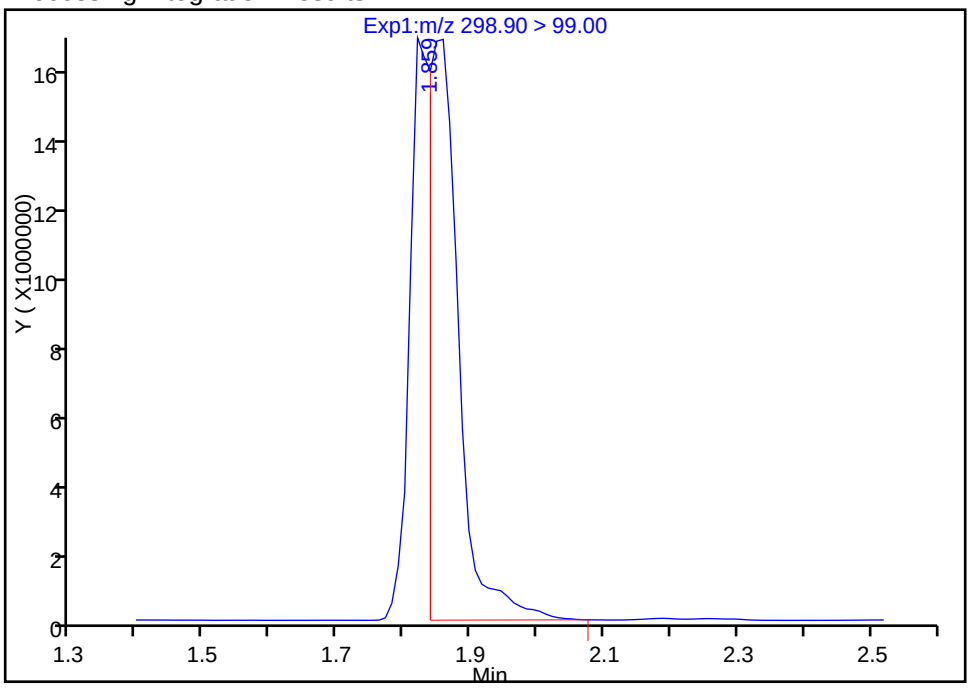
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_005.d				
Injection Date:	29-Dec-2016 00:21:58	Instrument ID:	A8_N		
Lims ID:	320-24149-A-1-A	Lab Sample ID:	320-24149-1		
Client ID:	FSS4TMW-1216				
Operator ID:	A8-PC\A8	ALS Bottle#:	3	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

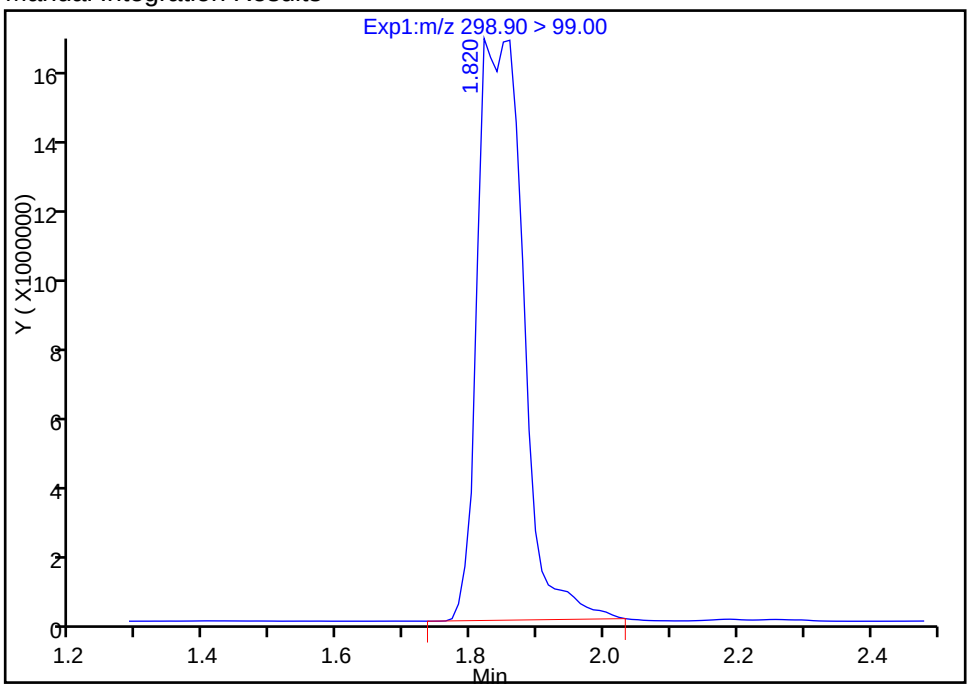
Processing Integration Results

RT: 1.86
Area: 45626725
Amount: 828.7685
Amount Units: ng/ml



Manual Integration Results

RT: 1.82
Area: 76957241
Amount: 1239.6201
Amount Units: ng/ml



Reviewer: phomsophat, 06-Jan-2017 09:06:24

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_005.d

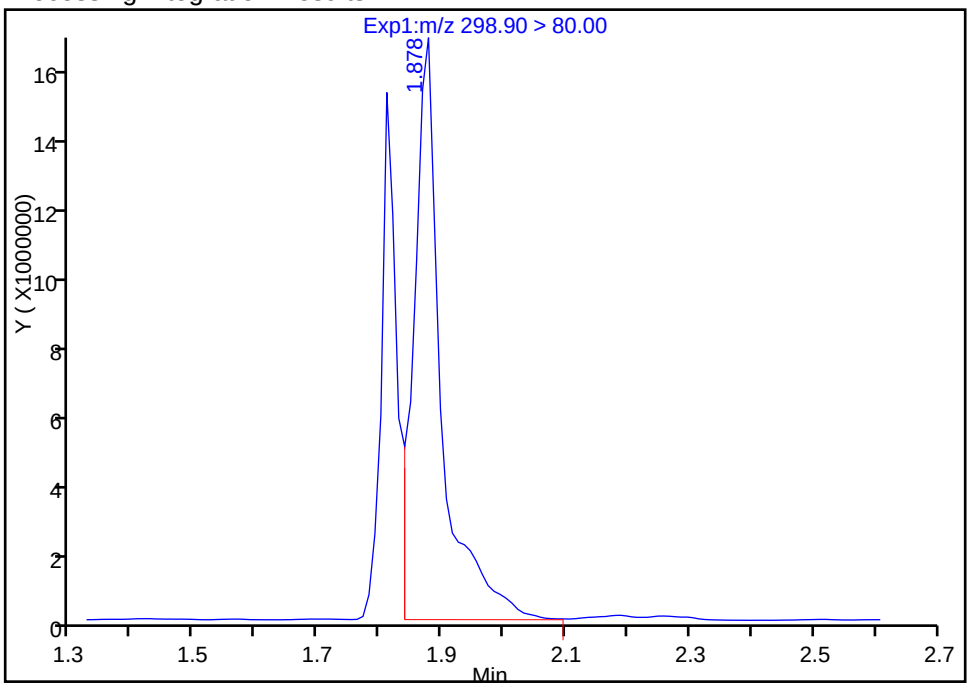
Injection Date:	29-Dec-2016 00:21:58	Instrument ID:	A8_N		
Lims ID:	320-24149-A-1-A	Lab Sample ID:	320-24149-1		
Client ID:	FSS4TMW-1216				
Operator ID:	A8-PC\A8	ALS Bottle#:	3	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

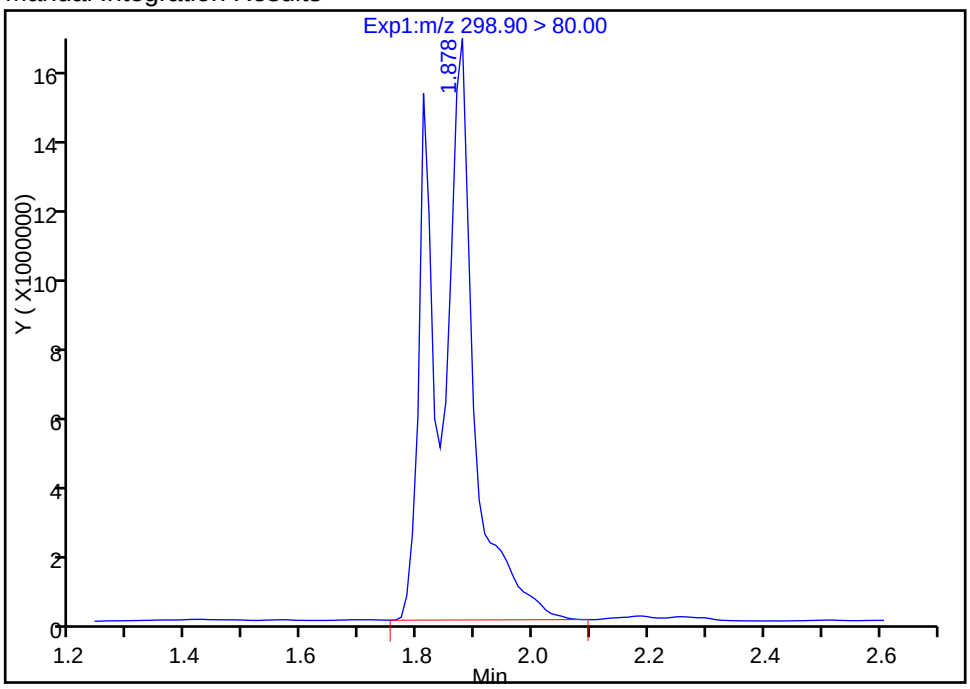
Processing Integration Results

RT: 1.88
Area: 49570434
Amount: 828.7685
Amount Units: ng/ml



Manual Integration Results

RT: 1.88
Area: 74144361
Amount: 1239.6201
Amount Units: ng/ml



Reviewer: phomsophat, 06-Jan-2017 09:10:18

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento

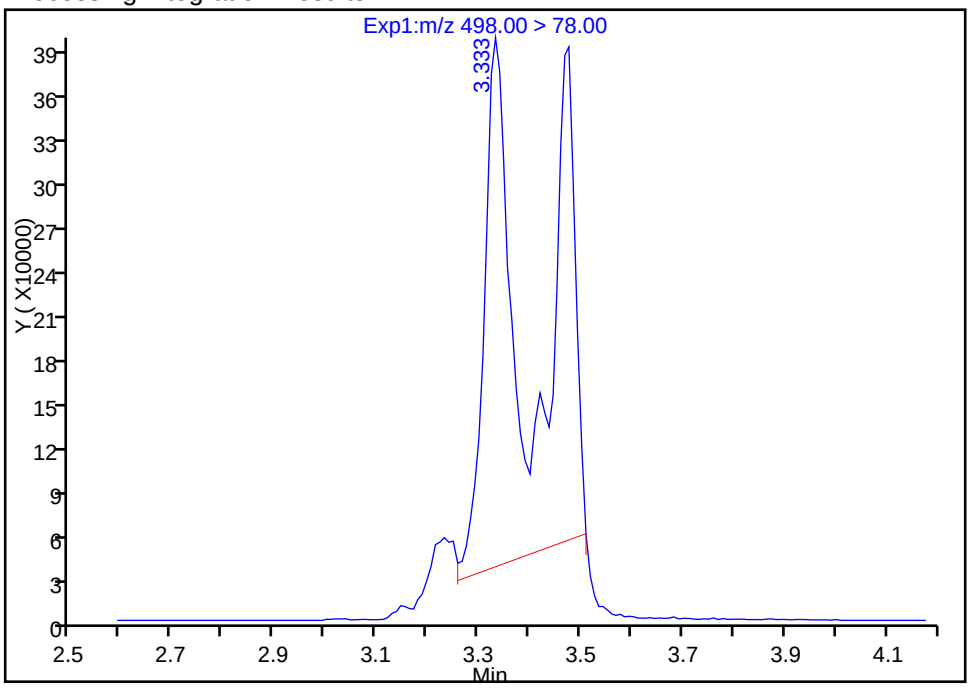
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_005.d				
Injection Date:	29-Dec-2016 00:21:58	Instrument ID:	A8_N		
Lims ID:	320-24149-A-1-A	Lab Sample ID:	320-24149-1		
Client ID:	FSS4TMW-1216				
Operator ID:	A8-PC\A8	ALS Bottle#:	3	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

22 Perfluorooctane Sulfonamide, CAS: 754-91-6

Signal: 1

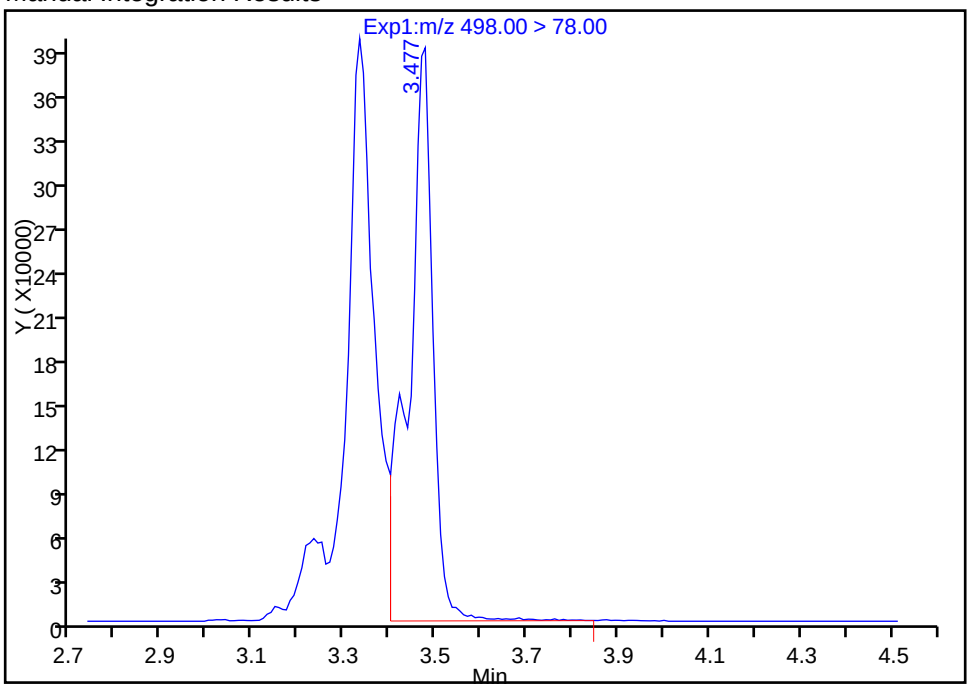
Processing Integration Results

RT: 3.33
Area: 2290004
Amount: 10.490199
Amount Units: ng/ml



Manual Integration Results

RT: 3.48
Area: 1432759
Amount: 6.563276
Amount Units: ng/ml



Reviewer: phomsophat, 29-Dec-2016 17:32:19
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS4TMW-1216 DL2 Lab Sample ID: 320-24149-1 DL2

Matrix: Water Lab File ID: 04JAN2017A_044.d

Analysis Method: 537 (Modified) Date Collected: 12/06/2016 12:20

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 281.4(mL) Date Analyzed: 01/04/2017 21:25

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 145022 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1200		14	11	4.5

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	117		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_044.d
Lims ID: 320-24149-A-1-G
Client ID: FSS4TMW-1216
Sample Type: Client
Inject. Date: 04-Jan-2017 21:25:39 ALS Bottle#: 23 Worklist Smp#: 44
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24149-a-1-a 4000X CD
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 10-Jan-2017 11:01:13 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK032

First Level Reviewer: phomsophat Date: 10-Jan-2017 10:59:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.606	1.617	-0.011		22061769	63.4		127	2163889	
1 Perfluorobutyric acid										
212.90 > 169.00	1.606	1.617	-0.011	1.000	264880	0.7034			1877	
D 4 13C5-PFPeA										
267.90 > 223.00	1.897	1.909	-0.012		16836079	63.3		127	1012083	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.897	1.909	-0.012	1.000	589452	1.77			6426	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.935	1.948	-0.013	1.000	985973	1.92				
298.90 > 99.00	1.935	1.948	-0.013	1.000	418012		2.36(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.205	2.209	-0.004	1.000	1593360	5.50			54578	
D 6 13C2 PFHxA										
315.00 > 270.00	2.205	2.217	-0.012		15607005	63.7		127	1115886	
D 11 13C4-PFHpA										
367.00 > 322.00	2.547	2.558	-0.011		12418991	54.9		110	845870	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.540	2.558	-0.018	1.000	185664	0.7639			2409	
D 10 18O2 PFHxS										
403.00 > 84.00	2.563	2.573	-0.010		17123685	52.4		111	1174784	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.563	2.573	-0.010	1.000	24996177	67.1				
D 14 13C4 PFOA										
417.00 > 372.00	2.915	2.927	-0.012		14186552	61.6		123	1155903	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.915	2.927	-0.012	1.000	2201425	7.74			21014	M
413.00 > 169.00	2.890	2.927	-0.037	0.992	1375323		1.60(0.90-1.10)		26404	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.164	3.271	-0.107	1.000	49421905	170.4			330258	
499.00 > 99.00	3.172	3.271	-0.099	1.003	11588920		4.26(0.90-1.10)		180980	
D 17 13C4 PFOS										
503.00 > 80.00	3.289	3.294	-0.005		13943477	56.0		117	468373	
D 19 13C5 PFNA										
468.00 > 423.00	3.297	3.301	-0.004		10307411	58.0		116	229460	
20 Perfluorononanoic acid										
463.00 > 419.00	3.289	3.301	-0.012	1.000	6216	0.0317			98.6	
D 21 13C8 FOSA										
506.00 > 78.00	3.614	3.621	-0.007		25220188	65.7		131	568752	
D 23 13C2 PFDA										
515.00 > 470.00	3.648	3.665	-0.017		4463323	28.4		56.7	27730	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.639	3.665	-0.026	1.000	6679	0.0793			219	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.942	3.971	-0.029	1.000	865	0.005079				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.978	3.990	-0.012	1.000	22068	0.1324			701	
D 27 13C2 PFUnA										
565.00 > 520.00	3.968	3.990	-0.022		8719225	74.4		149	490285	
D 30 13C2 PFDoA										
615.00 > 570.00	4.270	4.284	-0.014		8049194	72.5		145	202382	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.770	4.783	-0.013	1.000	16671	0.0654			4.8	
713.00 > 169.00	4.762	4.783	-0.021	0.998	6181		2.70(0.00-0.00)		675	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 10-Jan-2017 11:01:23 Chrom Revision: 2.2 09-Jan-2017 13:04:14

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_044.d

Injection Date: 04-Jan-2017 21:25:39 Instrument ID: A8_N

Lims ID: 320-24149-A-1-G Lab Sample ID: 320-24149-1

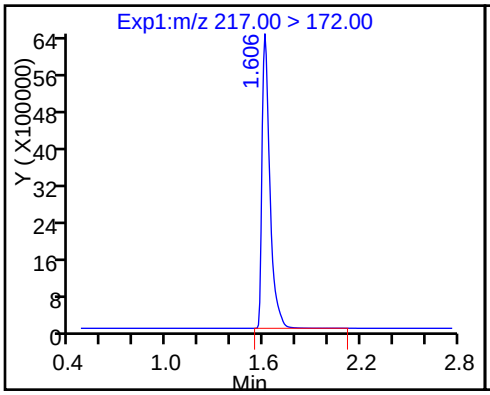
Client ID: FSS4TMW-1216

Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 44

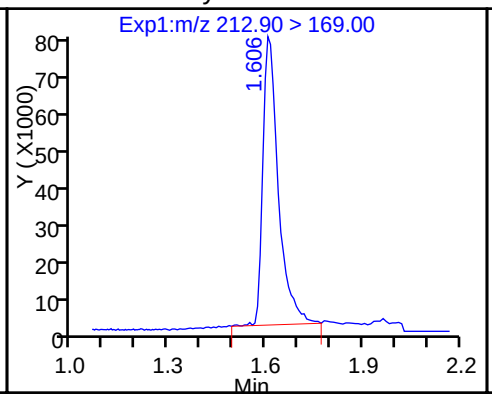
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

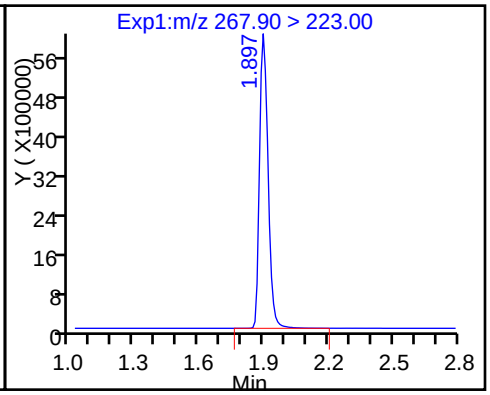
D 2 13C4 PFBA



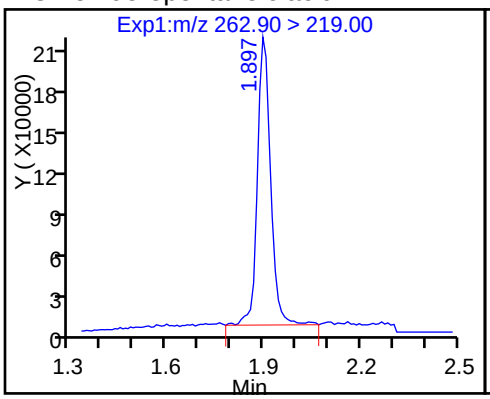
1 Perfluorobutyric acid



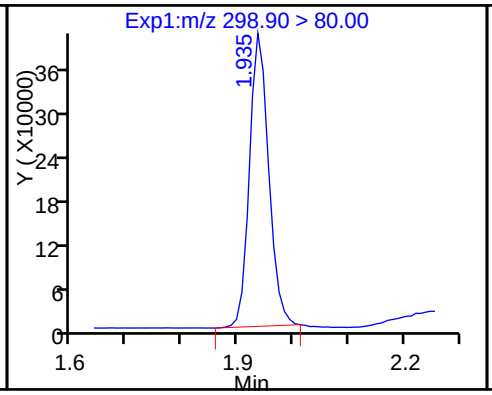
D 4 13C5-PFPeA



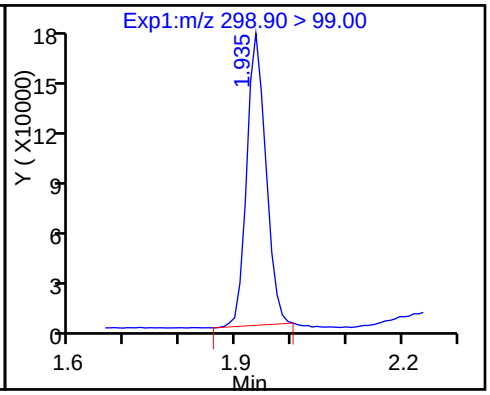
3 Perfluoropentanoic acid



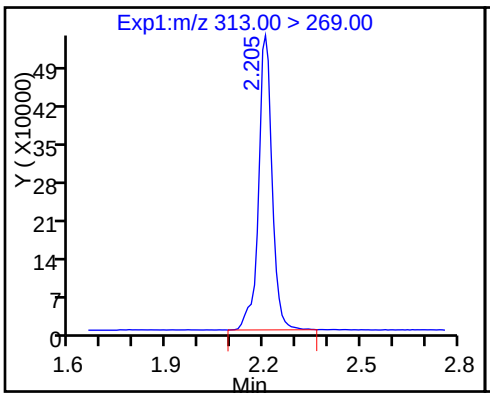
5 Perfluorobutanesulfonic acid



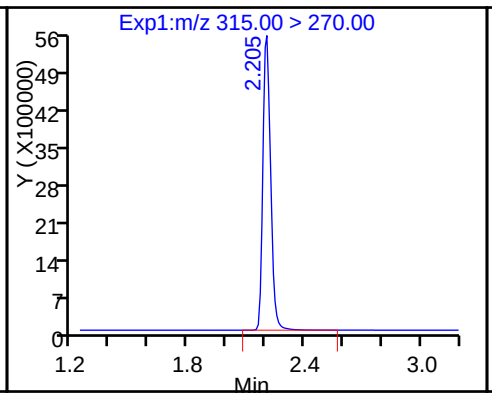
5 Perfluorobutanesulfonic acid



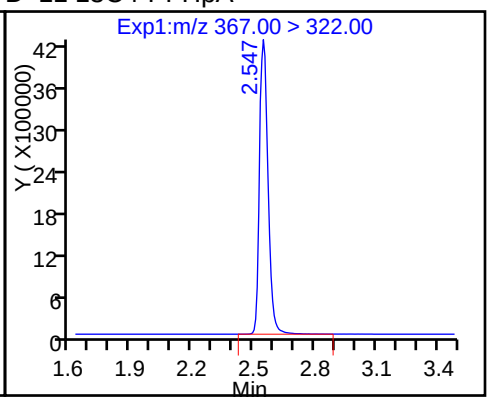
7 Perfluorohexanoic acid



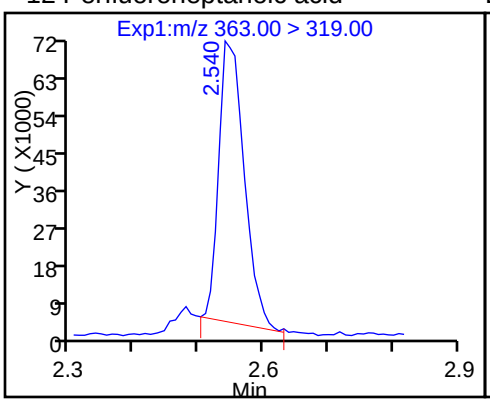
D 6 13C2 PFHxA



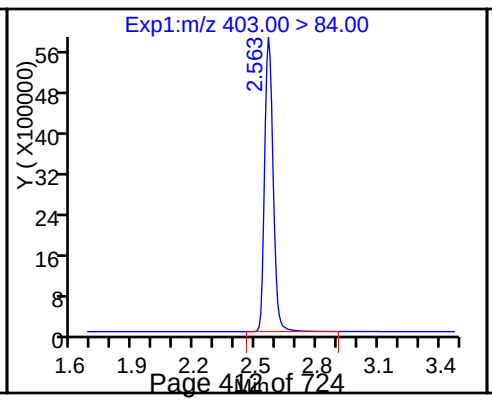
D 11 13C4-PFHpA



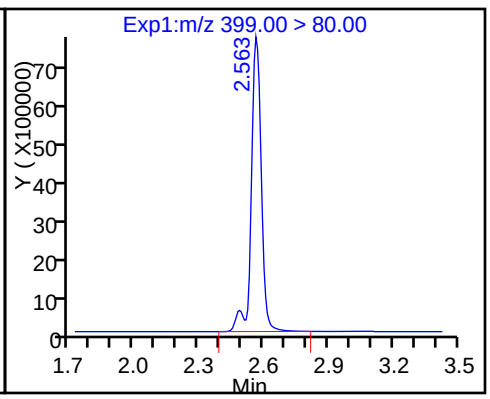
12 Perfluoroheptanoic acid



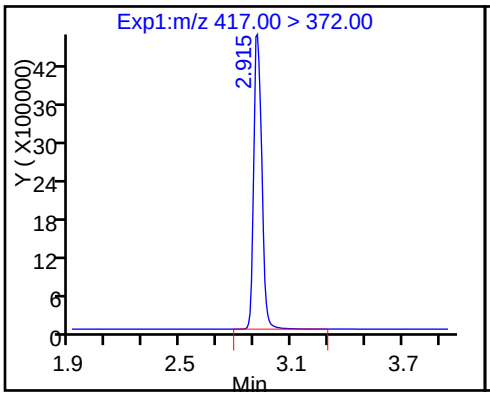
D 10 18O2 PFHxS



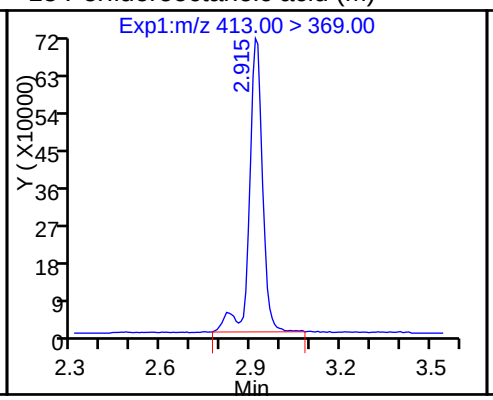
9 Perfluorohexanesulfonic acid



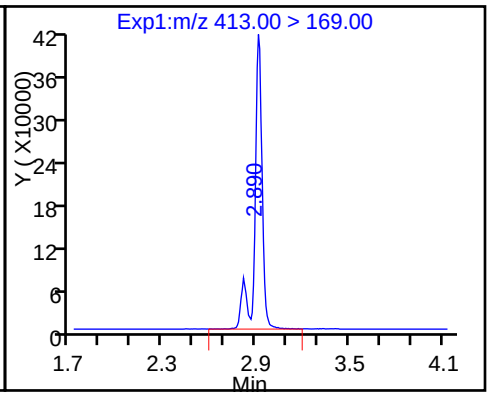
D 14 13C4 PFOA



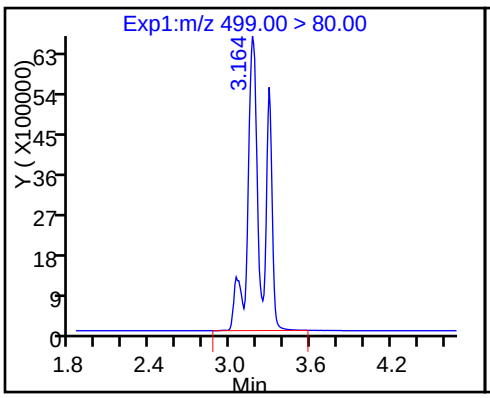
15 Perfluorooctanoic acid (M)



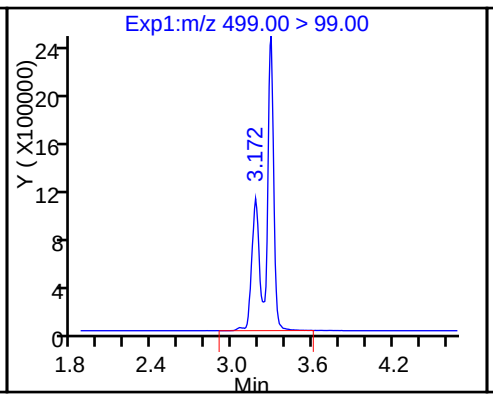
15 Perfluorooctanoic acid



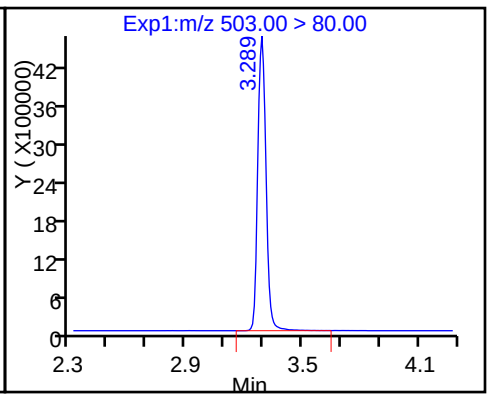
18 Perfluorooctane sulfonic acid



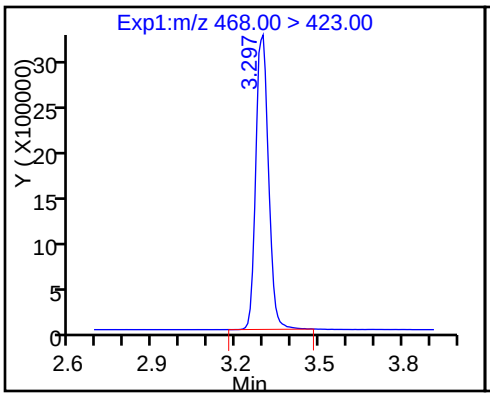
18 Perfluorooctane sulfonic acid



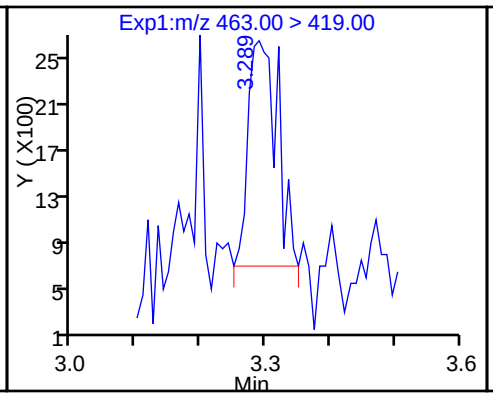
D 17 13C4 PFOS



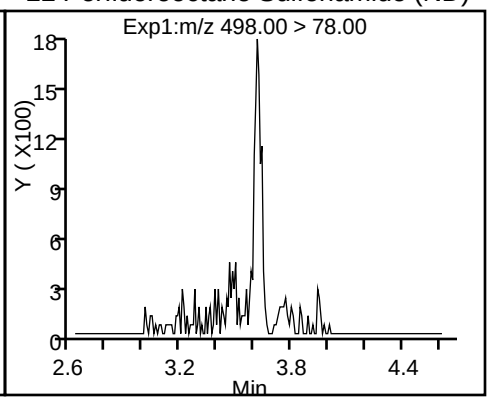
D 19 13C5 PFNA



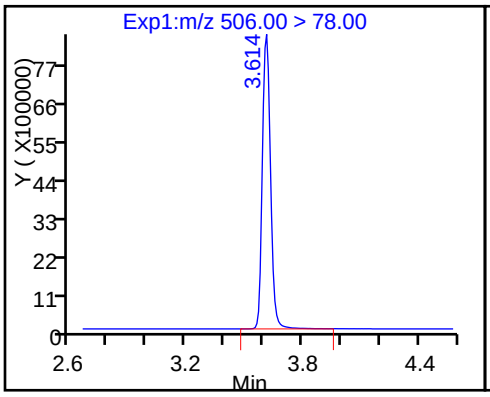
20 Perfluorononanoic acid



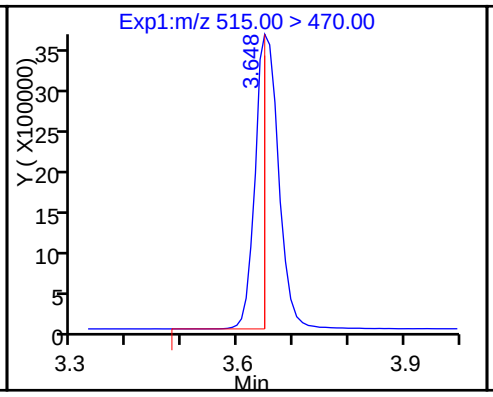
22 Perfluorooctane Sulfonamide (ND)



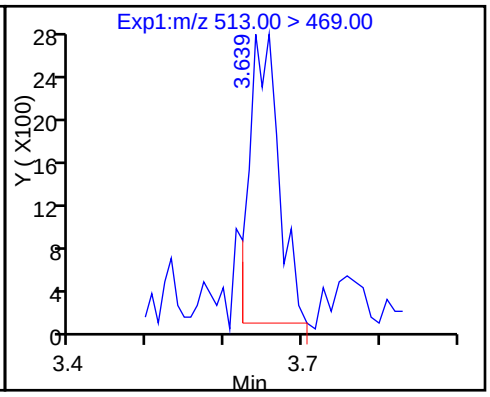
D 21 13C8 FOSA



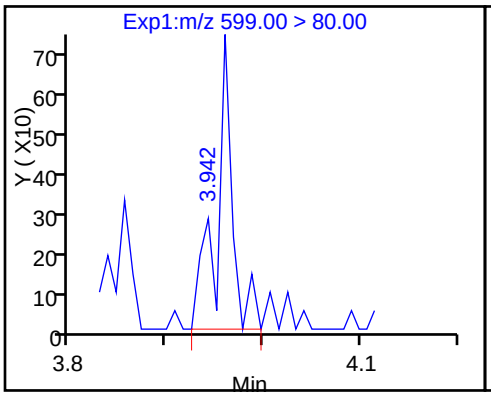
D 23 13C2 PFDA



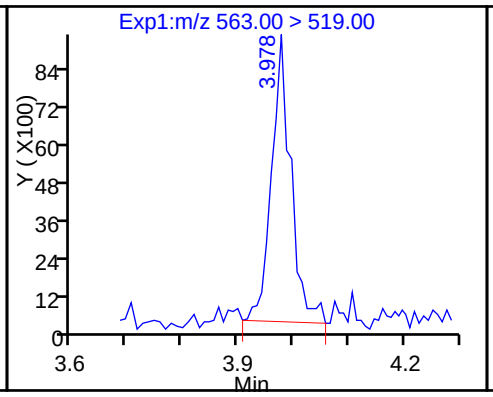
24 Perfluorodecanoic acid



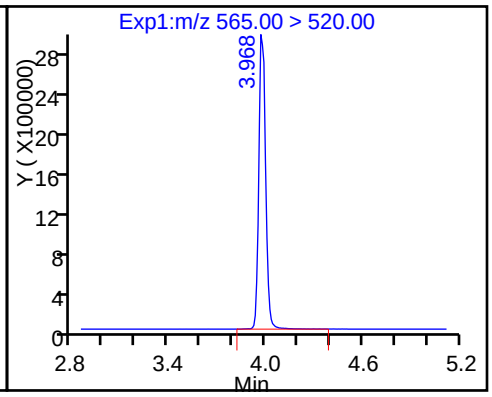
26 Perfluorodecane Sulfonic acid



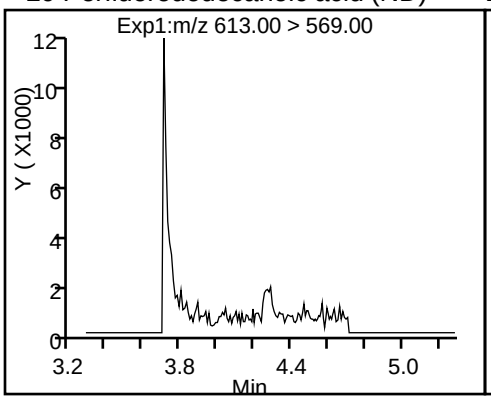
28 Perfluoroundecanoic acid



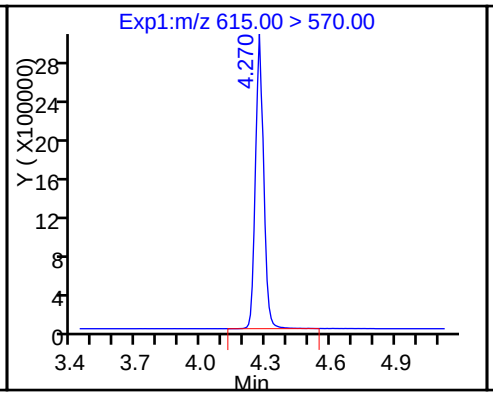
D 27 13C2 PFUnA



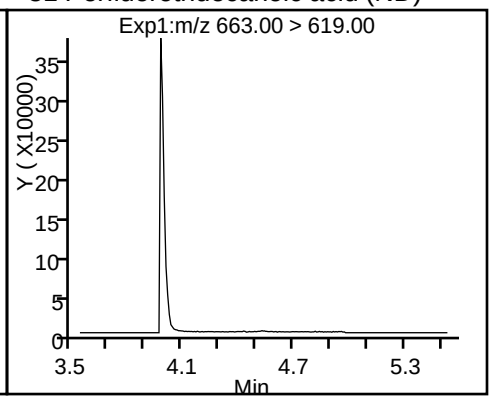
29 Perfluorododecanoic acid (ND)



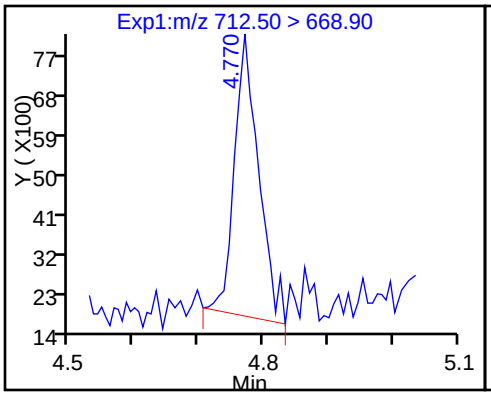
D 30 13C2 PFDoA



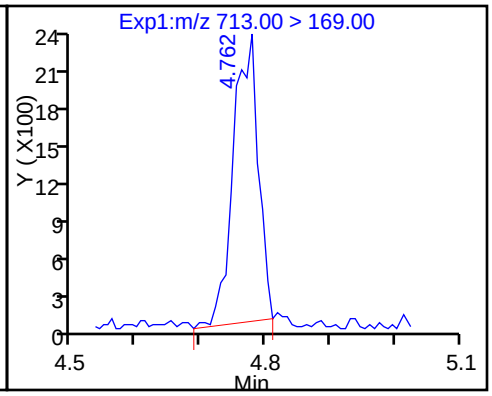
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS4TMW-1216 DL | Lab Sample ID: 320-24149-1 DL

Matrix: Water | Lab File ID: 30DEC2016B_003.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 12:20

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 281.4(mL) | Date Analyzed: 12/30/2016 12:33

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 200

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	5.0	D	0.44	0.18	0.081
2706-90-3	Perfluoropentanoic acid (PFPeA)	12	D	0.44	0.36	0.18
307-24-4	Perfluorohexanoic acid (PFHxA)	28	B D	0.44	0.36	0.14
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.1	D	0.44	0.36	0.14
335-67-1	Perfluorooctanoic acid (PFOA)	47	D M	0.44	0.36	0.13
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.17*	*J D*	*0.44*	0.36	*0.12*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.18*	*U*	*0.44*	0.18	*0.078*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.36*	*U*	*0.44*	0.36	*0.10*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.2	D	0.44	0.36	0.16
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	59	D	0.44	0.36	0.15
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	670	E D	0.71	0.53	0.23
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*0.53*	*U*	*0.71*	0.53	*0.21*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*0.36*	*U*	*0.44*	0.36	*0.11*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS4TMW-1216 DL | Lab Sample ID: 320-24149-1 DL

Matrix: Water | Lab File ID: 30DEC2016B_003.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 12:20

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 281.4(mL) | Date Analyzed: 12/30/2016 12:33

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 200

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	128		25-150
STL00992	13C4 PFBA	142		25-150
STL01893	13C5-PFPeA	134		25-150
STL00993	13C2 PFHxA	143		25-150
STL01892	13C4-PFHpA	65		25-150
STL00990	13C4 PFOA	88		25-150
STL00995	13C5 PFNA	58		25-150
STL00996	13C2 PFDA	153	Q	25-150
STL00997	13C2 PFUnA	146		25-150
STL00998	13C2 PFDoA	160	Q	25-150
STL00994	18O2 PFHxS	206	Q	25-150
STL00991	13C4 PFOS	57		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_003.d
Lims ID: 320-24149-A-1-A
Client ID: FSS4TMW-1216
Sample Type: Client
Inject. Date: 30-Dec-2016 12:33:53 ALS Bottle#: 1 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 200.0000
Sample Info: 320-24149-a-1-a 200X
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:00 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:47:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		123030	0.3538		0.7	10874	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	5854816	13.9			34471	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		89082	0.3348		0.7	12442	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	11953377	34.0			121680	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	19254894	20.2				
298.90 > 99.00	1.849	1.849	0.0	1.000	9086813		2.12(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.095	2.098	-0.003		87776	0.3581		0.7	16494	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.095	2.098	-0.003	1.000	25915233	79.5			604381	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.422	2.424	-0.002	1.000	114830722	165.6				
D 11 13C4-PFHpA										
367.00 > 322.00	2.422	2.431	-0.009		36891	0.1630		0.3	6743	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.422	2.431	-0.009	1.000	2486126	17.2			10611	
D 10 18O2 PFHxS										
403.00 > 84.00	2.444	2.454	-0.010		159187	0.4868		1.0	10753	
D 14 13C4 PFOA										
417.00 > 372.00	2.790	2.791	-0.001		50634	0.2198		0.4	6214	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.790	2.791	-0.001	1.000	27097907	133.4			201353	M
413.00 > 169.00	2.767	2.791	-0.024	0.992	19451668		1.39(0.90-1.10)		165484	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.009	3.135	-0.126	1.000	265879501	1886.9			146774	E
499.00 > 99.00	3.159	3.135	0.024	1.050	103590930		2.57(0.90-1.10)		516469	
D 17 13C4 PFOS										
503.00 > 80.00	3.159	3.159	0.0		33864	0.1361		0.3	213	
20 Perfluorononanoic acid										
463.00 > 419.00	3.159	3.159	0.0	1.000	47980	0.4890			619	
D 19 13C5 PFNA										
468.00 > 423.00	3.174	3.167	0.007		25770	0.1450		0.3	2662	
D 21 13C8 FOSA										
506.00 > 78.00	3.484	3.474	0.010		123095	0.3204		0.6	5977	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.355	3.482	-0.127	1.000	25842	0.0563			579	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.526	3.524	0.002	1.000	12521	0.0552			454	
D 23 13C2 PFDA										
515.00 > 470.00	3.526	3.524	0.002		60133	0.3823		0.8	2369	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.839	3.836	0.003	1.000	1855	0.0224				
D 27 13C2 PFUnA										
565.00 > 520.00	3.856	3.853	0.003		42801	0.3650		0.7	3521	
D 30 13C2 PFDoA										
615.00 > 570.00	4.151	4.149	0.002		44514	0.4012		0.8	2265	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 03-Jan-2017 14:28:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_003.d

Injection Date: 30-Dec-2016 12:33:53 Instrument ID: A8_N

Lims ID: 320-24149-A-1-A Lab Sample ID: 320-24149-1

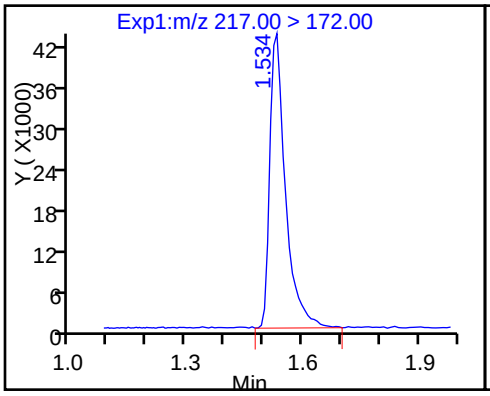
Client ID: FSS4TMW-1216

Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 13

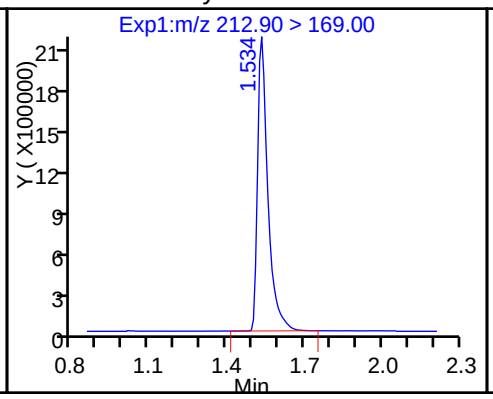
Injection Vol: 2.0 ul Dil. Factor: 200.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

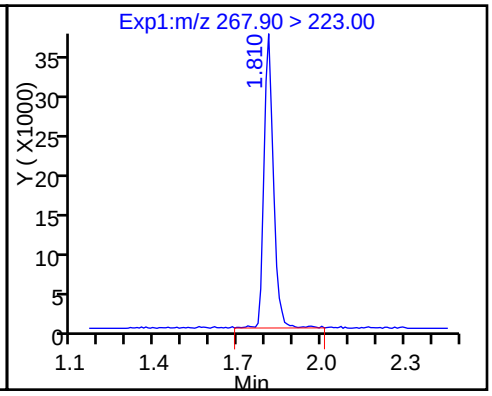
D 2 13C4 PFBA



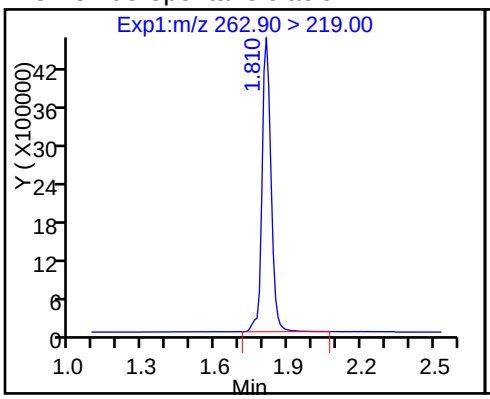
1 Perfluorobutyric acid



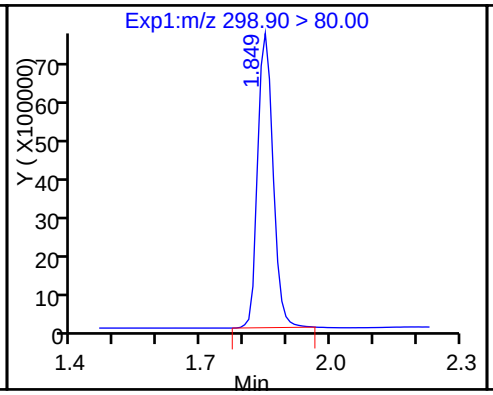
D 4 13C5-PFPeA



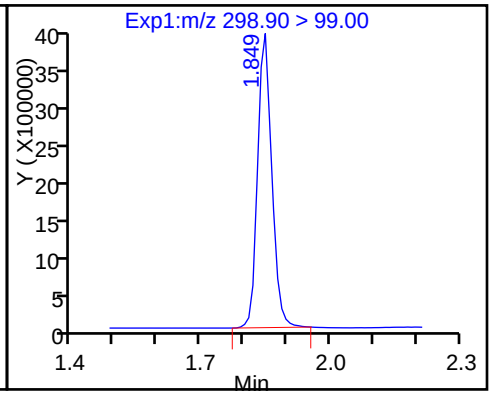
3 Perfluoropentanoic acid



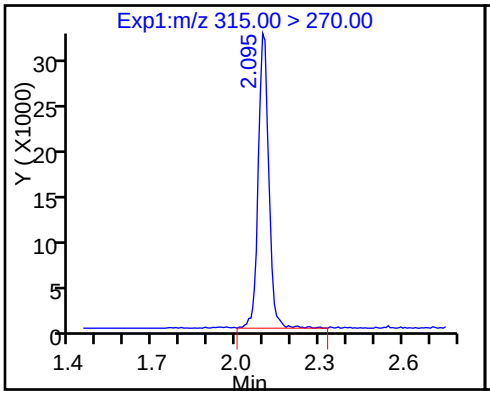
5 Perfluorobutanesulfonic acid



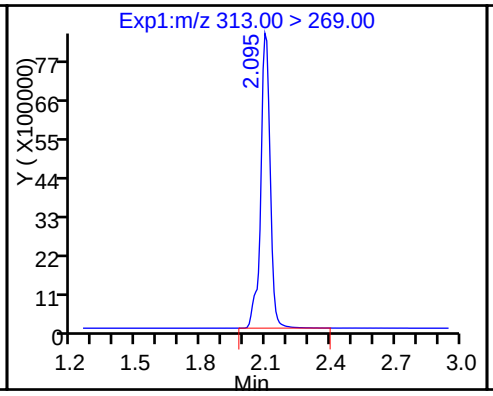
5 Perfluorobutanesulfonic acid



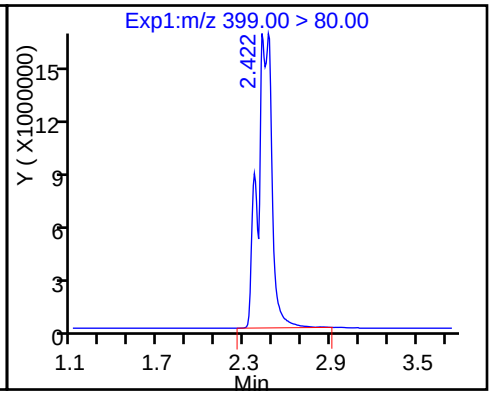
D 6 13C2 PFHxA



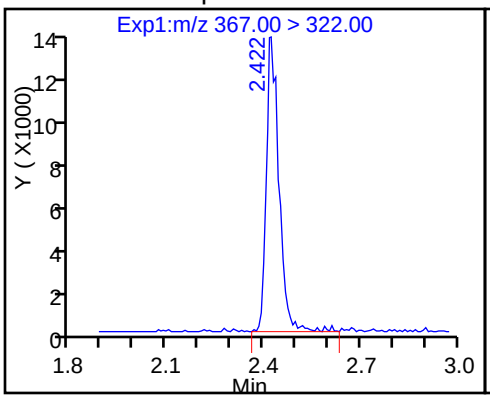
7 Perfluorohexanoic acid



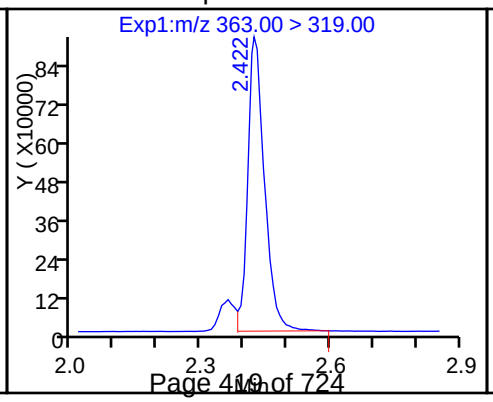
9 Perfluorohexanesulfonic acid



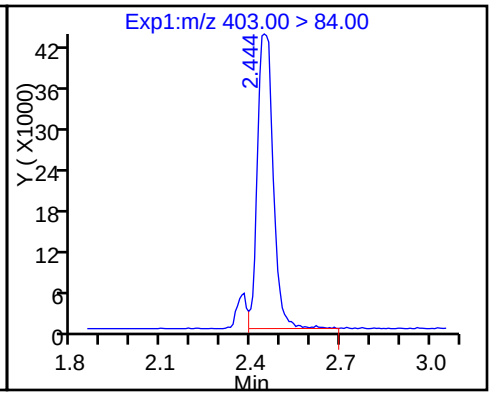
D 11 13C4-PFHpA



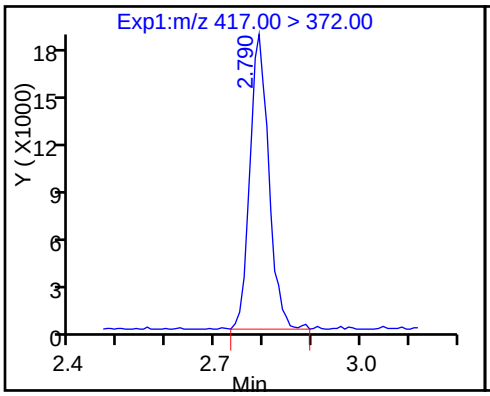
12 Perfluoroheptanoic acid



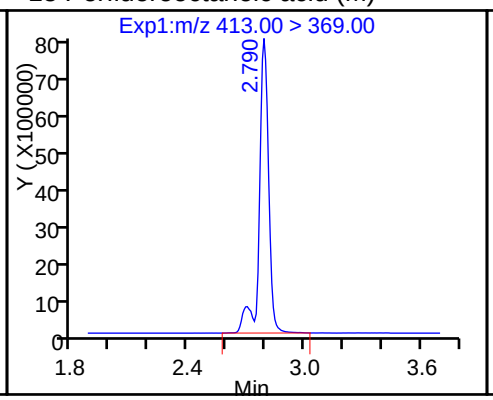
D 10 18O2 PFHxS



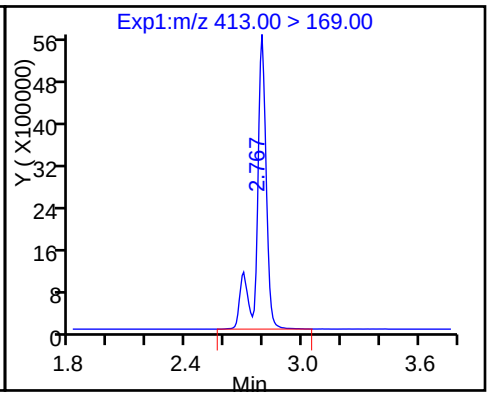
D 14 13C4 PFOA



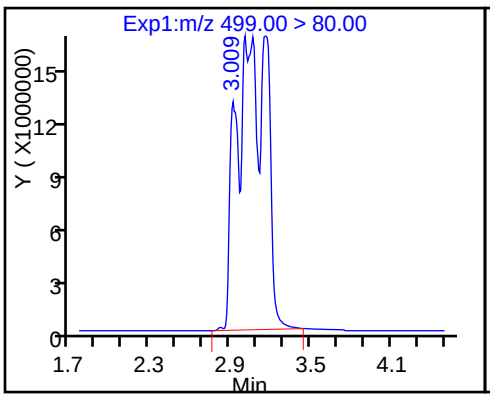
15 Perfluorooctanoic acid (M)



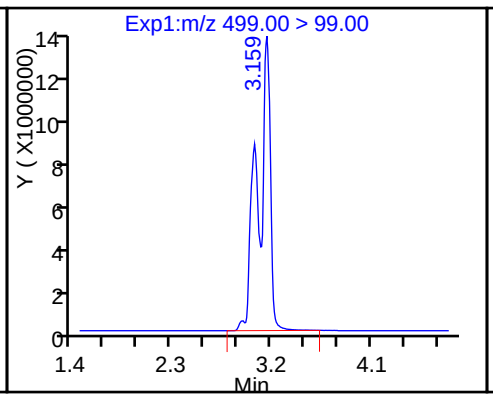
15 Perfluorooctanoic acid



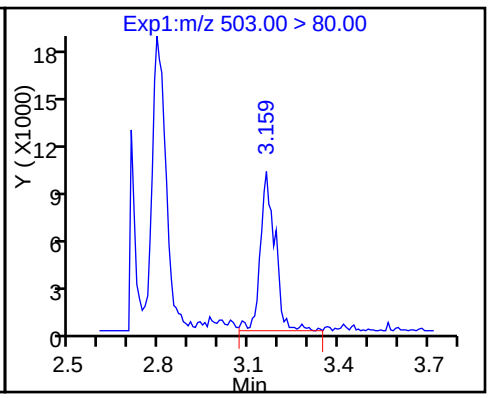
18 Perfluorooctane sulfonic acid



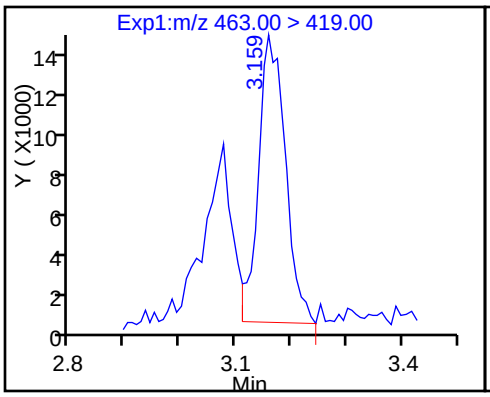
18 Perfluorooctane sulfonic acid



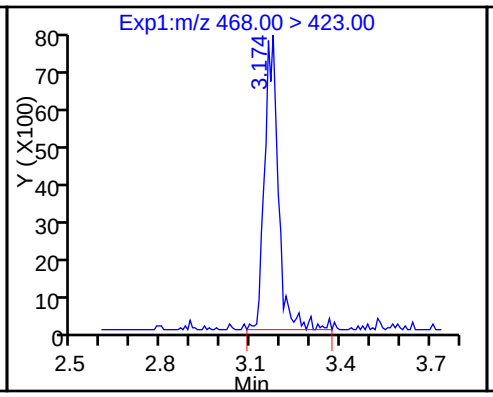
D 17 13C4 PFOS



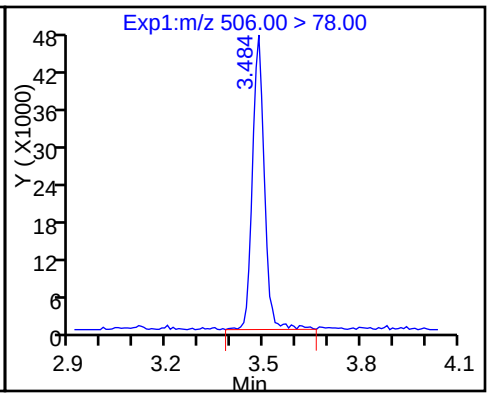
20 Perfluorononanoic acid



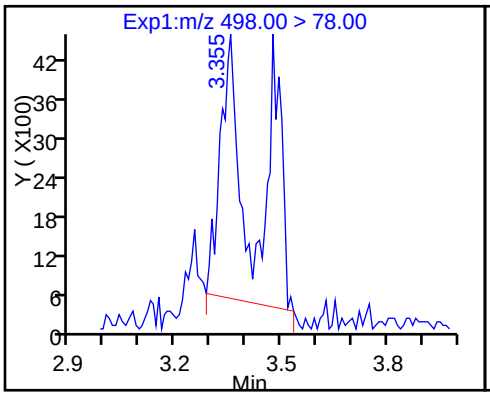
D 19 13C5 PFNA



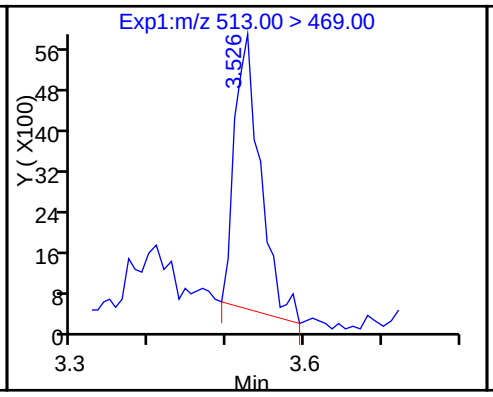
D 21 13C8 FOSA



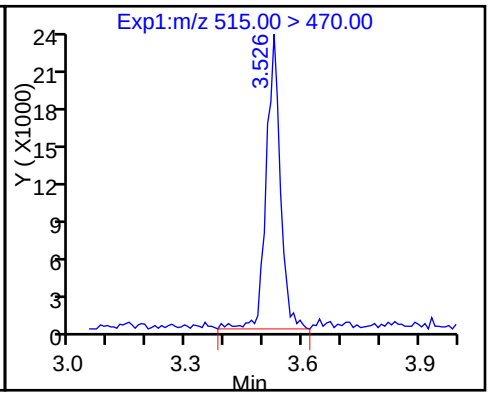
22 Perfluorooctane Sulfonamide



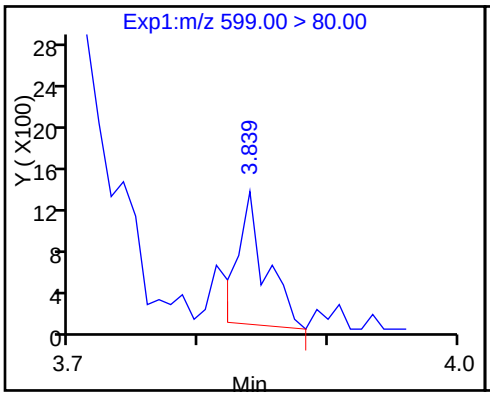
24 Perfluorodecanoic acid



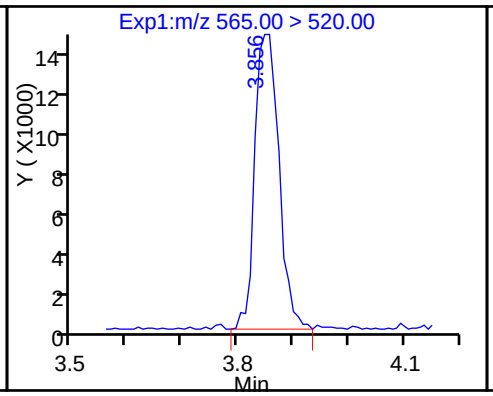
D 23 13C2 PFDA



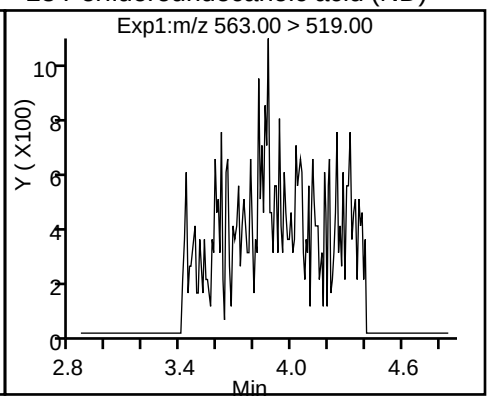
26 Perfluorodecane Sulfonic acid



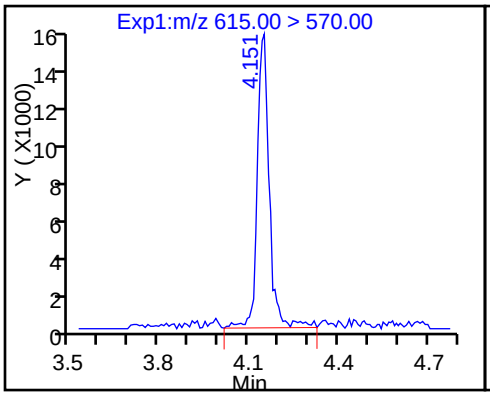
D 27 13C2 PFUnA



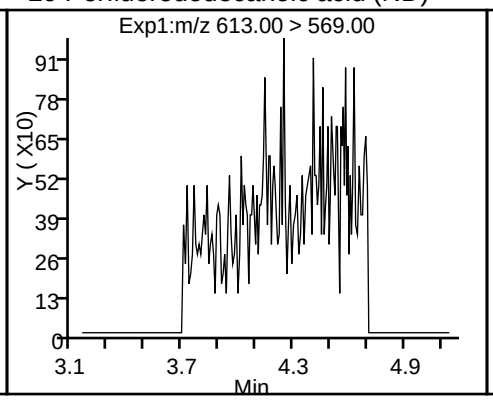
28 Perfluoroundecanoic acid (ND)



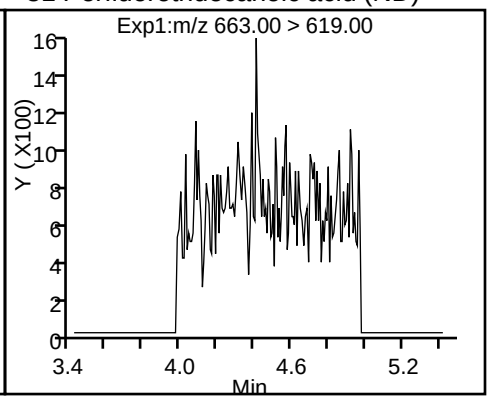
D 30 13C2 PFDoA



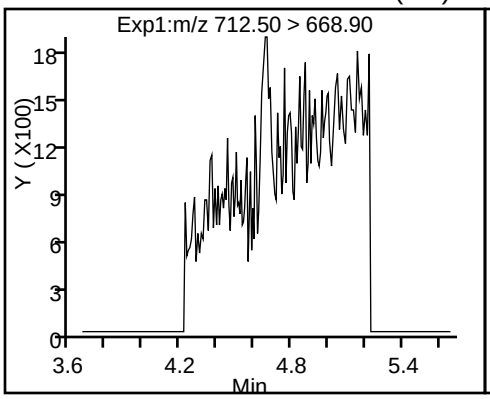
29 Perfluorododecanoic acid (ND)



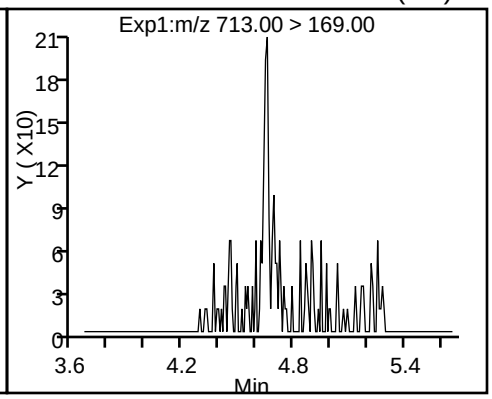
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid (ND)



33 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

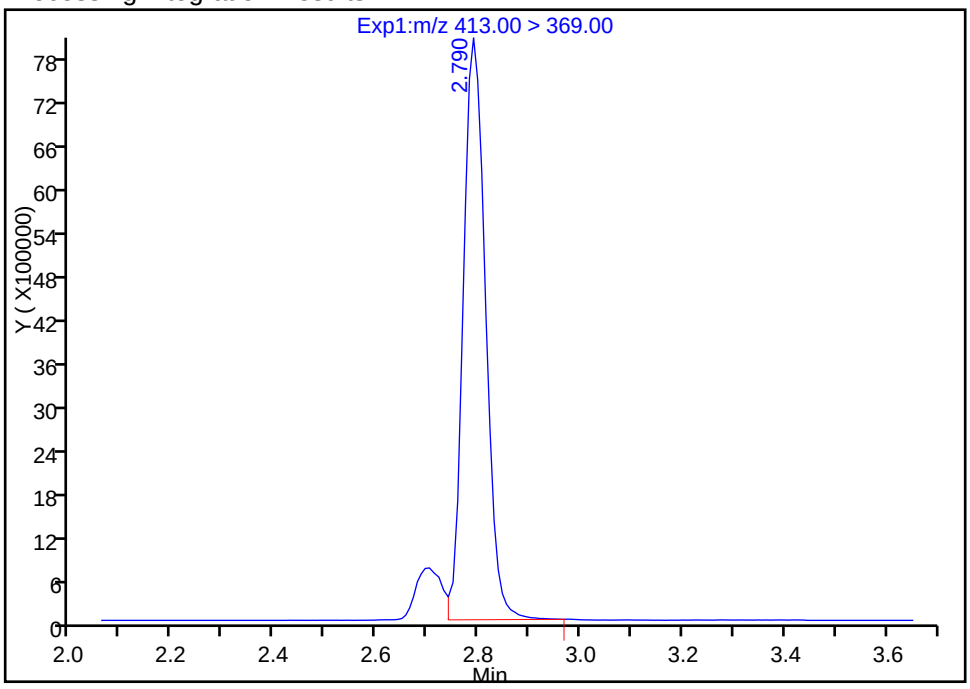
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_003.d				
Injection Date:	30-Dec-2016 12:33:53	Instrument ID:	A8_N		
Lims ID:	320-24149-A-1-A	Lab Sample ID:	320-24149-1		
Client ID:	FSS4TMW-1216				
Operator ID:	A8-PC\A8	ALS Bottle#:	1	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	200.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

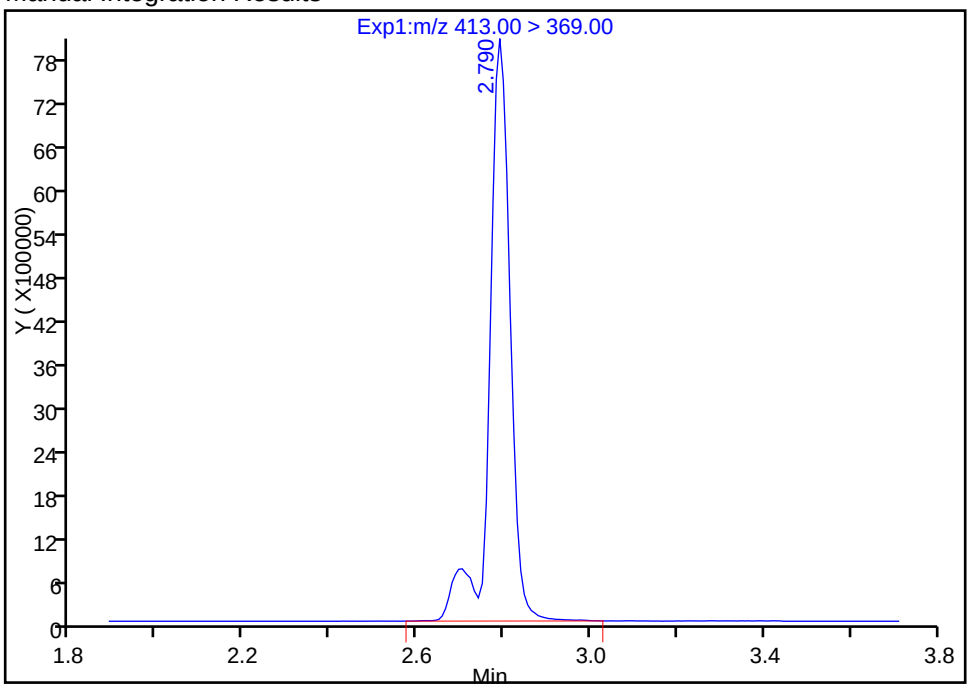
Processing Integration Results

RT: 2.79
Area: 24410357
Amount: 120.1459
Amount Units: ng/ml



Manual Integration Results

RT: 2.79
Area: 27097907
Amount: 133.3738
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:47:16

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS5TMW-1216 | Lab Sample ID: 320-24149-2

Matrix: Water | Lab File ID: 28DEC2016C_006.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 11:00

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 286(mL) | Date Analyzed: 12/29/2016 00:29

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.22		0.0022	0.00087	0.00040
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.30		0.0022	0.0017	0.00086
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*0.40*	*E B*	*0.0022*	0.0017	*0.00069*
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.17		0.0022	0.0017	0.00070
335-67-1	Perfluorooctanoic acid (PFOA)	0.20	M	0.0022	0.0017	0.00065
375-95-1	Perfluorononanoic acid (PFNA)	0.010		0.0022	0.0017	0.00057
335-76-2	Perfluorodecanoic acid (PFDA)	0.0026		0.0022	0.00087	0.00038
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0017	U	0.0022	0.0017	0.00065
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0017	U	0.0022	0.0017	0.00051
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0017	U	0.0022	0.0017	0.00048
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00037	J	0.0022	0.00087	0.00035
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.22		0.0022	0.0017	0.00080
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*0.48*	*E*	*0.0022*	0.0017	*0.00076*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0026	U	0.0035	0.0026	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0017	U	0.0022	0.0017	0.00056

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS5TMW-1216 | Lab Sample ID: 320-24149-2

Matrix: Water | Lab File ID: 28DEC2016C_006.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 11:00

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 286(mL) | Date Analyzed: 12/29/2016 00:29

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	4	Q	25-150
STL00992	13C4 PFBA	45		25-150
STL01893	13C5-PFPeA	79		25-150
STL00993	13C2 PFHxA	87		25-150
STL01892	13C4-PFHpA	76		25-150
STL00990	13C4 PFOA	90		25-150
STL00995	13C5 PFNA	65		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	98		25-150
STL00998	13C2 PFDoA	98		25-150
STL00994	18O2 PFHxS	91		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_006.d
Lims ID: 320-24149-A-2-A
Client ID: FSS5TMW-1216
Sample Type: Client
Inject. Date: 29-Dec-2016 00:29:30 ALS Bottle#: 4 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24149-a-2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Dec-2016 17:35:05 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:35:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.525	1.534	-0.009		7895083	22.7		45.4	561821	
1 Perfluorobutyric acid										
212.90 > 169.00	1.525	1.534	-0.009	1.000	17248634	128.0			63928	
D 4 13C5-PFPeA										
267.90 > 223.00	1.800	1.810	-0.010		10447163	39.3		78.5	467395	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.800	1.810	-0.010	1.000	35169096	170.6			156998	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.839	1.849	-0.010	1.000	54146068	128.3				
298.90 > 99.00	1.839	1.849	-0.010	1.000	31400884		1.72(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.093	2.097	-0.004		10651541	43.5		86.9	521768	
7 Perfluorohexanoic acid										E
313.00 > 269.00	2.093	2.097	-0.004	1.000	44713764	226.0			144603	E
9 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.433	2.422	0.011	1.000	84871663	276.7				E
D 11 13C4-PFHpA										
367.00 > 322.00	2.416	2.429	-0.013		8618673	38.1		76.2	521249	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.416	2.429	-0.013	1.000	16778527	99.4			38313	
D 10 18O2 PFHxS										
403.00 > 84.00	2.443	2.452	-0.010		14083930	43.1		91.1	635767	
D 14 13C4 PFOA										
417.00 > 372.00	2.775	2.790	-0.015		10364409	45.0		90.0	615925	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.775	2.790	-0.015	1.000	24082513	115.8			95609	M
413.00 > 169.00	2.752	2.790	-0.038	0.992	17247843		1.40(0.90-1.10)		104490	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.152	3.134	0.018	1.000	116785709	512.4			250960	E
499.00 > 99.00	3.144	3.134	0.010	0.997	29478651		3.96(0.90-1.10)		272717	
D 17 13C4 PFOS										
503.00 > 80.00	3.144	3.158	-0.014		10955571	44.0		92.1	191733	
20 Perfluorononanoic acid										
463.00 > 419.00	3.144	3.158	-0.014	1.000	638065	5.80			4313	
D 19 13C5 PFNA										
468.00 > 423.00	3.152	3.166	-0.014		5778791	32.5		65.0	264316	
D 21 13C8 FOSA										
506.00 > 78.00	3.476	3.481	-0.005		854693	2.22		4.4	81807	
D 23 13C2 PFDA										
515.00 > 470.00	3.509	3.523	-0.014		7602609	48.3		96.7	285887	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.509	3.523	-0.014	1.000	216721	1.51			3084	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.820	3.834	-0.014	1.000	2818	0.0211				
D 27 13C2 PFUnA										
565.00 > 520.00	3.837	3.851	-0.014		5718307	48.8		97.5	451905	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.828	3.851	-0.023	1.000	16551	0.1513			254	
D 30 13C2 PFDoA										
615.00 > 570.00	4.127	4.134	-0.007		5428581	48.9		97.8	264713	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.644	4.652	-0.008	1.000	36472	0.2120			531	
713.00 > 169.00	4.634	4.652	-0.018	0.998	7292		5.00(0.00-0.00)		3140	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

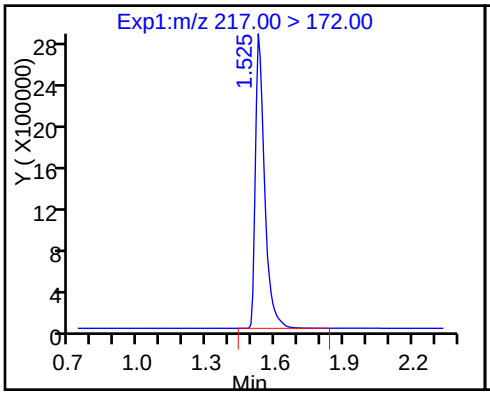
Report Date: 29-Dec-2016 17:35:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

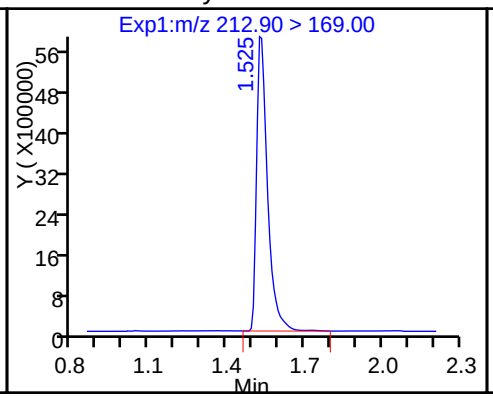
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_006.d

Injection Date:	29-Dec-2016 00:29:30	Instrument ID:	A8_N
Lims ID:	320-24149-A-2-A	Lab Sample ID:	320-24149-2
Client ID:	FSS5TMW-1216		
Operator ID:	A8-PC\A8	ALS Bottle#:	4 Worklist Smp#: 6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL

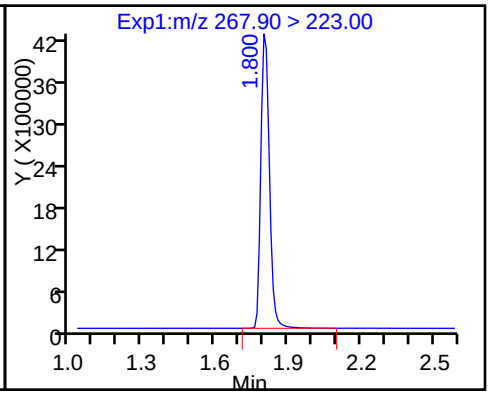
D 2 13C4 PFBA



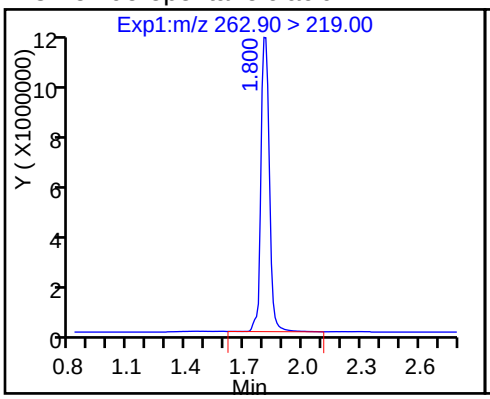
1 Perfluorobutyric acid



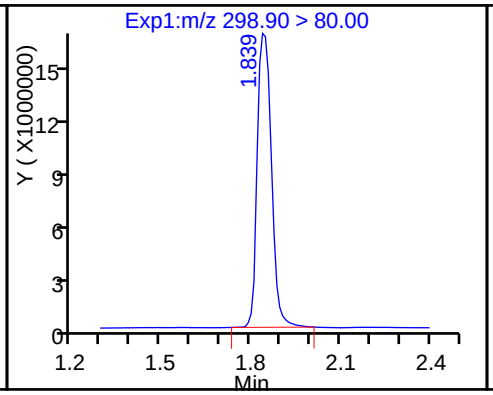
D 4 13C5-PFPeA



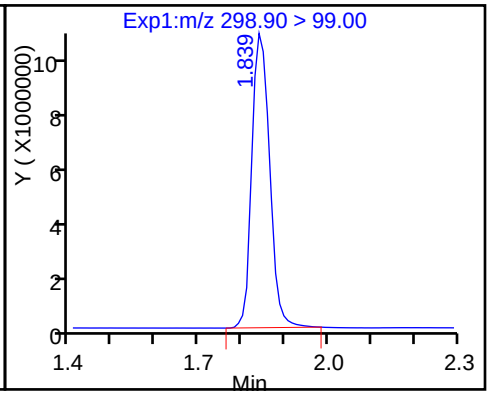
3 Perfluoropentanoic acid



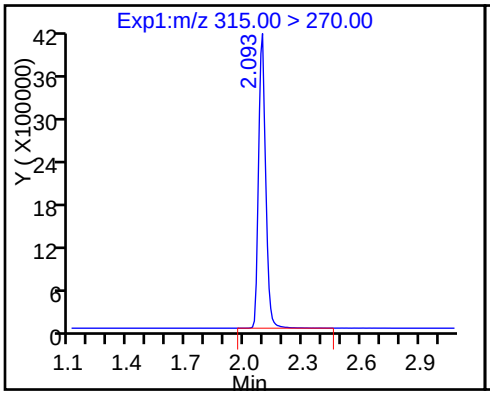
5 Perfluorobutanesulfonic acid



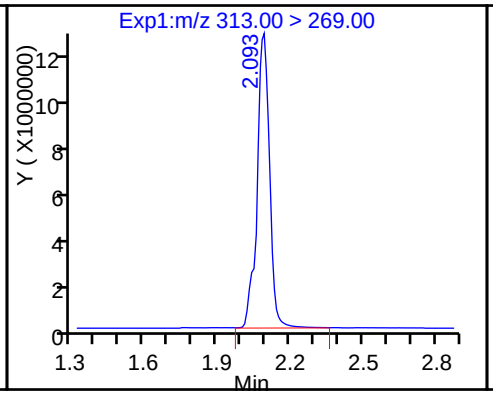
5 Perfluorobutanesulfonic acid



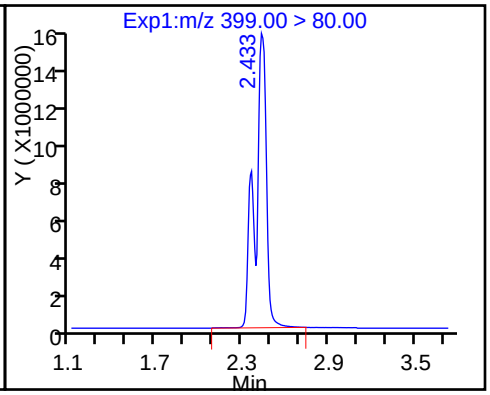
D 6 13C2 PFHxA



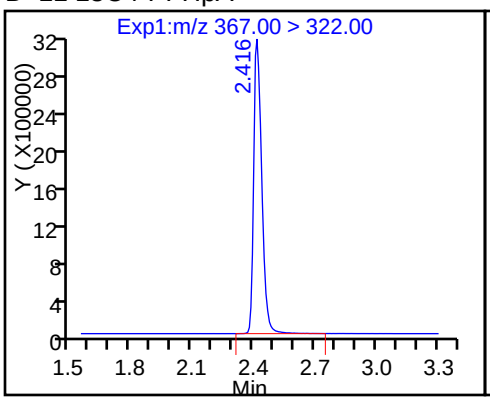
7 Perfluorohexanoic acid



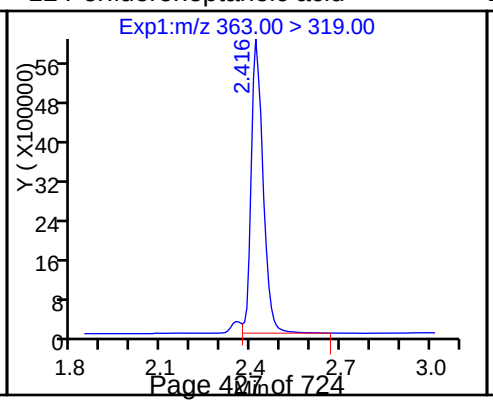
9 Perfluorohexanesulfonic acid



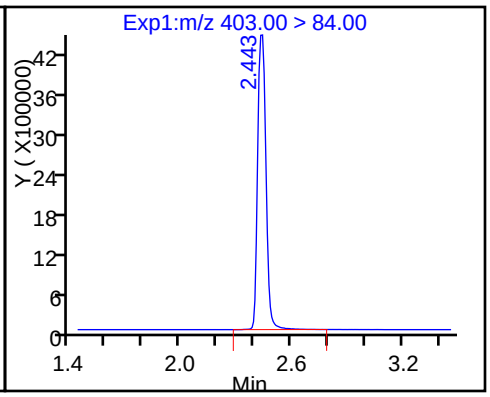
D 11 13C4-PFHpA



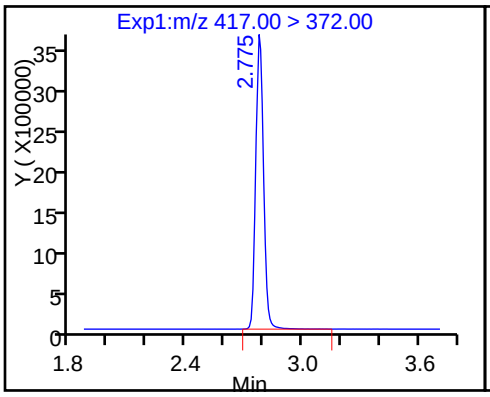
12 Perfluoroheptanoic acid



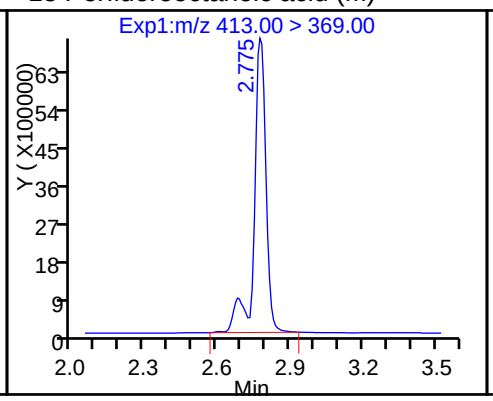
D 10 18O2 PFHxS



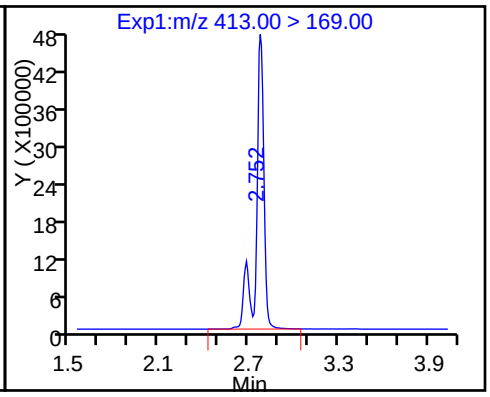
D 14 13C4 PFOA



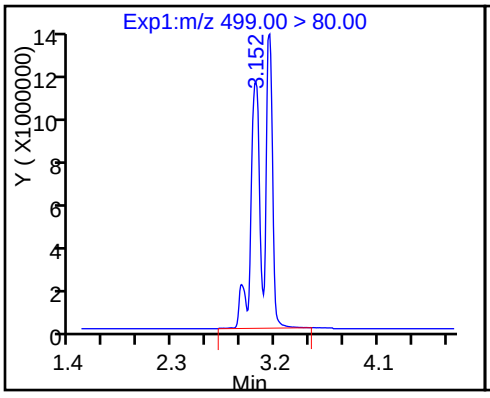
15 Perfluorooctanoic acid (M)



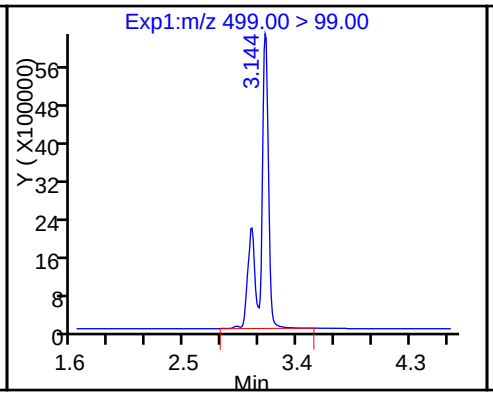
15 Perfluorooctanoic acid



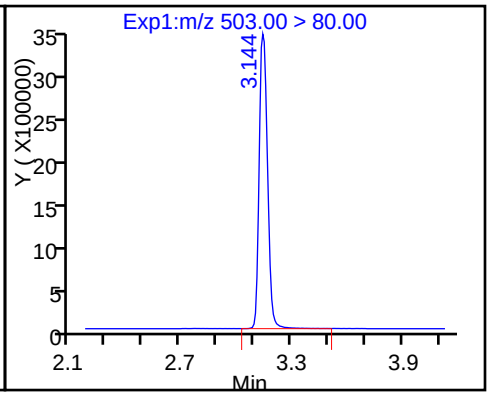
18 Perfluorooctane sulfonic acid



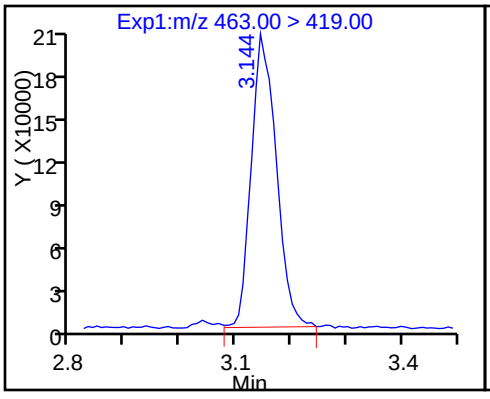
18 Perfluorooctane sulfonic acid



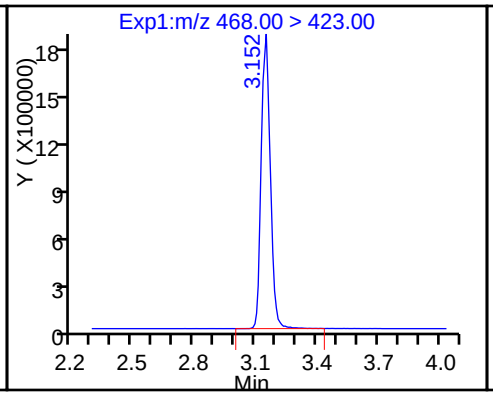
D 17 13C4 PFOS



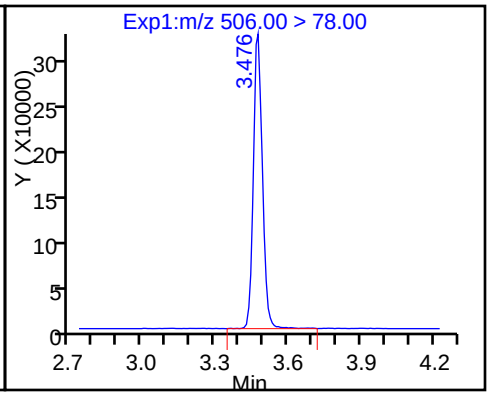
20 Perfluorononanoic acid



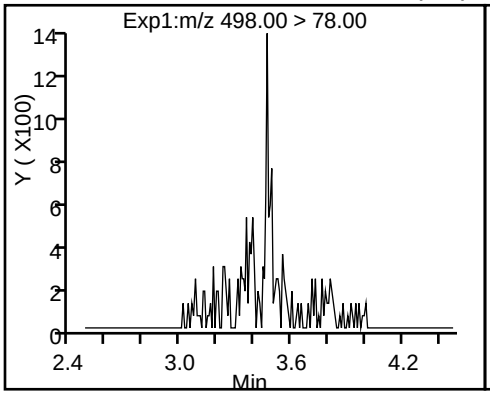
D 19 13C5 PFNA



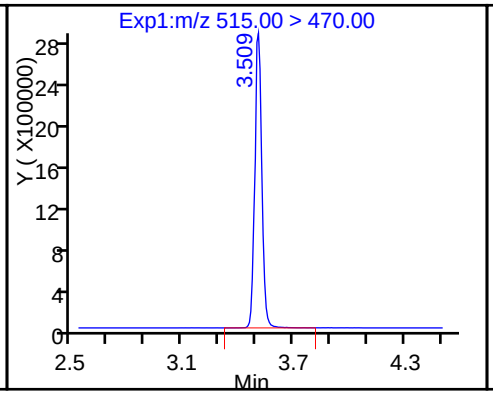
D 21 13C8 FOSA



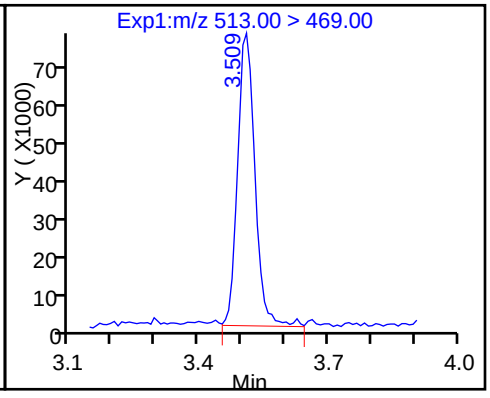
22 Perfluorooctane Sulfonamide (ND)



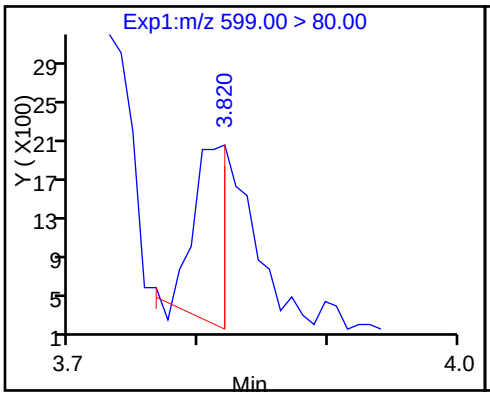
D 23 13C2 PFDA



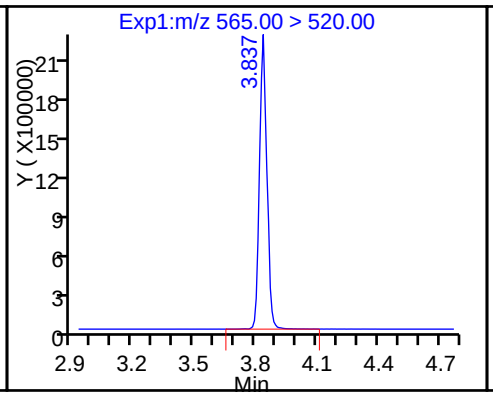
24 Perfluorodecanoic acid



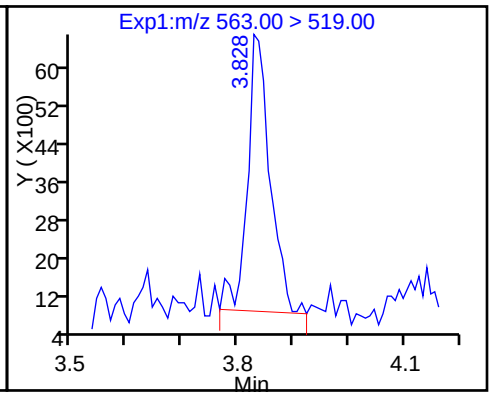
26 Perfluorodecane Sulfonic acid



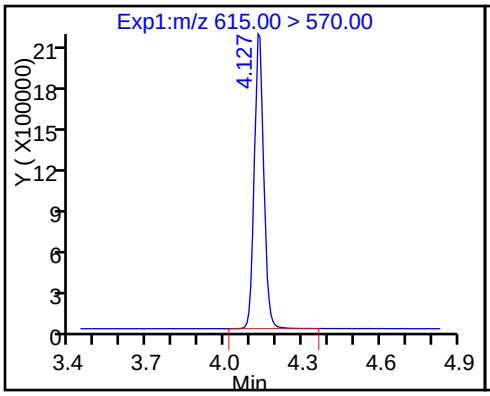
D 27 13C2 PFUnA



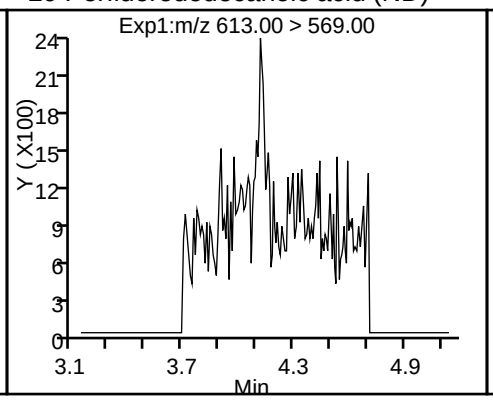
28 Perfluoroundecanoic acid



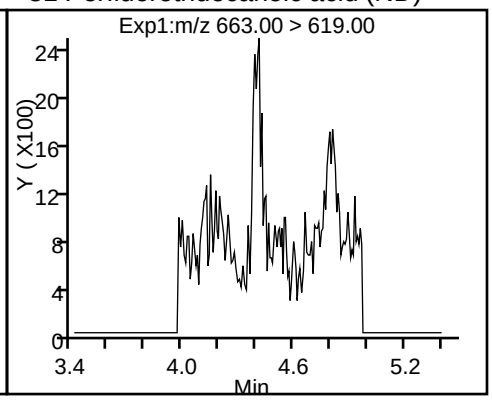
D 30 13C2 PFDoA



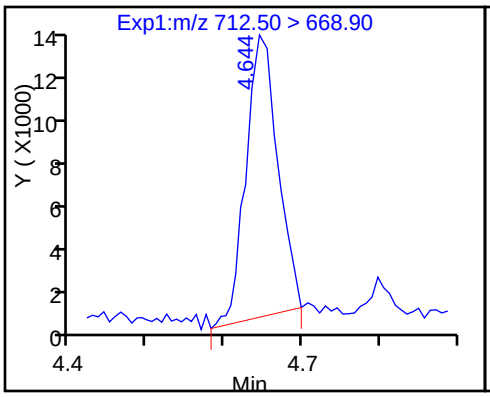
29 Perfluorododecanoic acid (ND)



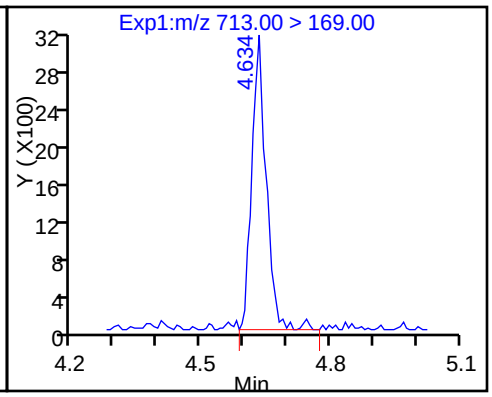
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

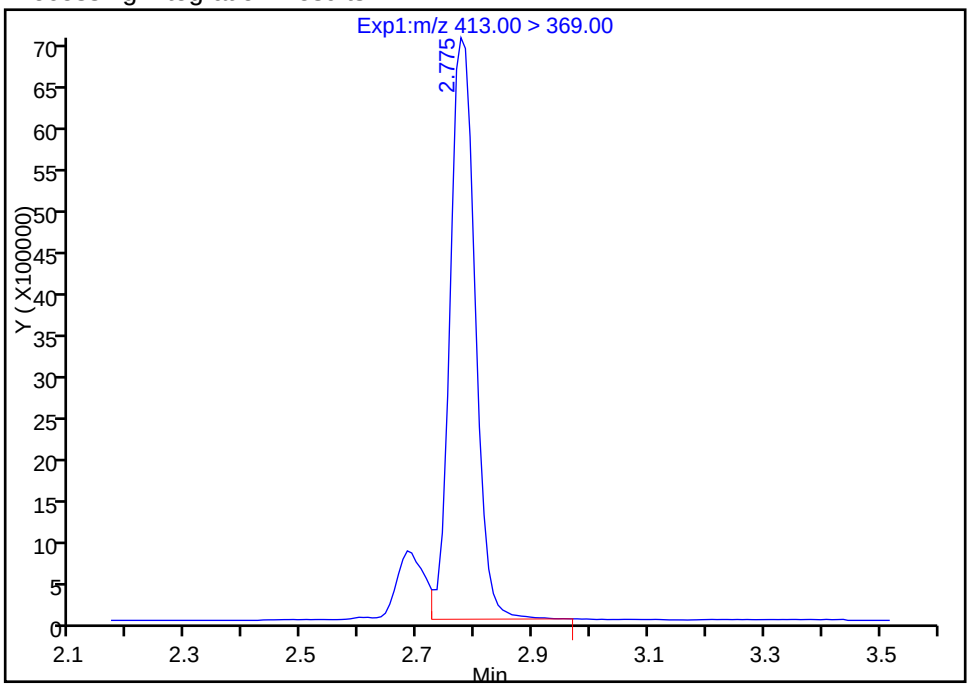
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_006.d				
Injection Date:	29-Dec-2016 00:29:30	Instrument ID:	A8_N		
Lims ID:	320-24149-A-2-A	Lab Sample ID:	320-24149-2		
Client ID:	FSS5TMW-1216				
Operator ID:	A8-PC\A8	ALS Bottle#:	4	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

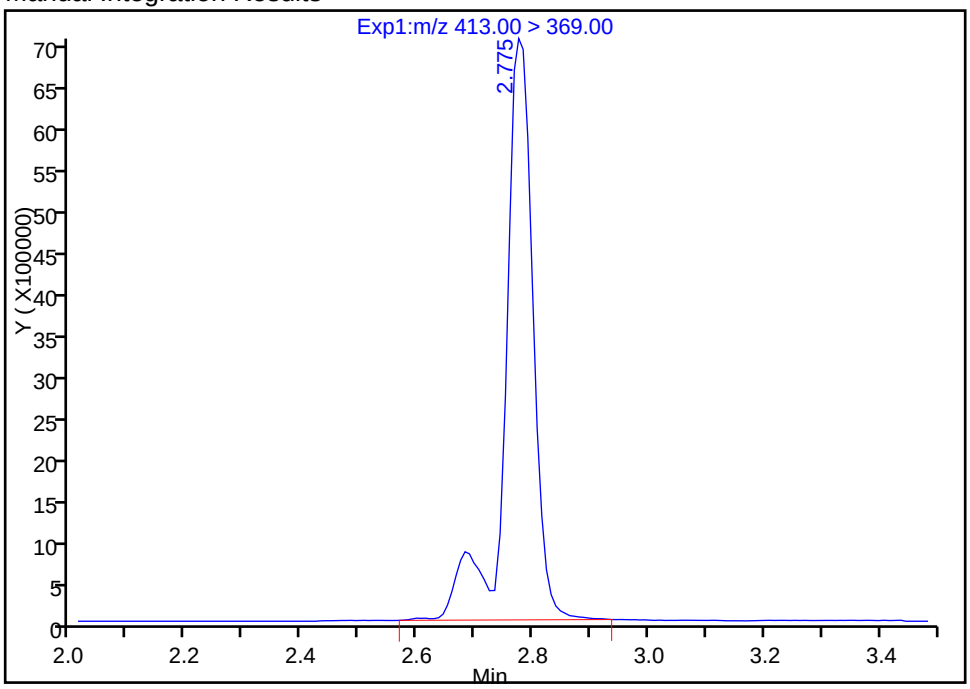
Processing Integration Results

RT: 2.78
Area: 21399641
Amount: 102.9127
Amount Units: ng/ml



Manual Integration Results

RT: 2.78
Area: 24082513
Amount: 115.8149
Amount Units: ng/ml



Reviewer: phomsophat, 29-Dec-2016 17:35:05

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS5TMW-1216 DL | Lab Sample ID: 320-24149-2 DL

Matrix: Water | Lab File ID: 30DEC2016B_007.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 11:00

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 286(mL) | Date Analyzed: 12/30/2016 13:03

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*0.23*	*D*	*0.022*	0.0087	*0.0040*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*0.40*	*D*	*0.022*	0.017	*0.0086*
307-24-4	Perfluorohexanoic acid (PFHxA)	0.53	D B	0.022	0.017	0.0069
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.17*	*D*	*0.022*	0.017	*0.0070*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.21*	*D M*	*0.022*	0.017	*0.0065*
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.010*	*J D*	*0.022*	0.017	*0.0057*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.0087*	*U*	*0.022*	0.0087	*0.0038*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*0.017*	*U*	*0.022*	0.017	*0.0065*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.017*	*U*	*0.022*	0.017	*0.0051*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*0.017*	*U*	*0.022*	0.017	*0.0048*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*0.0087*	*U*	*0.022*	0.0087	*0.0035*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*0.36*	*D*	*0.022*	0.017	*0.0080*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.63	D M	0.022	0.017	0.0076
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.95	D	0.035	0.026	0.011
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*0.026*	*U*	*0.035*	0.026	*0.011*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*0.017*	*U*	*0.022*	0.017	*0.0056*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: FSS5TMW-1216 DL | Lab Sample ID: 320-24149-2 DL

Matrix: Water | Lab File ID: 30DEC2016B_007.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 11:00

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 286(mL) | Date Analyzed: 12/30/2016 13:03

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	4	Q	25-150
STL00992	13C4 PFBA	96		25-150
STL01893	13C5-PFPeA	116		25-150
STL00993	13C2 PFHxA	102		25-150
STL01892	13C4-PFHpA	100		25-150
STL00990	13C4 PFOA	96		25-150
STL00995	13C5 PFNA	96		25-150
STL00996	13C2 PFDA	88		25-150
STL00997	13C2 PFUnA	86		25-150
STL00998	13C2 PFDoA	91		25-150
STL00994	18O2 PFHxS	121		25-150
STL00991	13C4 PFOS	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_007.d
Lims ID: 320-24149-A-2-A
Client ID: FSS5TMW-1216
Sample Type: Client
Inject. Date: 30-Dec-2016 13:03:55 ALS Bottle#: 4 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-24149-a-2-a 10X
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:00 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:50:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.529	1.534	-0.005		1666319	4.79		9.6	147366	
1 Perfluorobutyric acid										
212.90 > 169.00	1.529	1.534	-0.005	1.000	3685795	13.0			19347	
D 4 13C5-PFPeA										
267.90 > 223.00	1.804	1.810	-0.006		1540009	5.79		11.6	164765	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.804	1.810	-0.006	1.000	7009936	23.1			81401	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.842	1.849	-0.007	1.000	11639679	20.8				
298.90 > 99.00	1.842	1.849	-0.007	1.000	5033188		2.31(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.095	2.098	-0.003		1254765	5.12		10.2	128323	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.095	2.098	-0.003	1.000	7000553	30.0			115445	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.437	2.424	0.013	1.000	14644652	35.9				M
D 11 13C4-PFHpA										
367.00 > 322.00	2.423	2.431	-0.008		1129849	4.99		10.0	106566	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.423	2.431	-0.008	1.000	2189029	9.90			16024	
D 10 18O2 PFHxS										
403.00 > 84.00	2.437	2.454	-0.017		1871724	5.72		12.1	240601	
D 14 13C4 PFOA										
417.00 > 372.00	2.781	2.791	-0.010		1105157	4.80		9.6	102713	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.781	2.791	-0.010	1.000	2712002	12.2			35820	M
413.00 > 169.00	2.758	2.791	-0.033	0.992	1759681		1.54(0.90-1.10)		23352	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.910	3.135	-0.225	1.000	15027960	54.2			11673	
499.00 > 99.00	3.157	3.135	0.022	1.085	3142502		4.78(0.90-1.10)		123652	
D 17 13C4 PFOS										
503.00 > 80.00	3.157	3.159	-0.002		1332779	5.36		11.2	57980	
20 Perfluorononanoic acid										
463.00 > 419.00	3.157	3.159	-0.002	1.000	94067	0.5768			1605	
D 19 13C5 PFNA										
468.00 > 423.00	3.157	3.167	-0.010		856738	4.82		9.6	108107	
D 21 13C8 FOSA										
506.00 > 78.00	3.472	3.474	-0.002		84303	0.2195		0.4	4918	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.514	3.524	-0.010	1.000	19547	0.1504			562	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.524	-0.010		688661	4.38		8.8	32179	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.824	3.836	-0.012	1.000	881	0.005411				
D 27 13C2 PFUnA										
565.00 > 520.00	3.842	3.853	-0.011		502735	4.29		8.6	61938	
D 30 13C2 PFDoA										
615.00 > 570.00	4.139	4.149	-0.010		506186	4.56		9.1	27440	

QC Flag Legend

Review Flags

M - Manually Integrated

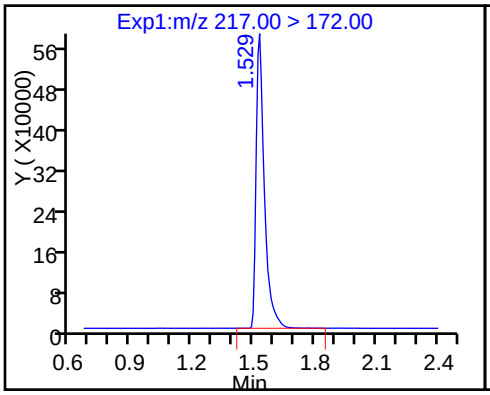
Report Date: 03-Jan-2017 14:28:11 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

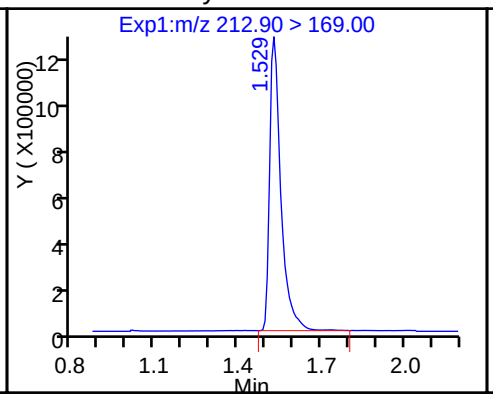
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_007.d

Injection Date:	30-Dec-2016 13:03:55	Instrument ID:	A8_N		
Lims ID:	320-24149-A-2-A	Lab Sample ID:	320-24149-2		
Client ID:	FSS5TMW-1216				
Operator ID:	A8-PC\A8	ALS Bottle#:	4	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

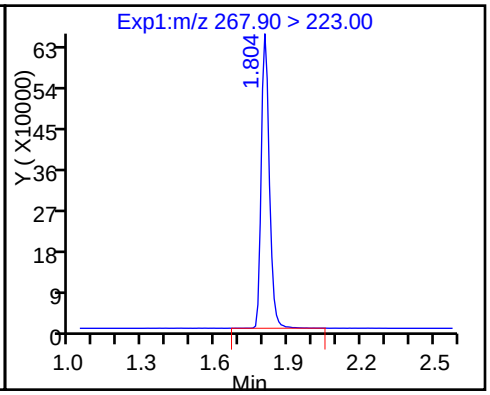
D 2 13C4 PFBA



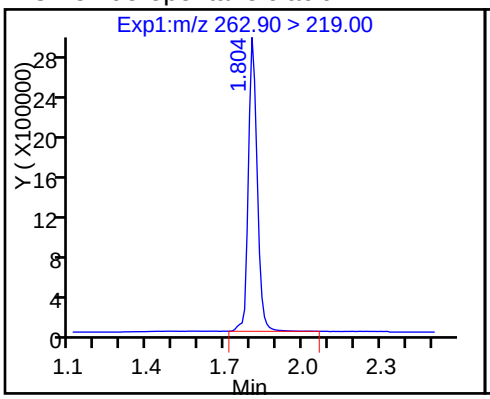
1 Perfluorobutyric acid



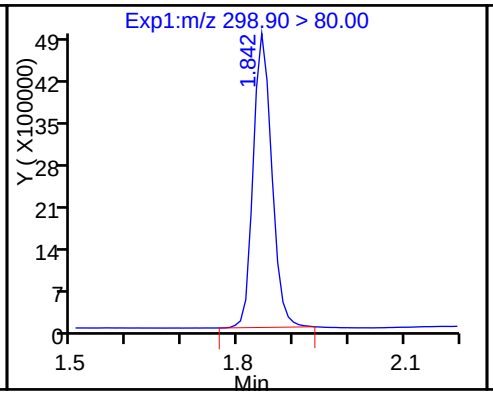
D 4 13C5-PFPeA



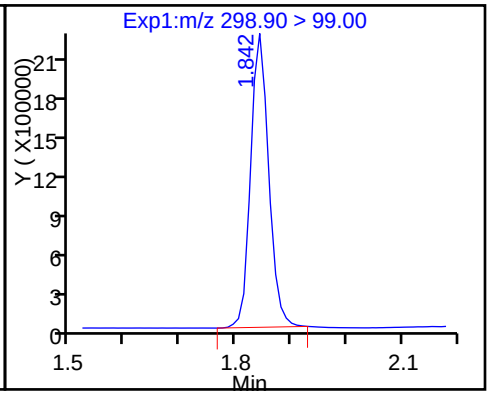
3 Perfluoropentanoic acid



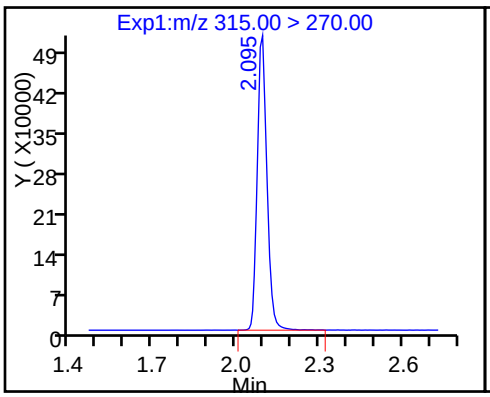
5 Perfluorobutanesulfonic acid



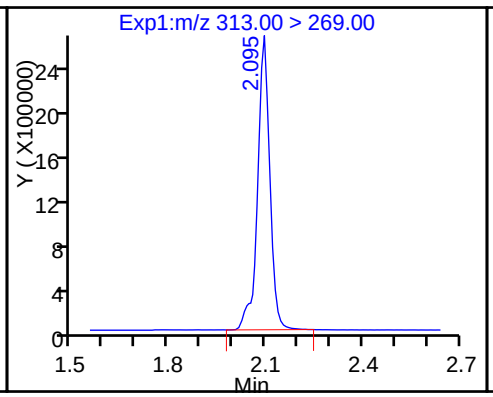
5 Perfluorobutanesulfonic acid



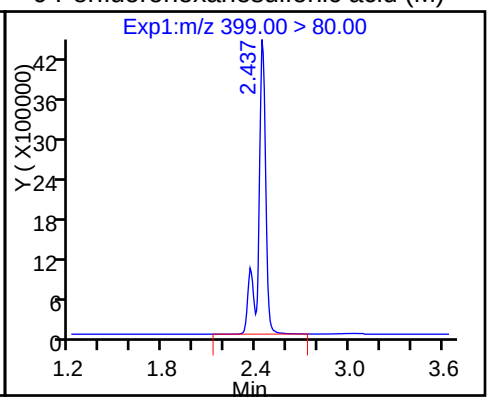
D 6 13C2 PFHxA



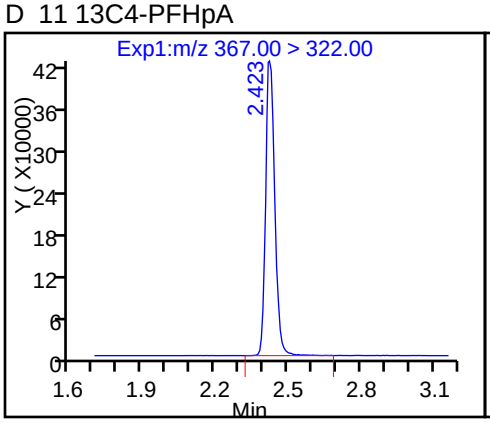
7 Perfluorohexanoic acid



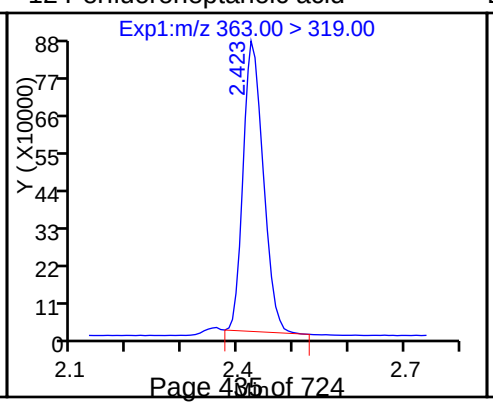
9 Perfluorohexanesulfonic acid (M)



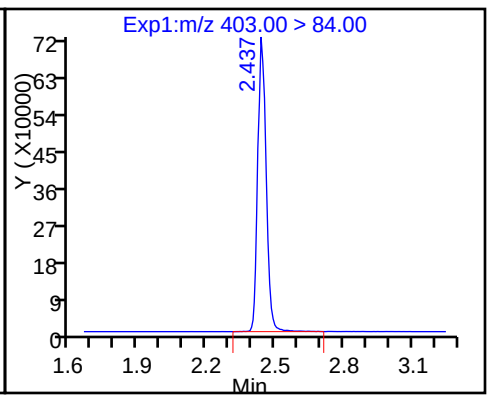
D 11 13C4-PFHpA



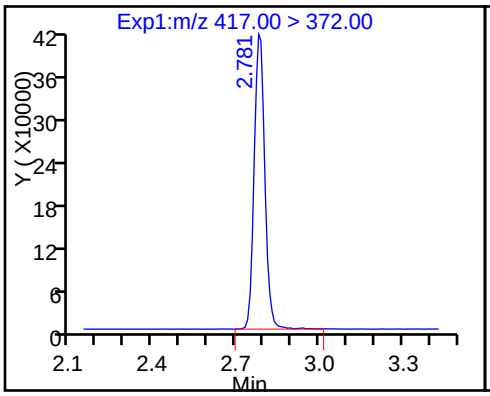
12 Perfluoroheptanoic acid



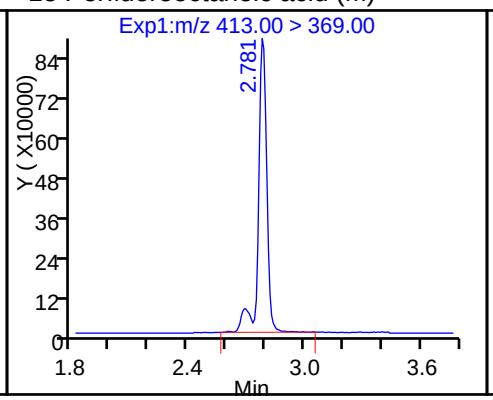
D 10 18O2 PFHxS



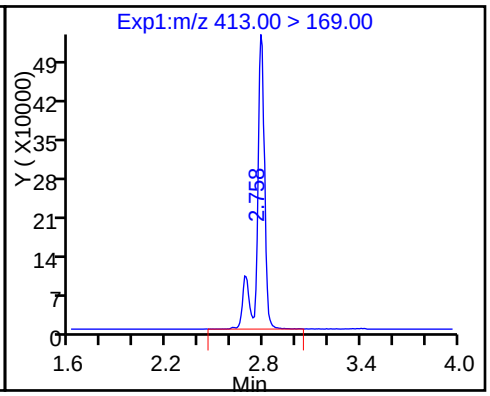
D 14 13C4 PFOA



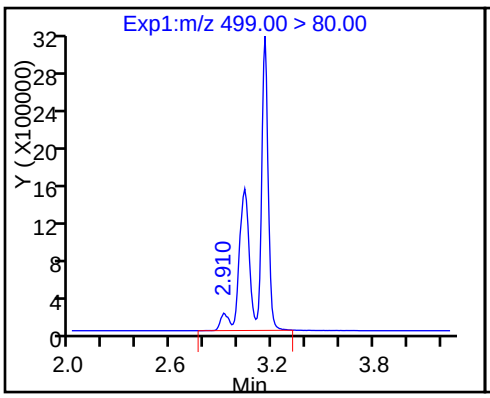
15 Perfluorooctanoic acid (M)



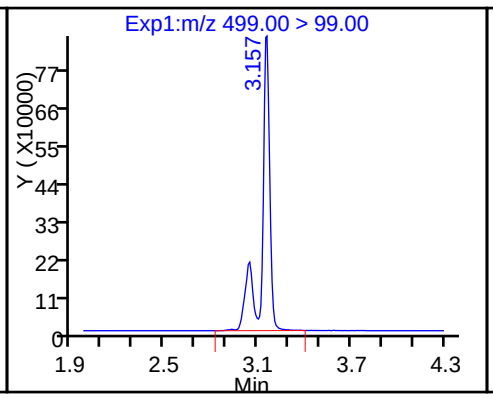
15 Perfluorooctanoic acid



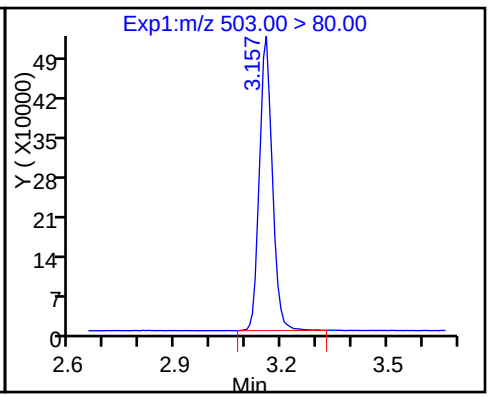
18 Perfluorooctane sulfonic acid



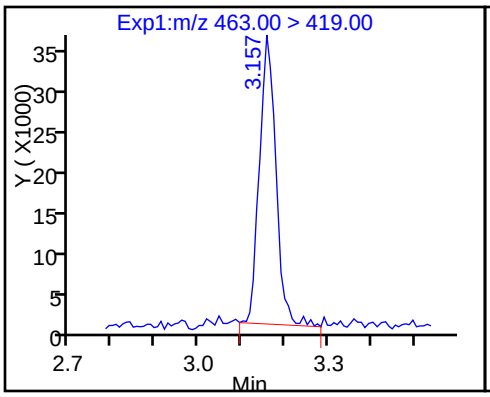
18 Perfluorooctane sulfonic acid



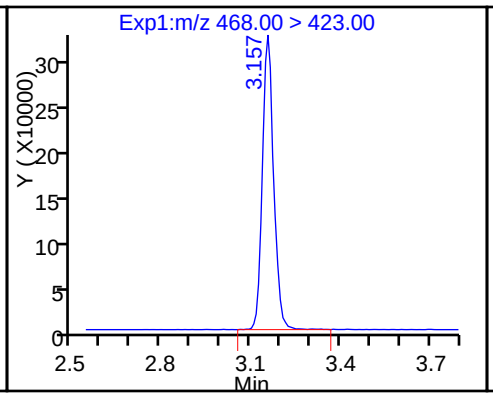
D 17 13C4 PFOS



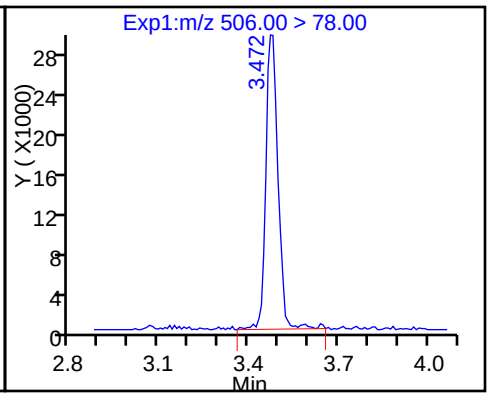
20 Perfluorononanoic acid



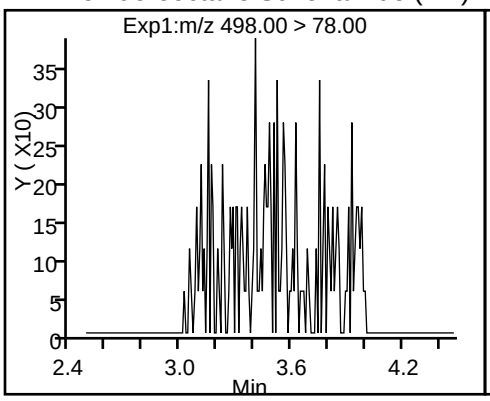
D 19 13C5 PFNA



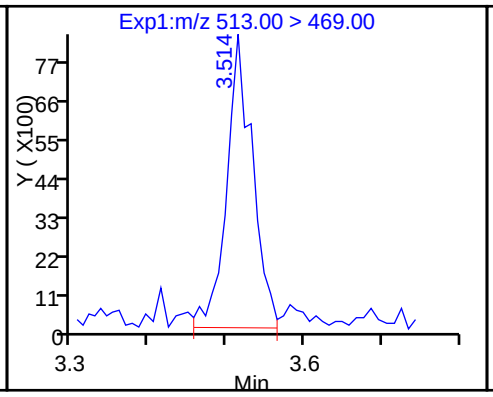
D 21 13C8 FOSA



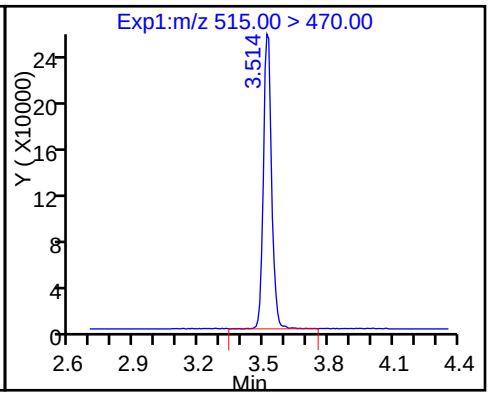
22 Perfluorooctane Sulfonamide (ND)



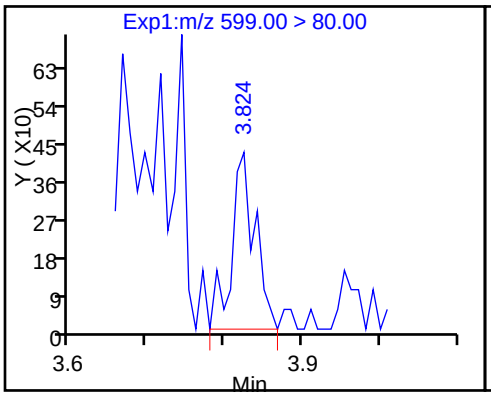
24 Perfluorodecanoic acid



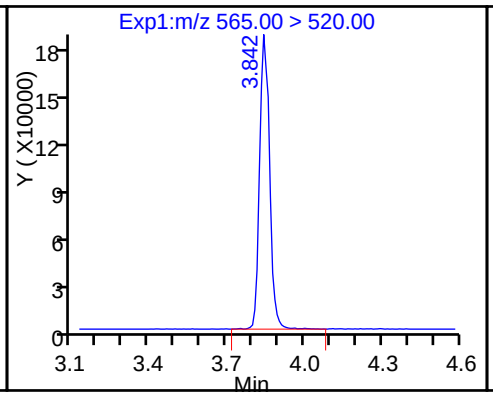
D 23 13C2 PFDA



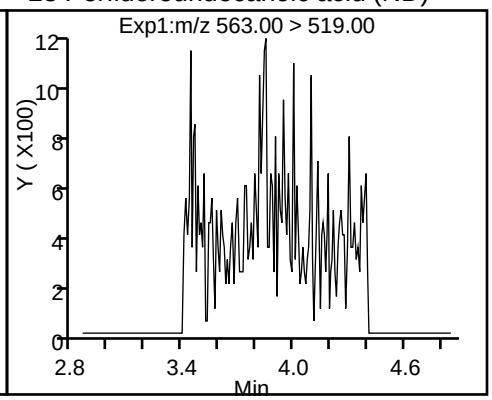
26 Perfluorodecane Sulfonic acid



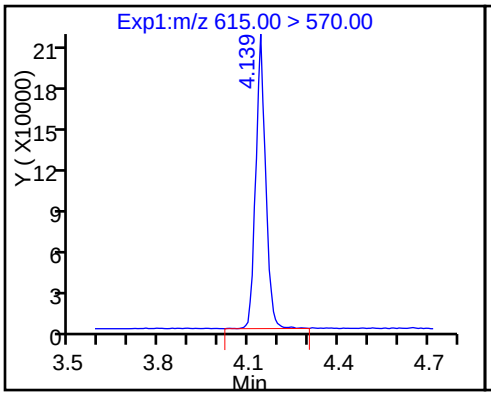
D 27 13C2 PFUnA



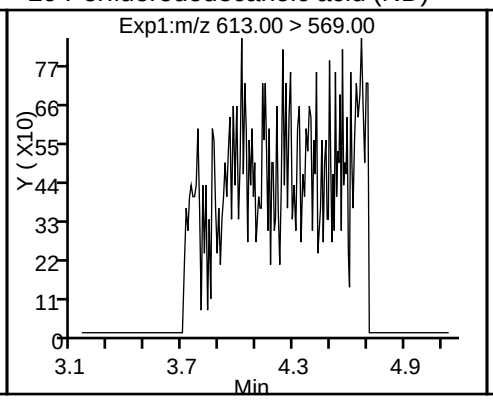
28 Perfluoroundecanoic acid (ND)



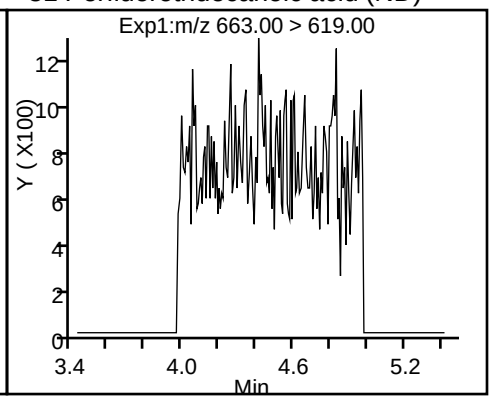
D 30 13C2 PFDoA



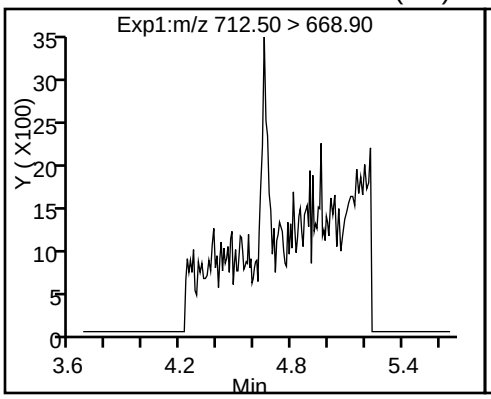
29 Perfluorododecanoic acid (ND)



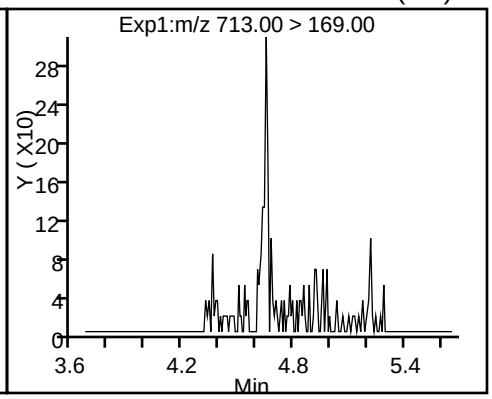
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid (ND)



33 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

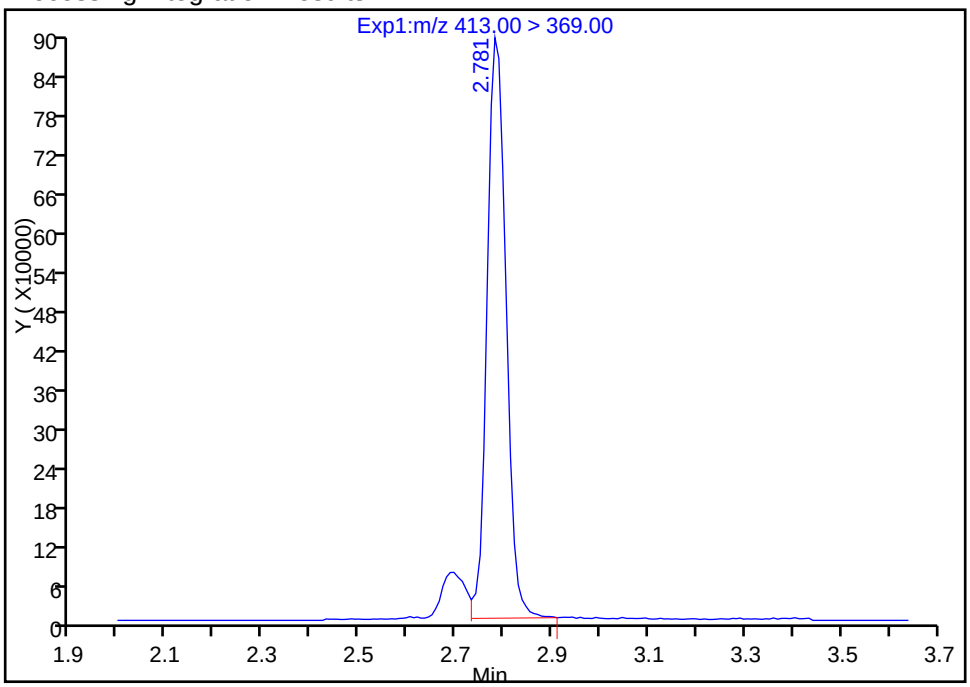
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_007.d				
Injection Date:	30-Dec-2016 13:03:55	Instrument ID:	A8_N		
Lims ID:	320-24149-A-2-A	Lab Sample ID:	320-24149-2		
Client ID:	FSS5TMW-1216				
Operator ID:	A8-PC\A8	ALS Bottle#:	4	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

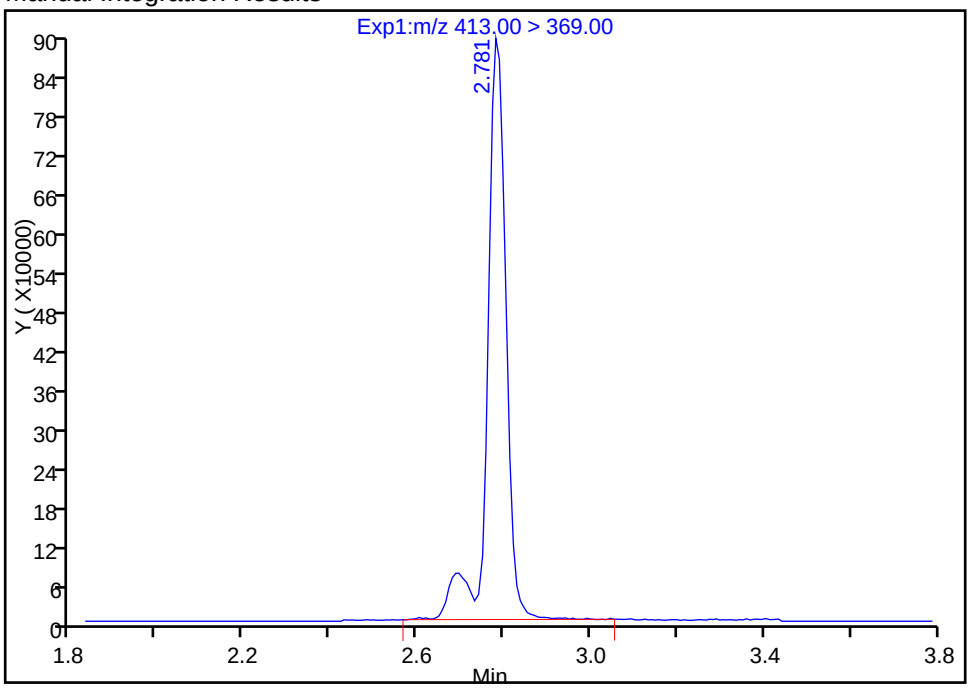
Processing Integration Results

RT: 2.78
Area: 2449842
Amount: 11.048952
Amount Units: ng/ml



Manual Integration Results

RT: 2.78
Area: 2712002
Amount: 12.231311
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:50:26

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

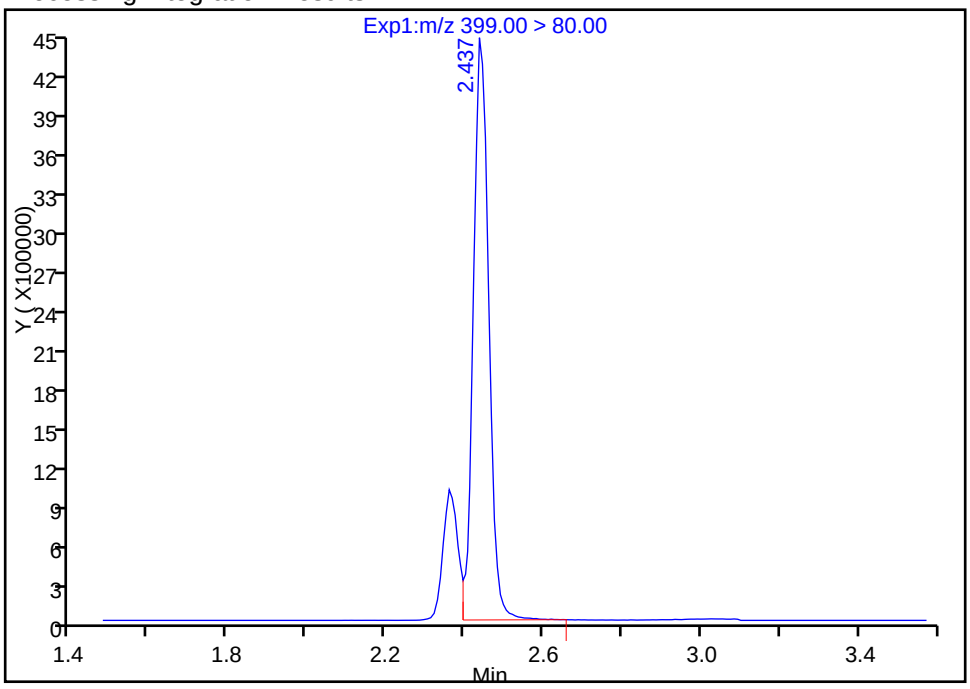
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_007.d				
Injection Date:	30-Dec-2016 13:03:55	Instrument ID:	A8_N		
Lims ID:	320-24149-A-2-A	Lab Sample ID:	320-24149-2		
Client ID:	FSS5TMW-1216				
Operator ID:	A8-PC\A8	ALS Bottle#:	4	Worklist Smp#:	17
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

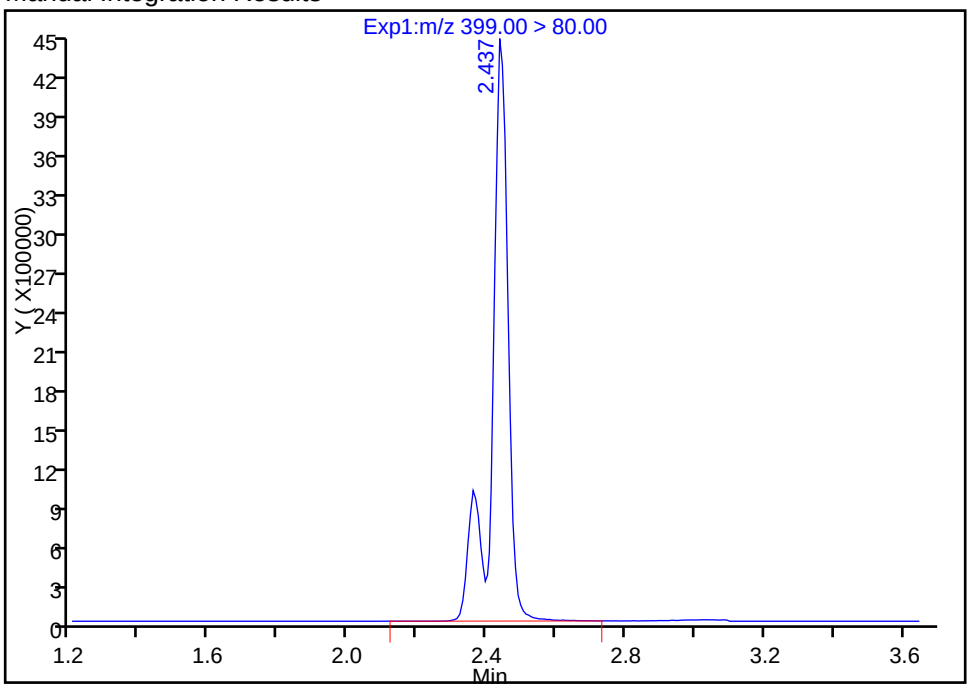
Processing Integration Results

RT: 2.44
Area: 12030079
Amount: 29.516434
Amount Units: ng/ml



Manual Integration Results

RT: 2.44
Area: 14644652
Amount: 35.931427
Amount Units: ng/ml



Reviewer: phomsophat, 03-Jan-2017 13:50:26

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: EBGW120616 | Lab Sample ID: 320-24149-3

Matrix: Water | Lab File ID: 30DEC2016B_010.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 12:45

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 274.2(mL) | Date Analyzed: 12/30/2016 13:26

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.00091	U	0.0023	0.00091	0.00042
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0018	U	0.0023	0.0018	0.00090
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0018	U	0.0023	0.0018	0.00072
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.0018	0.00073
335-67-1	Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.0018	0.00068
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.0018	0.00060
335-76-2	Perfluorodecanoic acid (PFDA)	0.00091	U	0.0023	0.00091	0.00040
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0023	0.0018	0.00068
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0023	0.0018	0.00053
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0023	0.0018	0.00050
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00091	U	0.0023	0.00091	0.00036
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.0018	0.00084
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0023	0.0018	0.00079
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0027	0.0012
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0027	U	0.0036	0.0027	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0018	U	0.0023	0.0018	0.00058

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Client Sample ID: EBGW120616 Lab Sample ID: 320-24149-3

Matrix: Water Lab File ID: 30DEC2016B_010.d

Analysis Method: 537 (Modified) Date Collected: 12/06/2016 12:45

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 274.2(mL) Date Analyzed: 12/30/2016 13:26

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	42		25-150
STL00992	13C4 PFBA	131		25-150
STL01893	13C5-PFPeA	131		25-150
STL00993	13C2 PFHxA	118		25-150
STL01892	13C4-PFHpA	120		25-150
STL00990	13C4 PFOA	126		25-150
STL00995	13C5 PFNA	122		25-150
STL00996	13C2 PFDA	135		25-150
STL00997	13C2 PFUnA	133		25-150
STL00998	13C2 PFDoA	132		25-150
STL00994	18O2 PFHxS	122		25-150
STL00991	13C4 PFOS	127		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_010.d
Lims ID: 320-24149-A-3-A
Client ID: EBGW120616
Sample Type: Client
Inject. Date: 30-Dec-2016 13:26:25 ALS Bottle#: 6 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24149-a-3-a
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:00 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:52:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		22708440	65.3		131	1472976	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	39639	0.1022			130	
D 4 13C5-PFPeA										
267.90 > 223.00	1.820	1.810	0.010		17491181	65.7		131	1366920	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	40044	0.1160			355	
D 6 13C2 PFHxA										
315.00 > 270.00	2.107	2.098	0.009		14474486	59.1		118	680494	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.107	2.098	0.009	1.000	22412	0.0834			553	
D 11 13C4-PFHpA										
367.00 > 322.00	2.438	2.431	0.007		13560492	59.9		120	864575	
D 10 18O2 PFHxS										
403.00 > 84.00	2.453	2.454	-0.001		18867046	57.7		122	874150	
D 14 13C4 PFOA										
417.00 > 372.00	2.790	2.791	-0.001		14531766	63.1		126	670855	
D 17 13C4 PFOS										
503.00 > 80.00	3.158	3.159	-0.001		15051815	60.5		127	671688	
D 19 13C5 PFNA										
468.00 > 423.00	3.166	3.167	-0.001		10852992	61.1		122	489409	
D 21 13C8 FOSA										
506.00 > 78.00	3.490	3.474	0.016		8056542	21.0		41.9	445117	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.506	3.524	-0.018	1.000	6529	0.0325			145	
D 23 13C2 PFDA										
515.00 > 470.00	3.523	3.524	-0.001		10649272	67.7		135	363188	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.816	3.836	-0.020	1.000	1619	0.008804				
D 27 13C2 PFUnA										
565.00 > 520.00	3.851	3.853	-0.002		7812668	66.6		133	768828	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.851	3.853	-0.002	1.000	20682	0.1384			705	
D 30 13C2 PFDoA										
615.00 > 570.00	4.148	4.149	-0.001		7339554	66.1		132	224217	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.418	4.421	-0.003	1.000	6696	0.0503			178	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.662	4.664	-0.002	1.000	43778	0.1882			619	
713.00 > 169.00	4.643	4.664	-0.021	0.996	8490		5.16(0.00-0.00)		3539	

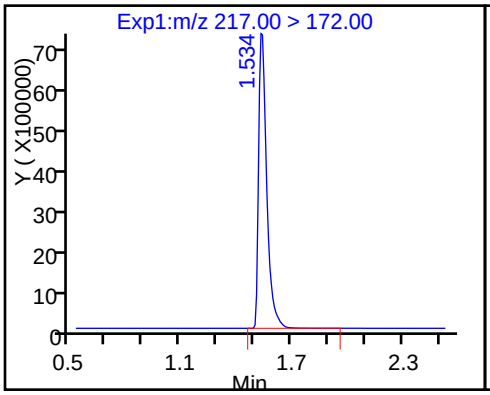
Report Date: 03-Jan-2017 14:28:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

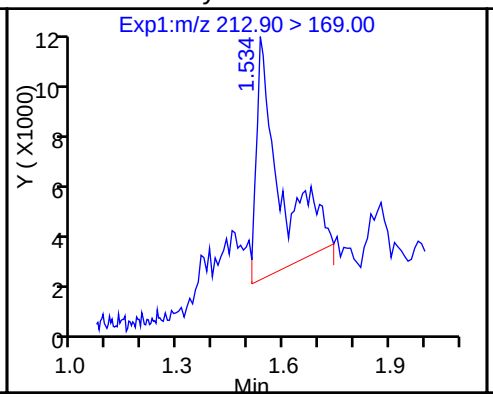
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_010.d

Injection Date:	30-Dec-2016 13:26:25	Instrument ID:	A8_N		
Lims ID:	320-24149-A-3-A	Lab Sample ID:	320-24149-3		
Client ID:	EBGW120616				
Operator ID:	A8-PC\A8	ALS Bottle#:	6	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

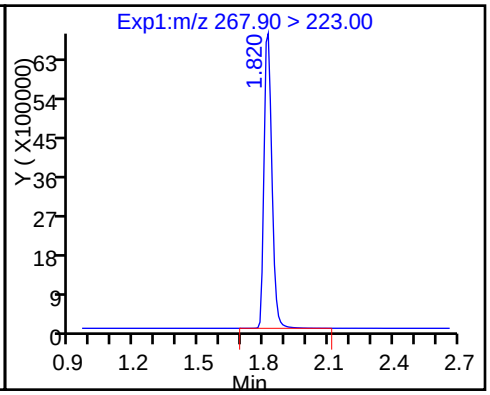
D 2 13C4 PFBA



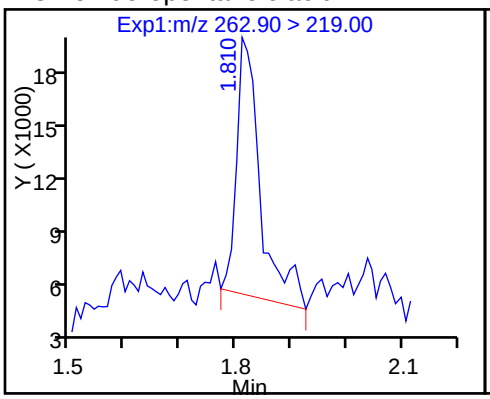
1 Perfluorobutyric acid



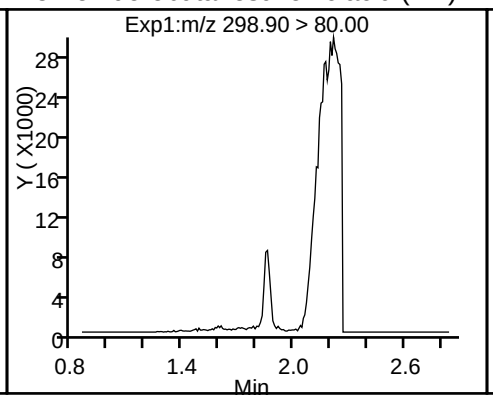
D 4 13C5-PFPeA



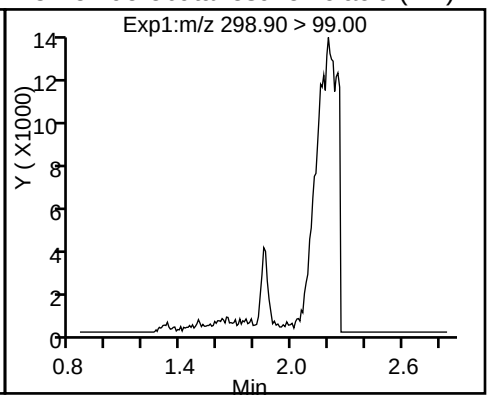
3 Perfluoropentanoic acid



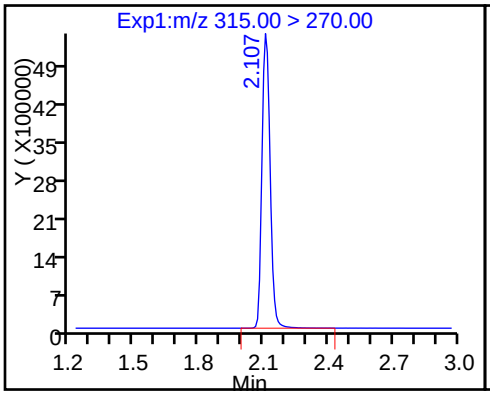
5 Perfluorobutanesulfonic acid (ND)



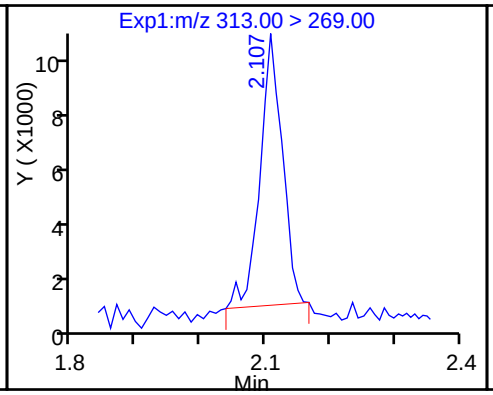
5 Perfluorobutanesulfonic acid (ND)



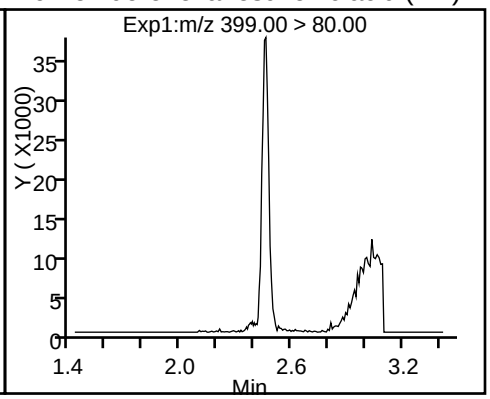
D 6 13C2 PFHxA



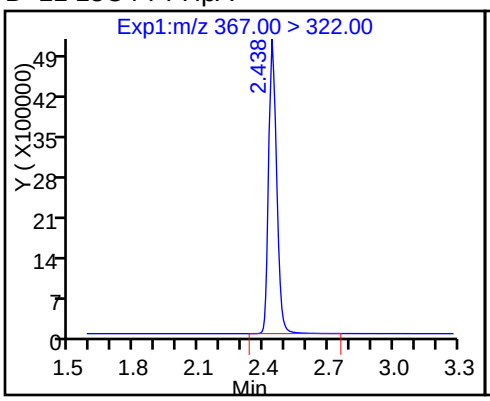
7 Perfluorohexanoic acid



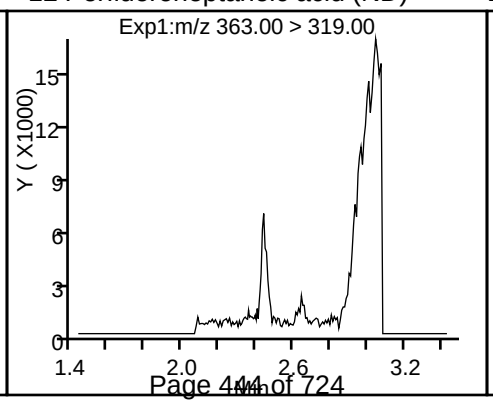
9 Perfluorohexanesulfonic acid (ND)



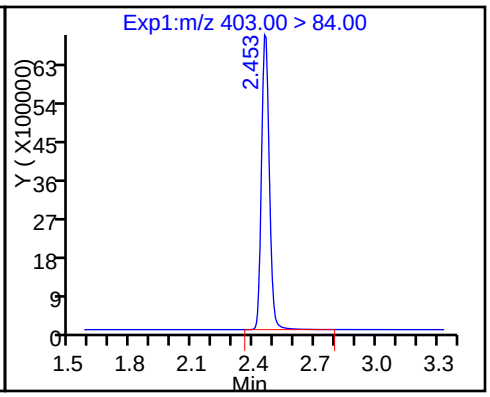
D 11 13C4-PFHpA



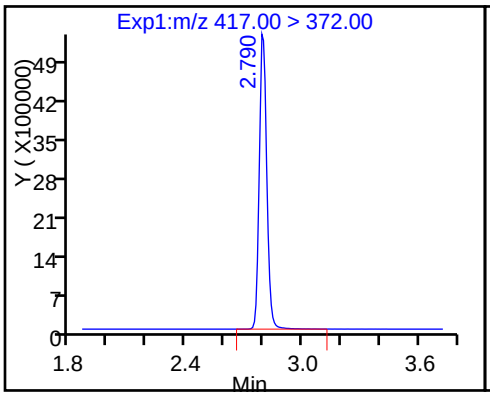
12 Perfluoroheptanoic acid (ND)



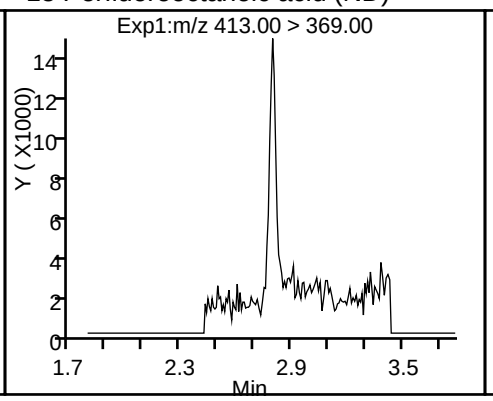
D 10 18O2 PFHxS



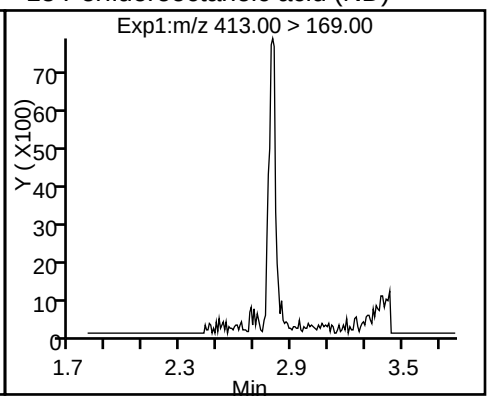
D 14 13C4 PFOA



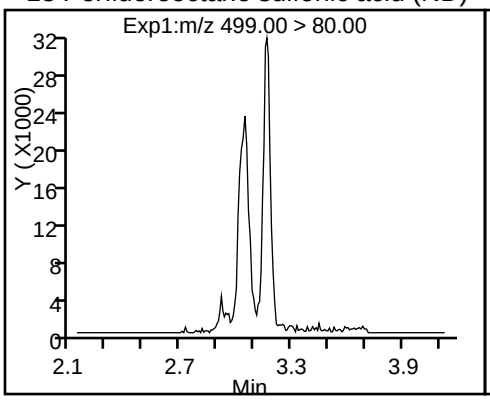
15 Perfluorooctanoic acid (ND)



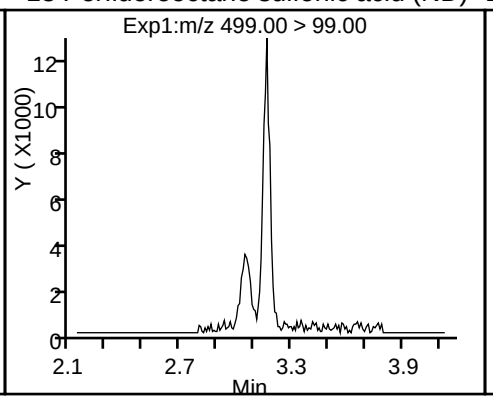
15 Perfluorooctanoic acid (ND)



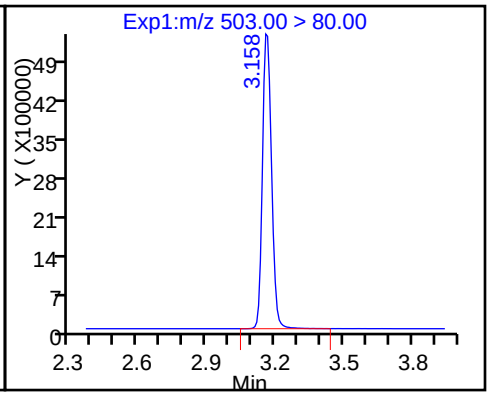
18 Perfluorooctane sulfonic acid (ND)



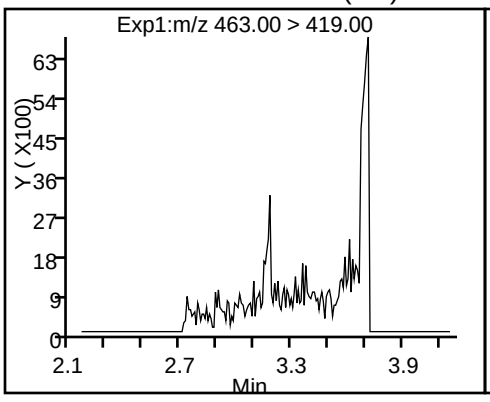
18 Perfluorooctane sulfonic acid (ND)



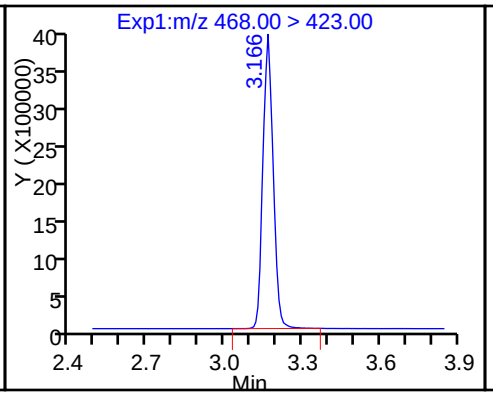
D 17 13C4 PFOS



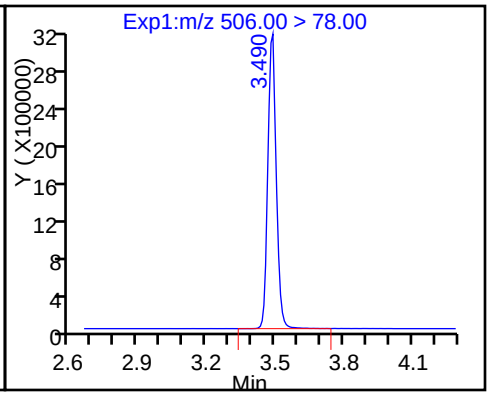
20 Perfluorononanoic acid (ND)



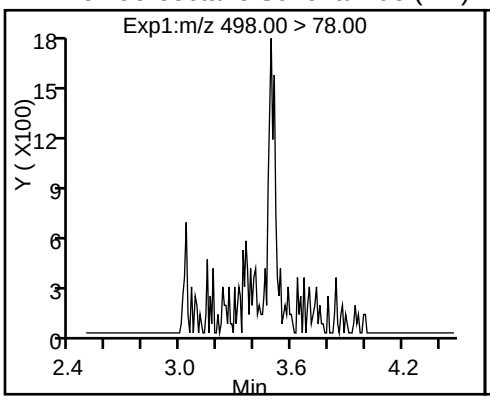
D 19 13C5 PFNA



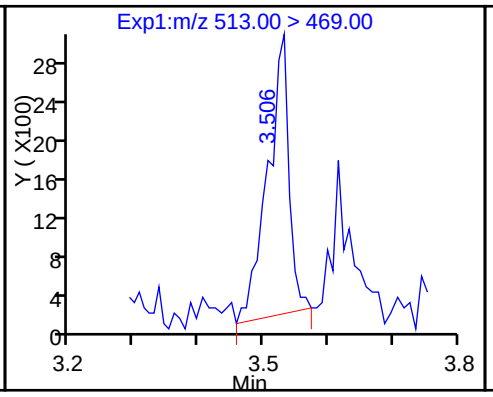
D 21 13C8 FOSA



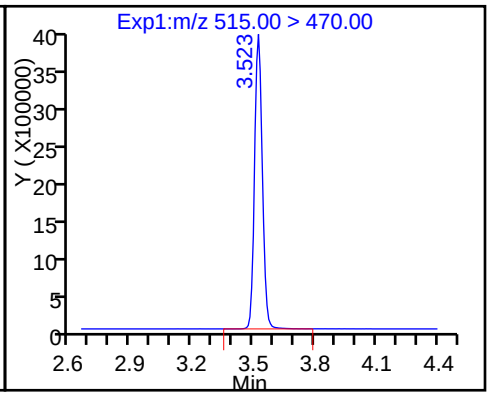
22 Perfluorooctane Sulfonamide (ND)



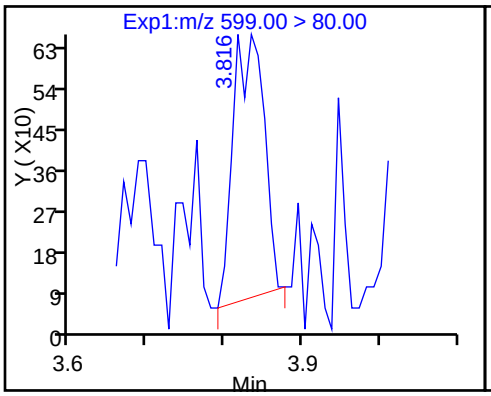
24 Perfluorodecanoic acid



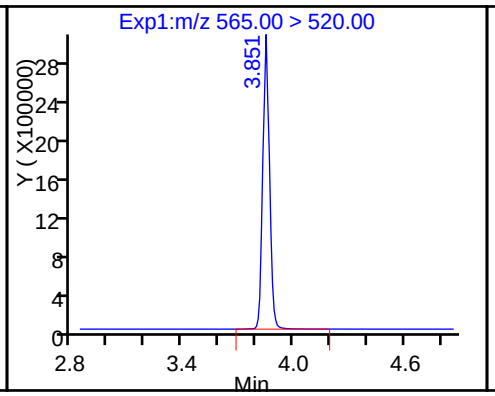
D 23 13C2 PFDA



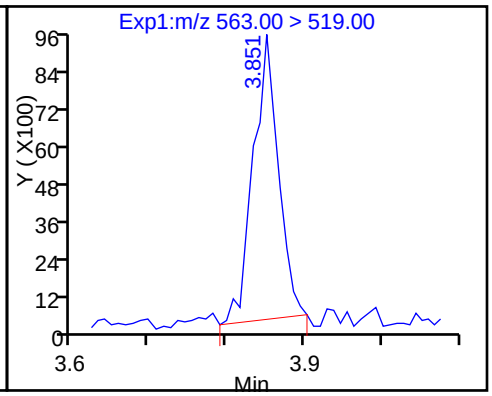
26 Perfluorodecane Sulfonic acid



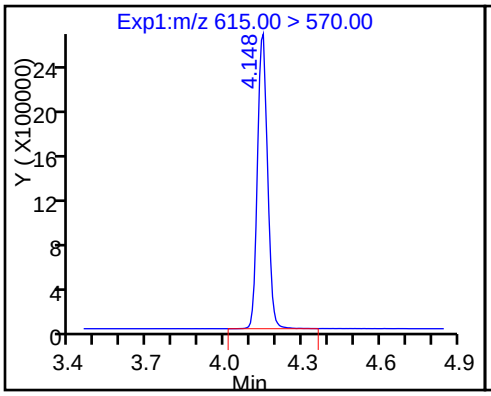
D 27 13C2 PFUnA



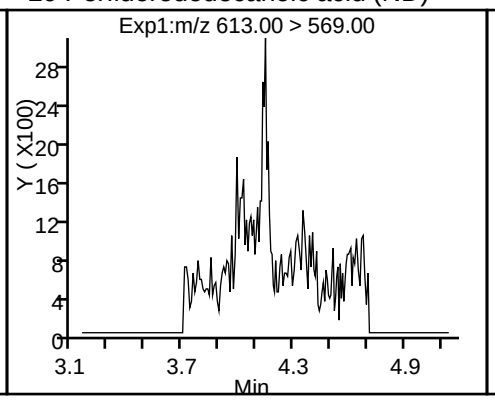
28 Perfluoroundecanoic acid



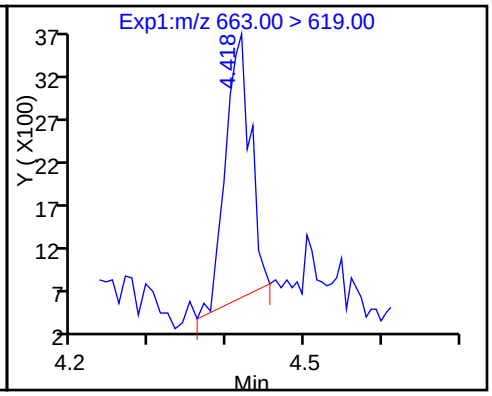
D 30 13C2 PFDoA



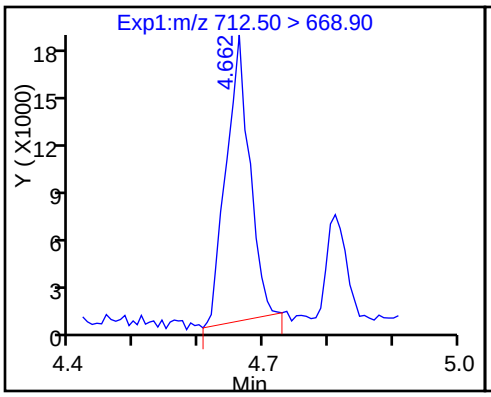
29 Perfluorododecanoic acid (ND)



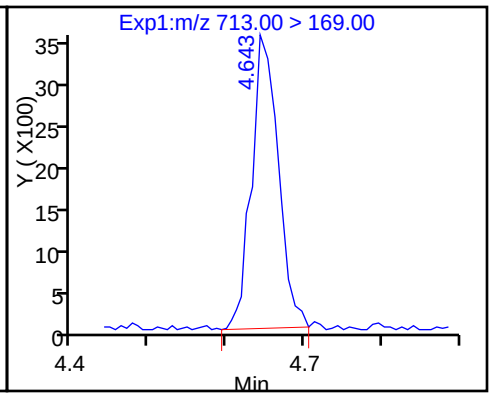
31 Perfluorotridecanoic acid



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: EBWC120616 | Lab Sample ID: 320-24149-4

Matrix: Water | Lab File ID: 28DEC2016C_008.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 13:10

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 264.8(mL) | Date Analyzed: 12/29/2016 00:44

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.00094	U	0.0024	0.00094	0.00043
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0019	U	0.0024	0.0019	0.00093
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0019	U	0.0024	0.0019	0.00074
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.0019	0.00076
335-67-1	Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.0019	0.00071
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.0019	0.00062
335-76-2	Perfluorodecanoic acid (PFDA)	0.00094	U	0.0024	0.00094	0.00042
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.0019	0.00071
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.0019	0.00055
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.0019	0.00052
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00094	U	0.0024	0.00094	0.00038
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00087
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0014	J	0.0024	0.0019	0.00082
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0028	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.0019	0.00060

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: EBWC120616 | Lab Sample ID: 320-24149-4

Matrix: Water | Lab File ID: 28DEC2016C_008.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 13:10

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 264.8(mL) | Date Analyzed: 12/29/2016 00:44

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	55		25-150
STL00992	13C4 PFBA	126		25-150
STL01893	13C5-PFPeA	132		25-150
STL00993	13C2 PFHxA	122		25-150
STL01892	13C4-PFHpA	126		25-150
STL00990	13C4 PFOA	129		25-150
STL00995	13C5 PFNA	124		25-150
STL00996	13C2 PFDA	127		25-150
STL00997	13C2 PFUnA	122		25-150
STL00998	13C2 PFDoA	118		25-150
STL00994	18O2 PFHxS	126		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_008.d
Lims ID: 320-24149-A-4-A
Client ID: EBWC120616
Sample Type: Client
Inject. Date: 29-Dec-2016 00:44:30 ALS Bottle#: 6 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24149-a-4-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Dec-2016 17:35:05 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:37:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.529	1.534	-0.005		21927447	63.1		126	1038092	
1 Perfluorobutyric acid										
212.90 > 169.00	1.441	1.534	-0.093	1.000	17584	0.0470			66.2	
D 4 13C5-PFPeA										
267.90 > 223.00	1.813	1.810	0.003		17591198	66.1		132	1341149	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.804	1.810	-0.006	1.000	35232	0.1015			354	
D 6 13C2 PFHxA										
315.00 > 270.00	2.093	2.097	-0.004		15006800	61.2		122	692095	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.093	2.097	-0.004	1.000	39315	0.1410			590	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.446	2.422	0.024	1.000	306852	0.7242				
D 11 13C4-PFHpA										
367.00 > 322.00	2.424	2.429	-0.005		14273261	63.1		126	639649	
D 10 18O2 PFHxS										
403.00 > 84.00	2.446	2.452	-0.006		19458917	59.5		126	1689371	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.790	-0.008		14836699	64.4		129	866596	
D 17 13C4 PFOS										
503.00 > 80.00	3.151	3.158	-0.007		14659846	58.9		123	1344078	
D 19 13C5 PFNA										
468.00 > 423.00	3.151	3.166	-0.015		11019358	62.0		124	997327	
D 21 13C8 FOSA										
506.00 > 78.00	3.482	3.481	0.001		10534533	27.4		54.8	393582	
D 23 13C2 PFDA										
515.00 > 470.00	3.515	3.523	-0.008		10001467	63.6		127	338160	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
24 Perfluorodecanoic acid										
513.00 > 469.00	3.507	3.523	-0.016	1.000	6042	0.0320			207	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.808	3.834	-0.026	1.000	877	0.004897				
D 27 13C2 PFUnA										
565.00 > 520.00	3.843	3.851	-0.008		7179010	61.2		122	359435	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.852	3.851	0.001	1.000	16432	0.1197			450	
D 30 13C2 PFDoA										
615.00 > 570.00	4.133	4.134	-0.001		6549266	59.0		118	341561	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.652	4.652	0.0	1.000	39142	0.1886			368	
713.00 > 169.00	4.642	4.652	-0.010	0.998	8070		4.85(0.00-0.00)		3491	

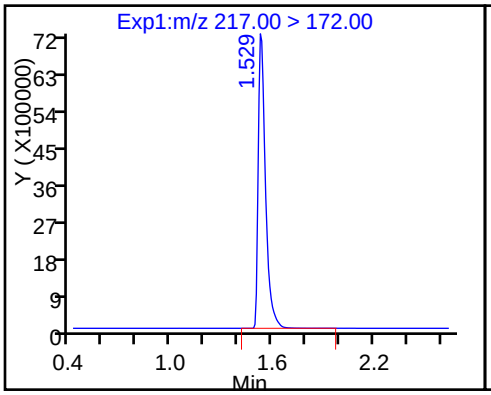
Report Date: 29-Dec-2016 17:37:04 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

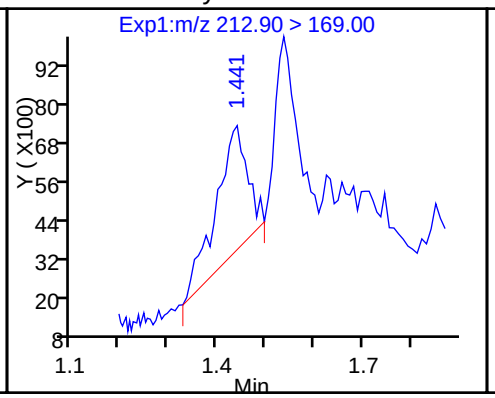
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_008.d

Injection Date:	29-Dec-2016 00:44:30	Instrument ID:	A8_N
Lims ID:	320-24149-A-4-A	Lab Sample ID:	320-24149-4
Client ID:	EBWC120616		
Operator ID:	A8-PC\A8	ALS Bottle#:	6 Worklist Smp#: 8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL

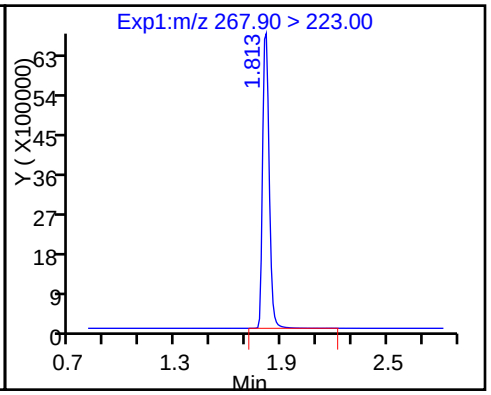
D 2 13C4 PFBA



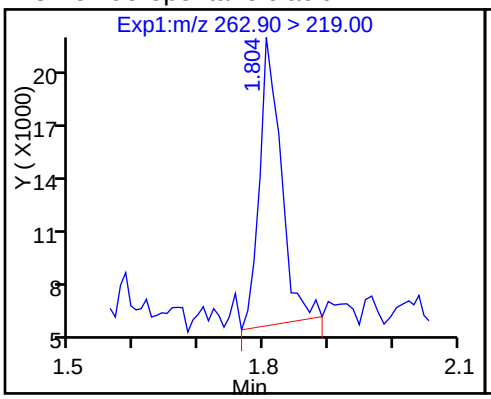
1 Perfluorobutyric acid



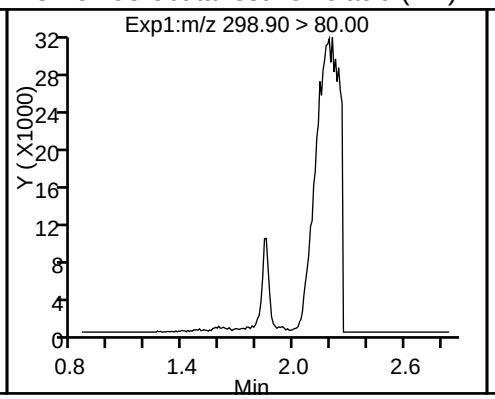
D 4 13C5-PFPeA



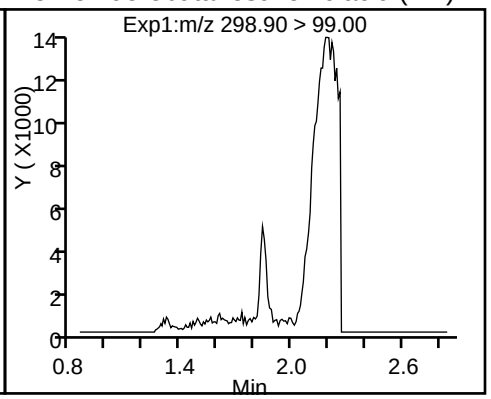
3 Perfluoropentanoic acid



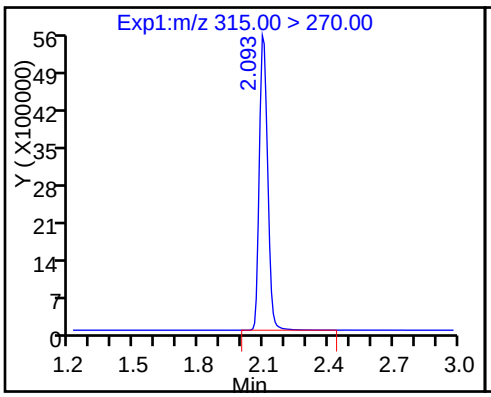
5 Perfluorobutanesulfonic acid (ND)



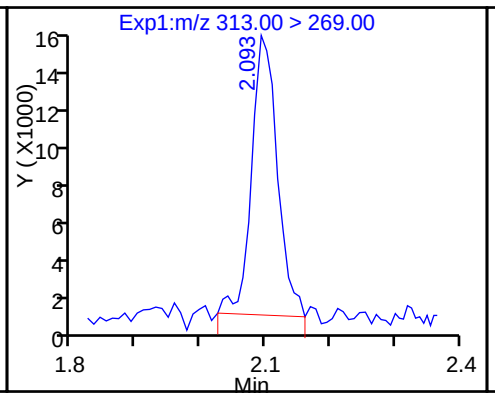
5 Perfluorobutanesulfonic acid (ND)



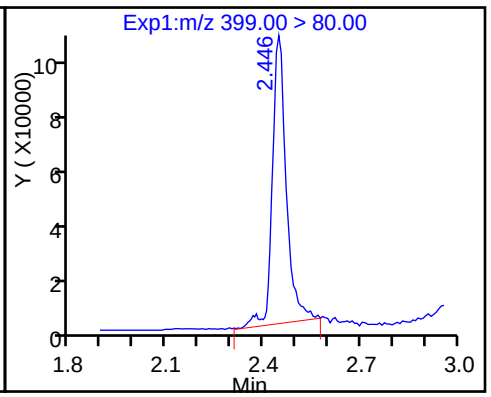
D 6 13C2 PFHxA



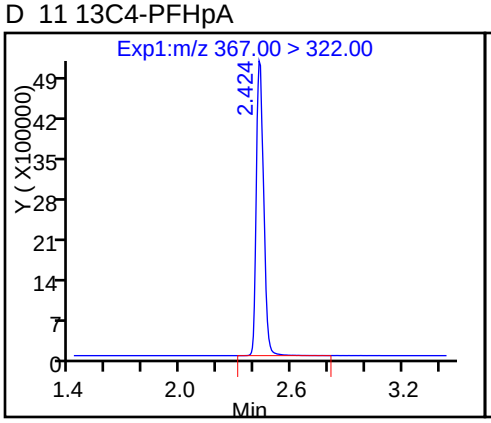
7 Perfluorohexanoic acid



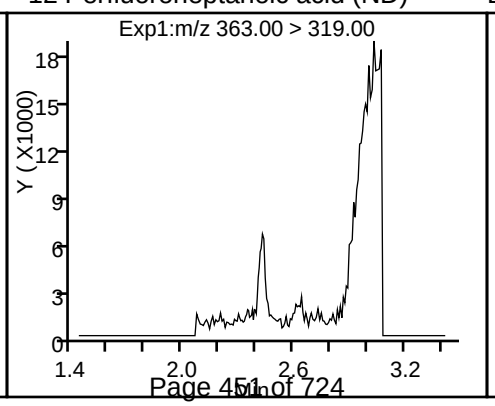
9 Perfluorohexanesulfonic acid



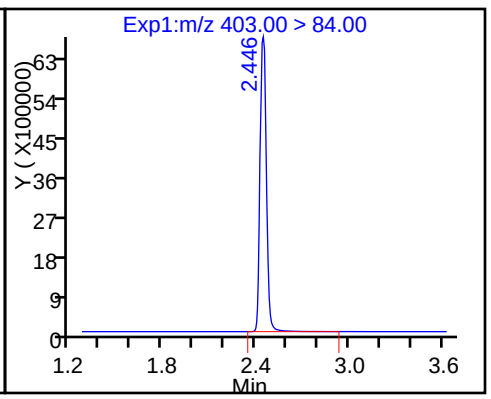
D 11 13C4-PFHpA



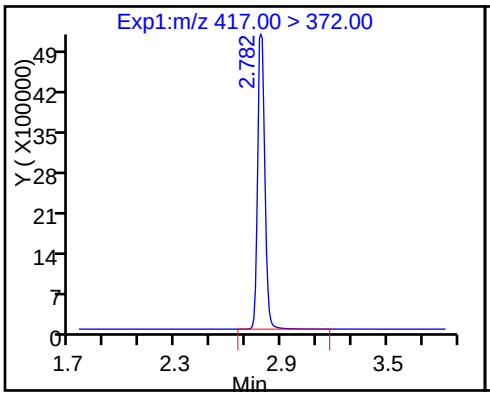
12 Perfluoroheptanoic acid (ND)



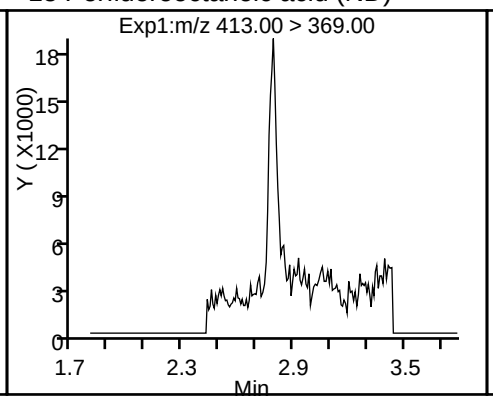
D 10 18O2 PFHxS



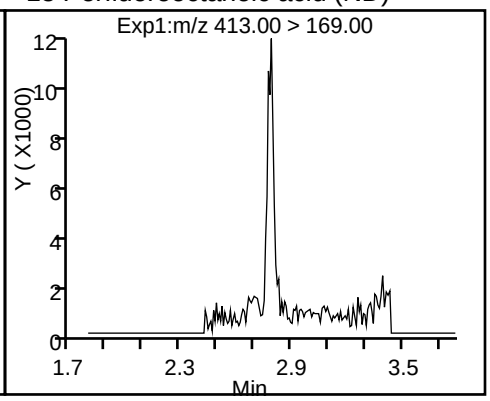
D 14 13C4 PFOA



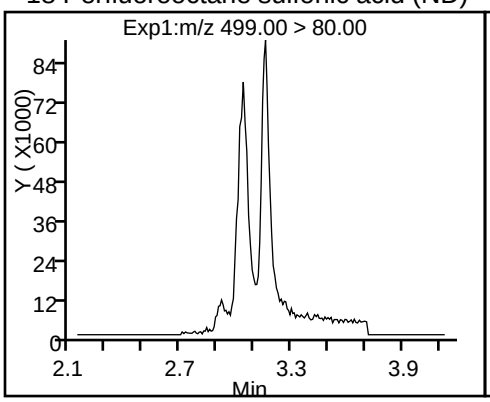
15 Perfluorooctanoic acid (ND)



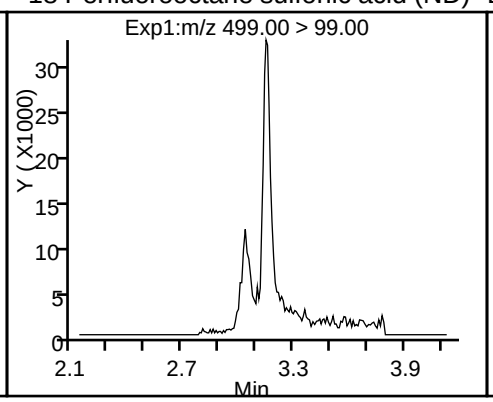
15 Perfluorooctanoic acid (ND)



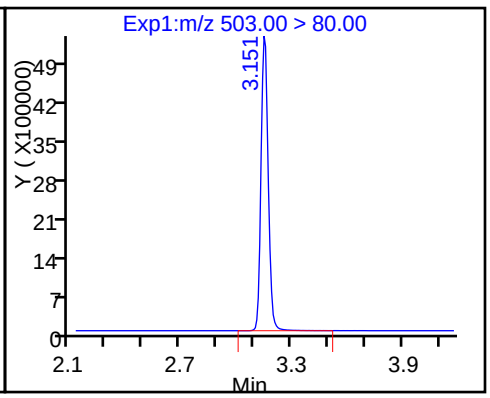
18 Perfluorooctane sulfonic acid (ND)



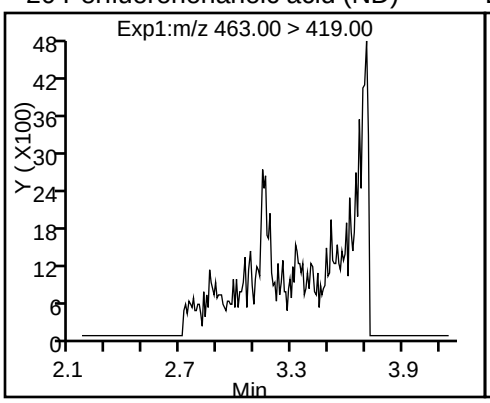
18 Perfluorooctane sulfonic acid (ND)



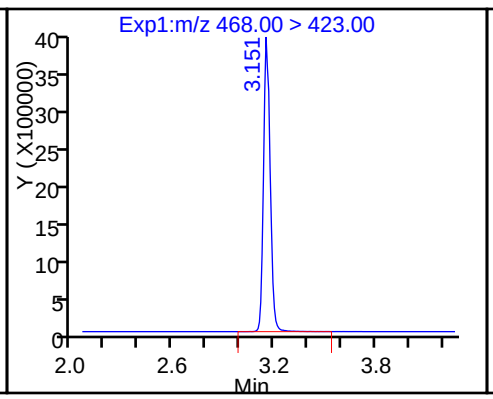
D 17 13C4 PFOS



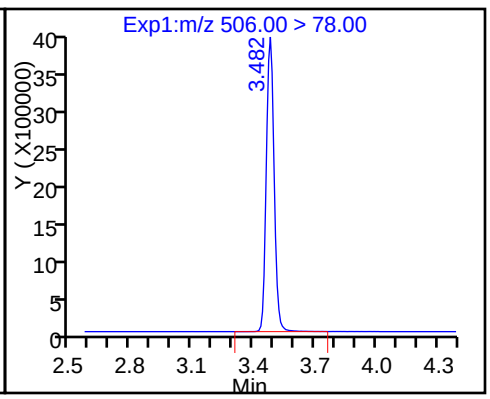
20 Perfluorononanoic acid (ND)



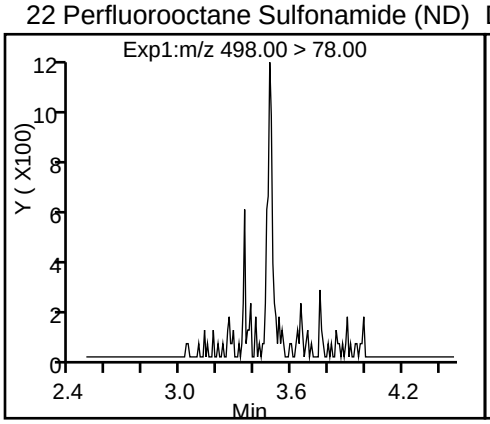
D 19 13C5 PFNA



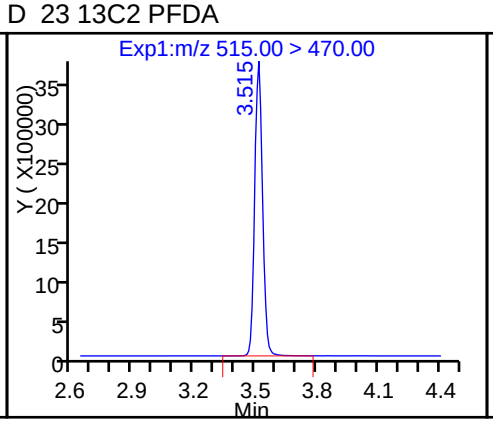
D 21 13C8 FOSA



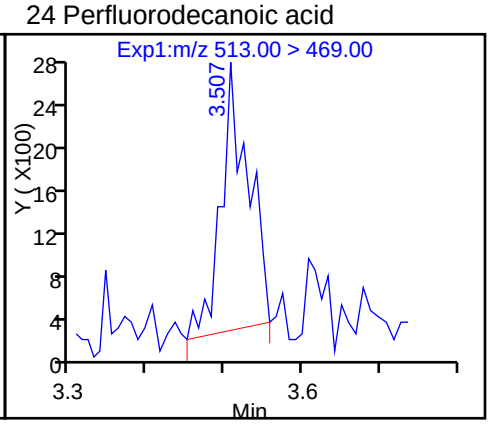
22 Perfluorooctane Sulfonamide (ND)



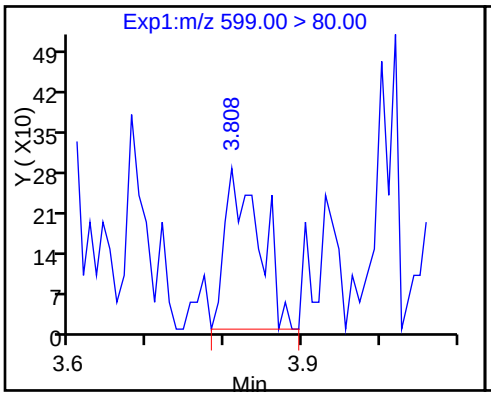
D 23 13C2 PFDA



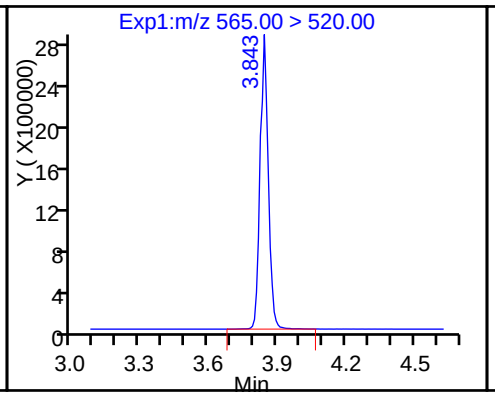
24 Perfluorodecanoic acid



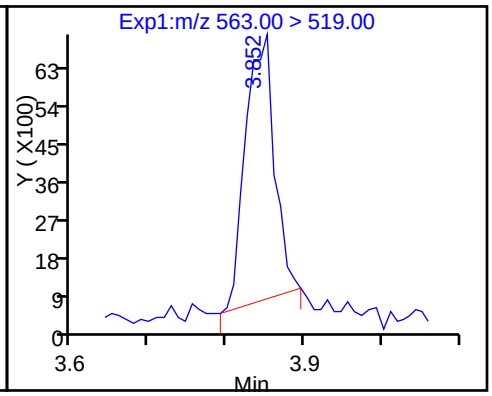
26 Perfluorodecane Sulfonic acid



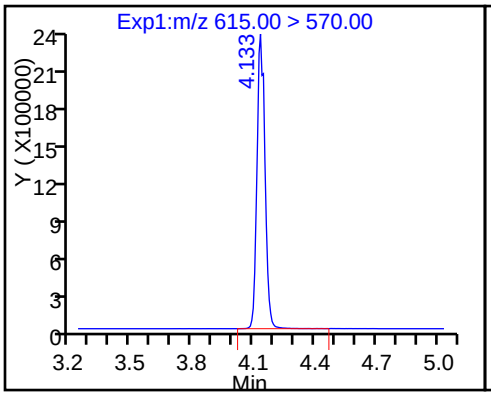
D 27 13C2 PFUnA



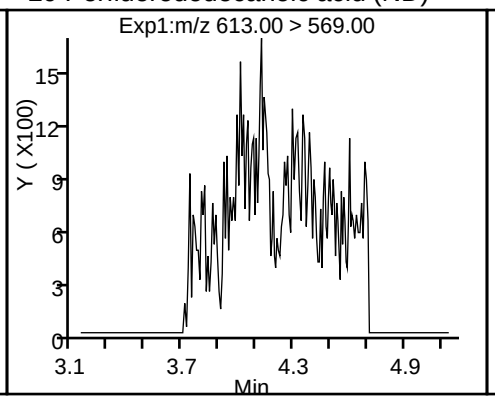
28 Perfluoroundecanoic acid



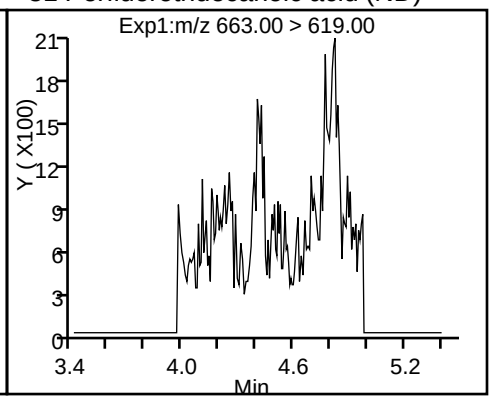
D 30 13C2 PFDoA



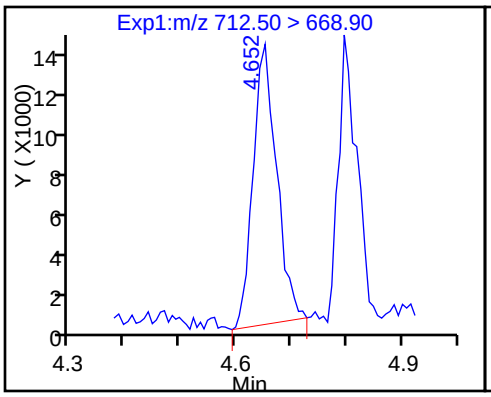
29 Perfluorododecanoic acid (ND)



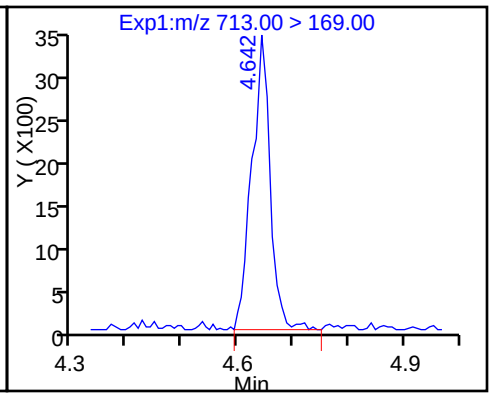
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: EBWC120616 RA | Lab Sample ID: 320-24149-4 RA

Matrix: Water | Lab File ID: 30DEC2016B_034.d

Analysis Method: 537 (Modified) | Date Collected: 12/06/2016 13:10

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 264.8(mL) | Date Analyzed: 12/30/2016 16:26

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0028	U	0.0038	0.0028	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	116		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_034.d
Lims ID: 320-24149-A-4-A
Client ID: EBWC120616
Sample Type: Client
Inject. Date: 30-Dec-2016 16:26:39 ALS Bottle#: 24 Worklist Smp#: 44
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24149-a-4-a
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:47 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 14:23:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		20333843	58.5		117	1383493	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		15842525	59.5		119	1049377	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	32395	0.1036			297	
D 6 13C2 PFHxA										
315.00 > 270.00	2.097	2.093	0.004		13222627	53.9		108	463431	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.106	2.093	0.013	1.000	26387	0.1074			611	
D 11 13C4-PFHpA										
367.00 > 322.00	2.430	2.424	0.006		12704565	56.1		112	926974	
D 10 18O2 PFHxS										
403.00 > 84.00	2.445	2.447	-0.003		17878390	54.7		116	1076794	
D 14 13C4 PFOA										
417.00 > 372.00	2.790	2.791	-0.001		13056016	56.7		113	801328	
D 17 13C4 PFOS										
503.00 > 80.00	3.159	3.160	-0.001		13755041	55.3		116	973907	
D 19 13C5 PFNA										
468.00 > 423.00	3.159	3.160	-0.001		9885554	55.6		111	426931	
D 21 13C8 FOSA										
506.00 > 78.00	3.490	3.491	-0.001		9900627	25.8		51.5	618186	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.524	3.524	0.0	1.000	7916	0.0459			204	
D 23 13C2 PFDA										
515.00 > 470.00	3.524	3.524	0.0		9145835	58.1		116	352980	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.835	3.836	-0.001	1.000	827	0.004921				

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 27 13C2 PFUnA										
565.00 > 520.00	3.853	3.853	0.0		7038169	60.0		120	378305	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.853	3.853	0.0	1.000	17679	0.1313			471	
D 30 13C2 PFDoA										
615.00 > 570.00	4.142	4.144	-0.002		6337446	57.1		114	267960	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.663	4.658	0.005	1.000	37767	0.1880			401	
713.00 > 169.00	4.644	4.658	-0.014	0.996	7235		5.22(0.00-0.00)		2598	

Report Date: 03-Jan-2017 14:28:54 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_034.d

Injection Date: 30-Dec-2016 16:26:39 Instrument ID: A8_N

Lims ID: 320-24149-A-4-A Lab Sample ID: 320-24149-4

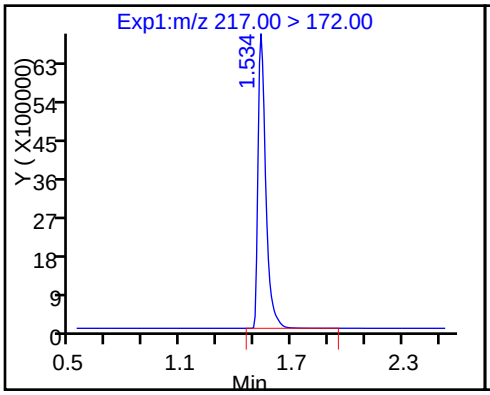
Client ID: EBWC120616

Operator ID: A8-PC\A8 ALS Bottle#: 24 Worklist Smp#: 44

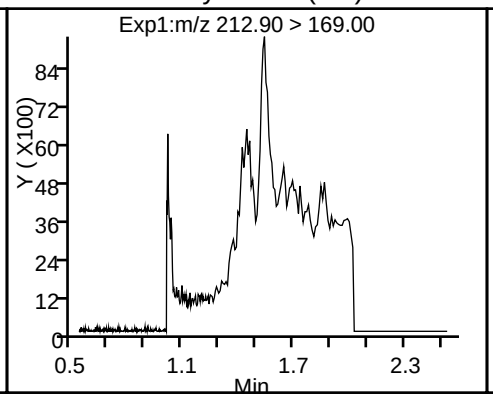
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

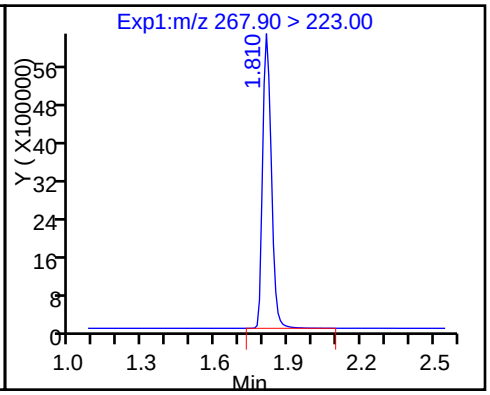
D 2 13C4 PFBA



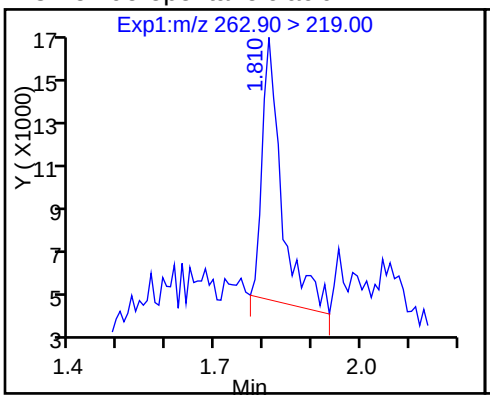
1 Perfluorobutyric acid (ND)



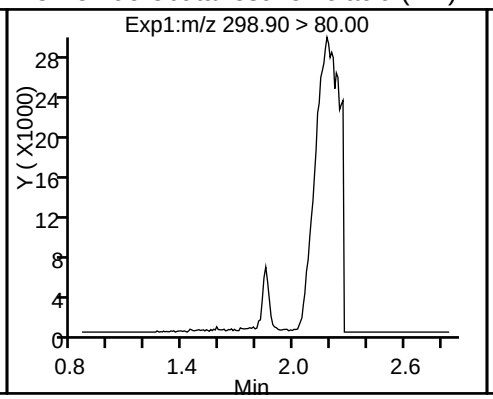
D 4 13C5-PFPeA



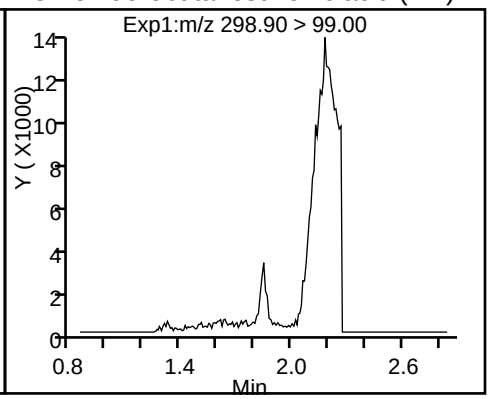
3 Perfluoropentanoic acid



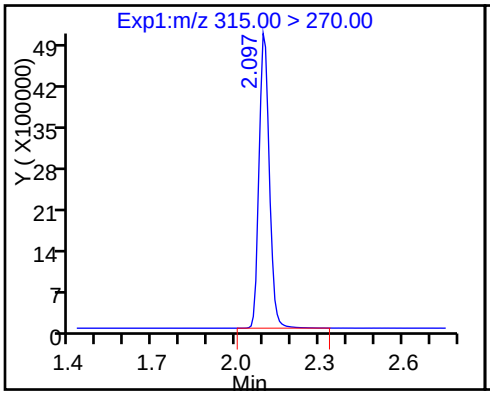
5 Perfluorobutanesulfonic acid (ND)



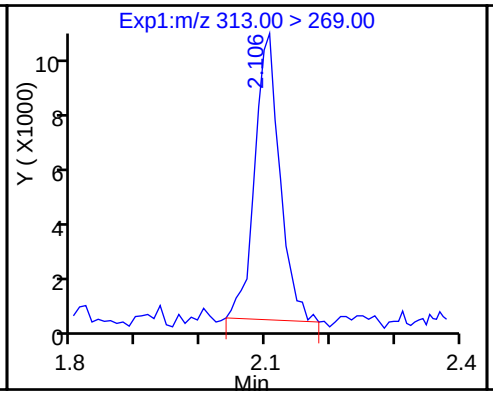
5 Perfluorobutanesulfonic acid (ND)



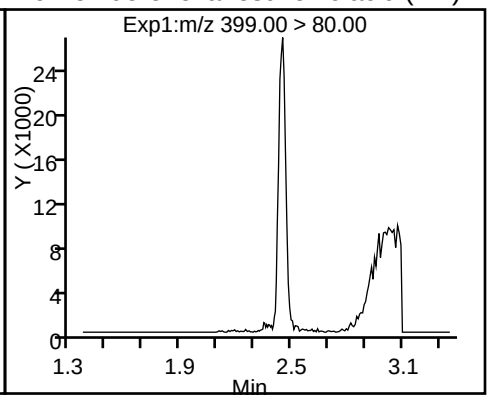
D 6 13C2 PFHxA



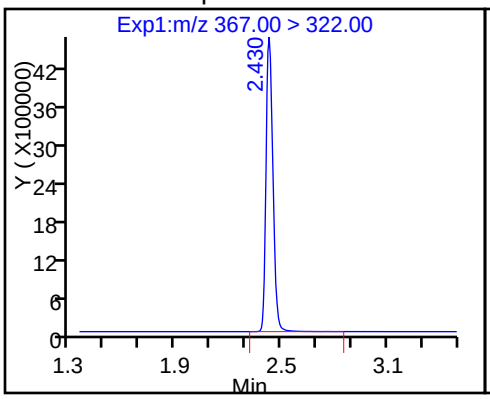
7 Perfluorohexanoic acid



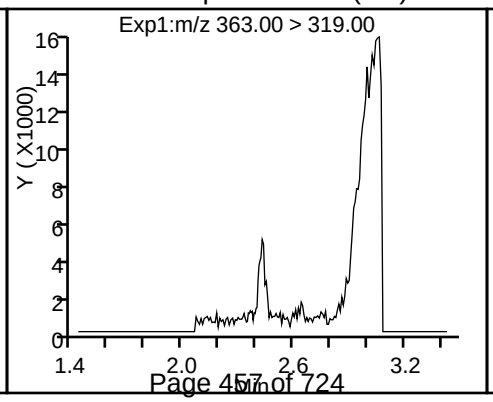
9 Perfluorohexanesulfonic acid (ND)



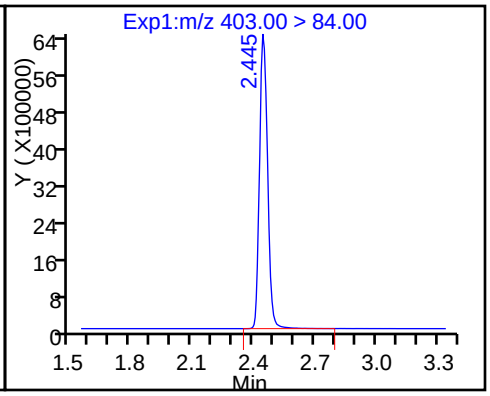
D 11 13C4-PFHpA



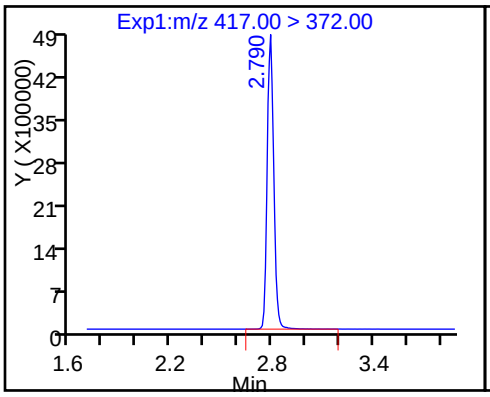
12 Perfluoroheptanoic acid (ND)



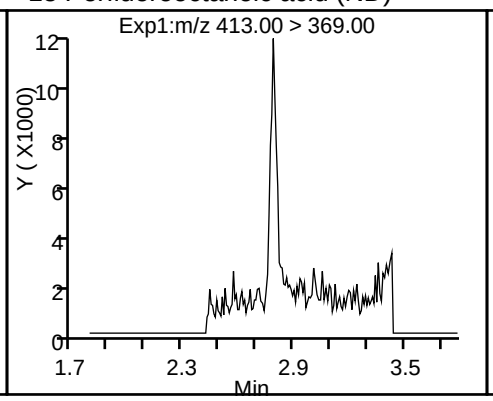
D 10 18O2 PFHxS



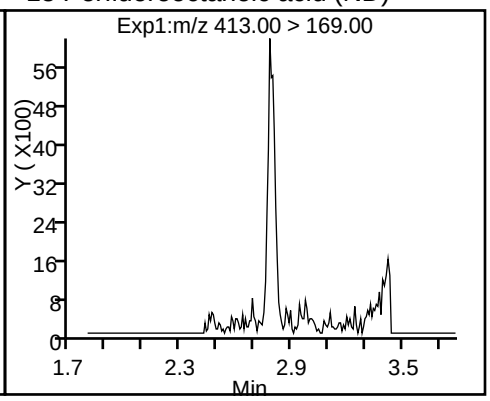
D 14 13C4 PFOA



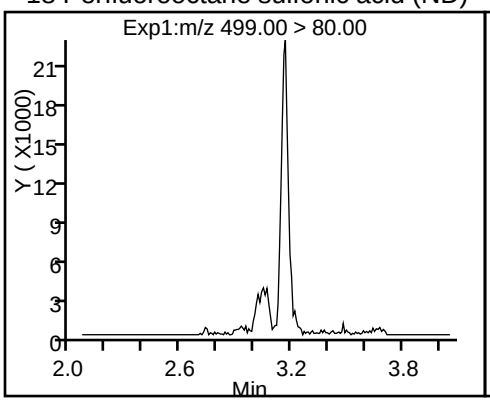
15 Perfluorooctanoic acid (ND)



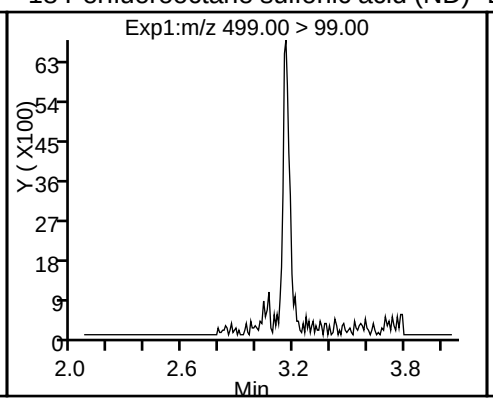
15 Perfluorooctanoic acid (ND)



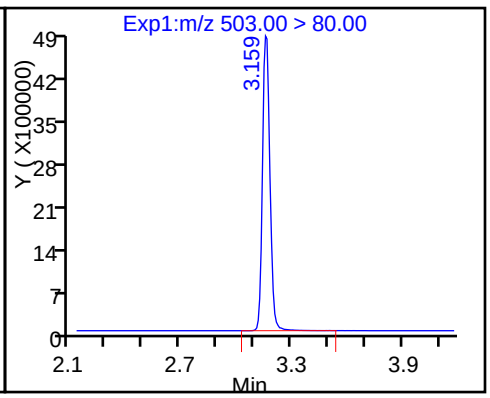
18 Perfluorooctane sulfonic acid (ND)



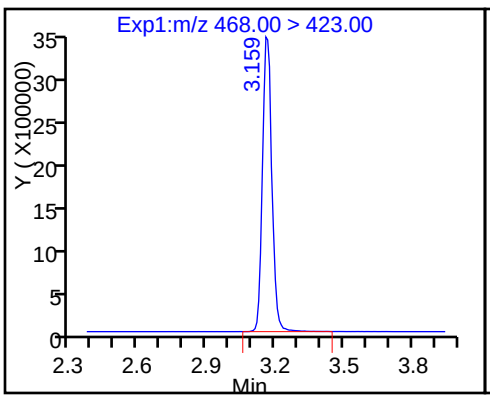
18 Perfluorooctane sulfonic acid (ND)



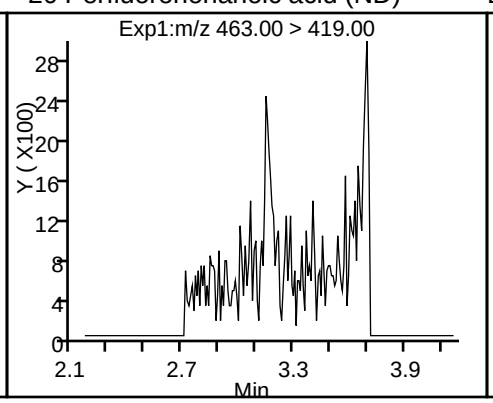
D 17 13C4 PFOS



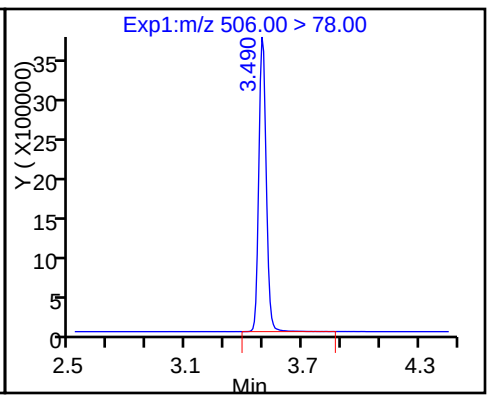
D 19 13C5 PFNA



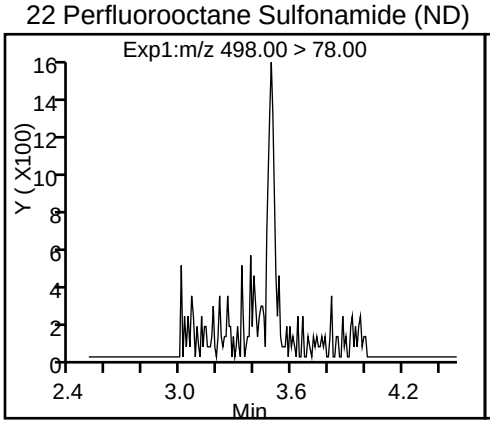
20 Perfluorononanoic acid (ND)



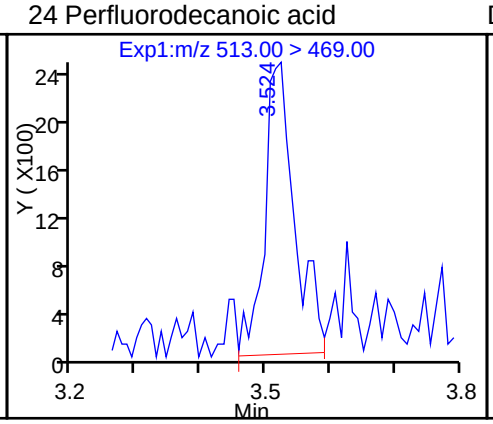
D 21 13C8 FOSA



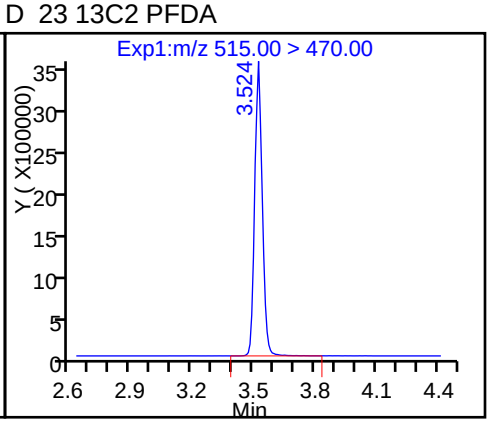
22 Perfluorooctane Sulfonamide (ND)



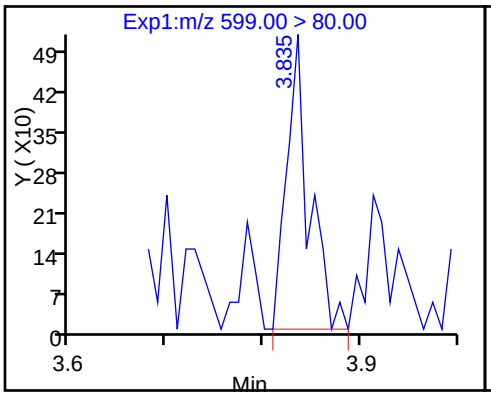
24 Perfluorodecanoic acid



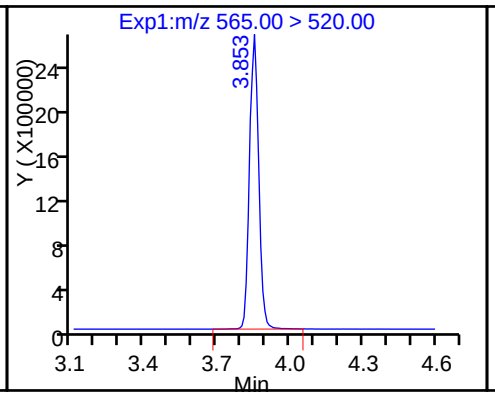
D 23 13C2 PFDA



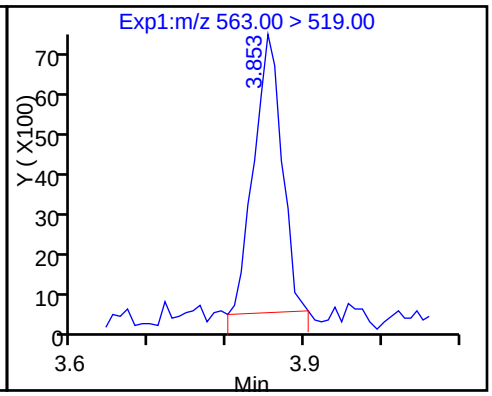
26 Perfluorodecane Sulfonic acid



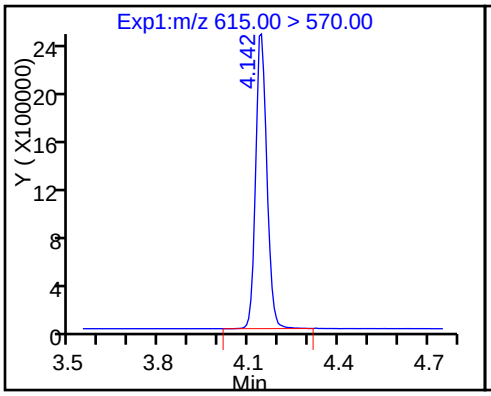
D 27 13C2 PFUnA



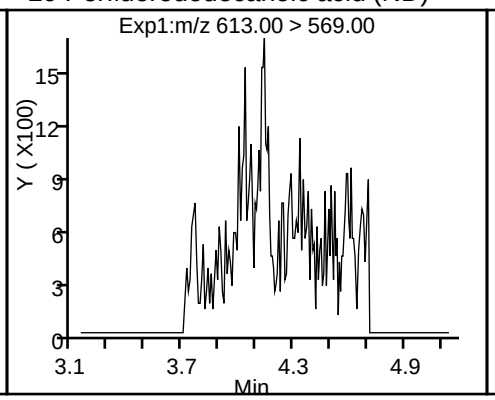
28 Perfluoroundecanoic acid



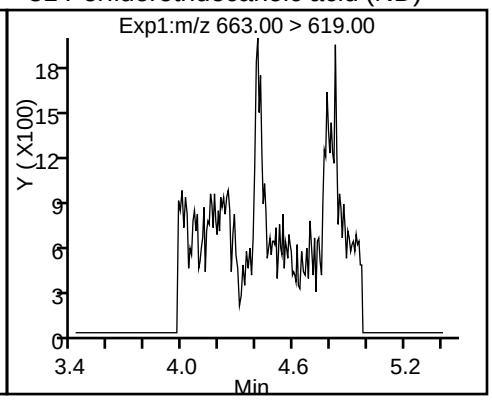
D 30 13C2 PFDoA



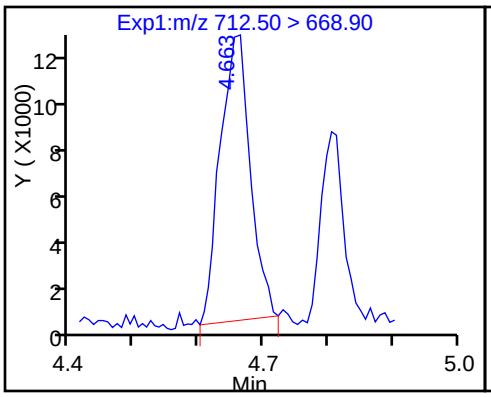
29 Perfluorododecanoic acid (ND)



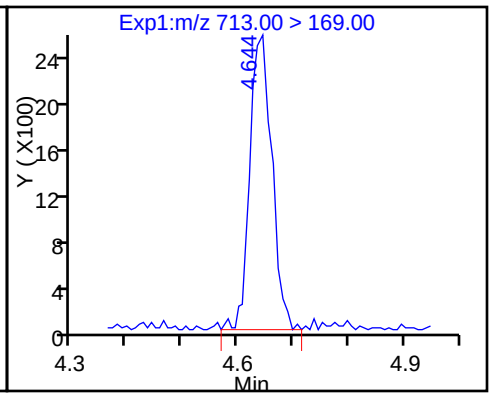
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B_004.d
Level 2	IC 320-142379/13	15DEC2016BB_013.d
Level 3	IC 320-142379/5	15DEC2016B_005.d
Level 4	IC 320-142379/14	15DEC2016B_014.d
Level 5	IC 320-142379/6	15DEC2016B_006.d
Level 6	IC 320-142379/15	15DEC2016B_015.d
Level 7	IC 320-142379/7	15DEC2016B_007.d
Level 8	IC 320-142379/16	15DEC2016B_016.d
Level 9	IC 320-142379/8	15DEC2016B_008.d
Level 10	IC 320-142379/17	15DEC2016B_017.d
Level 11	IC 320-142379/9	15DEC2016B_009.d
Level 12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.542 1.537		1.530		1.534		1.534		1.533		1.285 - 1.785	1.535
Perfluoropentanoic acid (PFPeA)	1.810 1.813		1.805		1.810		1.810		1.810		1.560 - 2.060	1.810
Perfluorobutanesulfonic acid (PFBS)	1.849 1.852		1.844		1.849		1.849		1.848		1.668 - 2.028	1.849
Perfluorohexanoic acid (PFHxA)	2.097 2.096		2.092		2.097		2.093		2.098		1.846 - 2.346	2.096
Perfluorohexanesulfonic acid (PFHxS)	+++++ 2.444		2.445		2.364		2.440		2.446		2.181 - 2.681	2.428
Perfluoroheptanoic acid (PFHpA)	2.430 2.426		2.430		2.432		2.426		2.424		2.178 - 2.678	2.428
6:2FTS		+++++ 2.769		2.761		2.768		2.767		2.767	2.518 - 3.018	2.766
Perfluorooctanoic acid (PFOA)	+++++ 2.783		2.781		2.783		2.785		2.782		2.533 - 3.033	2.783
Perfluoroheptanesulfonic Acid (PFHpS)	2.790 2.791		2.789		2.792		2.785		2.791		2.540 - 3.040	2.790
Perfluorooctanesulfonic acid (PFOS)	+++++ 2.977		3.149		3.153		3.129		3.151		2.868 - 3.368	3.112
Perfluorononanoic acid (PFNA)	3.159 3.160		3.157		3.153		3.153		3.151		2.905 - 3.405	3.156
Perfluorooctane Sulfonamide (FOSA)	3.490 3.491		3.489		3.492		3.492		3.490		3.241 - 3.741	3.491
Perfluorodecanoic acid (PFDA)	3.515 3.516		3.506		3.509		3.509		3.507		3.260 - 3.760	3.510
8:2FTS		3.511 3.516		3.502		3.511		3.511		3.512	3.261 - 3.761	3.511

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		3.684 3.680		3.673		3.683		3.683		3.684	3.431 - 3.931	3.681
Perfluorodecanesulfonic acid (PFDS)	3.826 3.819		3.824		3.819		3.827		3.818		3.572 - 4.072	3.822
Perfluoroundecanoic acid (PFUnA)	3.834 3.845		3.833		3.837		3.844		3.844		3.589 - 4.089	3.840
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		3.865 3.853		3.855		3.847		3.847		3.857	3.604 - 4.104	3.854
MeFOSA		3.998 4.004		3.997		3.997		3.997		3.999	3.749 - 4.249	3.999
Perfluorododecanoic acid (PFDoA)	4.141 4.136		4.133		4.136		4.135		4.135		3.886 - 4.386	4.136
N-EtFOSA-M		4.187 4.193		4.179		4.186		4.186		4.189	3.937 - 4.437	4.187
Perfluorotridecanoic Acid (PFTriA)	4.404 4.407		4.396		4.398		4.398		4.398		4.150 - 4.650	4.400
Perfluorotetradecanoic acid (PFTeA)	4.643 4.635		4.643		4.645		4.644		4.645		4.392 - 4.892	4.643
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 5.060		5.058		5.059		5.059		5.059		4.809 - 5.309	5.059
Perfluoro-n-octadecanoic acid (PFODA)	5.413 5.414		5.413		5.414		5.413		5.413		5.164 - 5.664	5.413
13C4 PFBA	1.534 1.537		1.530		1.534		1.534		1.533		1.284 - 1.784	1.534
13C5-PFPeA	1.810 1.813		1.805		1.810		1.810		1.810		1.560 - 2.060	1.810
13C2 PFHxA	2.097 2.096		2.092		2.097		2.102		2.098		1.847 - 2.347	2.097
13C4-PFHpA	2.430 2.426		2.423		2.425		2.426		2.424		2.176 - 2.676	2.426
18O2 PFHxS	2.452 2.444		2.445		2.447		2.440		2.446		2.196 - 2.696	2.446
M2-6:2FTS		2.760 2.776		2.761		2.768		2.767		2.767	2.517 - 3.017	2.767
13C4 PFOA	2.782 2.783		2.781		2.783		2.785		2.782		2.533 - 3.033	2.783
13C4 PFOS	3.151 3.152		3.149		3.153		3.153		3.151		2.901 - 3.401	3.152
13C5 PFNA	3.159 3.152		3.149		3.153		3.153		3.151		2.903 - 3.403	3.153
13C8 FOSA	3.490 3.491		3.489		3.484		3.484		3.490		3.238 - 3.738	3.488
13C2 PFDA	3.515 3.508		3.514		3.509		3.517		3.516		3.263 - 3.763	3.513

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
M2-8:2FTS		3.511 3.516		3.511		3.511		3.511		3.520	3.263 - 3.763	3.513
d3-NMeFOSAA		3.684 3.680		3.673		3.673		3.673		3.675	3.426 - 3.926	3.676
13C2 PFUnA	3.843 3.845		3.842		3.845		3.835		3.844		3.592 - 4.092	3.842
d5-NEtFOSAA		3.848 3.845		3.838		3.838		3.838		3.848	3.592 - 4.092	3.843
d-N-MeFOSA-M		3.988 3.995		3.987		3.987		3.997		3.999	3.742 - 4.242	3.992
13C2 PFDoA	4.134 4.129		4.133		4.129		4.135		4.135		3.882 - 4.382	4.133
d-N-EtFOSA-M		4.180 4.186		4.172		4.179		4.179		4.182	3.930 - 4.430	4.180
13C2-PFTeDA	4.643 4.635		4.633		4.645		4.644		4.645		4.391 - 4.891	4.641
13C2-PFHxDA	5.058 5.060		5.047		5.059		5.059		5.059		4.807 - 5.307	5.057

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B_004.d
Level 2	IC 320-142379/13	15DEC2016BB_013.d
Level 3	IC 320-142379/5	15DEC2016B_005.d
Level 4	IC 320-142379/14	15DEC2016B_014.d
Level 5	IC 320-142379/6	15DEC2016B_006.d
Level 6	IC 320-142379/15	15DEC2016B_015.d
Level 7	IC 320-142379/7	15DEC2016B_007.d
Level 8	IC 320-142379/16	15DEC2016B_016.d
Level 9	IC 320-142379/8	15DEC2016B_008.d
Level 10	IC 320-142379/17	15DEC2016B_017.d
Level 11	IC 320-142379/9	15DEC2016B_009.d
Level 12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
13C4 PFBA	365277 360742 345484		364028 351708 299221		Ave		347743.167				7.2		50.0			
13C5-PFPeA	282426 281261 261073		281354 272343 217976		Ave		266072.353				9.4		50.0			
13C2 PFHxA	253106 254198 247986		256296 252164 206910		Ave		245109.910				7.7		50.0			
13C4-PFHpA	244814 245211 216032		244964 235764 171281		Ave		226344.393				12.9		50.0			
18O2 PFHxS	341723 342975 323020		340234 339593 274309		Ave		326975.747				8.2		50.0			
M2-6:2FTS		112694 117279 110718		107543 136249 117410	Ave		116982.140				8.7		50.0			
13C4 PFOA	250090 252701 222856		252554 236364 167605		Ave		230361.637				14.3		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
13C4 PFOS	256822 261188 249930		260657 254876 209612		Ave		248847.249				7.9		50.0			
13C5 PFNA	189110 195552 171630		190741 184721 134367		Ave		177686.923				12.8		50.0			
13C8 FOSA	407109 400699 376084		404776 394065 322114		Ave		384141.077				8.4		50.0			
13C2 PFDA	168454 164694 153437		169609 162695 124922		Ave		157301.833				10.7		50.0			
M2-8:2FTS		100584 111541 99917		96024 124933 111666	Ave		107444.339				10.0		50.0			
d3-NMeFOSAA		72700 80292 68450		71182 87583 71744	Ave		75324.9433				9.6		50.0			
13C2 PFUnA	127043 125252 113156		124385 124531 89132		Ave		117249.927				12.5		50.0			
d5-NEtFOSAA		77796 84707 69727		75140 88209 74518	Ave		78349.4833				8.8		50.0			
d-N-MeFOSA-M		86501 102439 90246		92791 105280 93163	Ave		95069.8233				7.6		50.0			
13C2 PFDoA	116302 115598 108083		116442 116336 92982		Ave		110957.213				8.5		50.0			
d-N-EtFOSA-M		75857 91238 82985		82198 93456 88971	Ave		85784.0067				7.7		50.0			
13C2-PFTeDA	239125 244965 219010		237709 233101 190415		Ave		227387.480				8.8		50.0			
13C2-PFHxDA	131492 130859 120547		133987 126716 103803		Ave		124567.543				9.0		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Perfluorobutanoic acid (PFBA)	310962 213818	334546	310647	308231	310088	AveID		0.8537				9.1		35.0			
Perfluoropentanoic acid (PFPeA)	304642 171455	288512	287573	263221	271648	AveID		0.9868				10.7		35.0			
Perfluorobutanesulfonic acid (PFBS)	490041 286903	557732	479895	487779	500362	AveID		1.4170				14.1		50.0			
Perfluorohexanoic acid (PFHxA)	252858 166120	246488	239458	230141	236657	AveID		0.9288				7.3		35.0			
Perfluorohexanesulfonic acid (PFHxS)	+++++ 253974	363991	382940	335246	339121	AveID		1.0300				7.4		35.0			
Perfluoroheptanoic acid (PFHpA)	258208 151171	237386	237734	215989	235022	AveID		0.9788				5.9		35.0			
6:2FTS	85456	+++++ 89174	127446	112813	109001	AveID		0.8914				15.8		35.0			
Perfluorooctanoic acid (PFOA)	+++++ 153922	255488	254861	228712	247908	AveID		1.0031				6.0		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	283576 201995	315862	279184	286553	283857	AveID		1.1019				8.2		50.0			
Perfluorooctanesulfonic acid (PFOS)	+++++ 215911	272566	237468	253058	247933	AveID		0.9945				6.4		35.0			
Perfluorononanoic acid (PFNA)	180132 123966	178149	188341	164925	180502	AveID		0.9518				2.7		35.0			
Perfluorooctane Sulfonamide (FOSA)	391498 239019	399542	381363	354739	397863	AveID		0.9327				10.5		35.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Perfluorodecanoic acid (PFDA)	164274 113084	158337	155537	146490	154381	AveID		0.9438				3.1		35.0			
8:2FTS	83185	83106 84092	116095	79051	100536	AveID		0.8473				12.1		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	57133	59646 64621	85412	57389	74839	AveID		0.8846				15.4		35.0			
Perfluorodecanesulfonic acid (PFDS)	143714 124235	159960	145051	150246	147895	AveID		0.5840				4.8		50.0			
Perfluoroundecanoic acid (PFUnA)	130000 84265	121036	119189	108755	109942	AveID		0.9563				4.9		35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	53544	59930 59690	75946	53623	68286	AveID		0.7929				15.1		35.0			
MeFOSA	68699	72138 80570	97349	70049	88147	AveID		0.8376				13.3		35.0			
Perfluorododecanoic acid (PFDoA)	105614 87129	111590	103481	101460	101274	AveID		0.9180				3.5		35.0			
N-EtFOSA-M	65375	61986 78901	90659	62962	85286	AveID		0.8640				13.9		35.0			
Perfluorotridecanoic Acid (PFTriA)	106640 80194	104393	109461	99013	105018	AveID		0.9069				2.9		50.0			
Perfluorotetradecanoic acid (PFTeA)	197042 136554	183949	187123	172910	180115	AveID		1.5848				4.6		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 88775	113395	173261	106364	119906	L1ID	0.5185	0.9555							1.0000		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	123098 91965	122262	114997	117393	116752	AveID		1.0304				3.9		50.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B_004.d
Level 2	IC 320-142379/13	15DEC2016BB_013.d
Level 3	IC 320-142379/5	15DEC2016B_005.d
Level 4	IC 320-142379/14	15DEC2016B_014.d
Level 5	IC 320-142379/6	15DEC2016B_006.d
Level 6	IC 320-142379/15	15DEC2016B_015.d
Level 7	IC 320-142379/7	15DEC2016B_007.d
Level 8	IC 320-142379/16	15DEC2016B_016.d
Level 9	IC 320-142379/8	15DEC2016B_008.d
Level 10	IC 320-142379/17	15DEC2016B_017.d
Level 11	IC 320-142379/9	15DEC2016B_009.d
Level 12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C4 PFBA	Ave	18263829 14961055	17585378	18201393	17274187	18037108	50.0 50.0	50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	14121285 10898820	13617158	14067714	13053659	14063070	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	12655304 10345480	12608210	12814780	12399280	12709919	50.0 50.0	50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	12240718 8564025	11788221	12248222	10801604	12260528	50.0 50.0	50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	16163510 12974829	16062766	16093048	15278828	16222736	47.3 47.3	47.3	47.3	47.3	47.3
M2-6:2FTS	Ave	5570739	5352965 5576967	6471813	5108306	5259120	47.5	47.5 47.5	47.5	47.5	47.5
13C4 PFOA	Ave	12504504 8380251	11818203	12627691	11142777	12635065	50.0 50.0	50.0	50.0	50.0	50.0
13C4 PFOS	Ave	12276070 10019454	12183062	12459383	11946650	12484772	47.8 47.8	47.8	47.8	47.8	47.8

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C5 PFNA	Ave	9455492 6718354	9236073	9537045	8581504	9777609	50.0 50.0	50.0	50.0	50.0	50.0
13C8 FOSA	Ave	20355431 16105707	19703272	20238792	18804188	20034933	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFDA	Ave	8422718 6246112	8134734	8480447	7671861	8234678	50.0 50.0	50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	5342826	4817997 5348797	5984276	4599569	4786038	47.9	47.9 47.9	47.9	47.9	47.9
d3-NMeFOSAA	Ave	4014623	3634985 3587176	4379131	3559083	3422485	50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	6352135 4456593	6226562	6219248	5657823	6262617	50.0 50.0	50.0	50.0	50.0	50.0
d5-NEtFOSAA	Ave	4235352	3889792 3725902	4410456	3757014	3486329	50.0	50.0 50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	5121953	4325034 4658153	5263980	4639527	4512300	50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	5815120 4649092	5816809	5822114	5404154	5779875	50.0 50.0	50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	4561882	3792851 4448546	4672820	4109875	4149228	50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	11956257 9520749	11655048	11885446	10950502	12248242	50.0 50.0	50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	6574607 5190172	6335821	6699329	6027362	6542972	50.0 50.0	50.0	50.0	50.0	50.0

Curve Type Legend:
Ave = Average

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B_004.d
Level 2	IC 320-142379/13	15DEC2016BB_013.d
Level 3	IC 320-142379/5	15DEC2016B_005.d
Level 4	IC 320-142379/14	15DEC2016B_014.d
Level 5	IC 320-142379/6	15DEC2016B_006.d
Level 6	IC 320-142379/15	15DEC2016B_015.d
Level 7	IC 320-142379/7	15DEC2016B_007.d
Level 8	IC 320-142379/16	15DEC2016B_016.d
Level 9	IC 320-142379/8	15DEC2016B_008.d
Level 10	IC 320-142379/17	15DEC2016B_017.d
Level 11	IC 320-142379/9	15DEC2016B_009.d
Level 12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorobutanoic acid (PFBA)		AveID	155481 42763611	6690917	310647	15411527	1550440	0.500 200	20.0	1.00	50.0	5.00
Perfluoropentanoic acid (PFPeA)		AveID	152321 34291076	5770240	287573	13161065	1358239	0.500 200	20.0	1.00	50.0	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	216598 50724469	9860707	424227	21559838	2211602	0.442 177	17.7	0.884	44.2	4.42
Perfluorohexanoic acid (PFHxA)		AveID	126429 33223923	4929766	239458	11507044	1183286	0.500 200	20.0	1.00	50.0	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 46223186	6624638	348475	15253691	1543002	+++++ 182	18.2	0.910	45.5	4.55
Perfluoroheptanoic acid (PFHpA)		AveID	129104 30234194	4747711	237734	10799449	1175112	0.500 200	20.0	1.00	50.0	5.00
6:2FTS		AveID	405060	+++++ 16907459	2416384	106947	5166665	4.74	+++++ 190	19.0	0.948	47.4
Perfluorooctanoic acid (PFOA)		AveID	+++++ 30784387	5109766	254861	11435583	1239541	+++++ 200	20.0	1.00	50.0	5.00

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	134982 38459925	6014021	265783	13639927	1351160	0.476 190	19.0	0.952	47.6	4.76
Perfluorooctanesulfonic acid (PFOS)		AveID	+++++ 40073141	5058824	220370	11741891	1150410	+++++ 186	18.6	0.928	46.4	4.64
Perfluorononanoic acid (PFNA)		AveID	90066 24793148	3562981	188341	8246252	902512	0.500 200	20.0	1.00	50.0	5.00
Perfluorooctane Sulfonamide (FOSA)		AveID	195749 47803717	7990835	381363	17736944	1989314	0.500 200	20.0	1.00	50.0	5.00
Perfluorodecanoic acid (PFDA)		AveID	82137 22616781	3166735	155537	7324495	771905	0.500 200	20.0	1.00	50.0	5.00
8:2FTS		AveID	398457	39808 16111959	2224381	75731	4815680	4.79	0.479 192	19.2	0.958	47.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	285665	29823 12924122	1708231	57389	3741936	5.00	0.500 200	20.0	1.00	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	69270 23952412	3084031	139829	7241868	712852	0.482 193	19.3	0.964	48.2	4.82
Perfluoroundecanoic acid (PFUnA)		AveID	65000 16852945	2420719	119189	5437764	549708	0.500 200	20.0	1.00	50.0	5.00
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	267721	29965 11938061	1518918	53623	3414301	5.00	0.500 200	20.0	1.00	50.0
MeFOSA		AveID	343493	36069 16114020	1946985	70049	4407328	5.00	0.500 200	20.0	1.00	50.0
Perfluorododecanoic acid (PFDoA)		AveID	52807 17425873	2231794	103481	5072994	506369	0.500 200	20.0	1.00	50.0	5.00
N-EtFOSA-M		AveID	326877	30993 15780196	1813178	62962	4264314	5.00	0.500 200	20.0	1.00	50.0

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorotridecanoic Acid (PFTriA)		AveID	53320 16038809	2087859	109461	4950651	525090	0.500 200	20.0	1.00	50.0	5.00
Perfluorotetradecanoic acid (PFTeA)		AveID	98521 27310864	3678976	187123	8645519	900575	0.500 200	20.0	1.00	50.0	5.00
Perfluoro-n-hexadecanoic acid (PFHxDA)		L1ID	+++++ 17754908	2267892	173261	5318207	599529	+++++ 200	20.0	1.00	50.0	5.00
Perfluoro-n-octadecanoic acid (PFODA)		AveID	61549 18392980	2445236	114997	5869666	583761	0.500 200	20.0	1.00	50.0	5.00

Curve Type Legend:

AveID = Average isotope dilution
L1ID = Linear 1/conc IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Lims ID: IC L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 15-Dec-2016 12:29:18 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:11 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:48:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		18263829	52.5		105	1469089	
1 Perfluorobutyric acid										
212.90 > 169.00	1.542	1.535	0.007	1.000	155481	0.4986		99.7	1121	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		14121285	53.1		106	1079323	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	152321	0.5465		109	1332	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.848	0.001	1.000	216598	0.4473		101		
298.90 > 99.00	1.849	1.848	0.001	1.000	87630		2.47(0.00-0.00)	101		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.097	2.096	0.001	1.000	126429	0.5378		108	4416	
D 6 13C2 PFHxA										
315.00 > 270.00	2.097	2.097	0.0		12655304	51.6		103	589404	
D 11 13C4-PFHpA										
367.00 > 322.00	2.430	2.426	0.004		12240718	54.1		108	647338	
12 Perfluoroheptanoic acid										M
363.00 > 319.00	2.430	2.428	0.002	1.000	129104	0.5388		108	1246	M
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.444	2.431	0.013	1.000	204063	0.5798		127		M
D 10 18O2 PFHxS										
403.00 > 84.00	2.452	2.446	0.006		16163510	49.4		105	1405328	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.783	-0.001		12504504	54.3		109	532215	

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	2.782	2.783	-0.001	1.000	145696	0.5807		116	1257	
413.00 > 169.00	2.790	2.783	0.007	1.003	87089		1.67(0.90-1.10)	116	4416	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.790	2.790	0.0	1.000	134982	0.4770		100		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.151	3.118	0.033	1.000	116569	0.4564		98.4	7996	M
499.00 > 99.00	3.159	3.118	0.041	1.003	24244		4.81(0.90-1.10)	98.4	1329	M
D 17 13C4 PFOS										
503.00 > 80.00	3.151	3.151	0.0		12276070	49.3		103	1128009	
D 19 13C5 PFNA										
468.00 > 423.00	3.159	3.153	0.006		9455492	53.2		106	520740	
20 Perfluorononanoic acid										
463.00 > 419.00	3.159	3.155	0.004	1.000	90066	0.5004		100	1349	
D 21 13C8 FOSA										
506.00 > 78.00	3.490	3.488	0.002		20355431	53.0		106	727464	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.490	3.491	-0.001	1.000	195749	0.5155		103	25454	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.515	3.510	0.005	1.000	82137	0.5166		103	2772	
D 23 13C2 PFDA										
515.00 > 470.00	3.515	3.513	0.002		8422718	53.5		107	284895	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.826	3.822	0.004	1.000	69270	0.4619		95.8		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.834	3.839	-0.005	1.000	65000	0.5350		107	1918	
D 27 13C2 PFUnA										
565.00 > 520.00	3.843	3.842	0.001		6352135	54.2		108	398643	
D 30 13C2 PFDoA										
615.00 > 570.00	4.134	4.132	0.002		5815120	52.4		105	205155	
29 Perfluorododecanoic acid										M
613.00 > 569.00	4.141	4.136	0.005	1.000	52807	0.4946		98.9	1204	M
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.404	4.400	0.004	1.000	53320	0.5055		101	1256	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.643	4.641	0.002		11956257	52.6		105	663687	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.643	4.642	0.001	1.000	98521	0.5345		107	1284	
713.00 > 169.00	4.633	4.642	-0.009	0.998	17902		5.50(0.00-0.00)	107	7022	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.058	5.057	0.001		6574607	52.8		106	132486	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.059	-0.001	1.000	125860	0.5899		118	92.5	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.414	-0.001	1.000	61549	0.5136		103	54.0	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00022 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

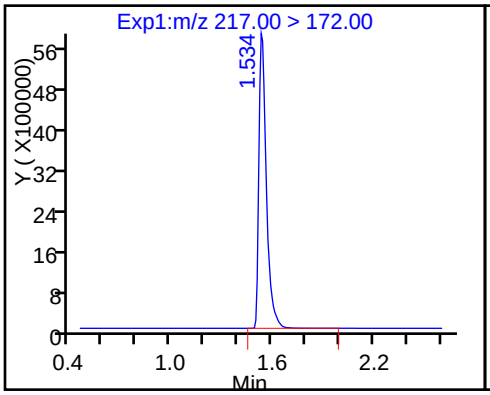
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

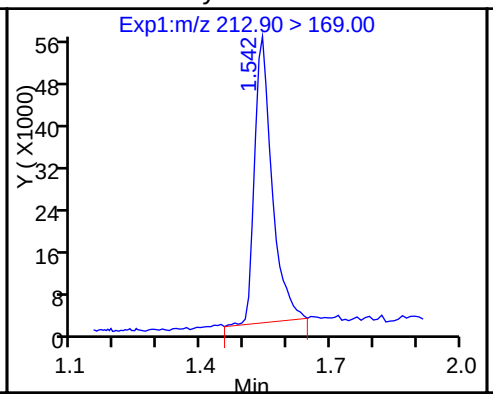
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

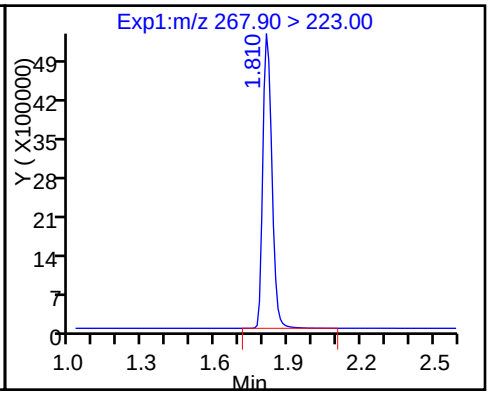
D 2 13C4 PFBA



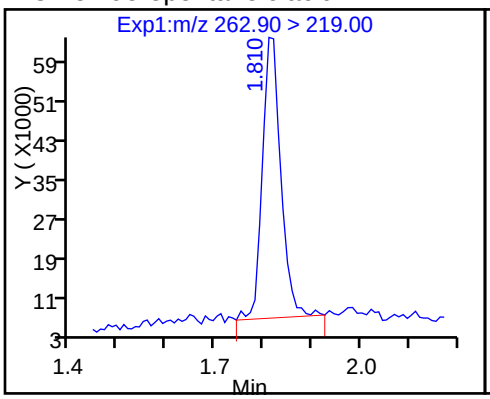
1 Perfluorobutyric acid



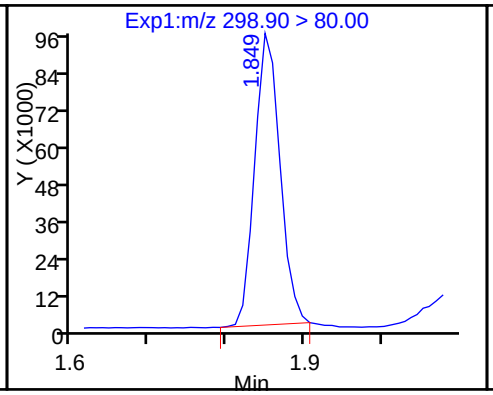
D 4 13C5-PFPeA



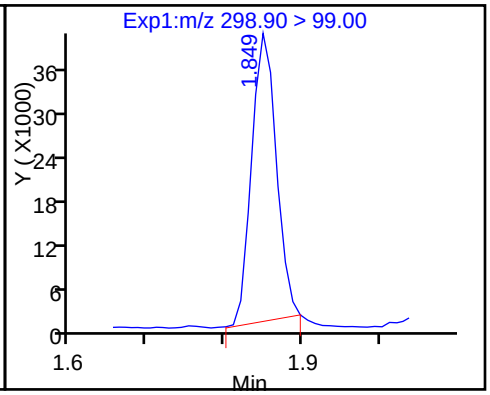
3 Perfluoropentanoic acid



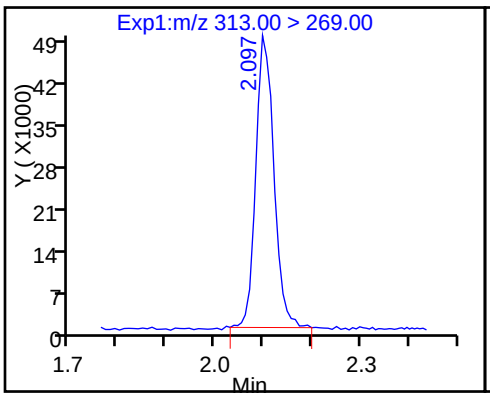
5 Perfluorobutanesulfonic acid



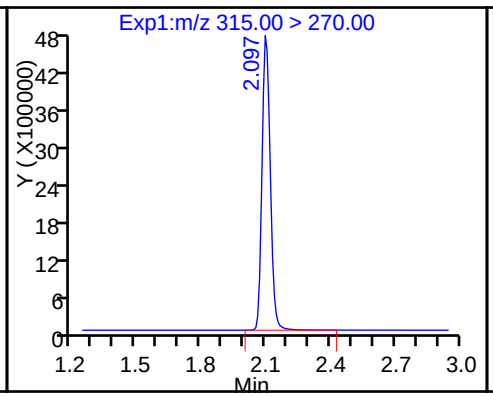
5 Perfluorobutanesulfonic acid



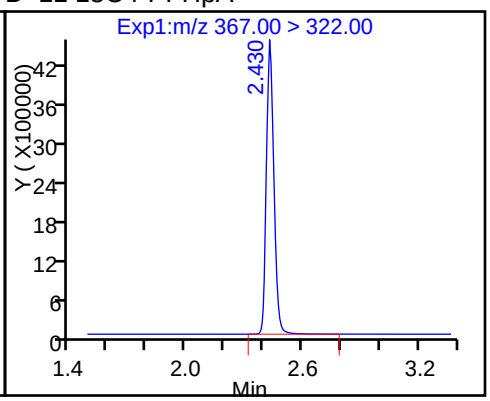
7 Perfluorohexanoic acid



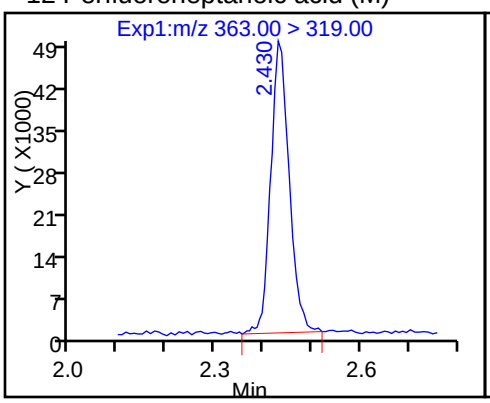
D 6 13C2 PFHxA



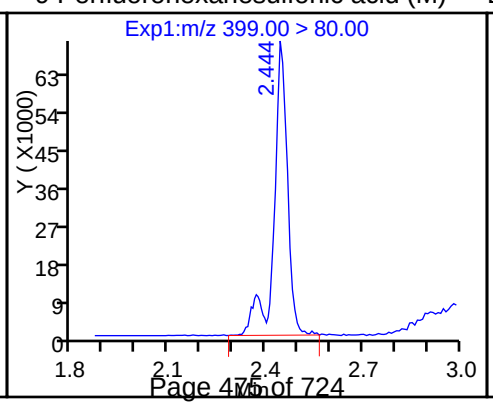
D 11 13C4-PFHpA



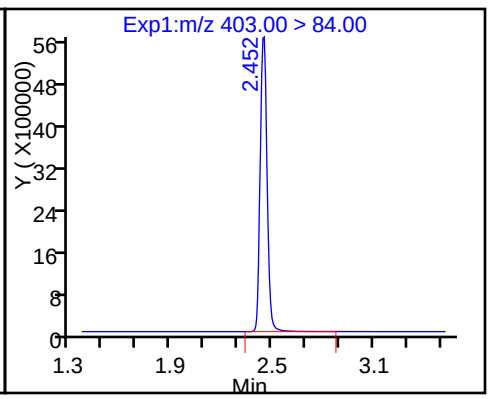
12 Perfluoroheptanoic acid (M)



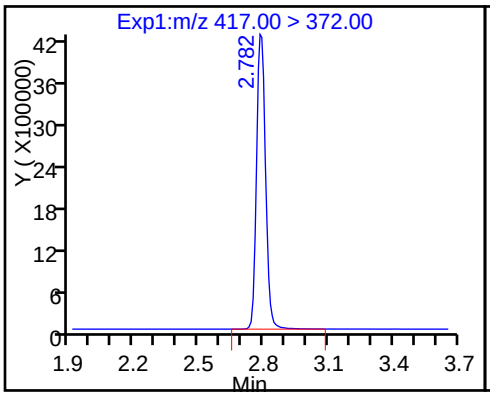
9 Perfluorohexanesulfonic acid (M)



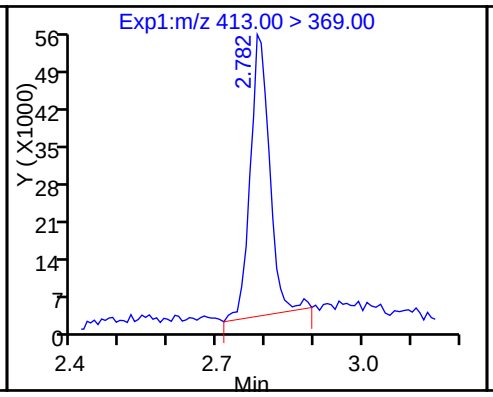
D 10 18O2 PFHxS



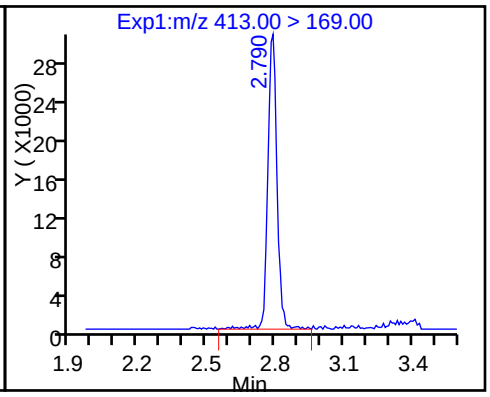
D 14 13C4 PFOA



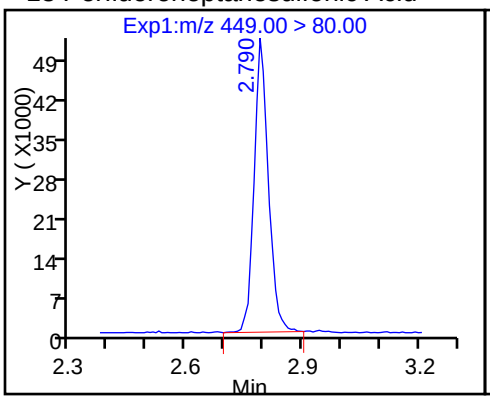
15 Perfluorooctanoic acid



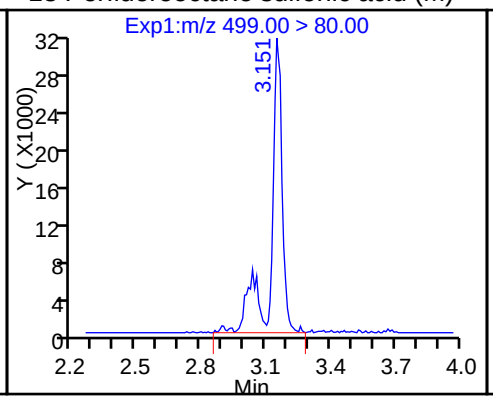
15 Perfluorooctanoic acid



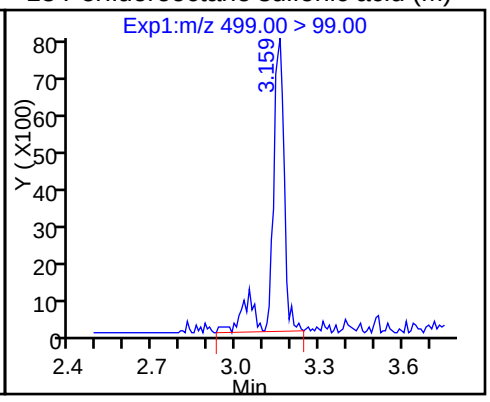
13 Perfluoroheptanesulfonic Acid



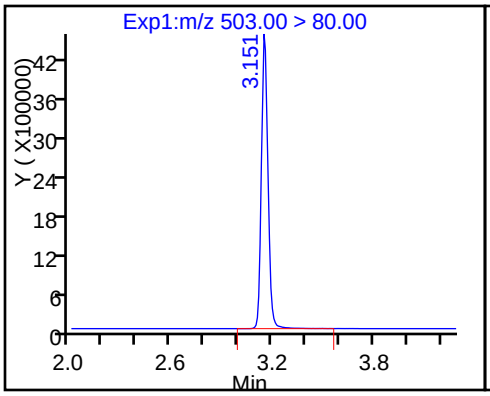
18 Perfluorooctane sulfonic acid (M)



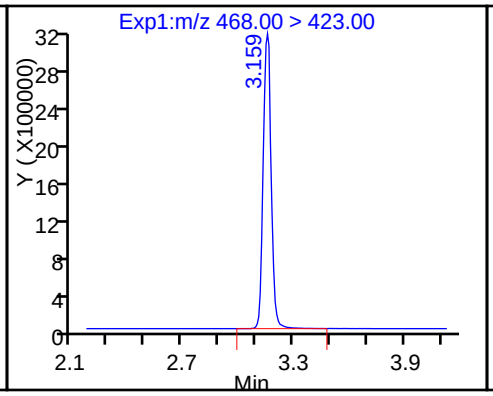
18 Perfluorooctane sulfonic acid (M)



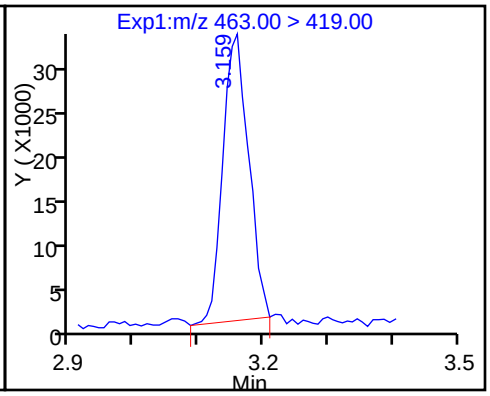
D 17 13C4 PFOS



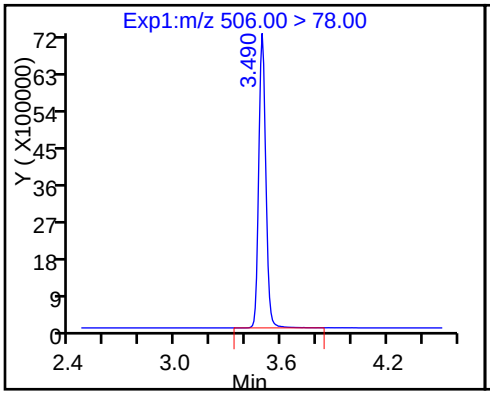
D 19 13C5 PFNA



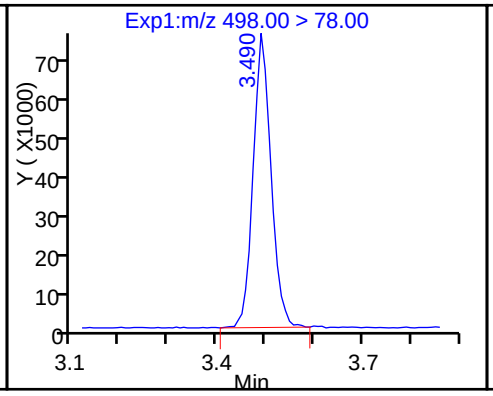
20 Perfluorononanoic acid



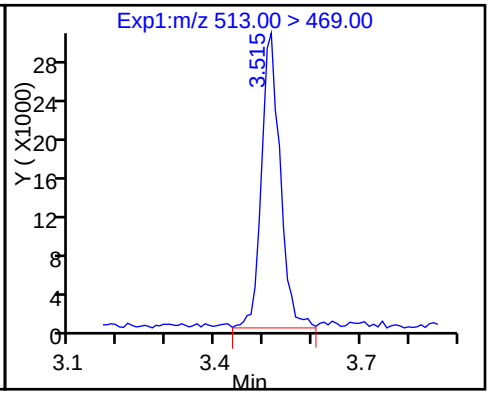
D 21 13C8 FOSA



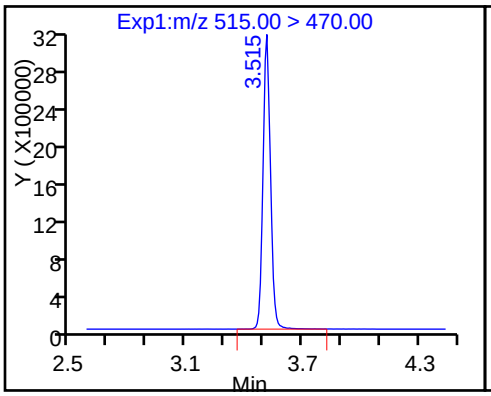
22 Perfluorooctane Sulfonamide



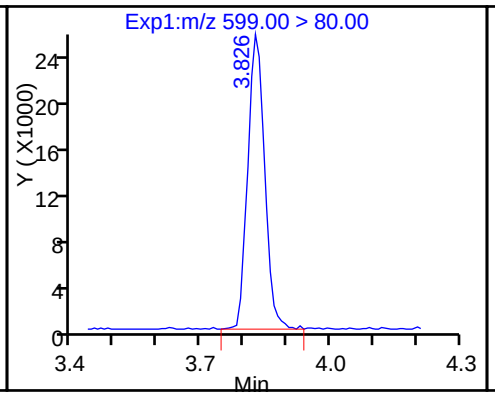
24 Perfluorodecanoic acid



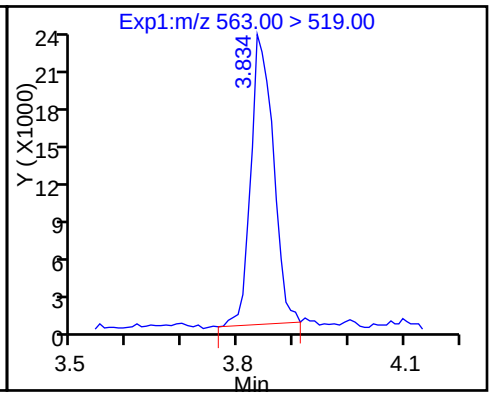
D 23 13C2 PFDA



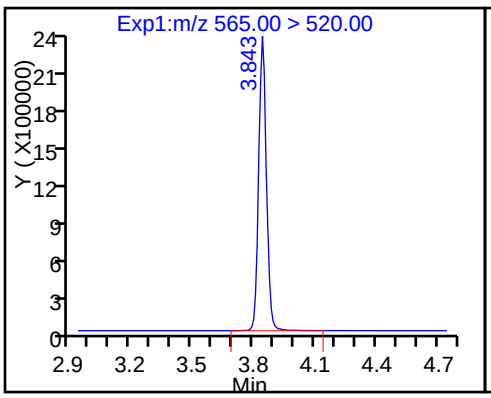
26 Perfluorodecane Sulfonic acid



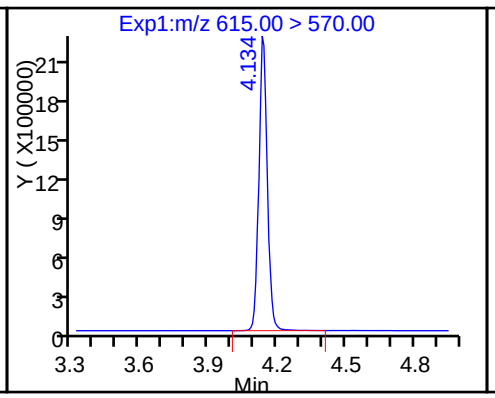
28 Perfluoroundecanoic acid



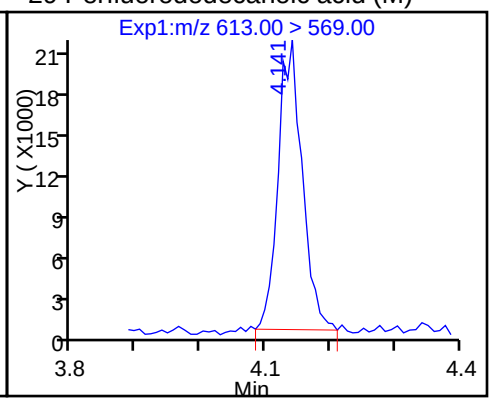
D 27 13C2 PFUnA



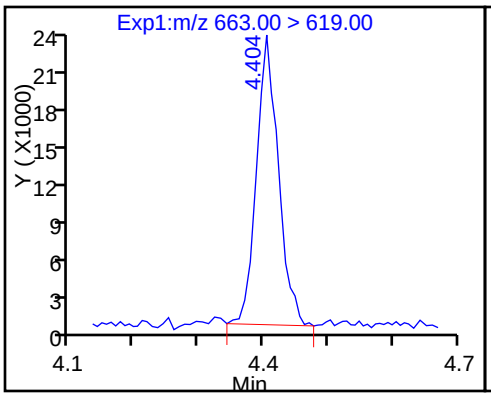
D 30 13C2 PFDoA



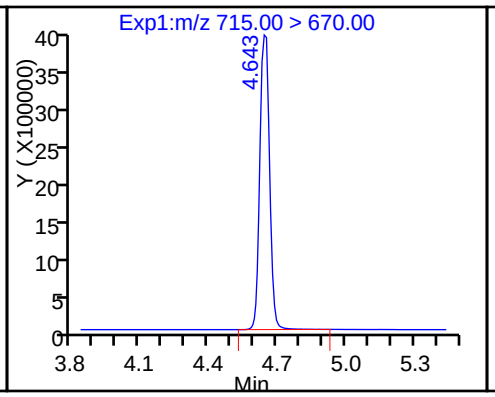
29 Perfluorododecanoic acid (M)



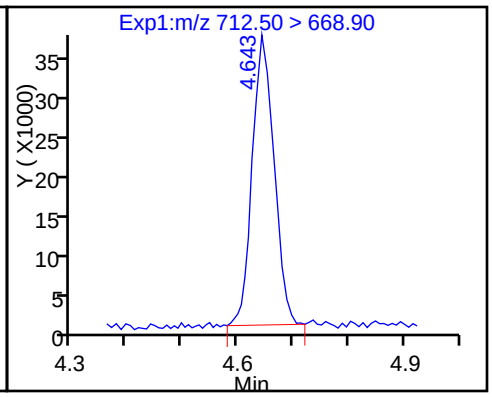
31 Perfluorotridecanoic acid



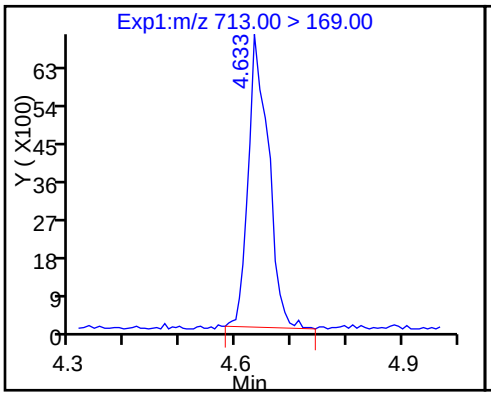
D 32 13C2-PFTeDA



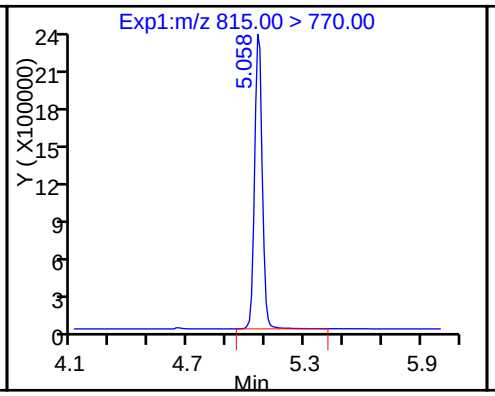
33 Perfluorotetradecanoic acid



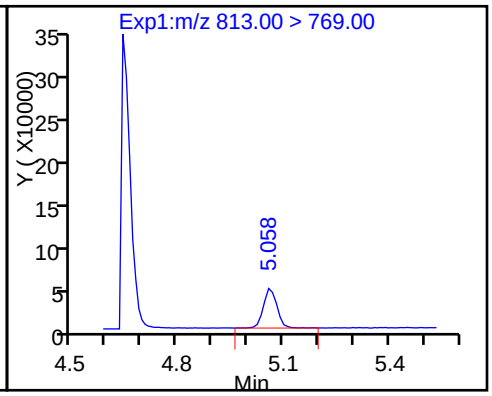
33 Perfluorotetradecanoic acid



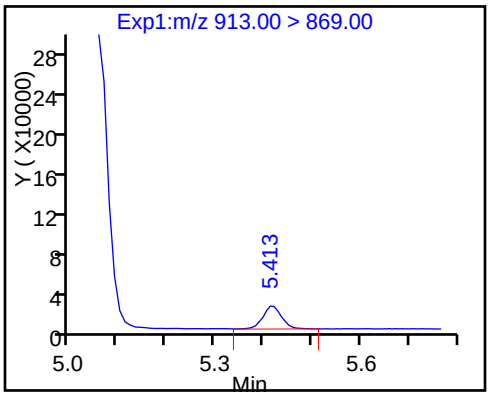
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

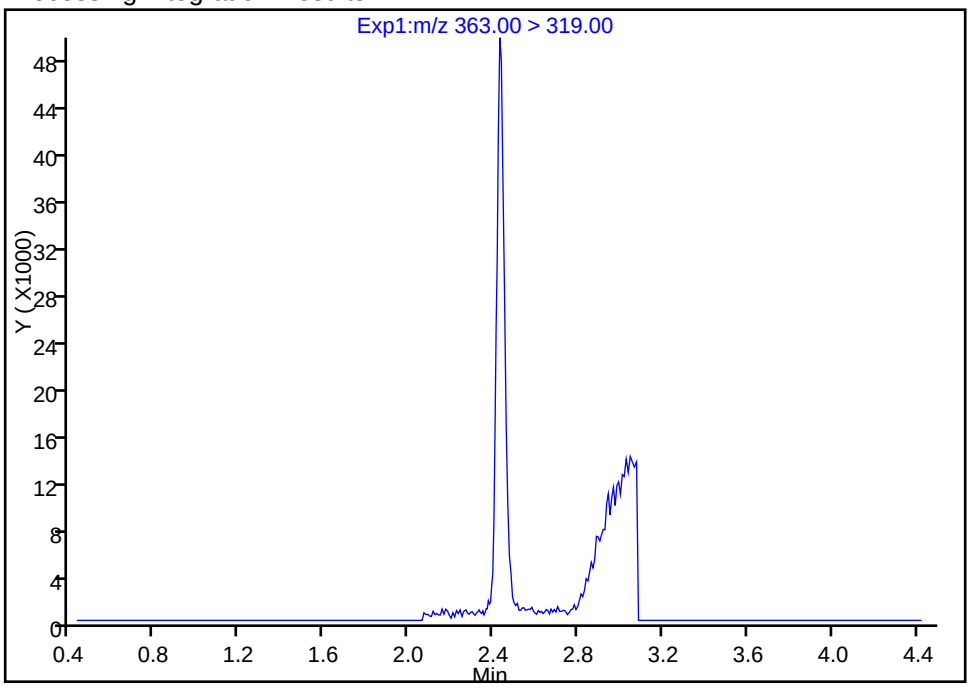
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

12 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

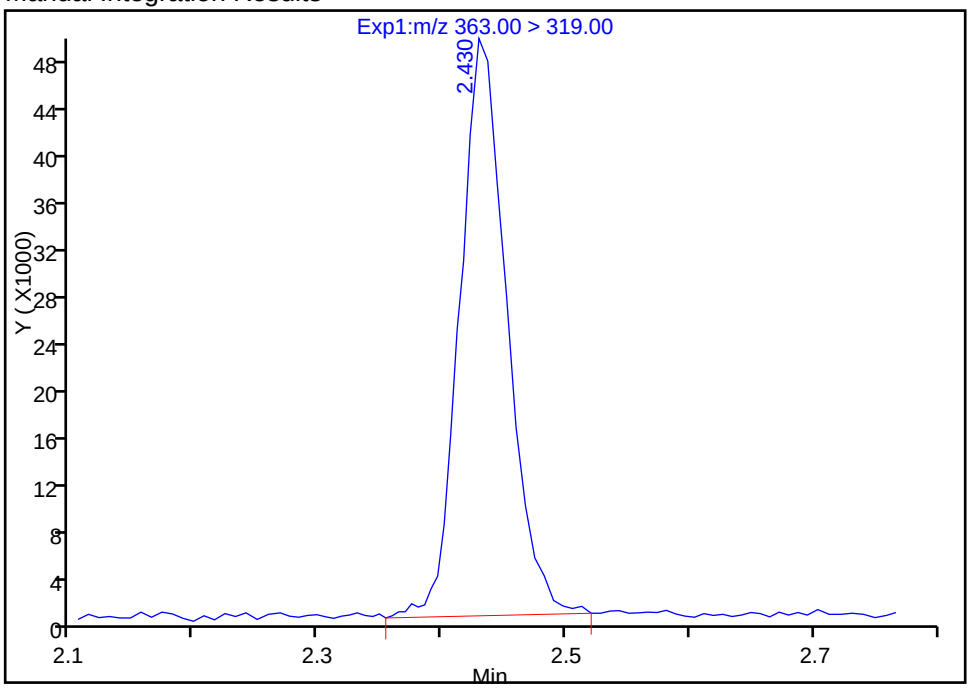
Processing Integration Results

Not Detected
Expected RT: 2.43



Manual Integration Results

RT: 2.43
Area: 129104
Amount: 0.538766
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento

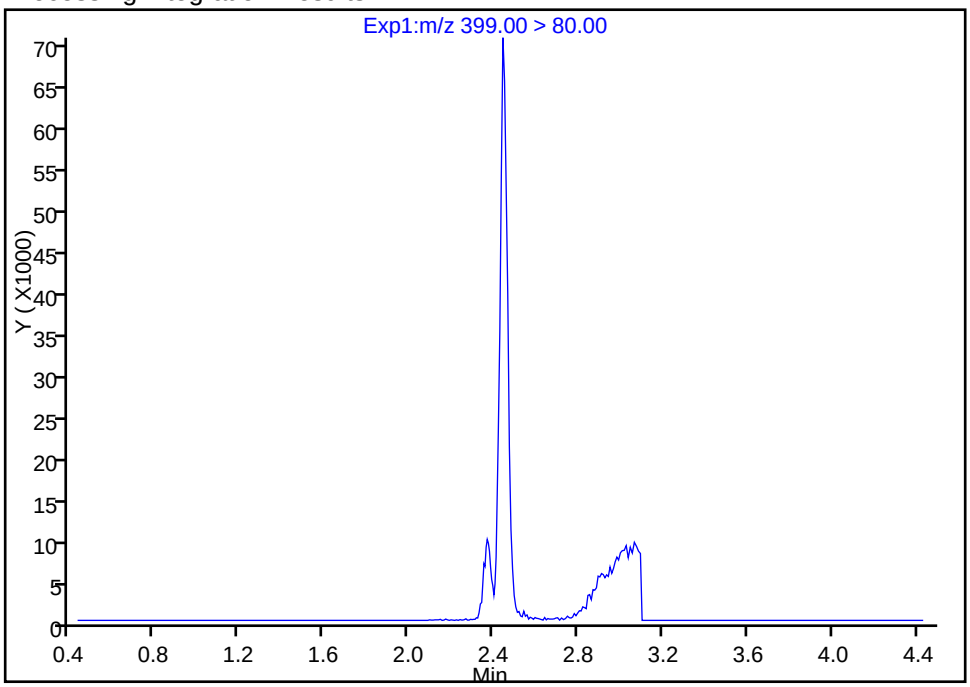
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

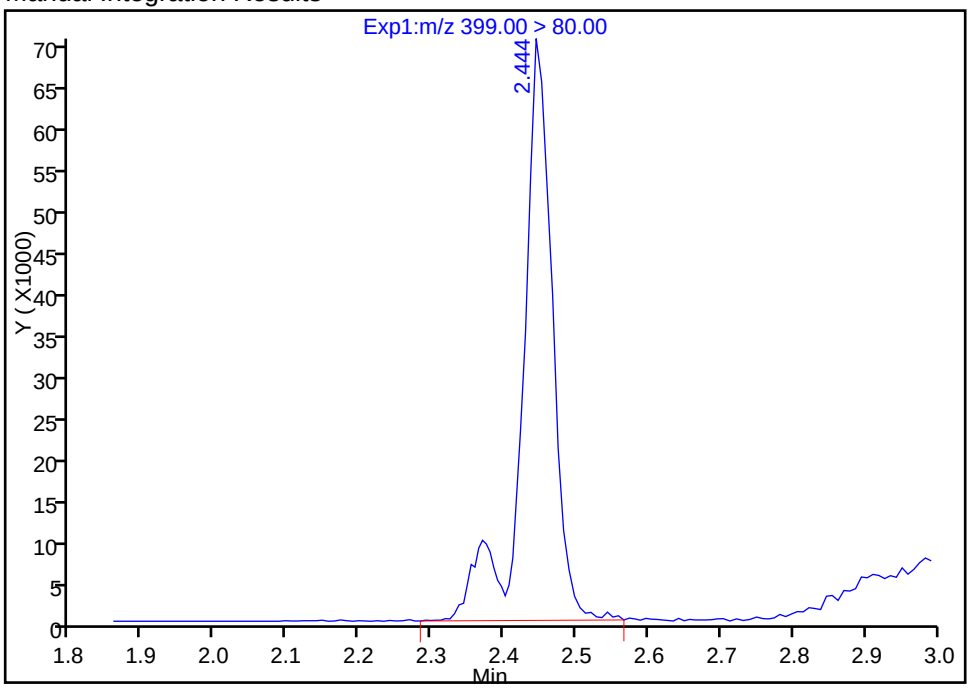
Not Detected
Expected RT: 2.43

Processing Integration Results



Manual Integration Results

RT: 2.44
Area: 204063
Amount: 0.579783
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

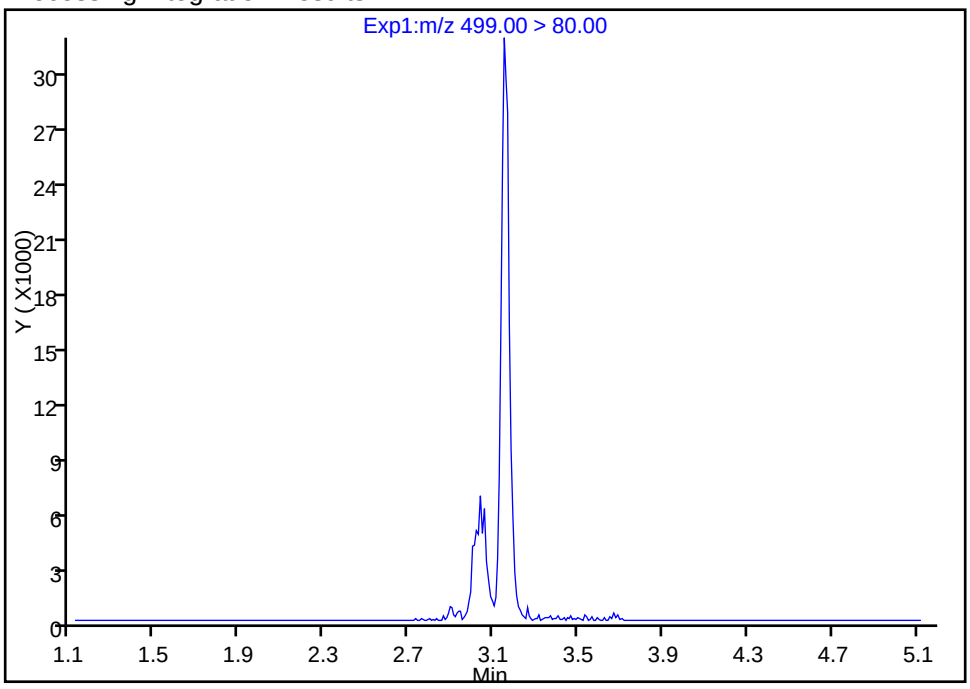
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d				
Injection Date:	15-Dec-2016 12:29:18	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

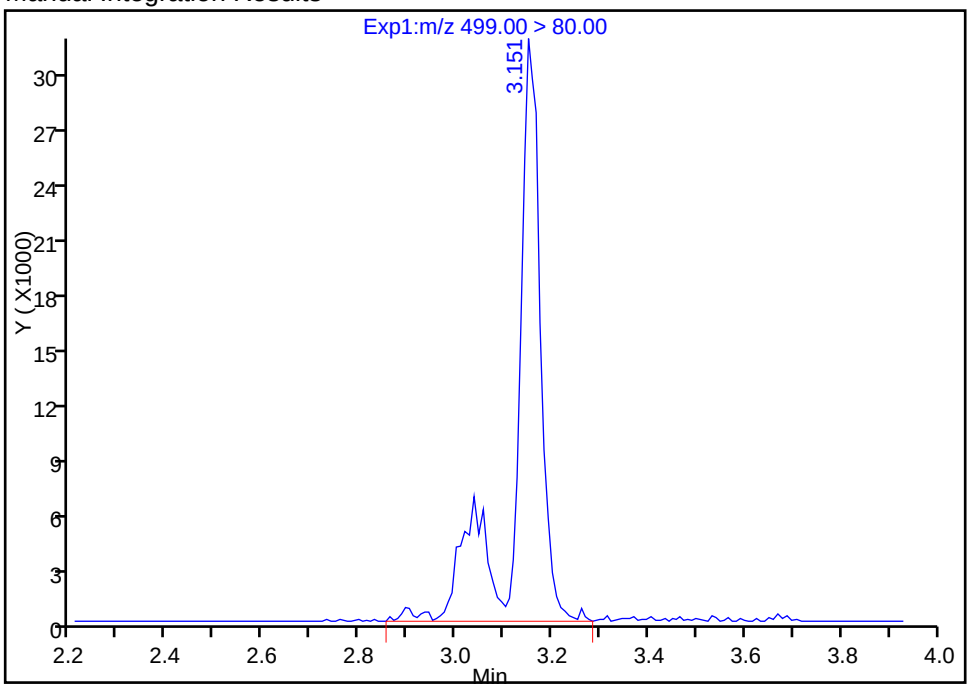
Processing Integration Results

Not Detected
Expected RT: 3.12



Manual Integration Results

RT: 3.15
Area: 116569
Amount: 0.456423
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

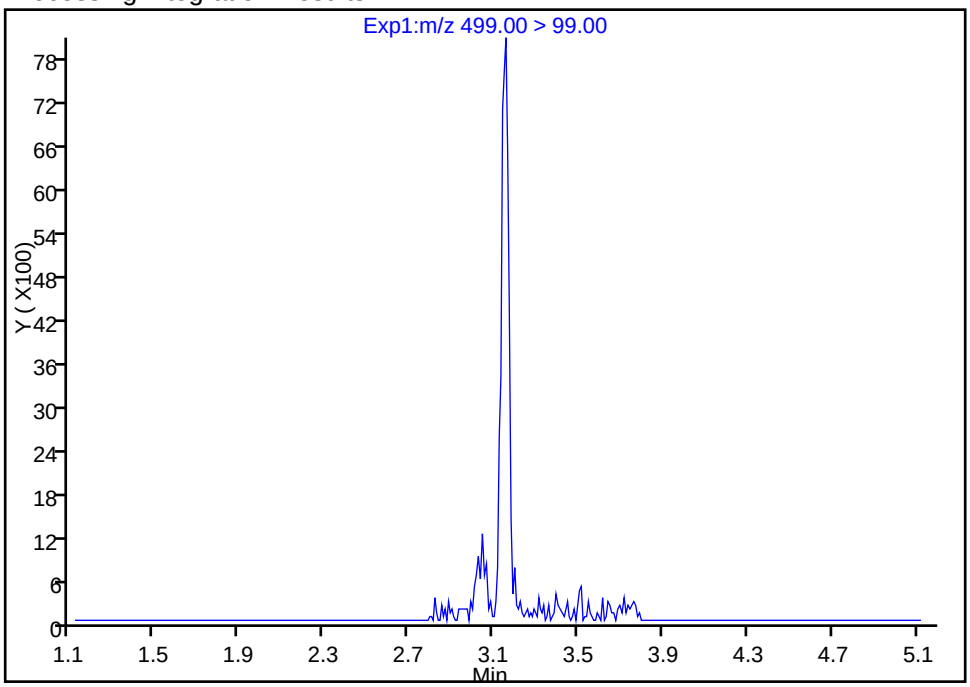
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

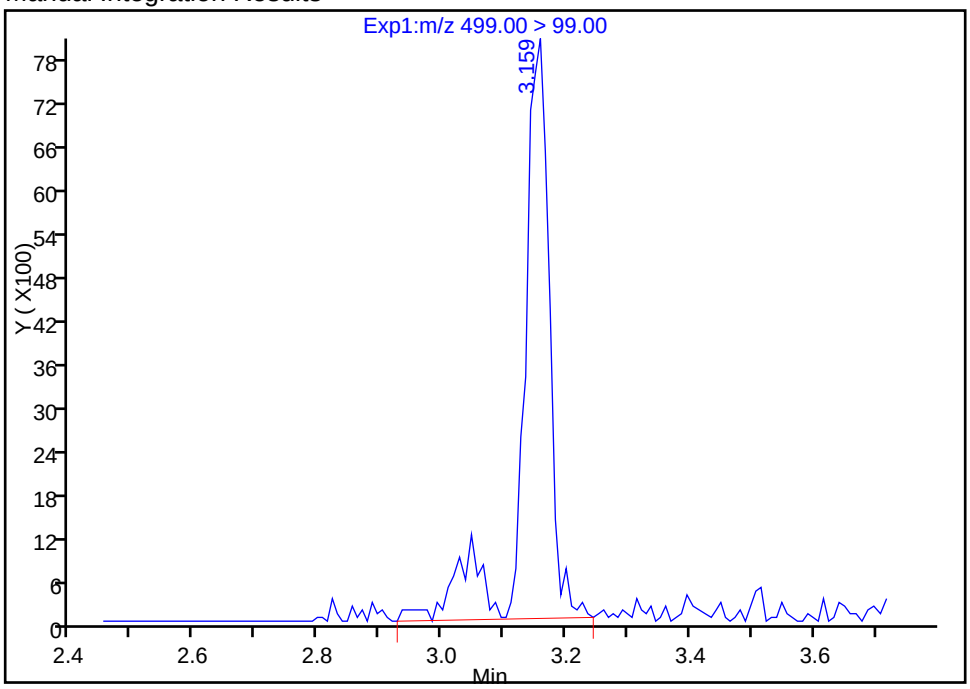
Processing Integration Results

Not Detected
Expected RT: 3.12



Manual Integration Results

RT: 3.16
Area: 24244
Amount: 0.456423
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento

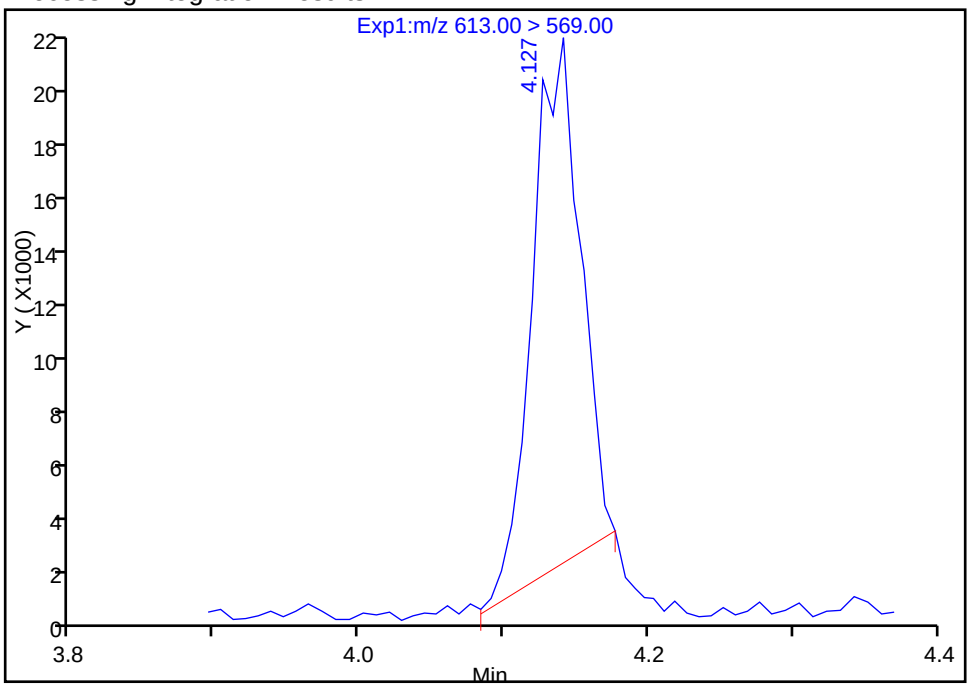
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

29 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

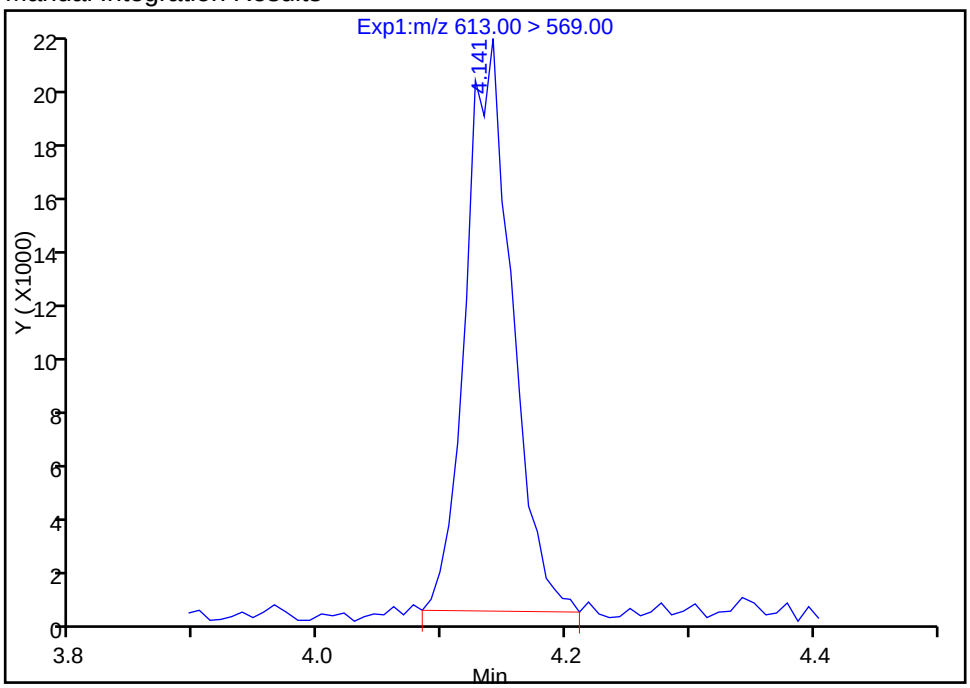
Processing Integration Results

RT: 4.13
Area: 43489
Amount: 0.419548
Amount Units: ng/ml



Manual Integration Results

RT: 4.14
Area: 52807
Amount: 0.494620
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d
Lims ID: IC L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 15-Dec-2016 12:36:48 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:15 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:50:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.530	1.534	-0.004		18201393	52.3		105	1000291	
1 Perfluorobutyric acid										
212.90 > 169.00	1.530	1.535	-0.005	1.000	310647	1.00		100.0	2583	
D 4 13C5-PFPeA										
267.90 > 223.00	1.805	1.810	-0.005		14067714	52.9		106	1093447	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.805	1.810	-0.005	1.000	287573	1.04		104	2935	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.844	1.848	-0.004	1.000	424227	0.8800		99.5		
298.90 > 99.00	1.844	1.848	-0.004	1.000	171864		2.47(0.00-0.00)	99.5		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.092	2.096	-0.004	1.000	239458	1.01		101	6854	
D 6 13C2 PFHxA										
315.00 > 270.00	2.092	2.097	-0.005		12814780	52.3		105	582538	
D 11 13C4-PFHpA										
367.00 > 322.00	2.423	2.426	-0.003		12248222	54.1		108	431068	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.430	2.428	0.002	1.000	237734	0.99		99.1	1884	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.445	2.431	0.014	1.000	348475	0.99		109		
D 10 18O2 PFHxS										
403.00 > 84.00	2.445	2.446	-0.001		16093048	49.2		104	960828	
D 14 13C4 PFOA										
417.00 > 372.00	2.781	2.783	-0.002		12627691	54.8		110	657205	

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	2.781	2.783	-0.002	1.000	254861	1.01		101	2003	
413.00 > 169.00	2.781	2.783	-0.002	1.000	159259		1.60(0.90-1.10)	101	7007	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.789	2.790	-0.001	1.000	265783	0.9254		97.2		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.149	3.118	0.031	1.000	220370	0.8502		91.6	15877	M
499.00 > 99.00	3.157	3.118	0.039	1.003	52990		4.16(0.90-1.10)	91.6	5530	M
D 17 13C4 PFOS										
503.00 > 80.00	3.149	3.151	-0.002		12459383	50.1		105	1105467	
D 19 13C5 PFNA										
468.00 > 423.00	3.149	3.153	-0.004		9537045	53.7		107	472742	
20 Perfluorononanoic acid										
463.00 > 419.00	3.157	3.155	0.002	1.000	188341	1.04		104	2906	
D 21 13C8 FOSA										
506.00 > 78.00	3.489	3.488	0.001		20238792	52.7		105	766772	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.489	3.491	-0.002	1.000	381363	1.01		101	46576	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.506	3.510	-0.004	1.000	155537	0.9716		97.2	5243	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.513	0.001		8480447	53.9		108	439565	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.824	3.822	0.002	1.000	139829	0.9186		95.3		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.833	3.839	-0.006	1.000	119189	1.00		100	2937	
D 27 13C2 PFUnA										
565.00 > 520.00	3.842	3.842	0.0		6219248	53.0		106	280274	
D 30 13C2 PFDoA										
615.00 > 570.00	4.133	4.132	0.001		5822114	52.5		105	270055	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.133	4.136	-0.003	1.000	103481	0.9681		96.8	2745	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.396	4.400	-0.004	1.000	109461	1.04		104	2155	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.633	4.641	-0.008		11885446	52.3		105	710542	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.643	4.642	0.001	1.000	187123	1.01		101	2896	
713.00 > 169.00	4.633	4.642	-0.009	0.998	31916		5.86(0.00-0.00)	101	12057	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.047	5.057	-0.010		6699329	53.8		108	126940	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.059	-0.001	1.000	173261	1.01		101	135	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.414	-0.001	1.000	114997	0.9585		95.8	91.0	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d

Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N

Lims ID: IC L2

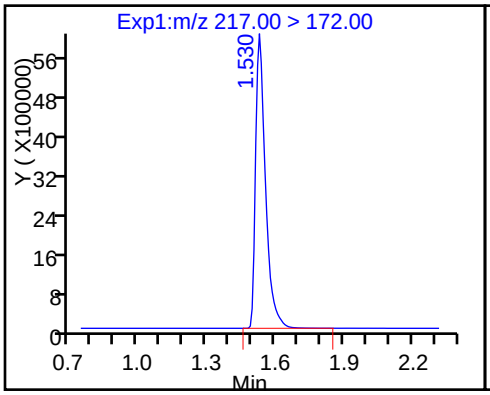
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

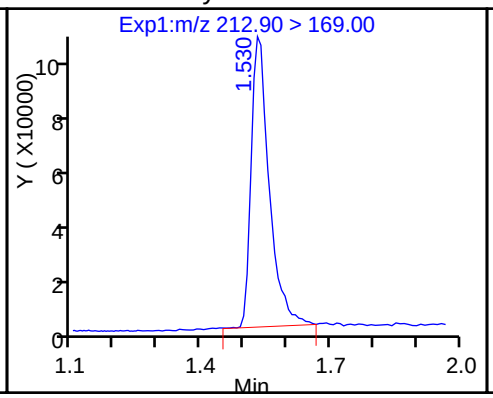
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

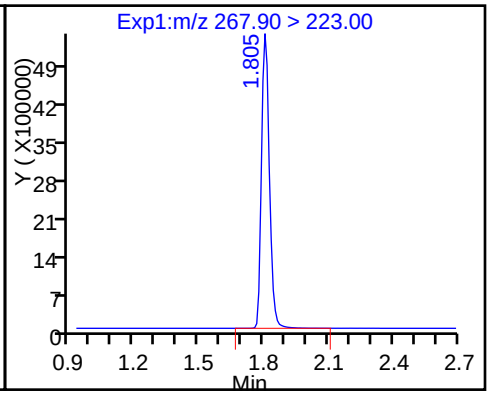
D 2 13C4 PFBA



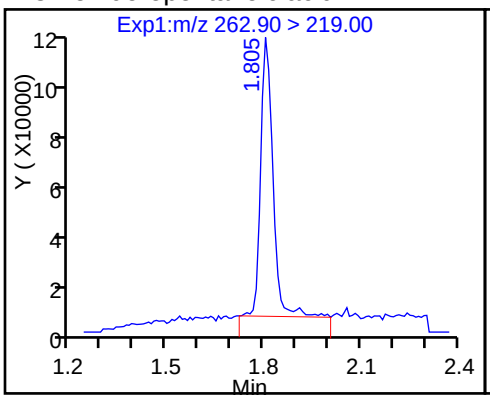
1 Perfluorobutyric acid



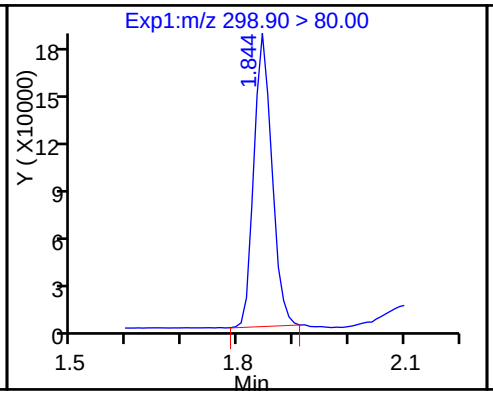
D 4 13C5-PFPeA



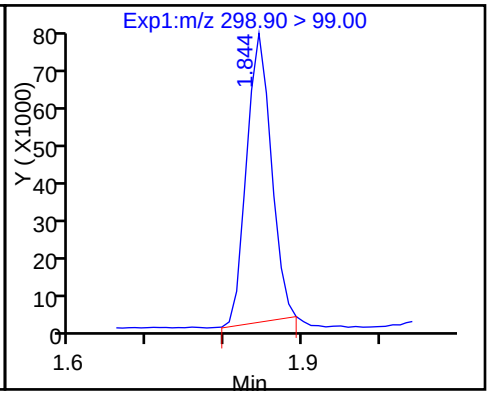
3 Perfluoropentanoic acid



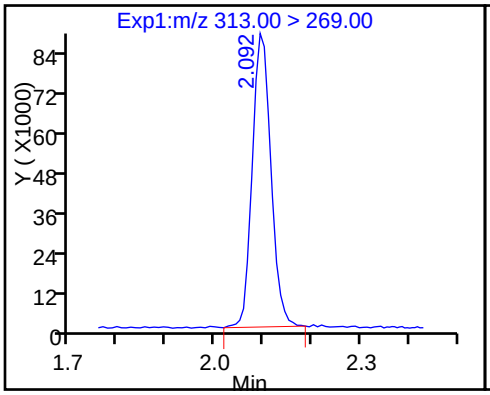
5 Perfluorobutanesulfonic acid



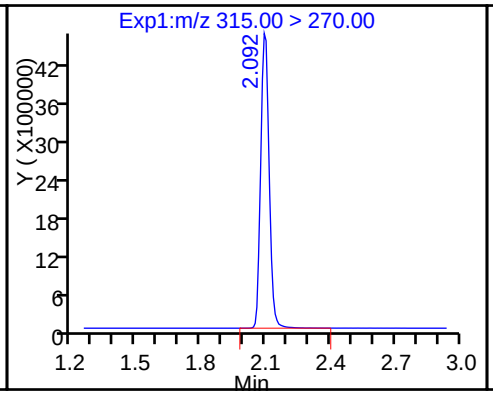
5 Perfluorobutanesulfonic acid



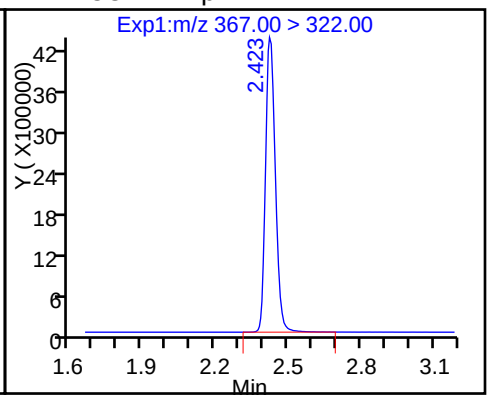
7 Perfluorohexanoic acid



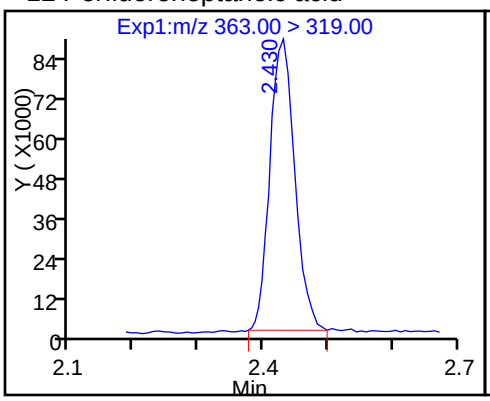
D 6 13C2 PFHxA



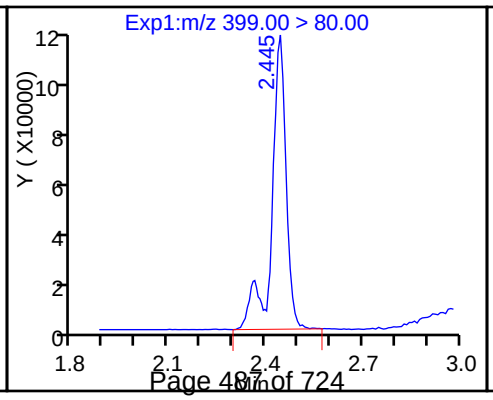
D 11 13C4-PFHpA



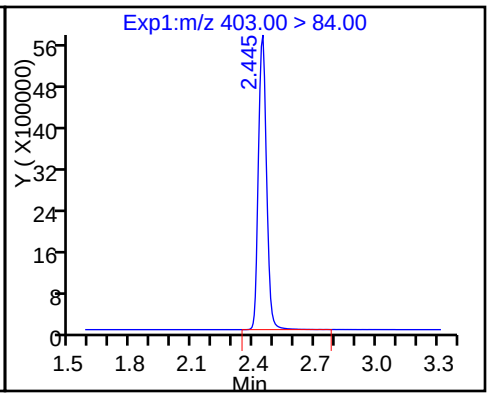
12 Perfluoroheptanoic acid



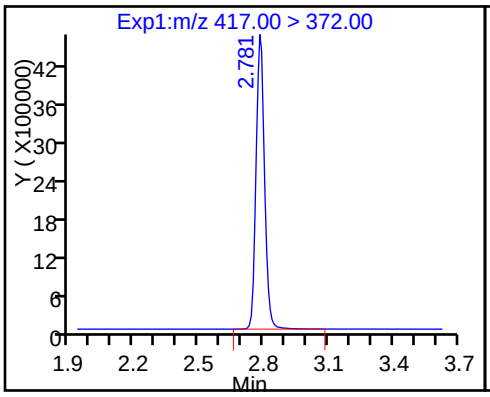
9 Perfluorohexanesulfonic acid



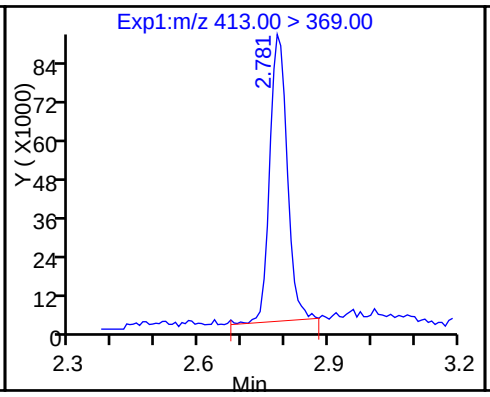
D 10 18O2 PFHxS



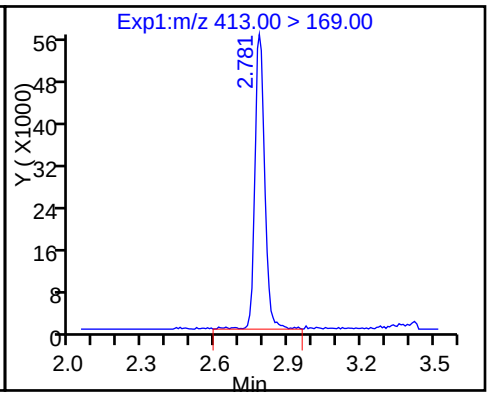
D 14 13C4 PFOA



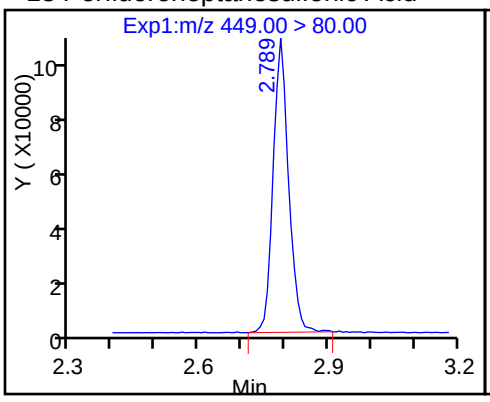
15 Perfluorooctanoic acid



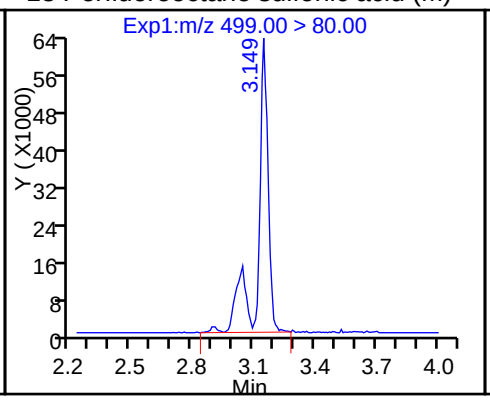
15 Perfluorooctanoic acid



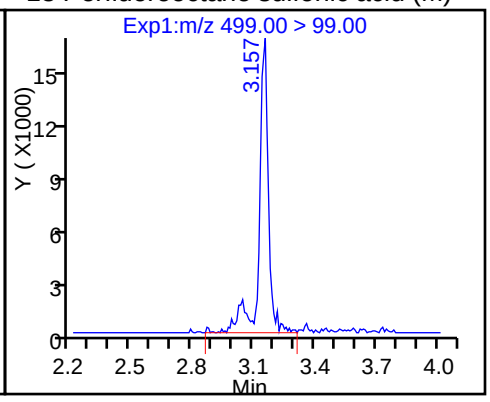
13 Perfluoroheptanesulfonic Acid



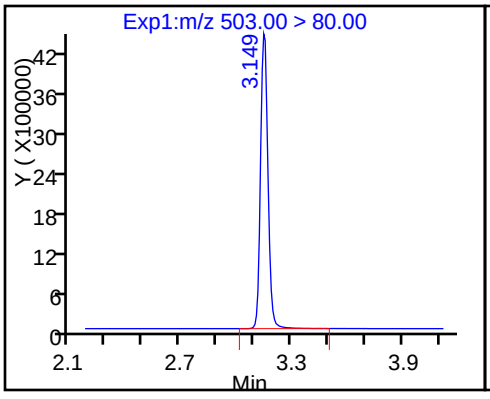
18 Perfluorooctane sulfonic acid (M)



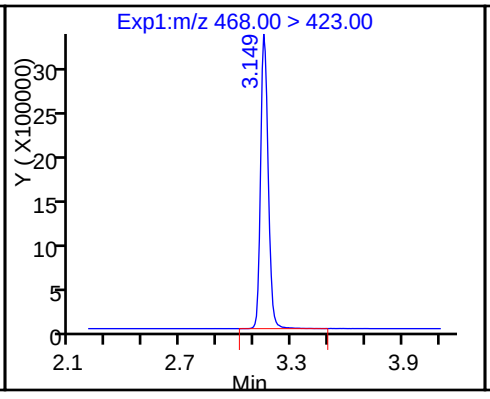
18 Perfluorooctane sulfonic acid (M)



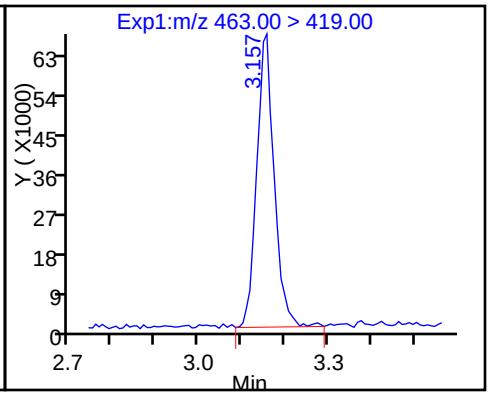
D 17 13C4 PFOS



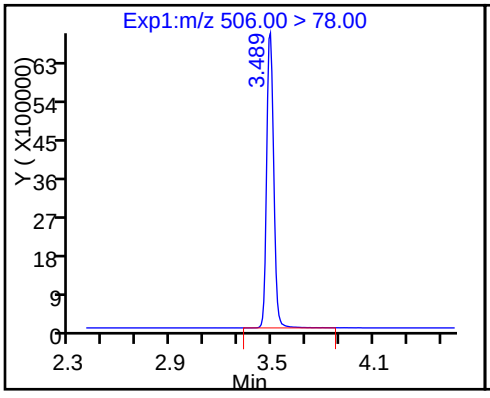
D 19 13C5 PFNA



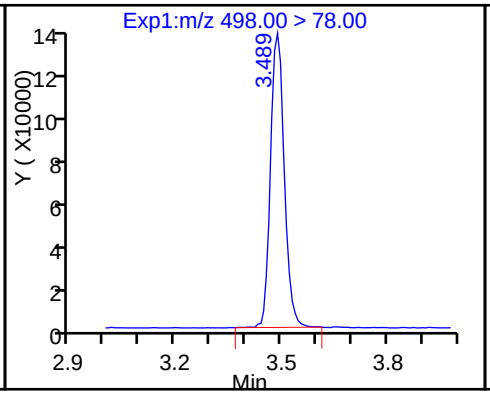
20 Perfluorononanoic acid



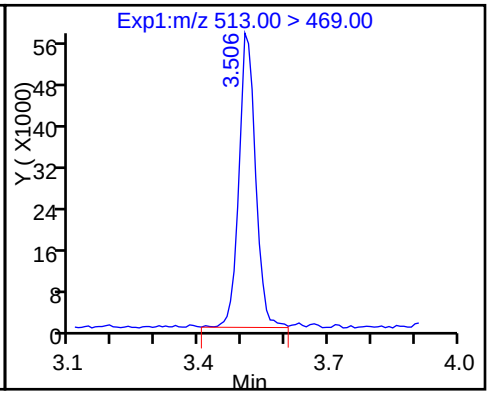
D 21 13C8 FOSA



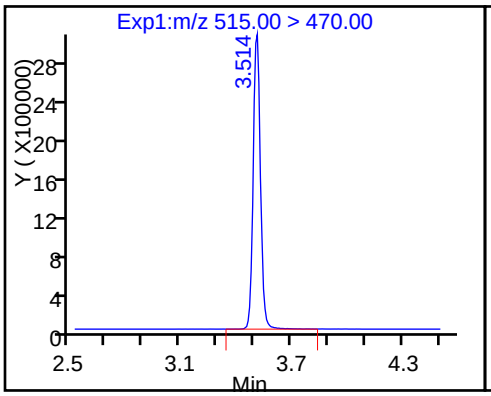
22 Perfluorooctane Sulfonamide



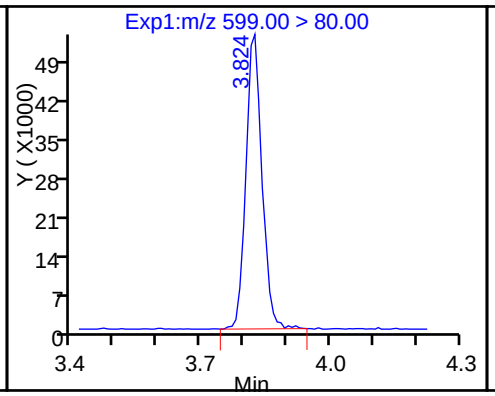
24 Perfluorodecanoic acid



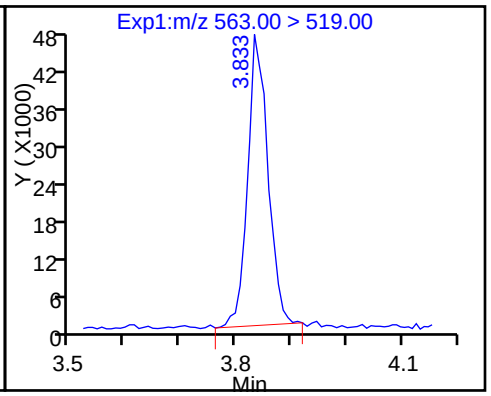
D 23 13C2 PFDA



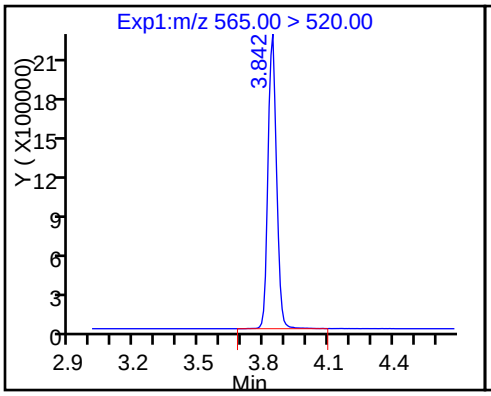
26 Perfluorodecane Sulfonic acid



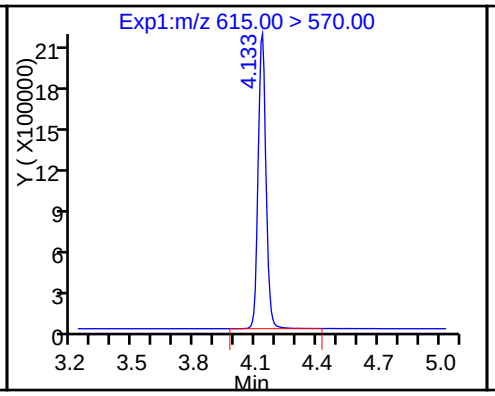
28 Perfluoroundecanoic acid



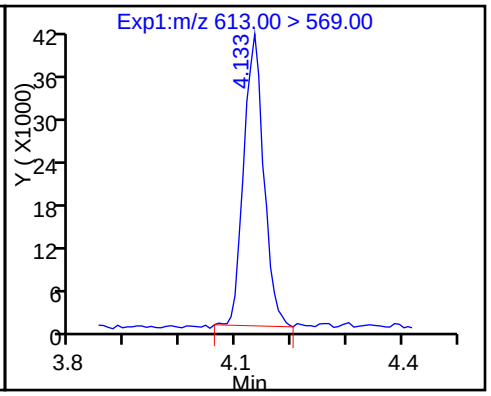
D 27 13C2 PFUnA



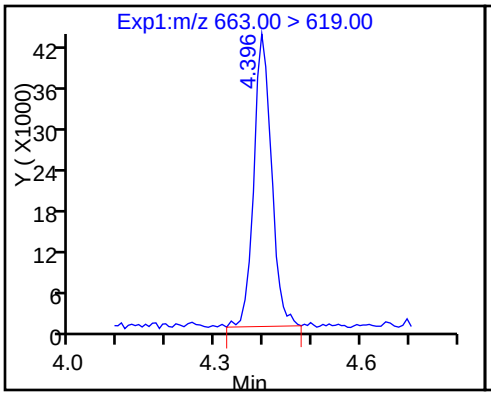
D 30 13C2 PFDoA



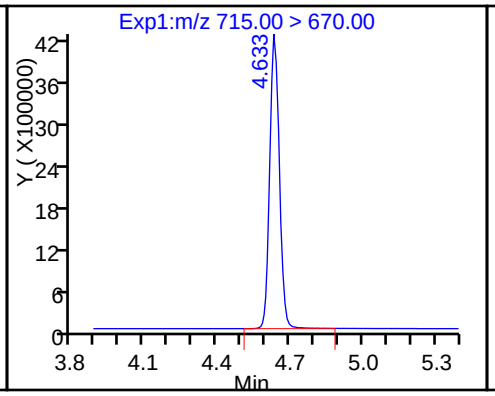
29 Perfluorododecanoic acid



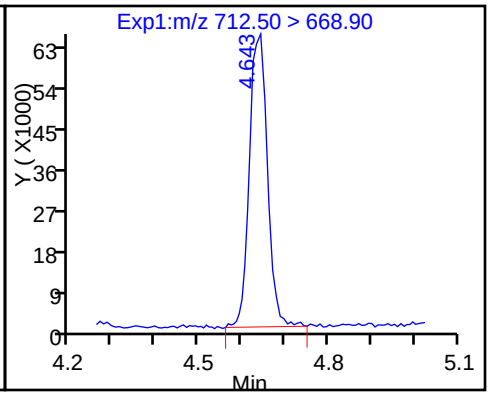
31 Perfluorotridecanoic acid



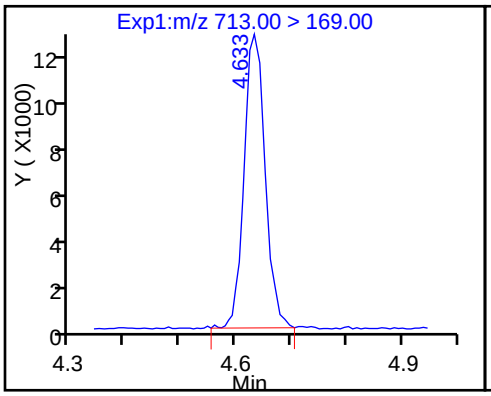
D 32 13C2-PFTeDA



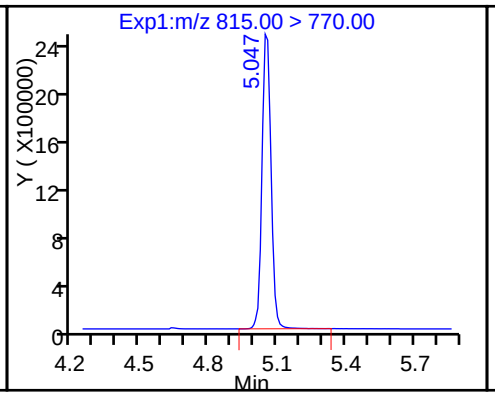
33 Perfluorotetradecanoic acid



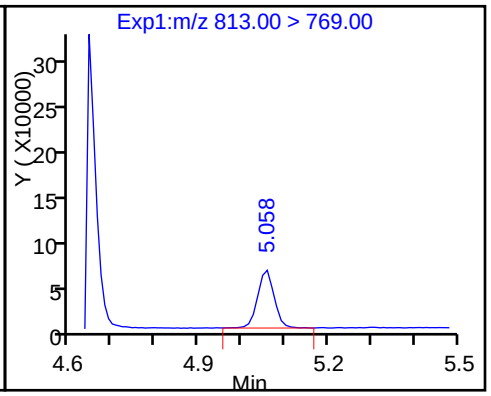
33 Perfluorotetradecanoic acid



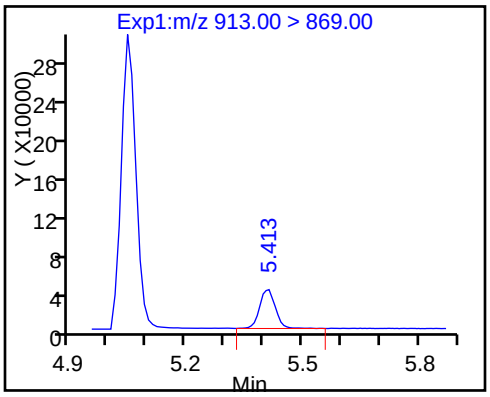
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

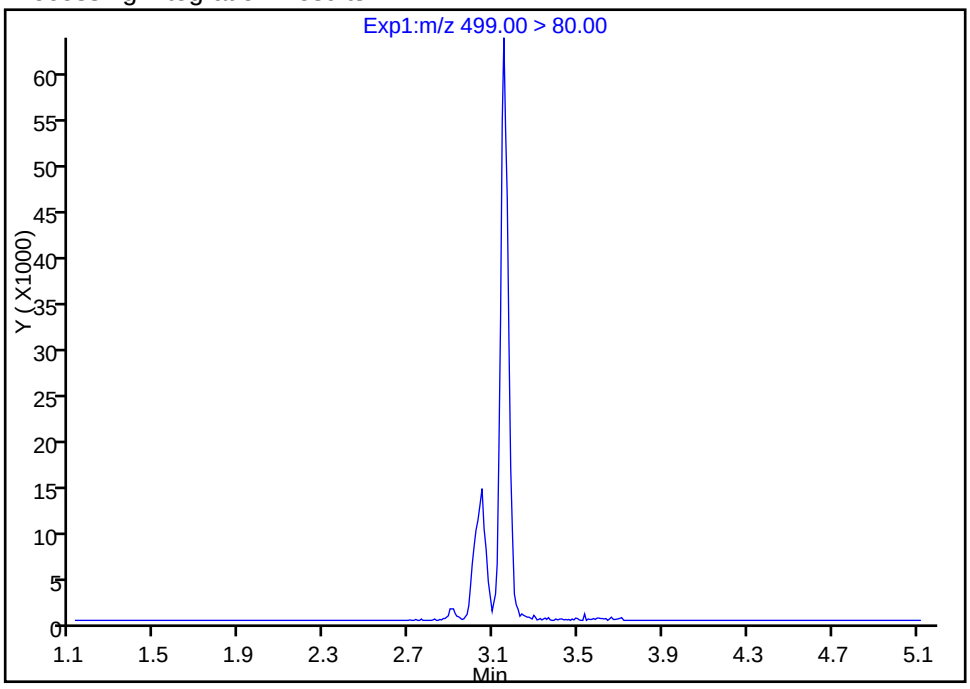
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d
Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

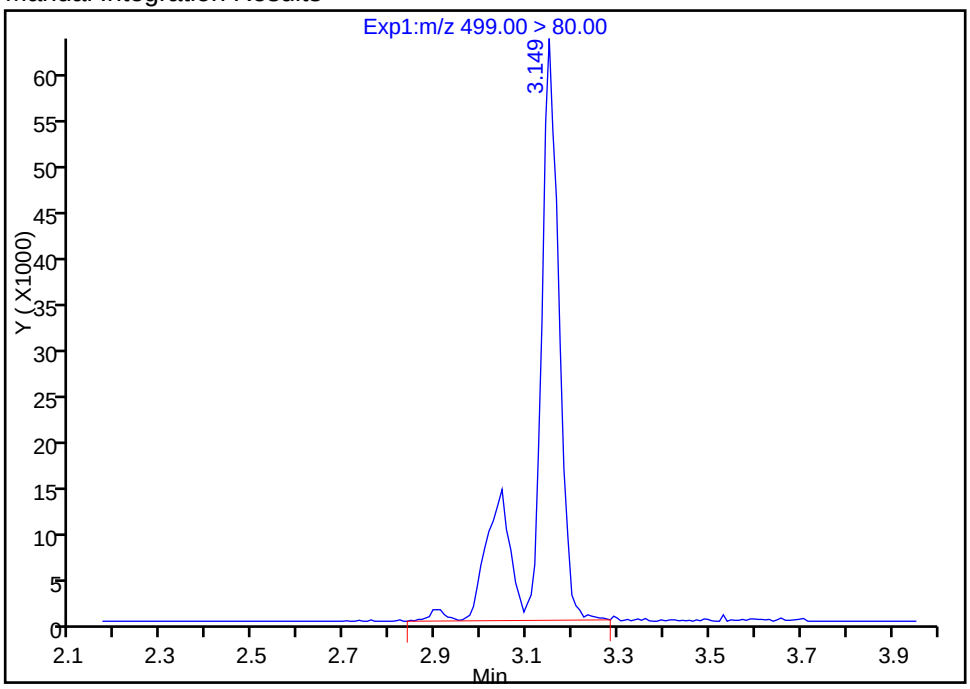
Not Detected
Expected RT: 3.12

Processing Integration Results



Manual Integration Results

RT: 3.15
Area: 220370
Amount: 0.850158
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:50:02
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

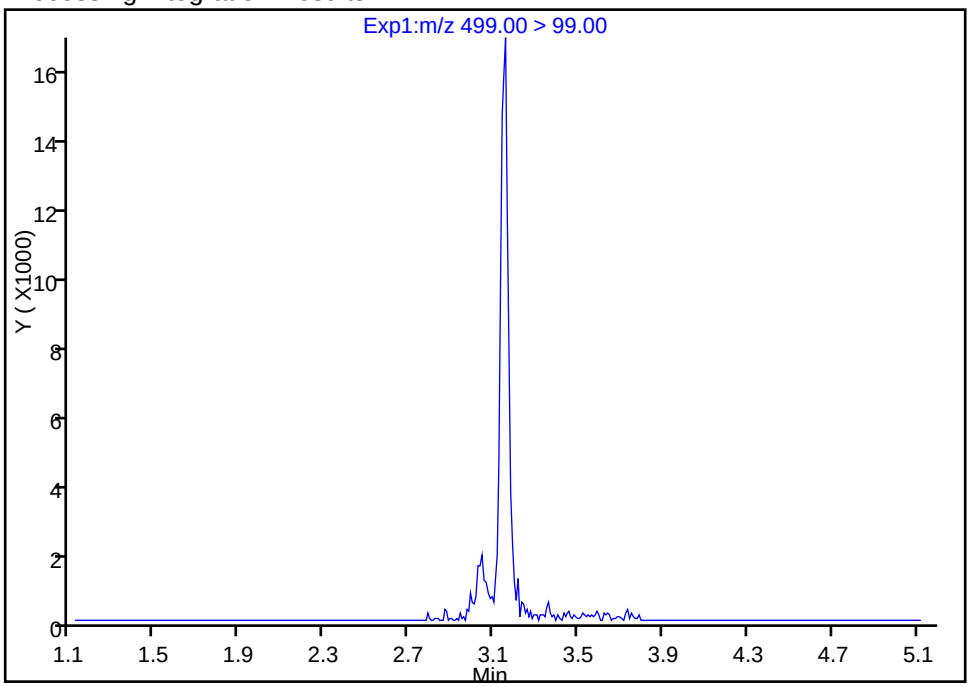
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d
Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

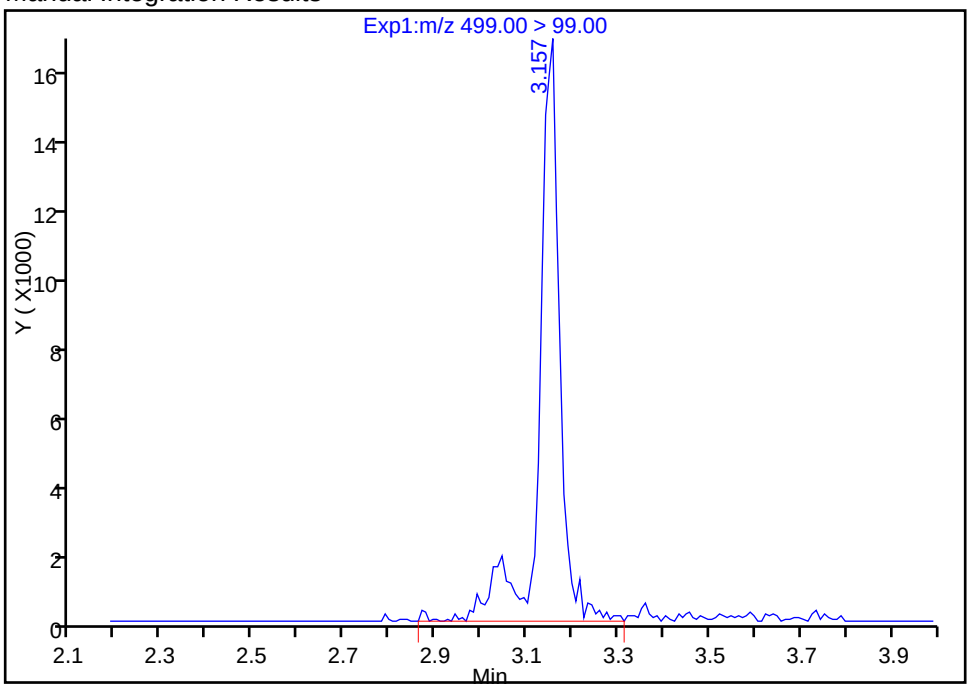
Not Detected
Expected RT: 3.12

Processing Integration Results



Manual Integration Results

RT: 3.16
Area: 52990
Amount: 0.850158
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:50:02
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_006.d
Lims ID: IC L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 15-Dec-2016 12:44:16 ALS Bottle#: 39 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:18 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:50:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		18037108	51.9		104	828248	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.535	-0.001	1.000	1550440	5.03		101	13427	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		14063070	52.9		106	1078697	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	1358239	4.89		97.9	15178	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.848	0.001	1.000	2211602	4.55		103		
298.90 > 99.00	1.849	1.848	0.001	1.000	918055		2.41(0.00-0.00)	103		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.097	2.096	0.001	1.000	1183286	5.01		100	39266	
D 6 13C2 PFHxA										
315.00 > 270.00	2.097	2.097	0.0		12709919	51.9		104	753338	
D 11 13C4-PFHpA										
367.00 > 322.00	2.425	2.426	-0.001		12260528	54.2		108	1467079	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.432	2.428	0.004	1.000	1175112	4.90		97.9	8914	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.364	2.431	-0.067	1.000	1543002	4.37		96.0		
D 10 18O2 PFHxS										
403.00 > 84.00	2.447	2.446	0.001		16222736	49.6		105	651458	
D 14 13C4 PFOA										
417.00 > 372.00	2.783	2.783	0.0		12635065	54.8		110	746410	

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	2.783	2.783	0.0	1.000	1239541	4.89		97.8	9812	
413.00 > 169.00	2.783	2.783	0.0	1.000	731249		1.70(0.90-1.10)	97.8	28264	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.792	2.790	0.002	1.000	1351160	4.69		98.6		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.153	3.118	0.035	1.000	1150410	4.43		95.5	65030	
499.00 > 99.00	3.153	3.118	0.035	1.000	246751		4.66(0.90-1.10)	95.5	15530	
D 17 13C4 PFOS										
503.00 > 80.00	3.153	3.151	0.002		12484772	50.2		105	473035	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0		9777609	55.0		110	653324	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.155	-0.002	1.000	902512	4.85		97.0	13825	
D 21 13C8 FOSA										
506.00 > 78.00	3.484	3.488	-0.004		20034933	52.2		104	309657	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.492	3.491	0.001	1.000	1989314	5.32		106	140153	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.509	3.510	-0.001	1.000	771905	4.97		99.3	27905	
D 23 13C2 PFDA										
515.00 > 470.00	3.509	3.513	-0.004		8234678	52.3		105	259288	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.819	3.822	-0.003	1.000	712852	4.67		97.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.837	3.839	-0.002	1.000	549708	4.59		91.8	14816	
D 27 13C2 PFUnA										
565.00 > 520.00	3.845	3.842	0.003		6262617	53.4		107	379922	
D 30 13C2 PFDoA										
615.00 > 570.00	4.129	4.132	-0.003		5779875	52.1		104	227122	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.136	4.136	0.0	1.000	506369	4.77		95.4	11299	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.398	4.400	-0.002	1.000	525090	5.01		100	10475	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.645	4.641	0.004		12248242	53.9		108	1049274	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.645	4.642	0.003	1.000	900575	4.92		98.3	12522	
713.00 > 169.00	4.635	4.642	-0.007	0.998	149199		6.04(0.00-0.00)	98.3	58819	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.059	5.057	0.002		6542972	52.5		105	140605	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.059	0.0	1.000	599529	4.89		97.7	502	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.414	5.414	0.0	1.000	583761	4.90		98.0	536	

Reagents:

LCPFC-L3_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_006.d

Injection Date: 15-Dec-2016 12:44:16 Instrument ID: A8_N

Lims ID: IC L3

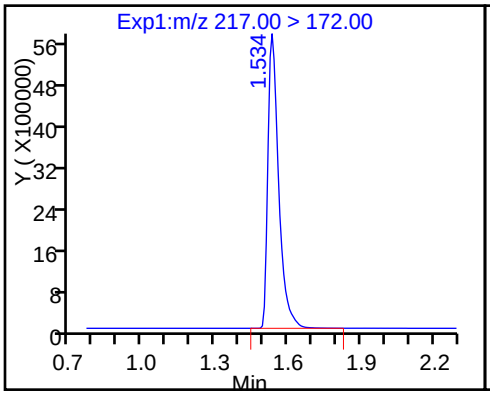
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 39 Worklist Smp#: 6

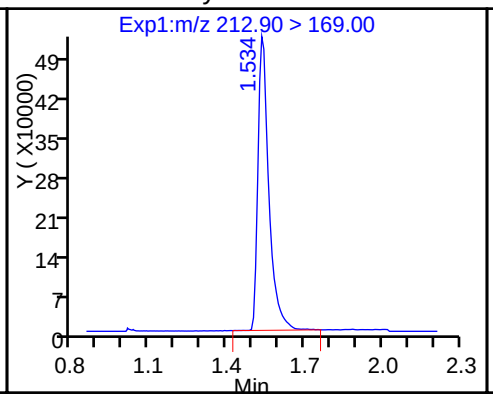
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

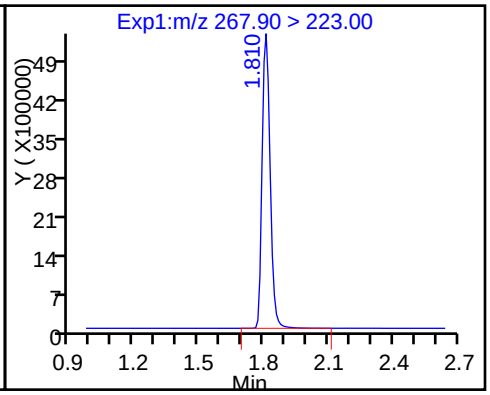
D 2 13C4 PFBA



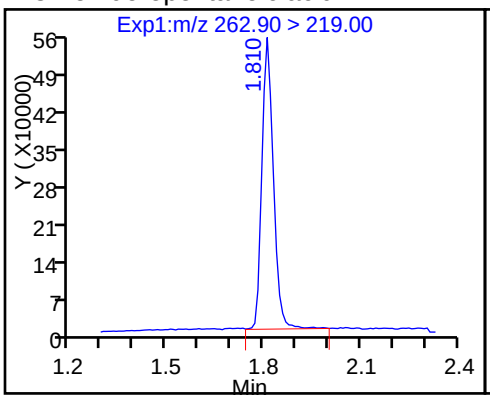
1 Perfluorobutyric acid



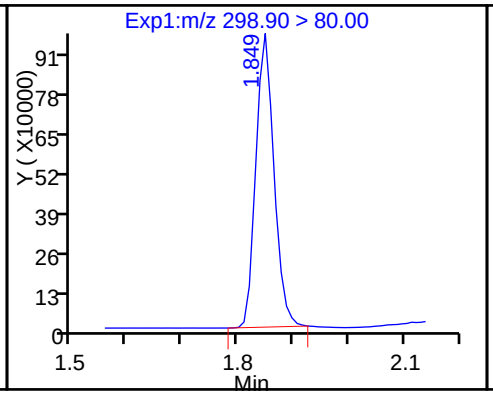
D 4 13C5-PFPeA



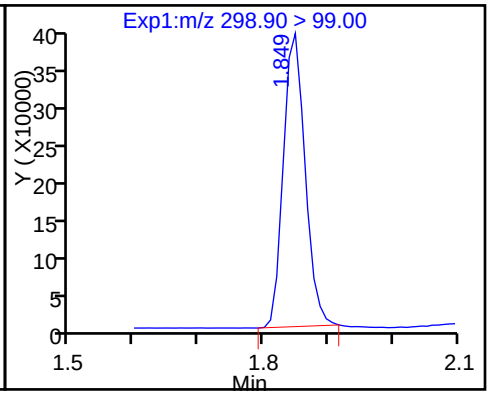
3 Perfluoropentanoic acid



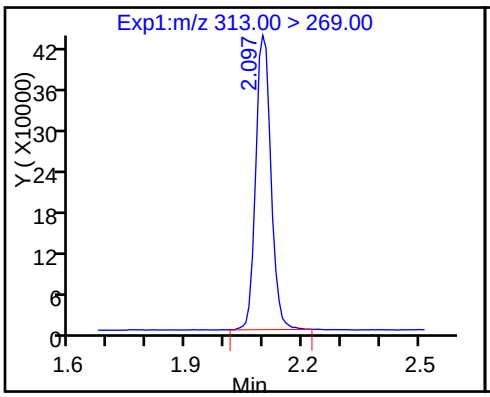
5 Perfluorobutanesulfonic acid



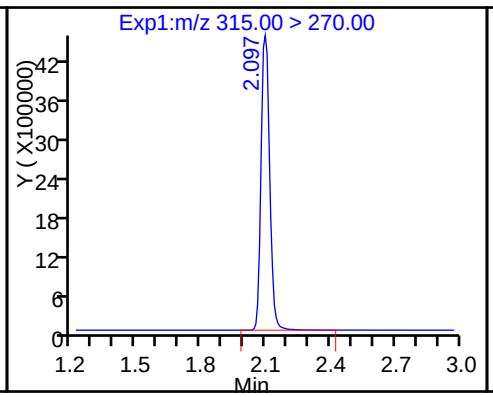
5 Perfluorobutanesulfonic acid



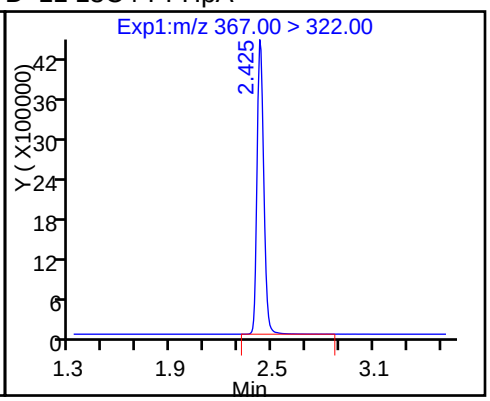
7 Perfluorohexanoic acid



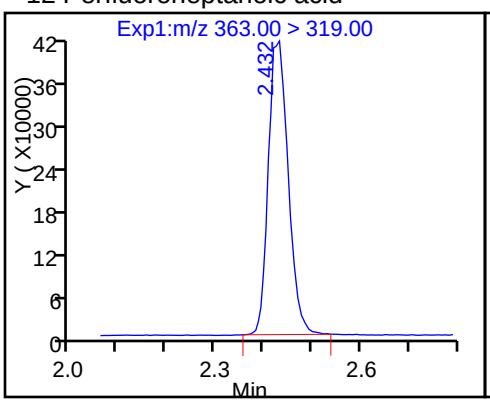
D 6 13C2 PFHxA



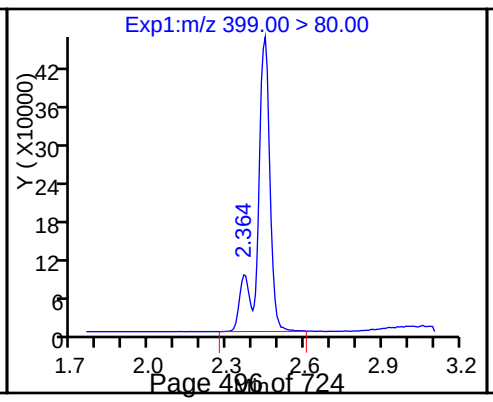
D 11 13C4-PFHpA



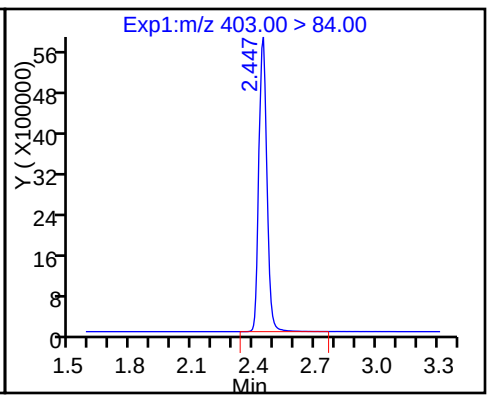
12 Perfluoroheptanoic acid



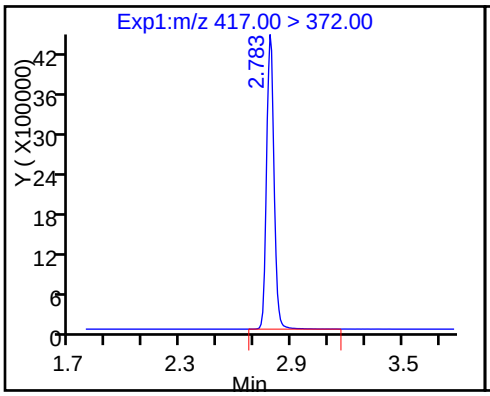
9 Perfluorohexanesulfonic acid



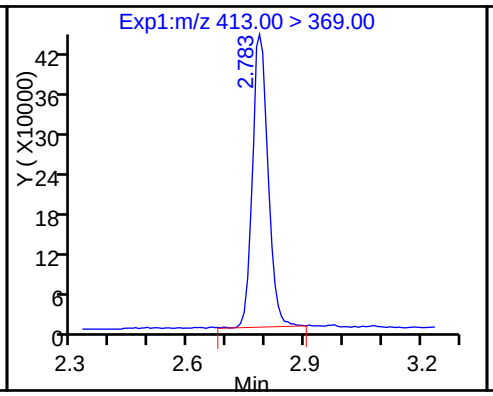
D 10 18O2 PFHxS



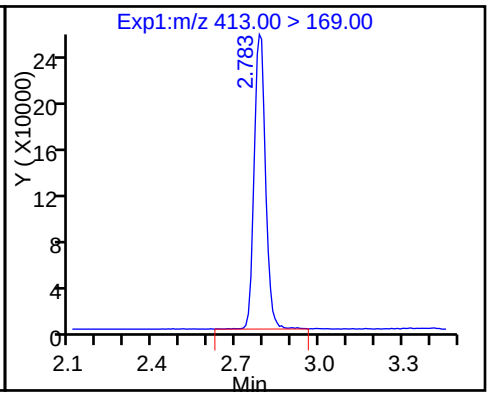
D 14 13C4 PFOA



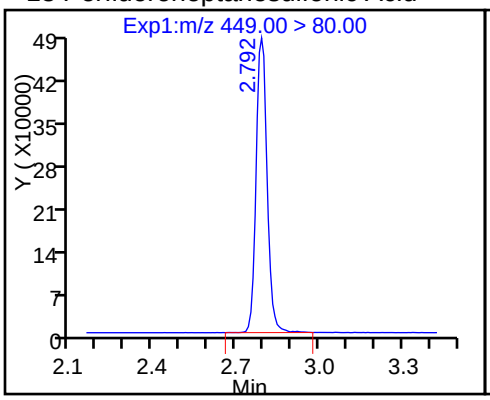
15 Perfluorooctanoic acid



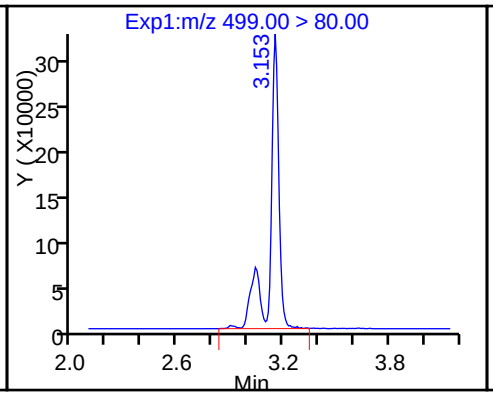
15 Perfluorooctanoic acid



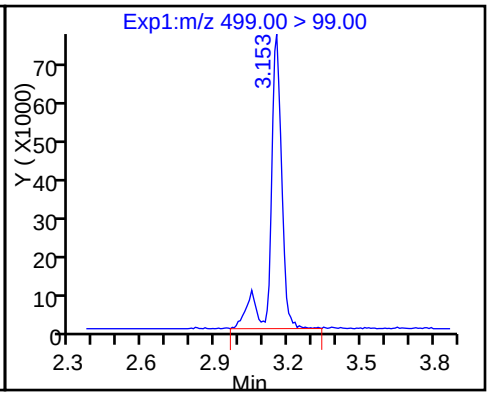
13 Perfluoroheptanesulfonic Acid



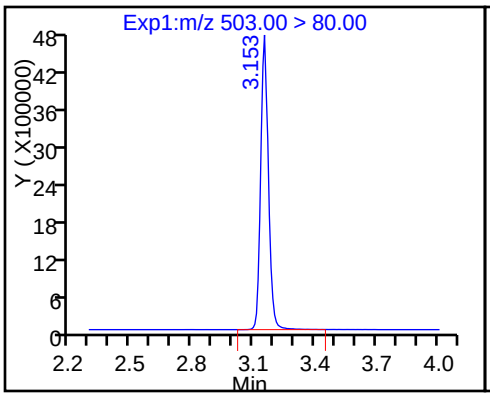
18 Perfluorooctane sulfonic acid



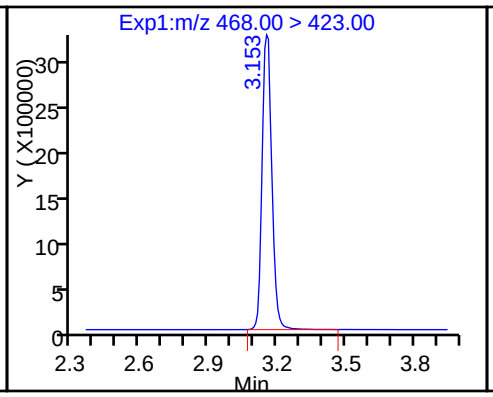
18 Perfluorooctane sulfonic acid



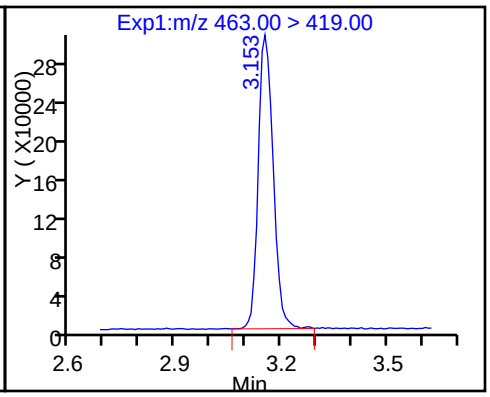
D 17 13C4 PFOS



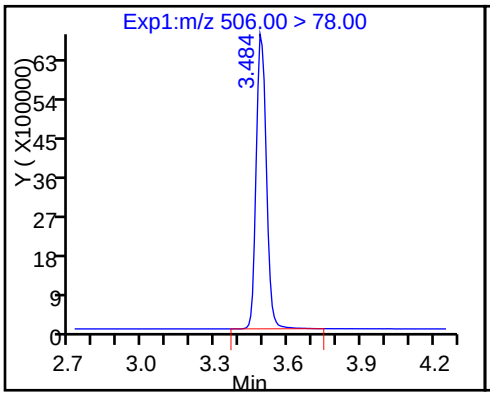
D 19 13C5 PFNA



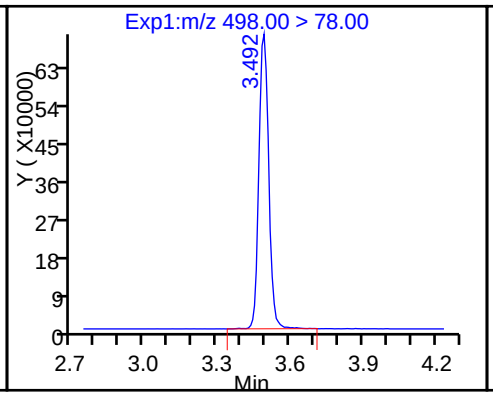
20 Perfluorononanoic acid



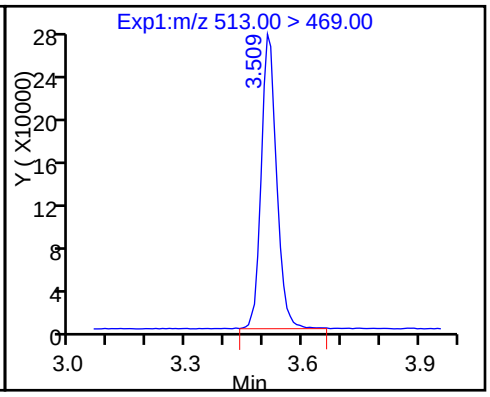
D 21 13C8 FOSA



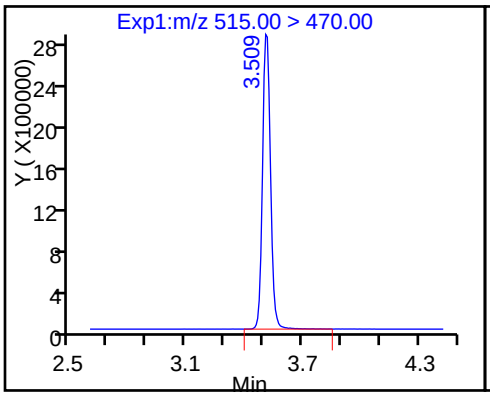
22 Perfluorooctane Sulfonamide



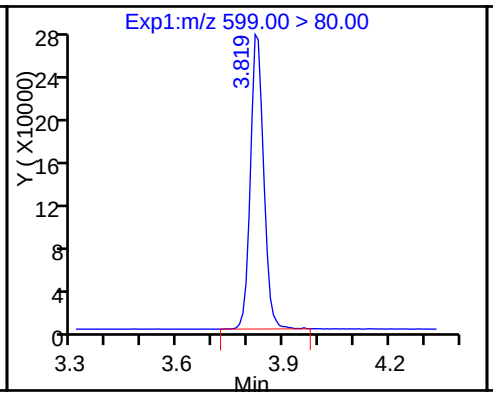
24 Perfluorodecanoic acid



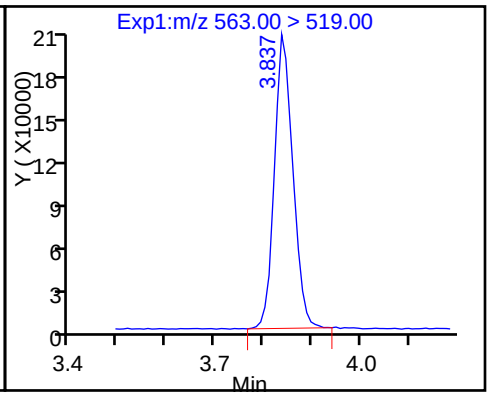
D 23 13C2 PFDA



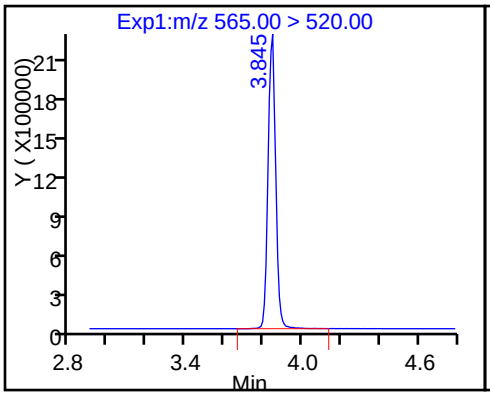
26 Perfluorodecane Sulfonic acid



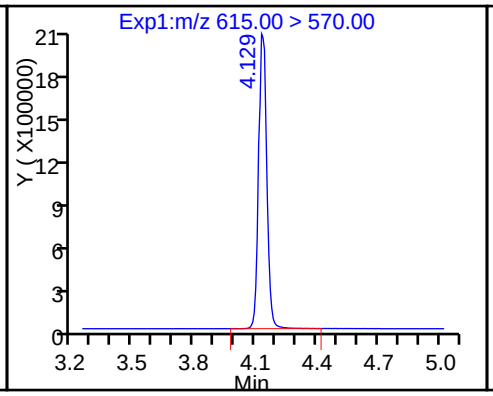
28 Perfluoroundecanoic acid



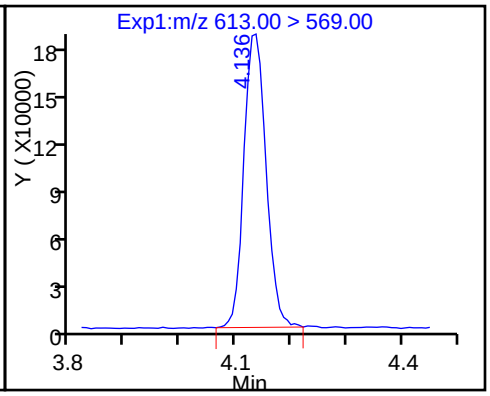
D 27 13C2 PFUnA



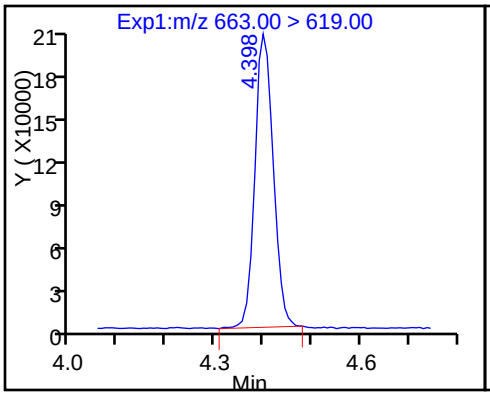
D 30 13C2 PFDoA



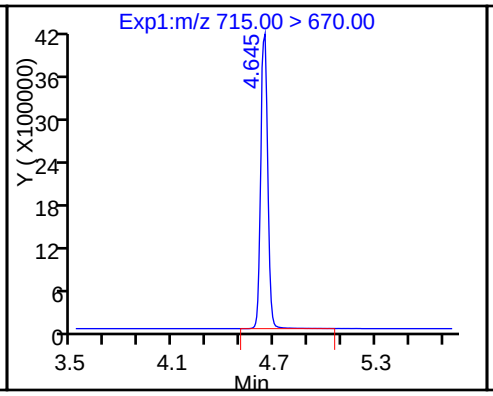
29 Perfluorododecanoic acid



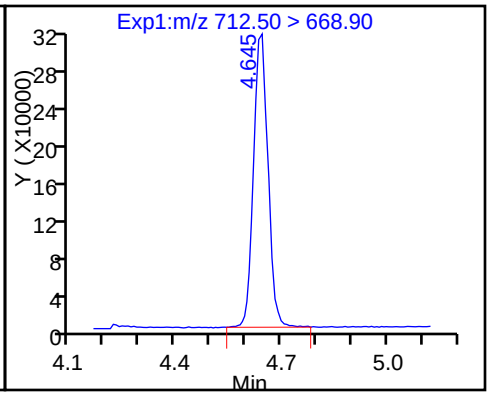
31 Perfluorotridecanoic acid



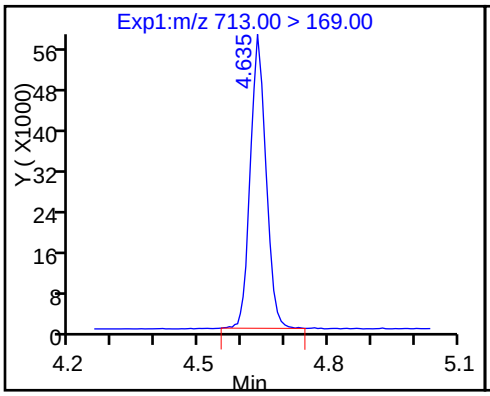
D 32 13C2-PFTeDA



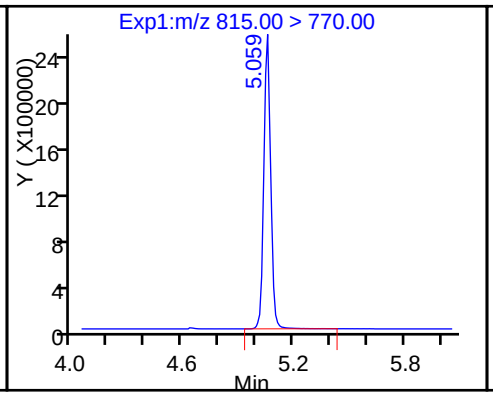
33 Perfluorotetradecanoic acid



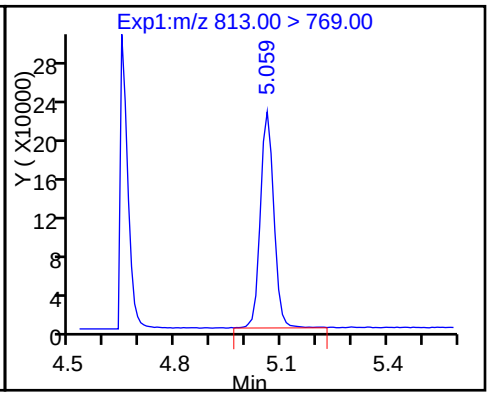
33 Perfluorotetradecanoic acid



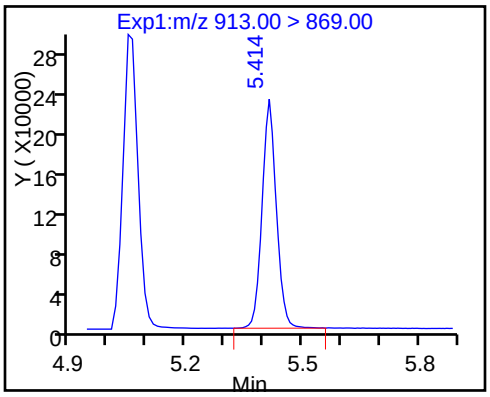
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_007.d
Lims ID: IC L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 15-Dec-2016 12:51:47 ALS Bottle#: 40 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:21 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:46:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		17585378	50.6		101	1140977	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.535	-0.001	1.000	6690917	22.3		111	52374	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		13617158	51.2		102	860552	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	5770240	21.5		107	61088	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.848	0.001	1.000	9860707	20.5		116		
298.90 > 99.00	1.849	1.848	0.001	1.000	4111615		2.40(0.00-0.00)	116		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.093	2.096	-0.003	1.000	4929766	21.0		105	144495	
D 6 13C2 PFHxA										
315.00 > 270.00	2.102	2.097	0.005		12608210	51.4		103	627430	
D 11 13C4-PFHpA										
367.00 > 322.00	2.426	2.426	0.0		11788221	52.1		104	459454	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.426	2.428	-0.002	1.000	4747711	20.6		103	44179	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.440	2.431	0.009	1.000	6624638	18.9		104		
D 10 18O2 PFHxS										
403.00 > 84.00	2.440	2.446	-0.006		16062766	49.1		104	697379	
D 14 13C4 PFOA										
417.00 > 372.00	2.785	2.783	0.002		11818203	51.3		103	403727	

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	2.785	2.783	0.002	1.000	5109766	21.6		108	40900	
413.00 > 169.00	2.785	2.783	0.002	1.000	3083663		1.66(0.90-1.10)	108	124075	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.785	2.790	-0.005	1.000	6014021	21.4		112		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.129	3.118	0.011	1.000	5058824	20.0		108	109804	
499.00 > 99.00	3.153	3.118	0.035	1.008	1125313		4.50(0.90-1.10)	108	92390	
D 17 13C4 PFOS										
503.00 > 80.00	3.153	3.151	0.002		12183062	49.0		102	250792	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0		9236073	52.0		104	341338	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.155	-0.002	1.000	3562981	20.3		101	53054	
D 21 13C8 FOSA										
506.00 > 78.00	3.484	3.488	-0.004		19703272	51.3		103	612200	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.492	3.491	0.001	1.000	7990835	21.7		109	298669	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.509	3.510	-0.001	1.000	3166735	20.6		103	81817	
D 23 13C2 PFDA										
515.00 > 470.00	3.517	3.513	0.004		8134734	51.7		103	195073	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.827	3.822	0.005	1.000	3084031	20.7		107		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.844	3.839	0.005	1.000	2420719	20.3		102	65024	
D 27 13C2 PFUnA										
565.00 > 520.00	3.835	3.842	-0.007		6226562	53.1		106	471162	
D 30 13C2 PFDoA										
615.00 > 570.00	4.135	4.132	0.003		5816809	52.4		105	222845	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.135	4.136	-0.001	1.000	2231794	20.9		104	47124	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.398	4.400	-0.002	1.000	2087859	19.8		98.9	37986	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.644	4.641	0.003		11655048	51.3		103	471362	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.644	4.642	0.002	1.000	3678976	20.0		99.8	48461	
713.00 > 169.00	4.635	4.642	-0.007	0.998	596997		6.16(0.00-0.00)	99.8	56132	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.059	5.057	0.002		6335821	50.9		102	120381	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.059	0.0	1.000	2267892	19.9		99.3	1990	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.414	-0.001	1.000	2445236	20.4		102	2369	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_007.d

Injection Date: 15-Dec-2016 12:51:47 Instrument ID: A8_N

Lims ID: IC L4

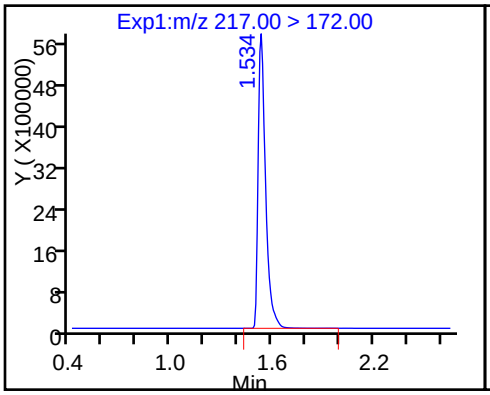
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7

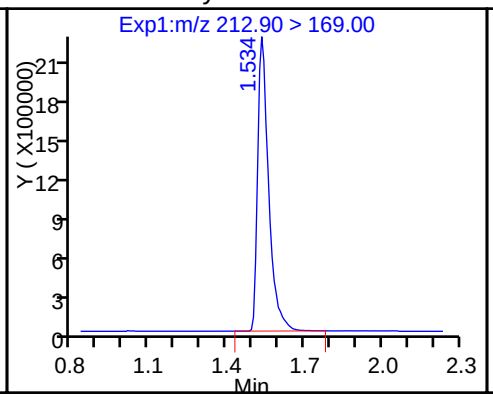
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

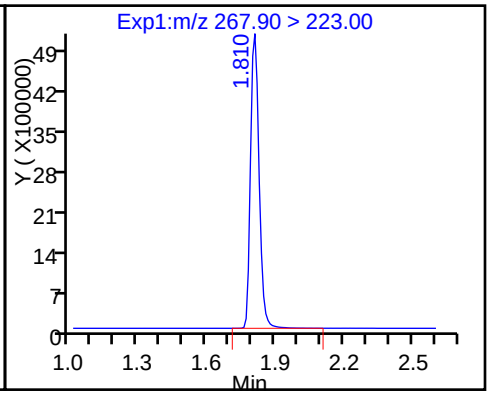
D 2 13C4 PFBA



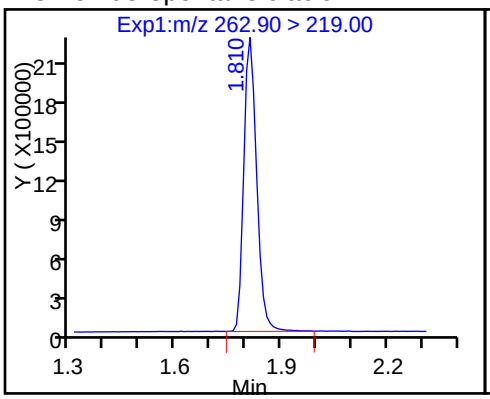
1 Perfluorobutyric acid



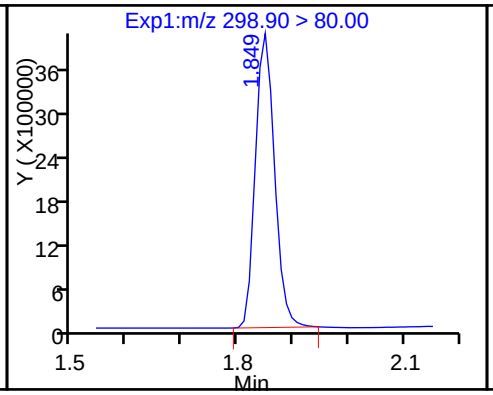
D 4 13C5-PFPeA



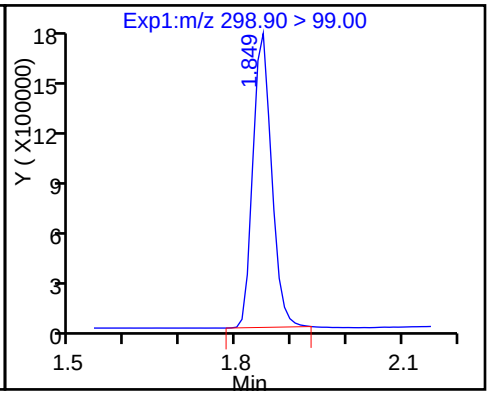
3 Perfluoropentanoic acid



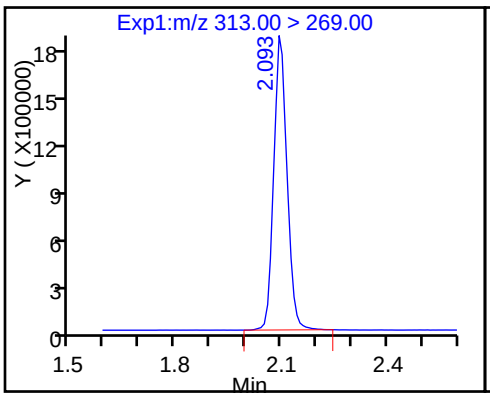
5 Perfluorobutanesulfonic acid



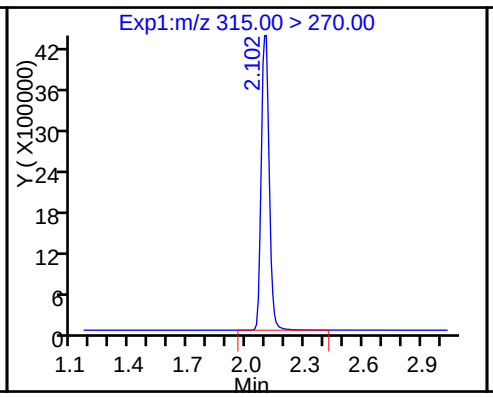
5 Perfluorobutanesulfonic acid



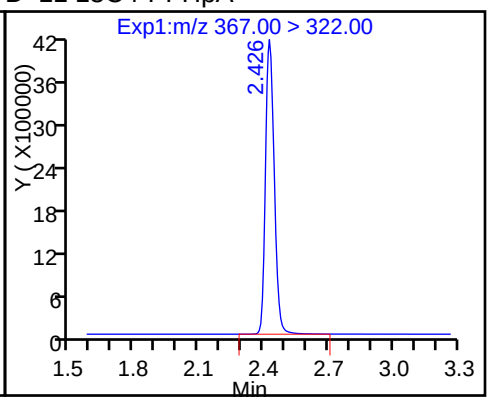
7 Perfluorohexanoic acid



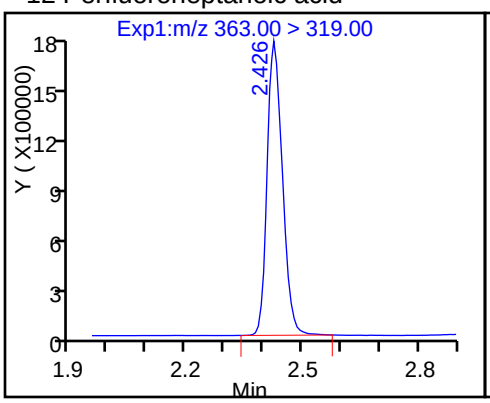
D 6 13C2 PFHxA



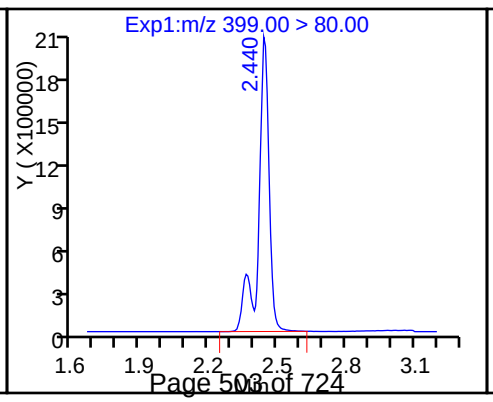
D 11 13C4-PFHpA



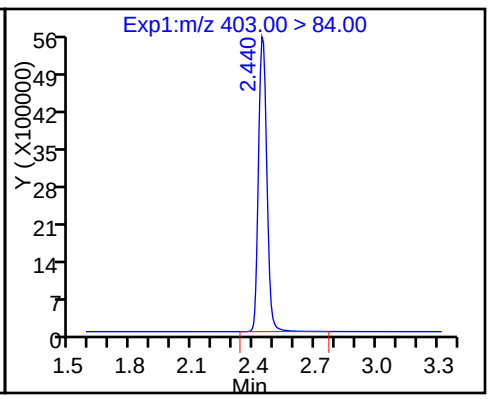
12 Perfluoroheptanoic acid



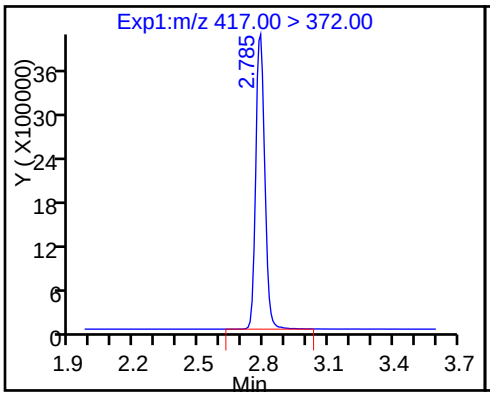
9 Perfluorohexanesulfonic acid



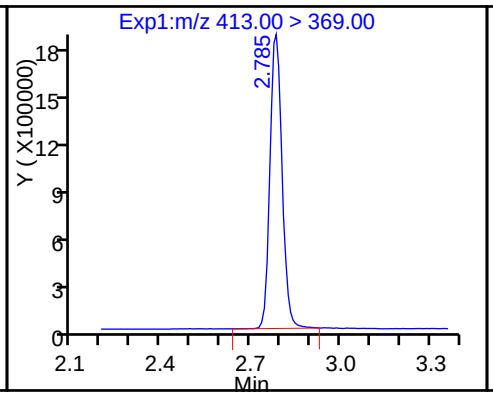
D 10 18O2 PFHxS



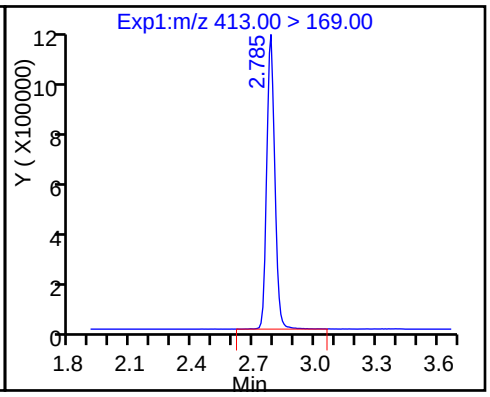
D 14 13C4 PFOA



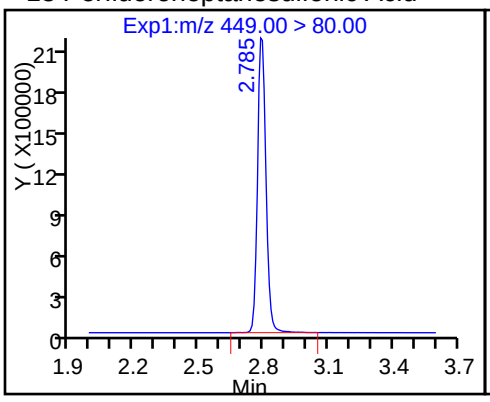
15 Perfluorooctanoic acid



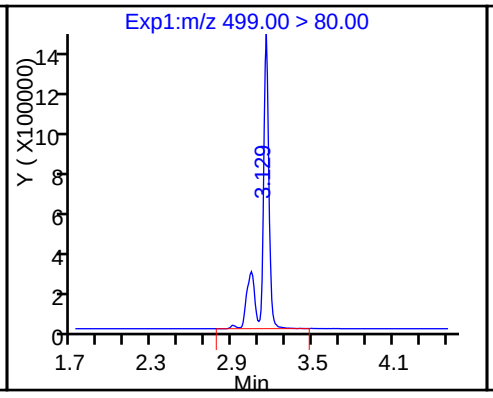
15 Perfluorooctanoic acid



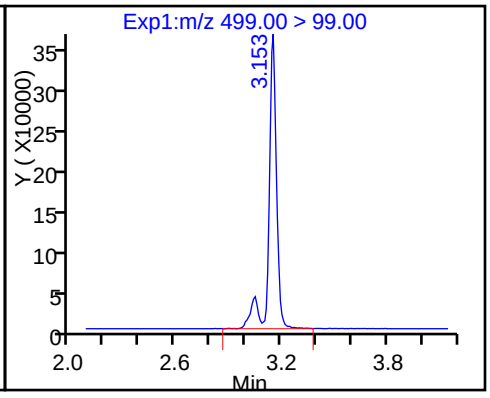
13 Perfluoroheptanesulfonic Acid



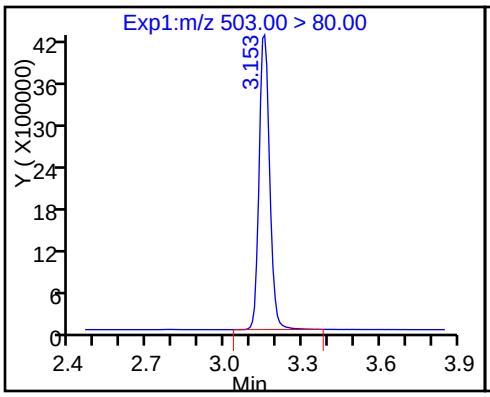
18 Perfluorooctane sulfonic acid



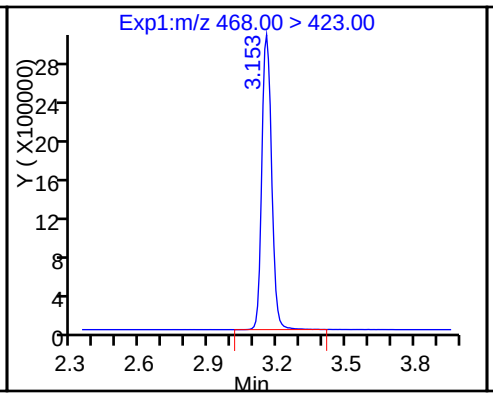
18 Perfluorooctane sulfonic acid



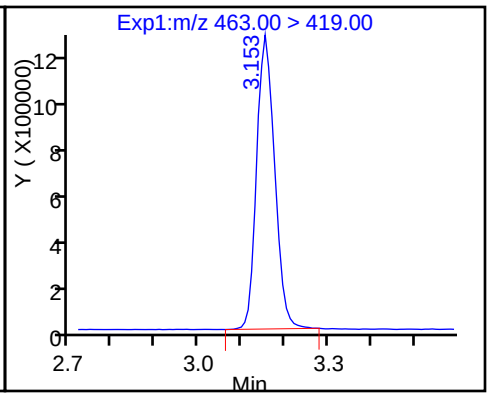
D 17 13C4 PFOS



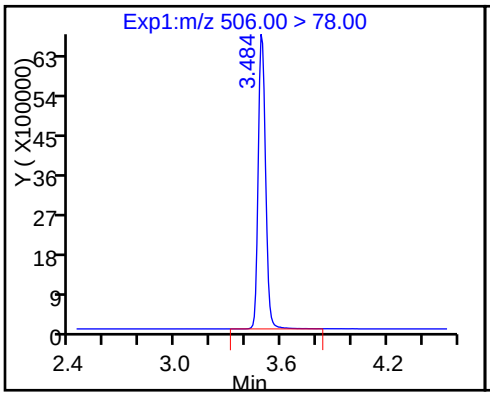
D 19 13C5 PFNA



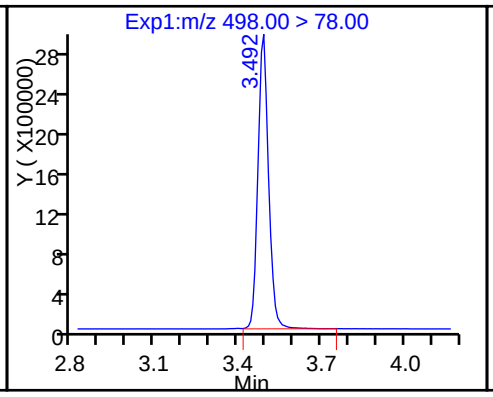
20 Perfluorononanoic acid



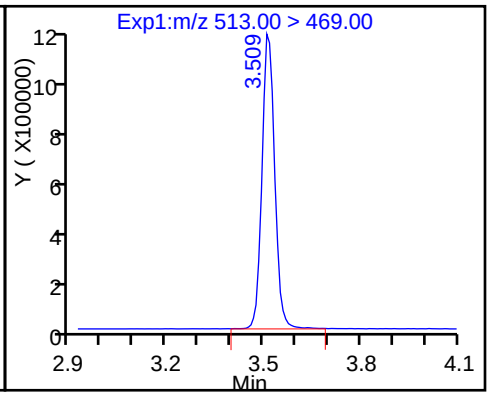
D 21 13C8 FOSA



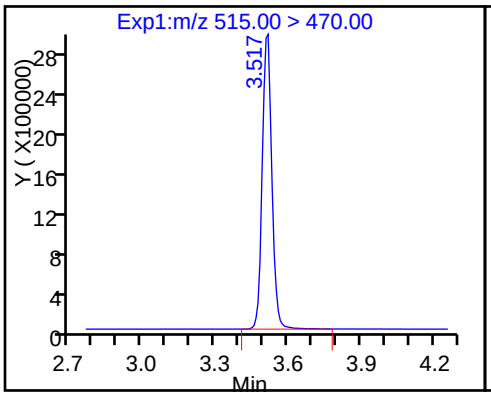
22 Perfluorooctane Sulfonamide



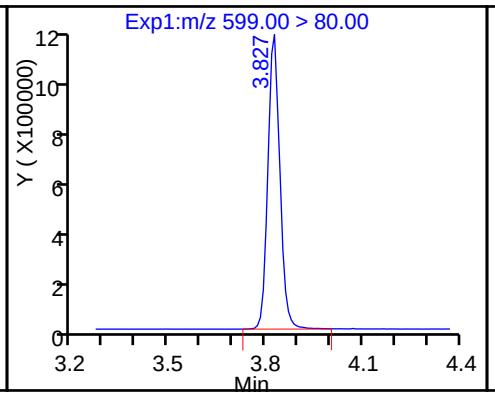
24 Perfluorodecanoic acid



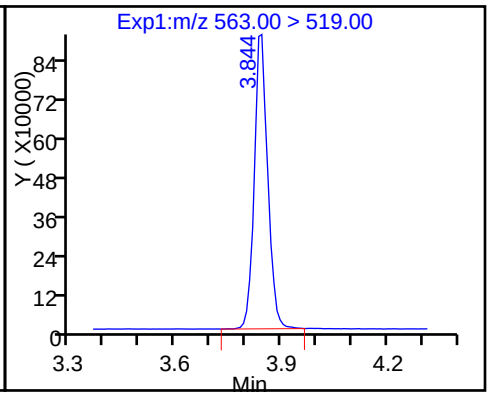
D 23 13C2 PFDA



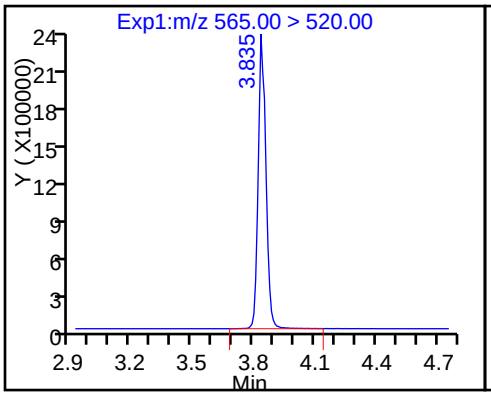
26 Perfluorodecane Sulfonic acid



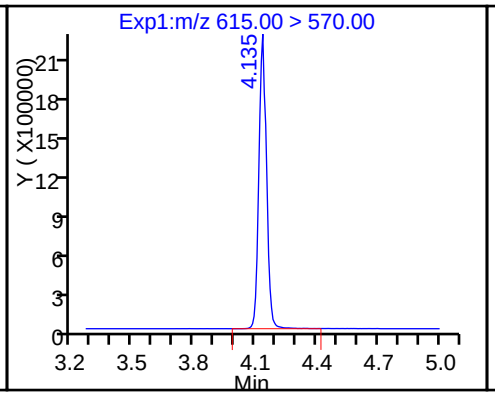
28 Perfluoroundecanoic acid



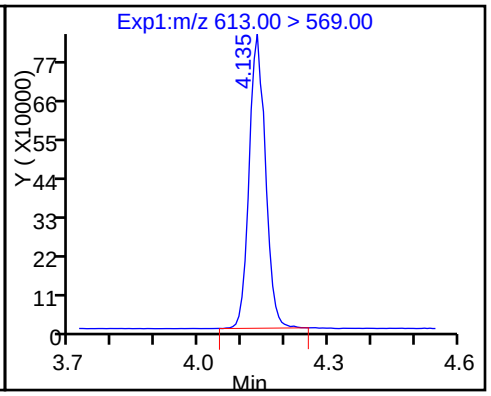
D 27 13C2 PFUnA



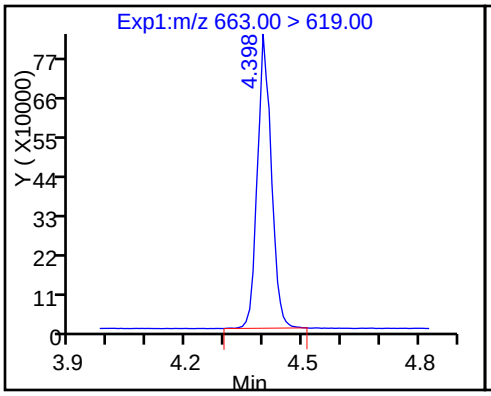
D 30 13C2 PFDoA



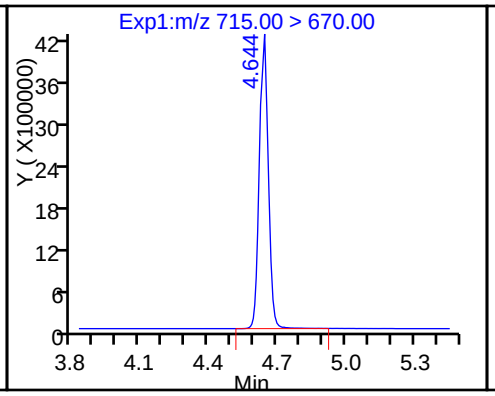
29 Perfluorododecanoic acid



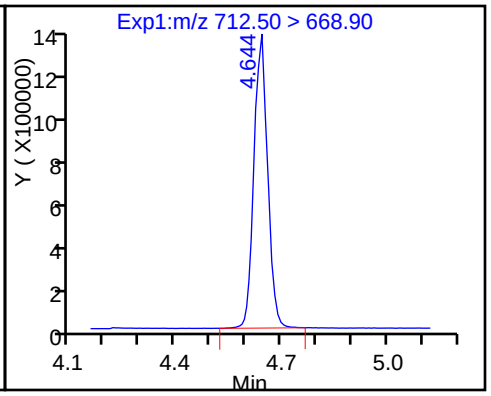
31 Perfluorotridecanoic acid



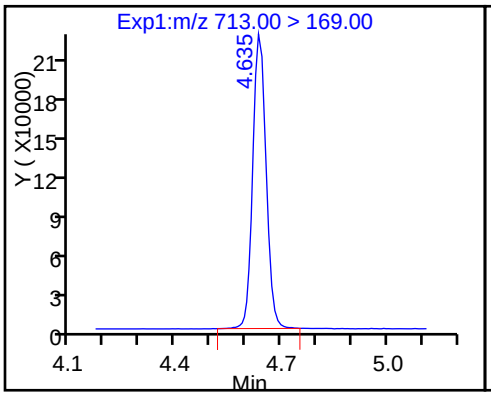
D 32 13C2-PFTeDA



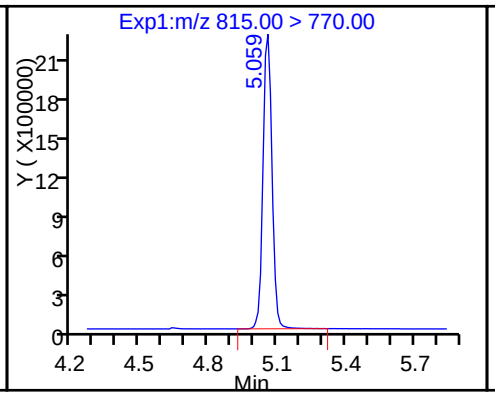
33 Perfluorotetradecanoic acid



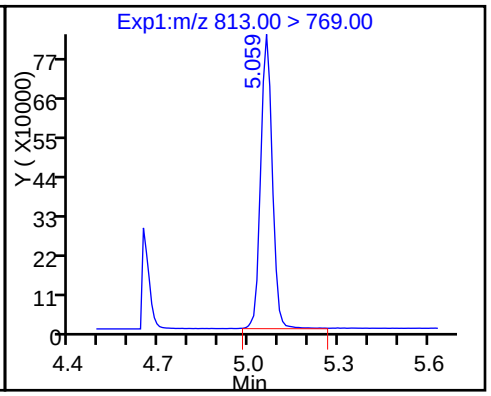
33 Perfluorotetradecanoic acid



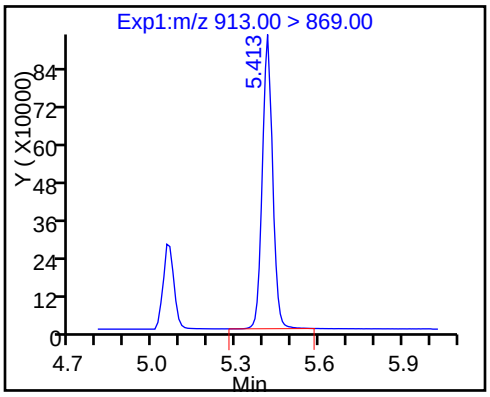
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_008.d
Lims ID: IC L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 15-Dec-2016 12:59:16 ALS Bottle#: 41 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:24 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:51:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.533	1.534	-0.001		17274187	49.7		99.4	927175	
1 Perfluorobutyric acid										
212.90 > 169.00	1.533	1.535	-0.002	1.000	15411527	52.3		105	124871	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		13053659	49.1		98.1	1261104	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	13161065	51.1		102	158308	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.848	1.848	0.0	1.000	21559838	47.1		107		
298.90 > 99.00	1.848	1.848	0.0	1.000	10128422		2.13(0.00-0.00)	107		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.098	2.096	0.002	1.000	11507044	50.0		99.9	330809	
D 6 13C2 PFHxA										
315.00 > 270.00	2.098	2.097	0.001		12399280	50.6		101	688050	
D 11 13C4-PFHpA										
367.00 > 322.00	2.424	2.426	-0.002		10801604	47.7		95.4	530896	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.424	2.428	-0.004	1.000	10799449	51.1		102	85838	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.446	2.431	0.015	1.000	15253691	45.8		101		
D 10 18O2 PFHxS										
403.00 > 84.00	2.446	2.446	0.0		15278828	46.7		98.8	1046737	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.783	-0.001		11142777	48.4		96.7	755641	

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	2.782	2.783	-0.001	1.000	11435583	51.2		102	92940	
413.00 > 169.00	2.782	2.783	-0.001	1.000	6849991		1.67(0.90-1.10)	102	293728	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.791	2.790	0.001	1.000	13639927	49.5		104		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.151	3.118	0.033	1.000	11741891	47.2		102	399791	
499.00 > 99.00	3.151	3.118	0.033	1.000	2632984		4.46(0.90-1.10)	102	139087	
D 17 13C4 PFOS										
503.00 > 80.00	3.151	3.151	0.0		11946650	48.0		100	237614	
D 19 13C5 PFNA										
468.00 > 423.00	3.151	3.153	-0.002		8581504	48.3		96.6	574194	
20 Perfluorononanoic acid										
463.00 > 419.00	3.151	3.155	-0.004	1.000	8246252	50.5		101	123521	
D 21 13C8 FOSA										
506.00 > 78.00	3.490	3.488	0.002		18804188	49.0		97.9	642404	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.490	3.491	-0.001	1.000	17736944	50.6		101	676782	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.507	3.510	-0.003	1.000	7324495	50.6		101	172410	
D 23 13C2 PFDA										
515.00 > 470.00	3.516	3.513	0.003		7671861	48.8		97.5	212001	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.818	3.822	-0.004	1.000	7241868	49.6		103		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.844	3.839	0.005	1.000	5437764	50.3		101	105822	
D 27 13C2 PFUnA										
565.00 > 520.00	3.844	3.842	0.002		5657823	48.3		96.5	259964	
D 30 13C2 PFDoA										
615.00 > 570.00	4.135	4.132	0.003		5404154	48.7		97.4	211794	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.135	4.136	-0.001	1.000	5072994	51.1		102	98593	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.398	4.400	-0.002	1.000	4950651	50.5		101	84213	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.645	4.641	0.004		10950502	48.2		96.3	504805	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.645	4.642	0.003	1.000	8645519	50.5		101	145963	
713.00 > 169.00	4.635	4.642	-0.007	0.998	1380699		6.26(0.00-0.00)	101	249413	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.059	5.057	0.002		6027362	48.4		96.8	112750	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.059	0.0	1.000	5318207	51.0		102	4484	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.414	-0.001	1.000	5869666	52.7		105	5549	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_008.d

Injection Date: 15-Dec-2016 12:59:16 Instrument ID: A8_N

Lims ID: IC L5

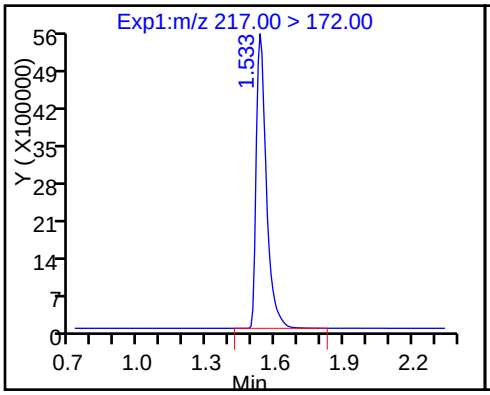
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 8

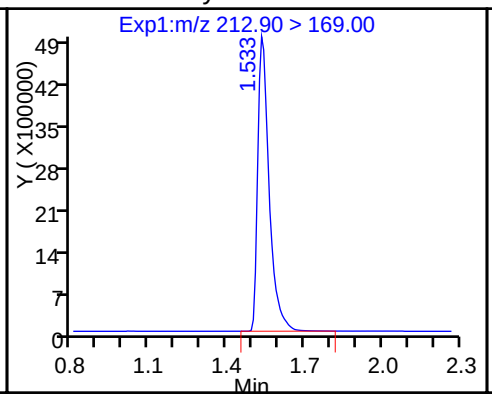
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

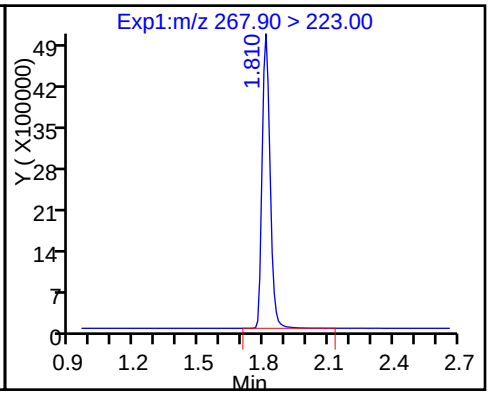
D 2 13C4 PFBA



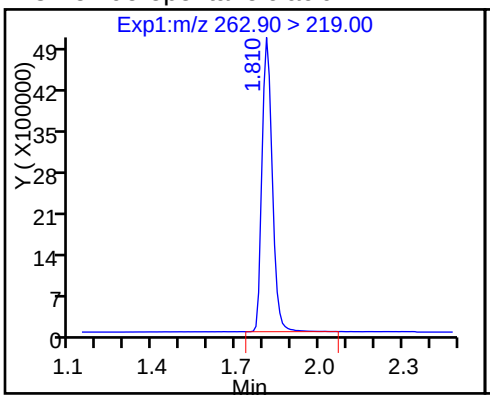
1 Perfluorobutyric acid



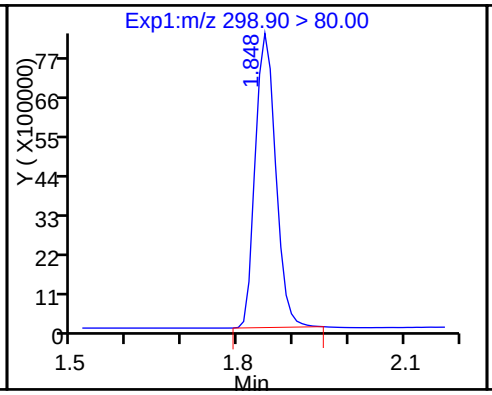
D 4 13C5-PFPeA



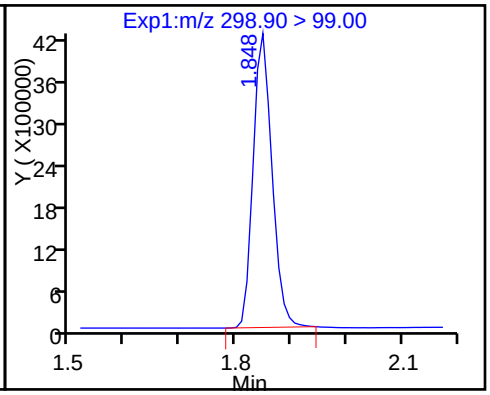
3 Perfluoropentanoic acid



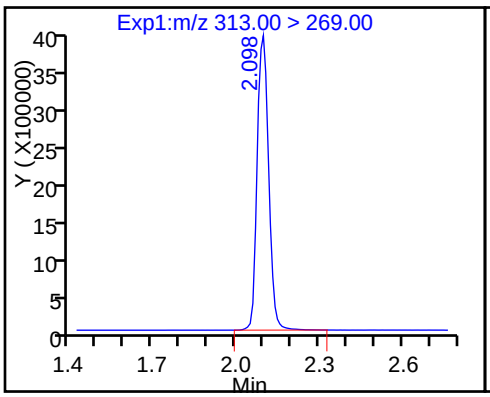
5 Perfluorobutanesulfonic acid



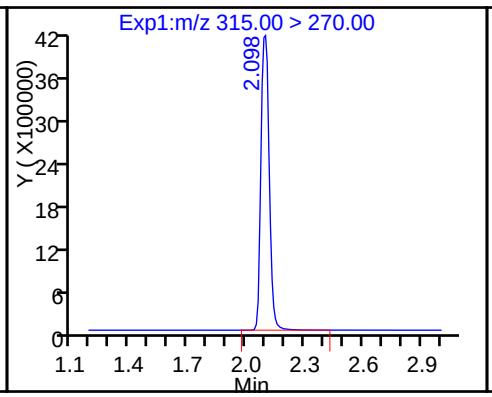
5 Perfluorobutanesulfonic acid



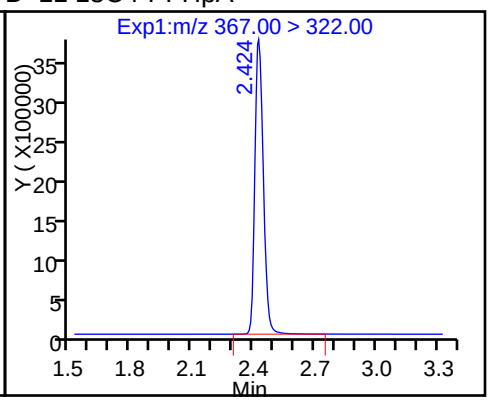
7 Perfluorohexanoic acid



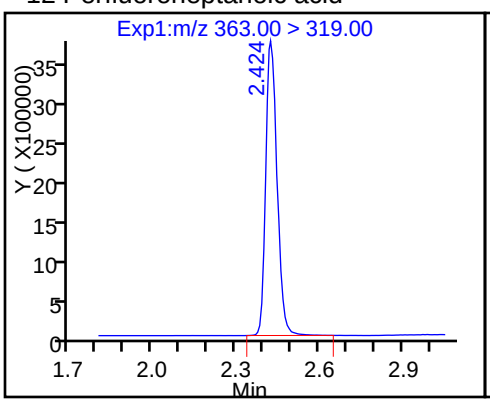
D 6 13C2 PFHxA



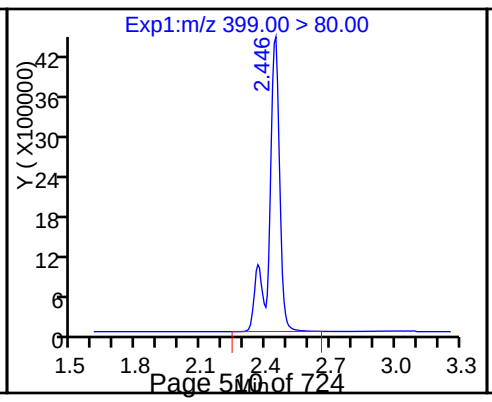
D 11 13C4-PFHpA



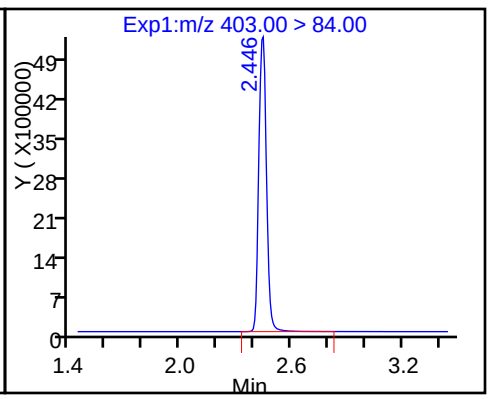
12 Perfluoroheptanoic acid



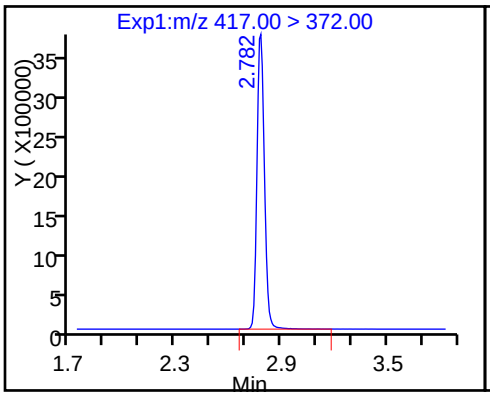
9 Perfluorohexanesulfonic acid



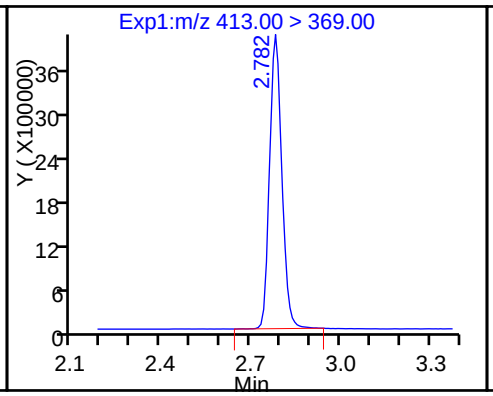
D 10 18O2 PFHxS



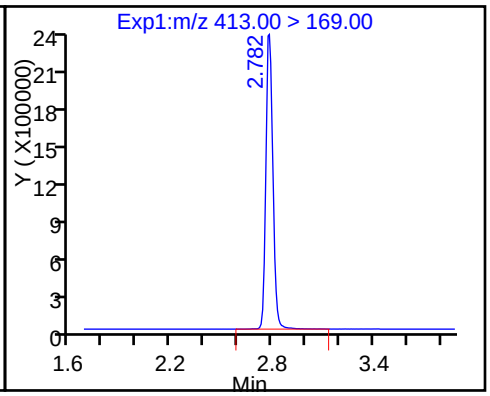
D 14 13C4 PFOA



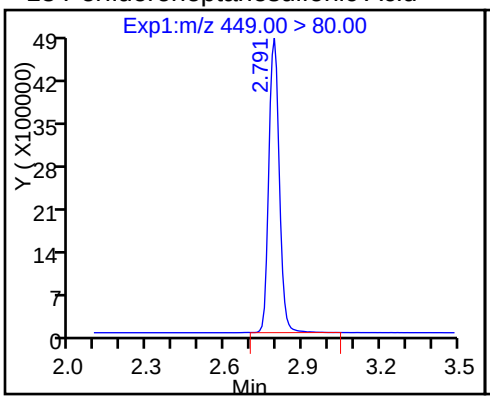
15 Perfluorooctanoic acid



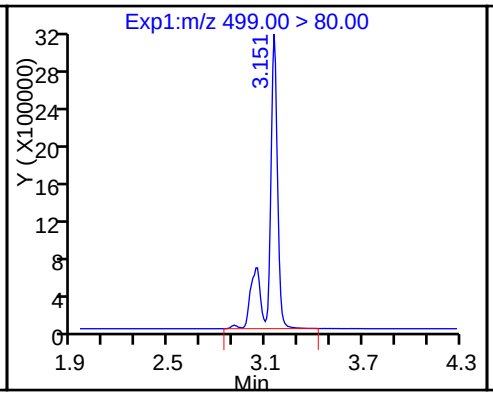
15 Perfluorooctanoic acid



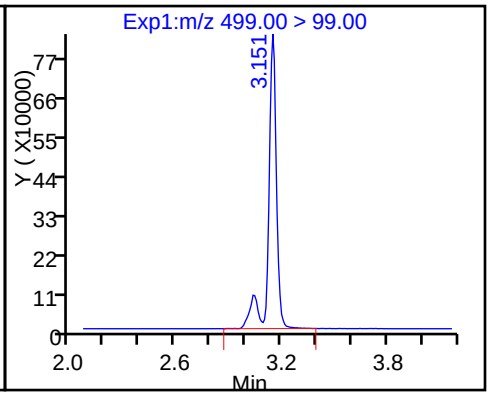
13 Perfluoroheptanesulfonic Acid



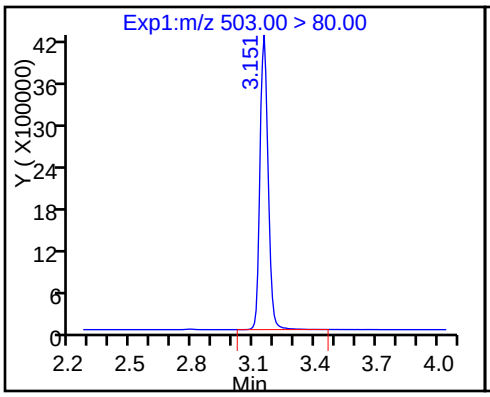
18 Perfluorooctane sulfonic acid



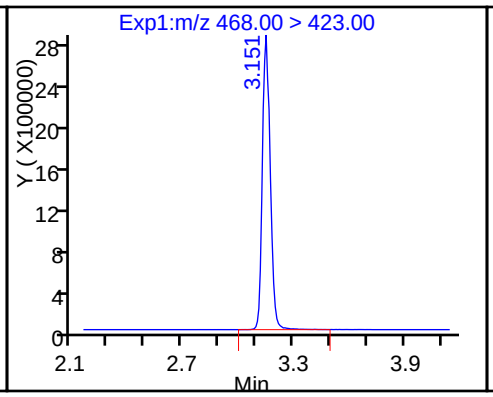
18 Perfluorooctane sulfonic acid



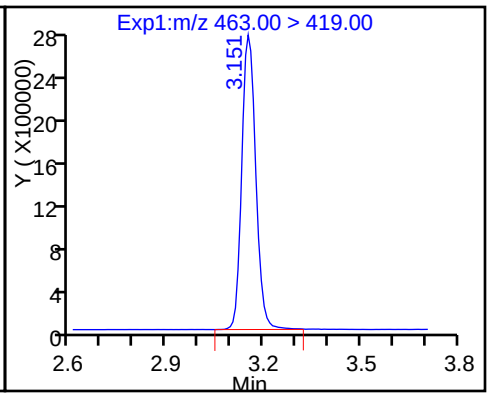
D 17 13C4 PFOS



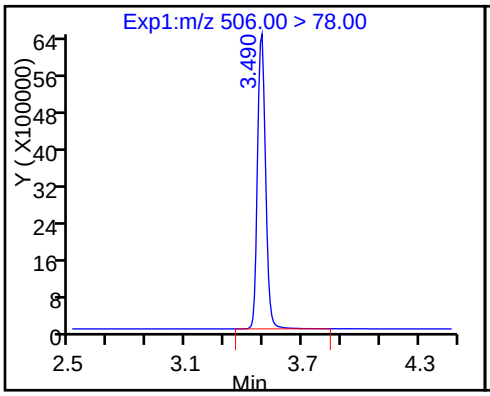
D 19 13C5 PFNA



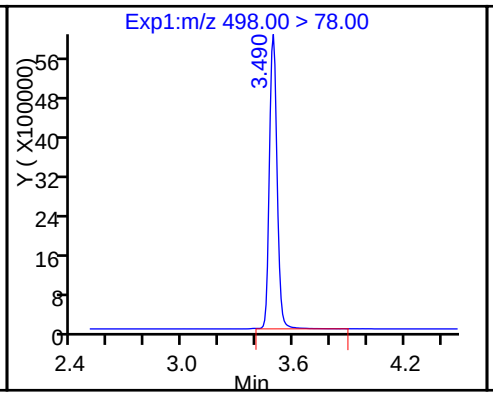
20 Perfluorononanoic acid



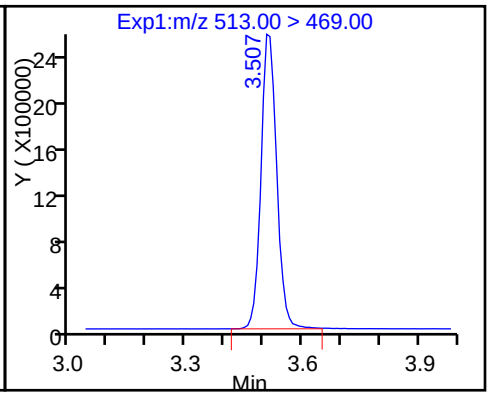
D 21 13C8 FOSA



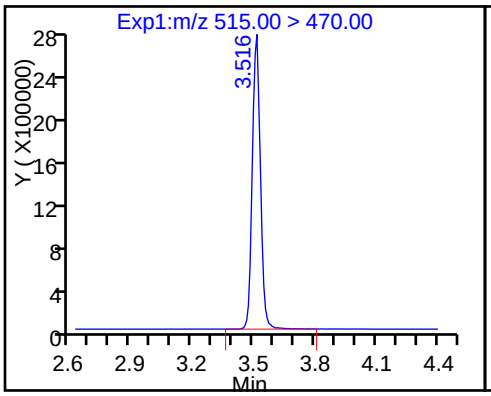
22 Perfluorooctane Sulfonamide



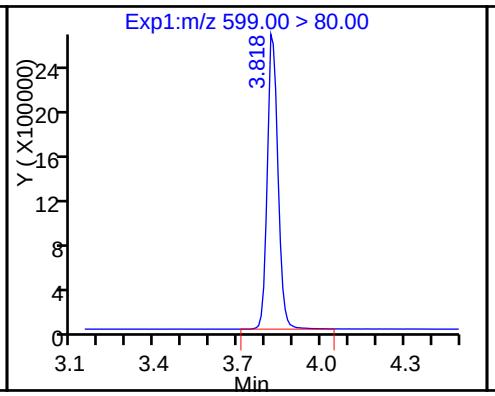
24 Perfluorodecanoic acid



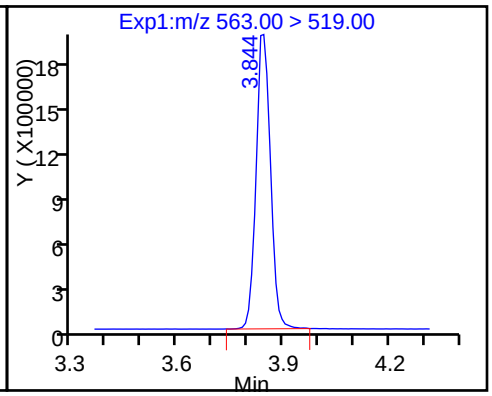
D 23 13C2 PFDA



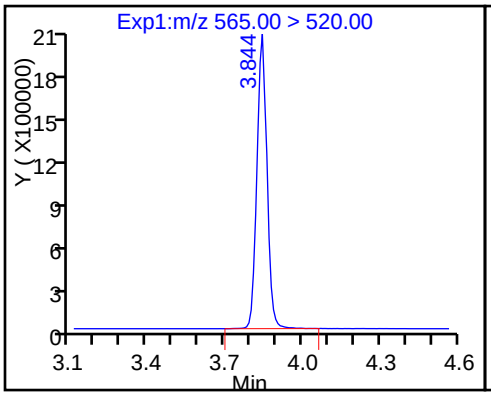
26 Perfluorodecane Sulfonic acid



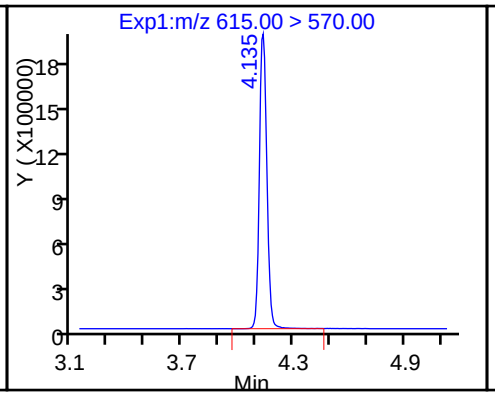
28 Perfluoroundecanoic acid



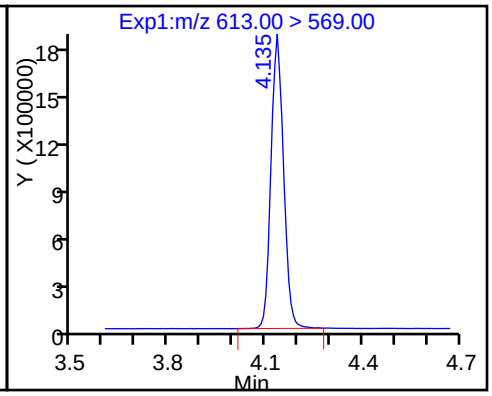
D 27 13C2 PFUnA



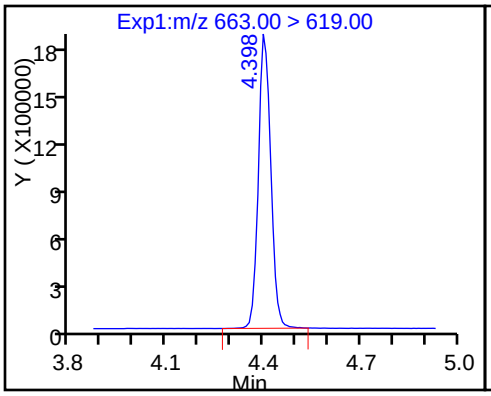
D 30 13C2 PFDoA



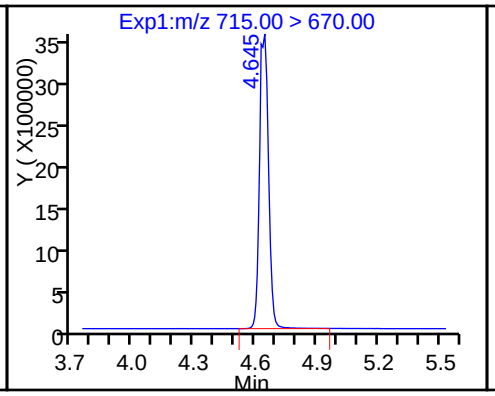
29 Perfluorododecanoic acid



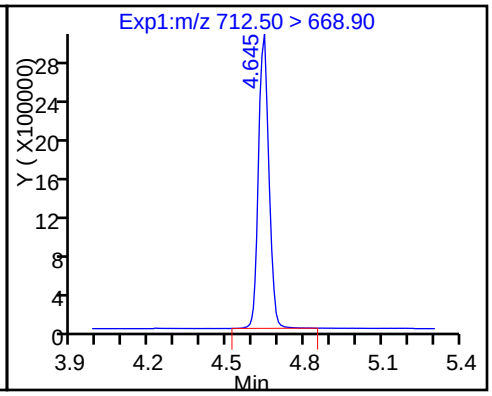
31 Perfluorotridecanoic acid



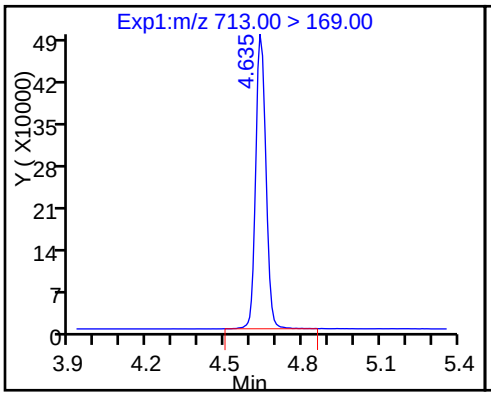
D 32 13C2-PFTeDA



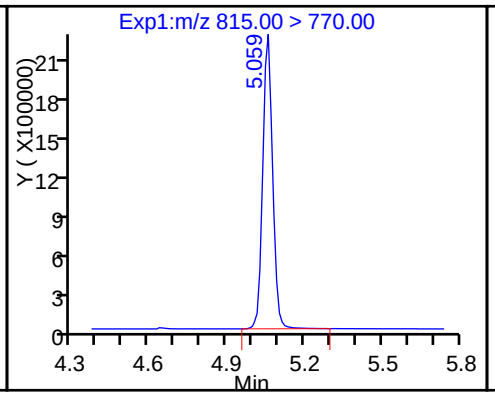
33 Perfluorotetradecanoic acid



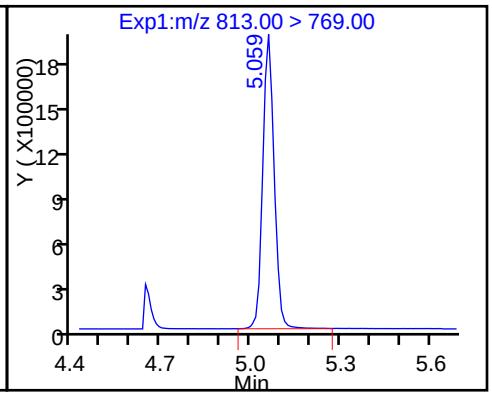
33 Perfluorotetradecanoic acid



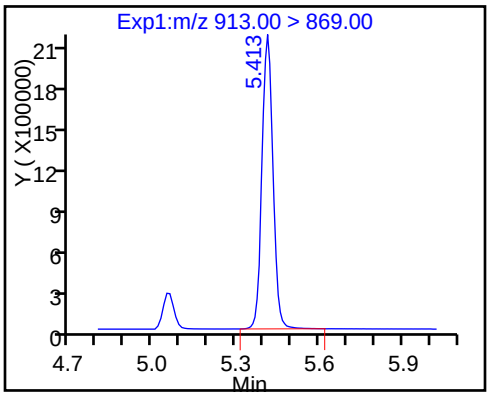
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d
Lims ID: IC L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 15-Dec-2016 13:06:46 ALS Bottle#: 42 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:27 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:51:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.537	1.534	0.003		14961055	43.0		86.0	920014	
1 Perfluorobutyric acid										
212.90 > 169.00	1.537	1.535	0.002	1.000	42763611	167.4		83.7	246189	
D 4 13C5-PFPeA										
267.90 > 223.00	1.813	1.810	0.003		10898820	41.0		81.9	1007026	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.813	1.810	0.003	1.000	34291076	159.4		79.7	297823	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.852	1.848	0.004	1.000	50724469	130.5		73.8		
298.90 > 99.00	1.842	1.848	-0.006	0.995	28243355		1.80(0.00-0.00)	73.8		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.096	2.096	0.0	1.000	33223923	172.9		86.4	549724	
D 6 13C2 PFHxA										
315.00 > 270.00	2.096	2.097	-0.001		10345480	42.2		84.4	508201	
D 11 13C4-PFHpA										
367.00 > 322.00	2.426	2.426	0.0		8564025	37.8		75.7	487796	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.426	2.428	-0.002	1.000	30234194	180.3		90.2	213534	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.444	2.431	0.013	1.000	46223186	163.6		89.9		
D 10 18O2 PFHxS										
403.00 > 84.00	2.444	2.446	-0.002		12974829	39.7		83.9	628886	
D 14 13C4 PFOA										
417.00 > 372.00	2.783	2.783	0.0		8380251	36.4		72.8	402245	

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	2.783	2.783	0.0	1.000	30784387	183.1		91.5	229181	
413.00 > 169.00	2.783	2.783	0.0	1.000	20338648		1.51(0.90-1.10)	91.5	70063	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.791	2.790	0.001	1.000	38459925	166.5		87.5		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.977	3.118	-0.141	1.000	40073141	192.2		104	5896	
499.00 > 99.00	3.152	3.118	0.034	1.059	9632026		4.16(0.90-1.10)	104	407968	
D 17 13C4 PFOS										
503.00 > 80.00	3.152	3.151	0.001		10019454	40.3		84.2	105595	
D 19 13C5 PFNA										
468.00 > 423.00	3.152	3.153	-0.001		6718354	37.8		75.6	515582	
20 Perfluorononanoic acid										
463.00 > 419.00	3.160	3.155	0.005	1.000	24793148	193.9		96.9	307568	
D 21 13C8 FOSA										
506.00 > 78.00	3.491	3.488	0.003		16105707	41.9		83.9	486146	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.491	3.491	0.0	1.000	47803717	159.1		79.6	542400	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.516	3.510	0.006	1.000	22616781	191.8		95.9	376094	
D 23 13C2 PFDA										
515.00 > 470.00	3.508	3.513	-0.005		6246112	39.7		79.4	243806	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.819	3.822	-0.004	1.000	23952412	195.7		101		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.845	3.839	0.006	1.000	16852945	197.7		98.9	570796	
D 27 13C2 PFUnA										
565.00 > 520.00	3.845	3.842	0.003		4456593	38.0		76.0	208308	
D 30 13C2 PFDoA										
615.00 > 570.00	4.129	4.132	-0.003		4649092	41.9		83.8	168499	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.136	4.136	0.0	1.000	17425873	204.2		102	228085	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.407	4.400	0.007	1.000	16038809	190.2		95.1	237459	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.635	4.641	-0.006		9520749	41.9		83.7	374846	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.635	4.642	-0.007	1.000	27310864	185.3		92.7	329988	
713.00 > 169.00	4.635	4.642	-0.007	1.000	4963804		5.50(0.00-0.00)	92.7	195544	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.060	5.057	0.003		5190172	41.7		83.3	150380	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.060	5.059	0.001	1.000	17754908	199.3		99.6	19037	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.414	5.414	0.0	1.000	18392980	192.0		96.0	19845	

Reagents:

LCPFC-L6_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d

Injection Date: 15-Dec-2016 13:06:46 Instrument ID: A8_N

Lims ID: IC L6

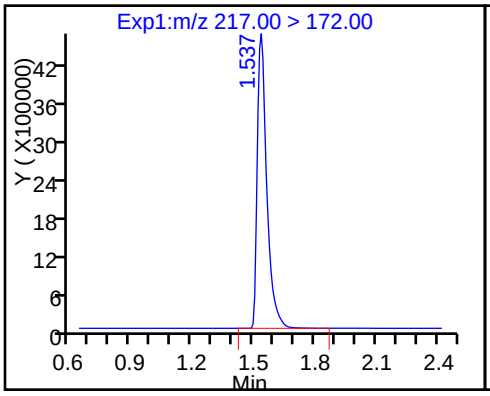
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9

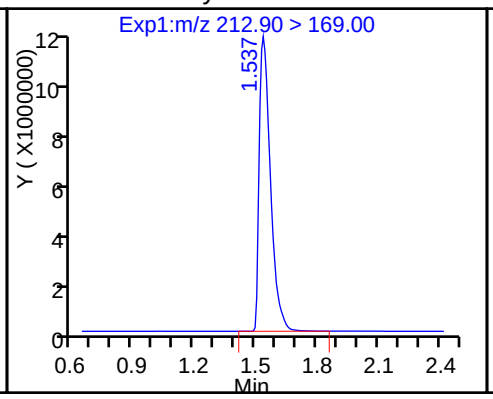
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

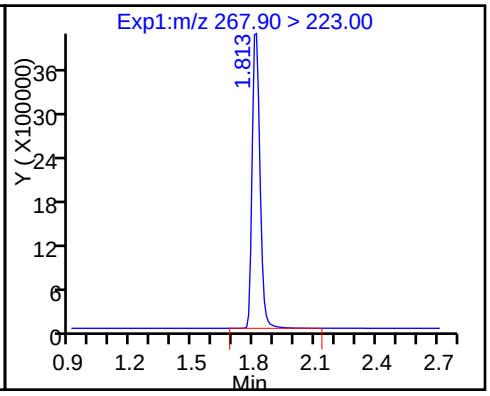
D 2 13C4 PFBA



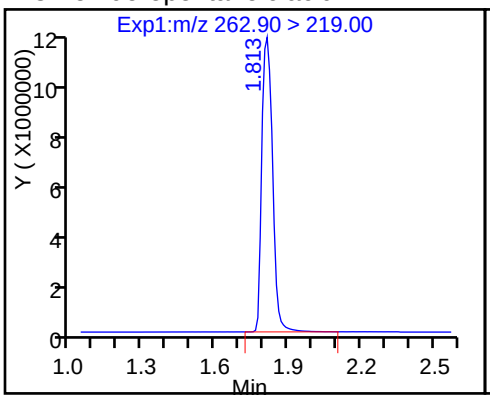
1 Perfluorobutyric acid



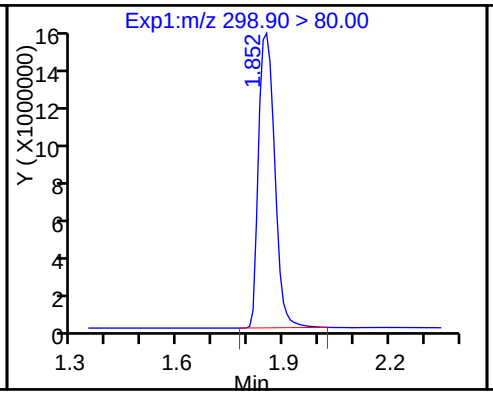
D 4 13C5-PFPeA



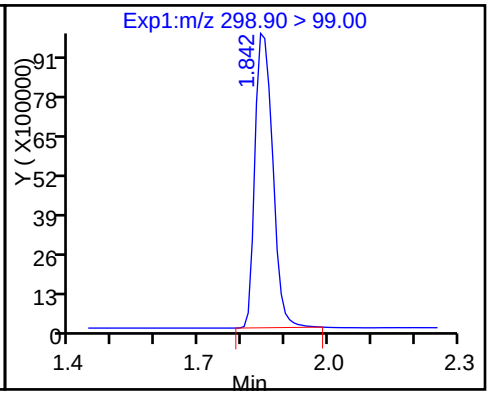
3 Perfluoropentanoic acid



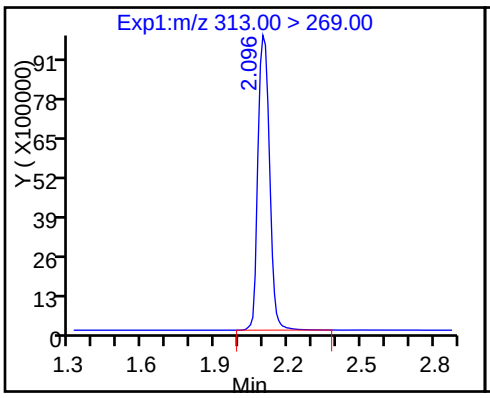
5 Perfluorobutanesulfonic acid



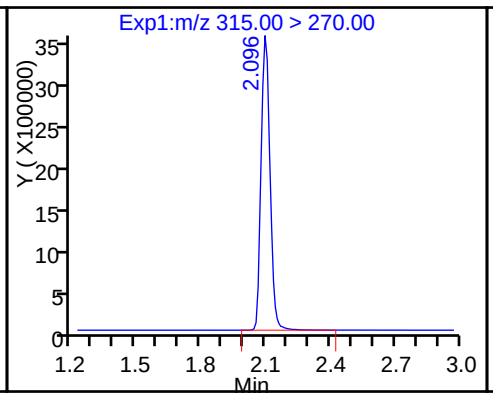
5 Perfluorobutanesulfonic acid



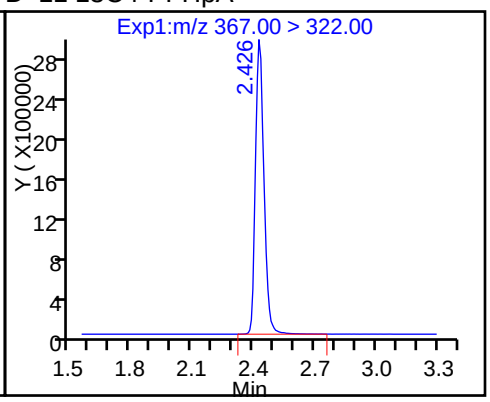
7 Perfluorohexanoic acid



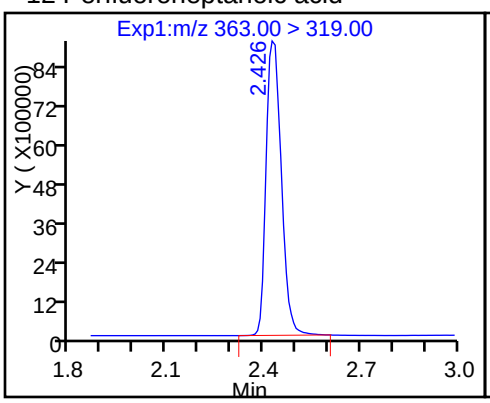
D 6 13C2 PFHxA



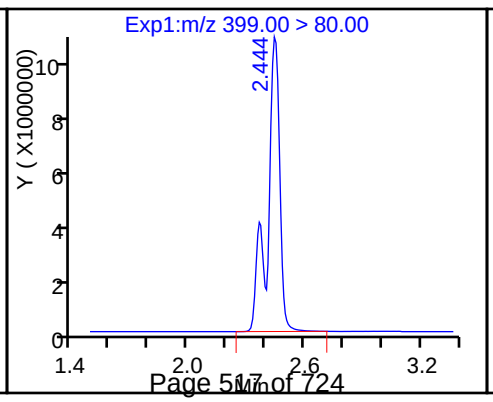
D 11 13C4-PFHpA



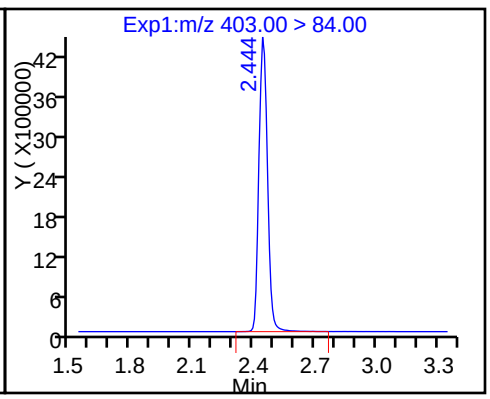
12 Perfluoroheptanoic acid



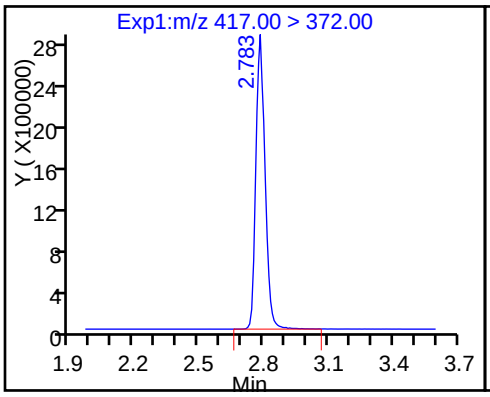
9 Perfluorohexanesulfonic acid



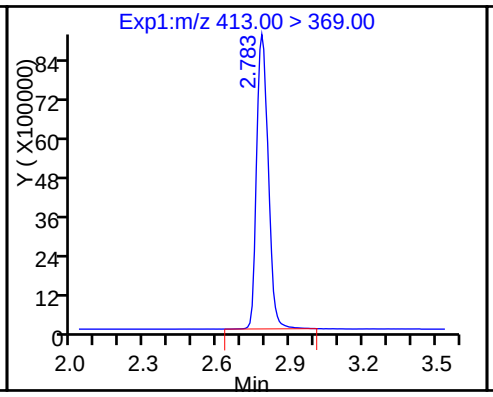
D 10 18O2 PFHxS



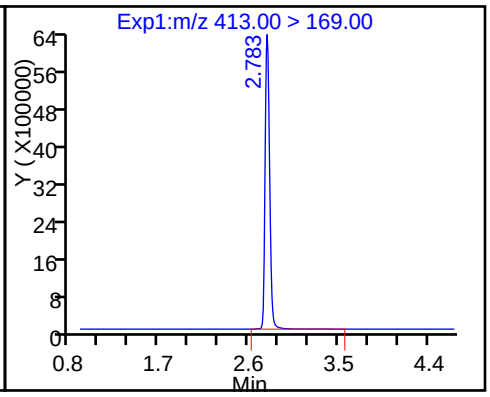
D 14 13C4 PFOA



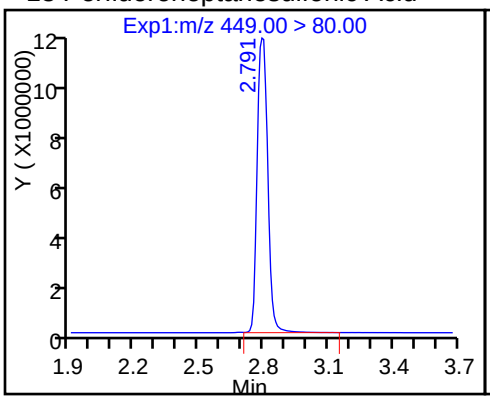
15 Perfluorooctanoic acid



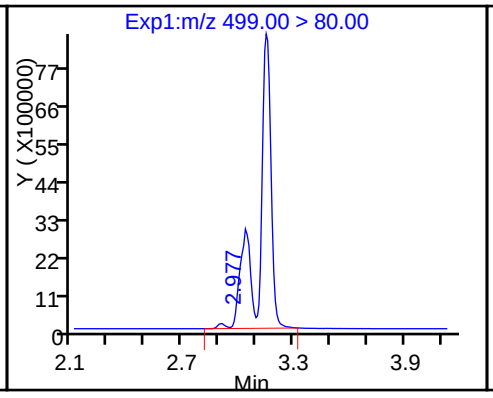
15 Perfluorooctanoic acid



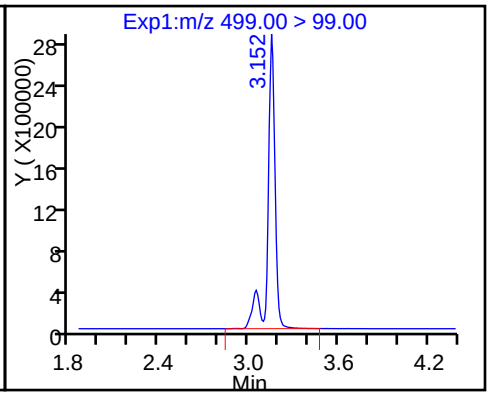
13 Perfluoroheptanesulfonic Acid



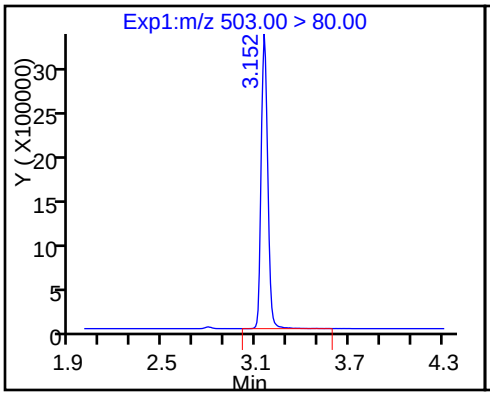
18 Perfluorooctane sulfonic acid



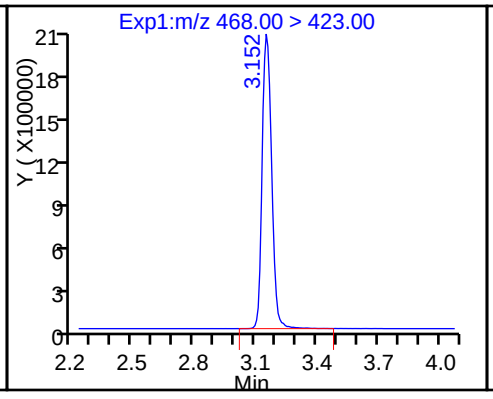
18 Perfluorooctane sulfonic acid



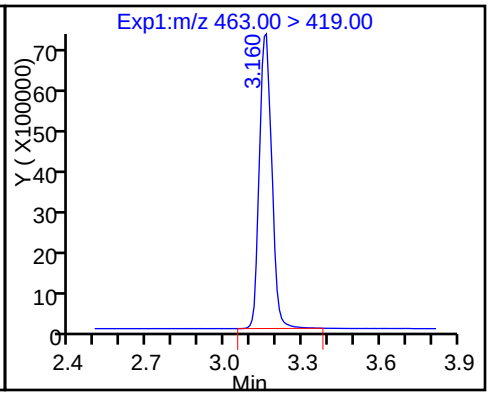
D 17 13C4 PFOS



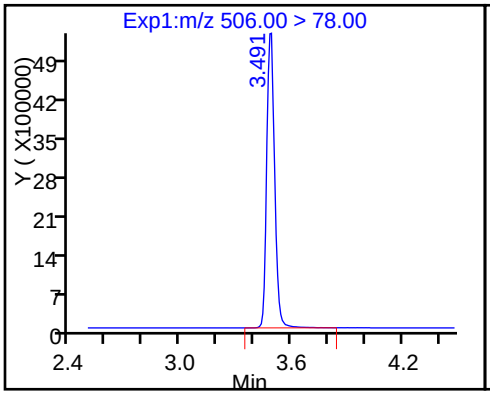
D 19 13C5 PFNA



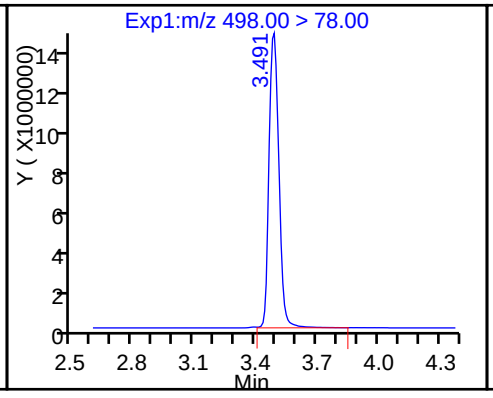
20 Perfluorononanoic acid



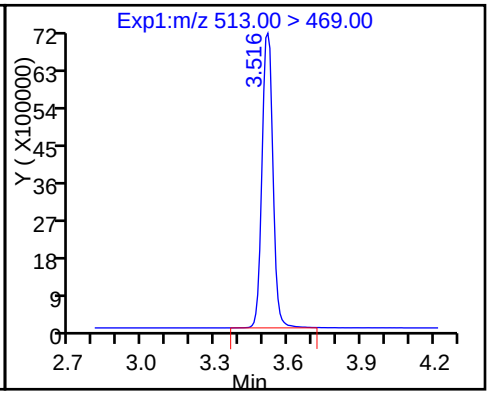
D 21 13C8 FOSA



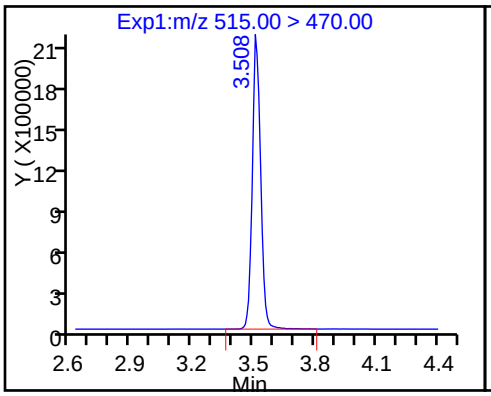
22 Perfluorooctane Sulfonamide



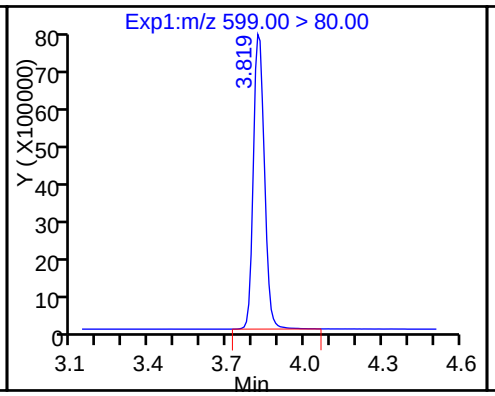
24 Perfluorodecanoic acid



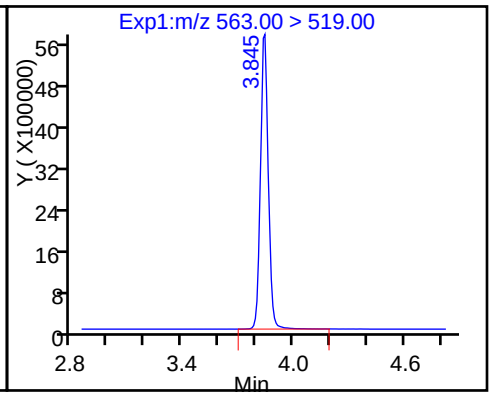
D 23 13C2 PFDA



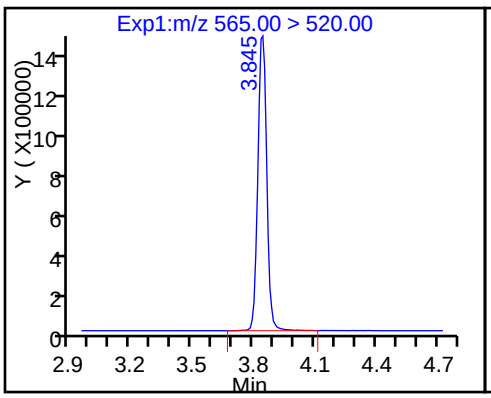
26 Perfluorodecane Sulfonic acid



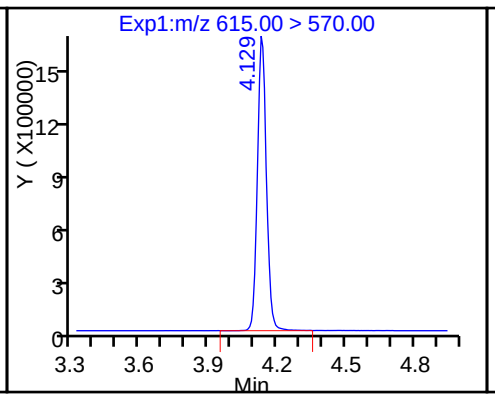
28 Perfluoroundecanoic acid



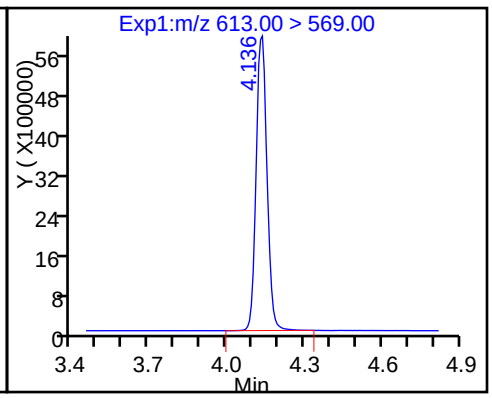
D 27 13C2 PFUnA



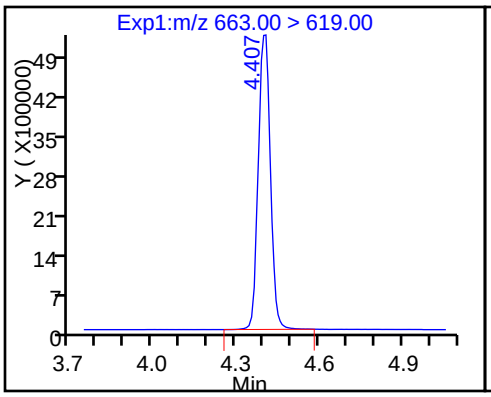
D 30 13C2 PFDoA



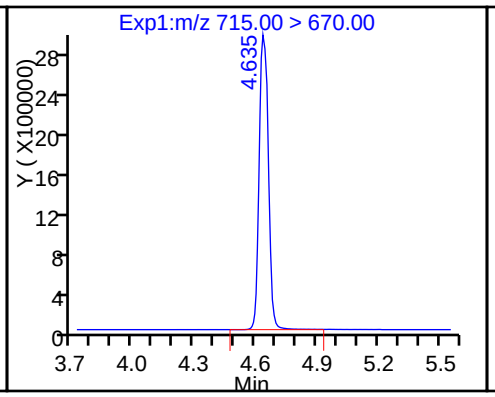
29 Perfluorododecanoic acid



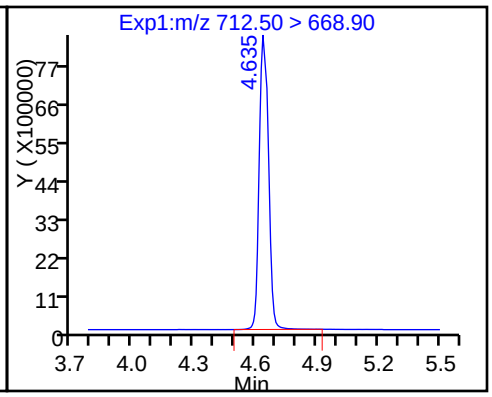
31 Perfluorotridecanoic acid



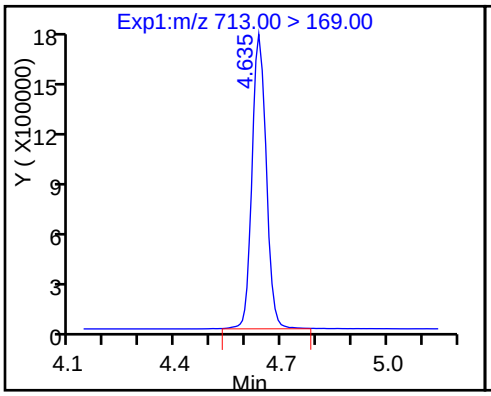
D 32 13C2-PFTeDA



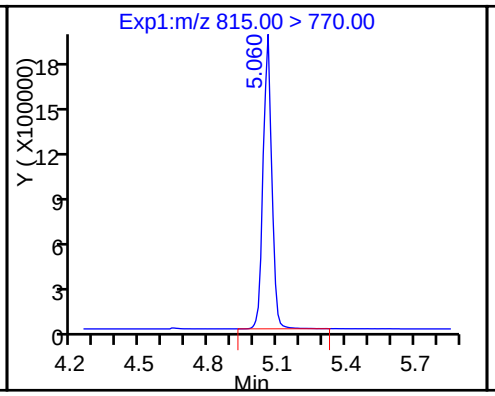
33 Perfluorotetradecanoic acid



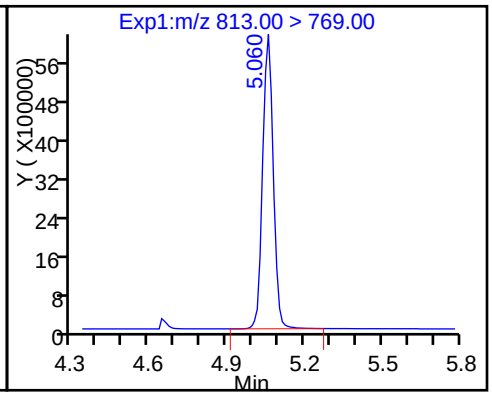
33 Perfluorotetradecanoic acid



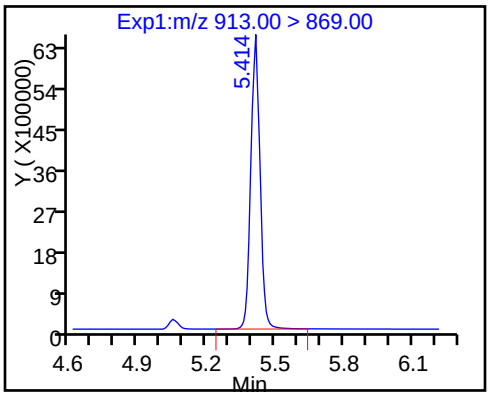
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016BB_013.d
Lims ID: IC L1 Add-on
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 15-Dec-2016 13:41:05 ALS Bottle#: 46 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:44 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:37:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.760	2.767	-0.007		5352965	45.8		96.3		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.776	2.768	0.008	1.000	48011	0.4779		101		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.511	3.511	0.0	1.000	39808	0.4671		97.5		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		4817997	44.8		93.6		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.684	3.676	0.008		3634985	48.3		96.5		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.684	3.681	0.003	1.000	29823	0.4637		92.7		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.848	3.842	0.006		3889792	49.6		99.3		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.865	3.854	0.011	1.005	29965	0.4858		97.2		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.988	3.992	-0.004		4325034	45.5		91.0		
54 MeFOSA										
512.00 > 169.00	3.998	3.999	-0.001	1.000	36069	0.4978		99.6		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.180	4.180	0.0		3792851	44.2		88.4		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.187	4.187	0.0	1.000	30993	0.4729		94.6		

Reagents:

LCPFC2-L1_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016BB_013.d

Injection Date: 15-Dec-2016 13:41:05 Instrument ID: A8_N

Lims ID: IC L1 Add-on

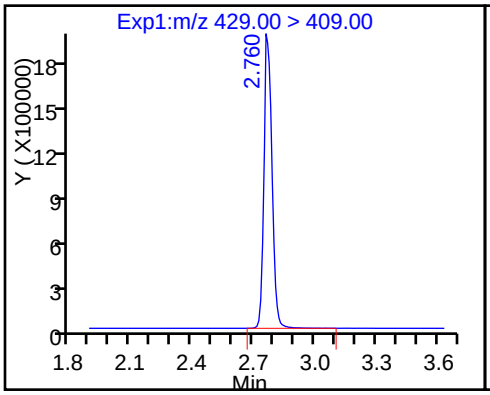
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 13

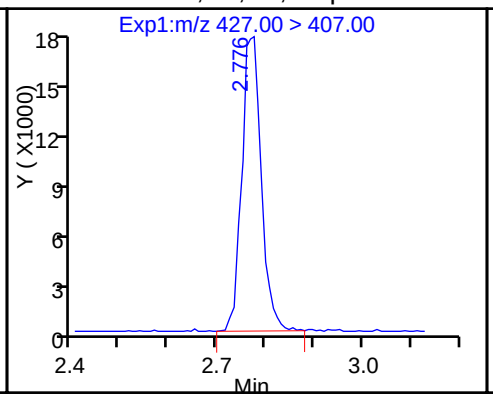
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

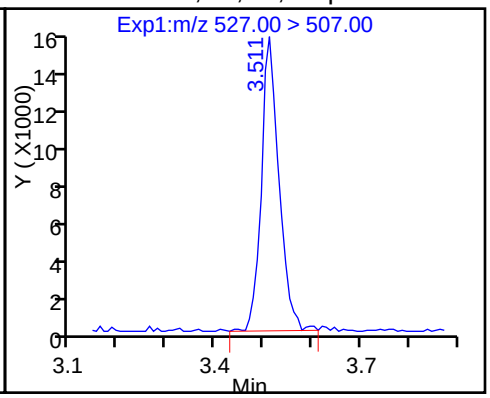
D 47 M2-6:2FTS



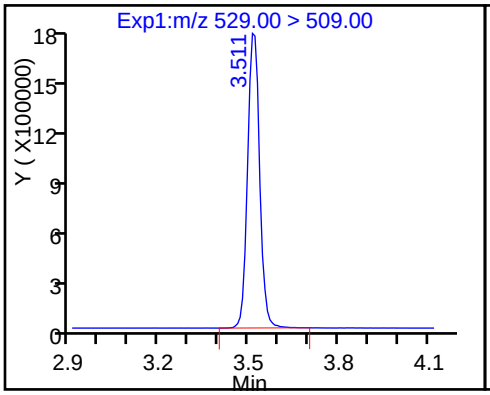
48 Sodium 1H,1H,2H,2H-perfluorooctane



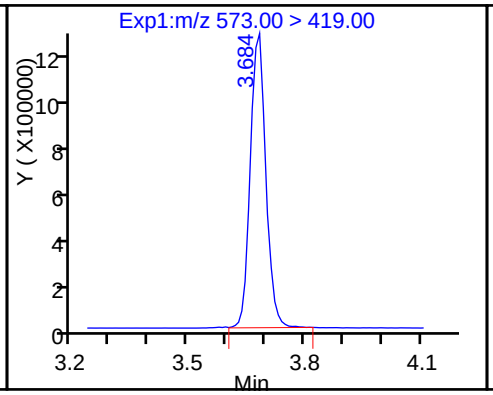
43 Sodium 1H,1H,2H,2H-perfluorooctane



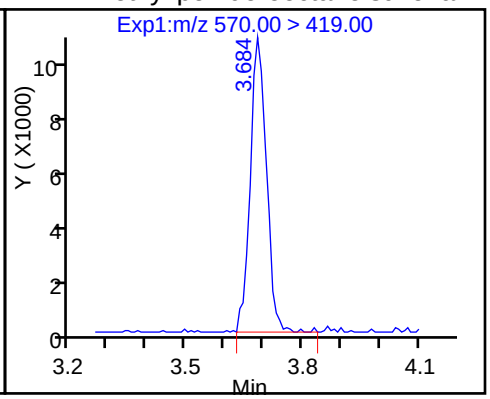
D 42 M2-8:2FTS



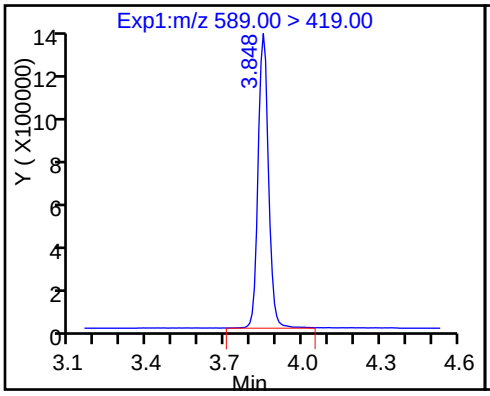
D 45 d3-NMeFOSAA



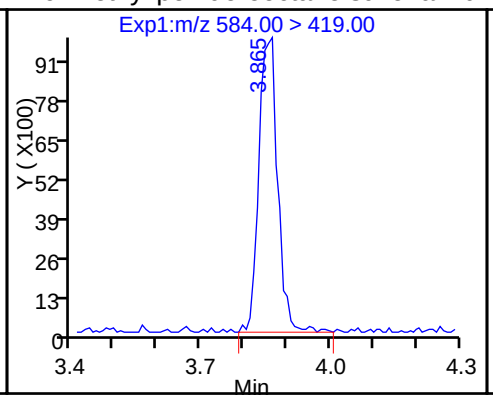
44 N-methyl perfluorooctane sulfonami



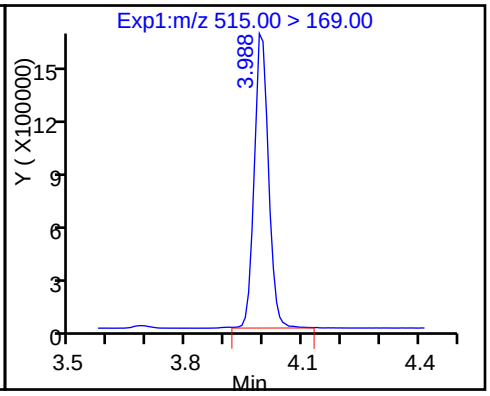
D 46 d5-NEtFOSAA



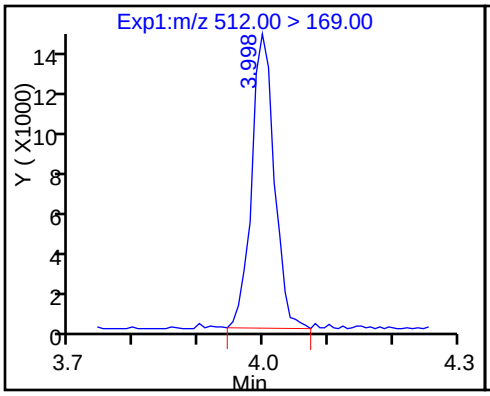
49 N-ethyl perfluorooctane sulfonamid



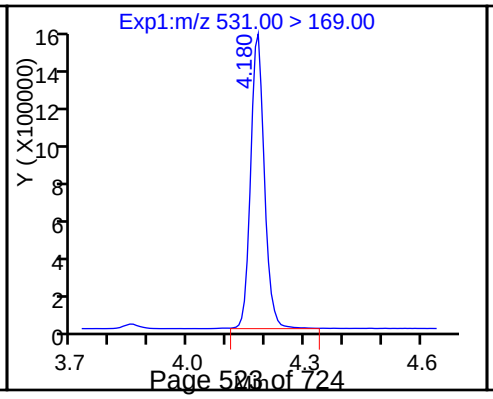
D 52 d-N-MeFOSA-M



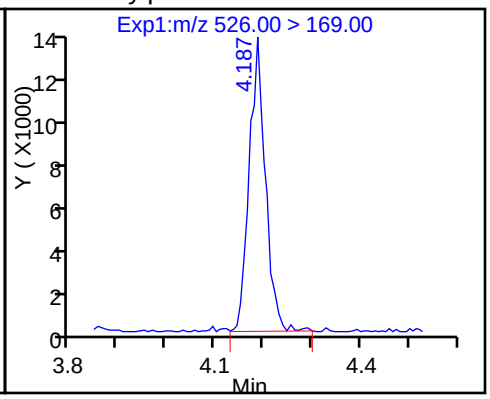
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_014.d
Lims ID: IC L2 Add-on
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 15-Dec-2016 13:48:34 ALS Bottle#: 47 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:46 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.761	2.767	-0.006		5108306	43.7		91.9		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.761	2.768	-0.007	1.000	106947	1.12		118		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.502	3.511	-0.009	0.998	75731	0.9308		97.2		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		4599569	42.8		89.4		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.673	3.676	-0.003		3559083	47.2		94.5		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.673	3.681	-0.008	1.000	57389	0.9114		91.1		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.838	3.842	-0.004		3757014	48.0		95.9		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.855	3.854	0.001	1.005	53623	0.9000		90.0		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.987	3.992	-0.005		4639527	48.8		97.6		
54 MeFOSA										
512.00 > 169.00	3.997	3.999	-0.002	1.000	70049	0.9013		90.1		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.172	4.180	-0.008		4109875	47.9		95.8		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.179	4.187	-0.008	1.000	62962	0.8865		88.7		

Reagents:

LCPFC2-L2_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_014.d

Injection Date: 15-Dec-2016 13:48:34 Instrument ID: A8_N

Lims ID: IC L2 Add-on

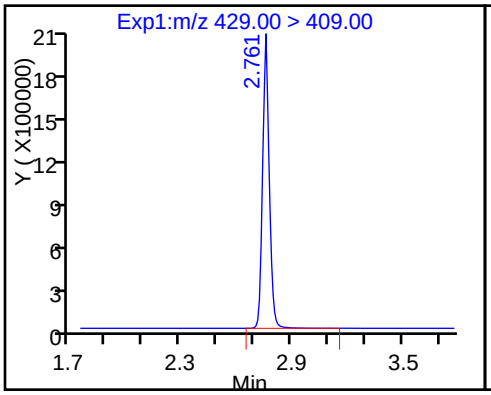
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 14

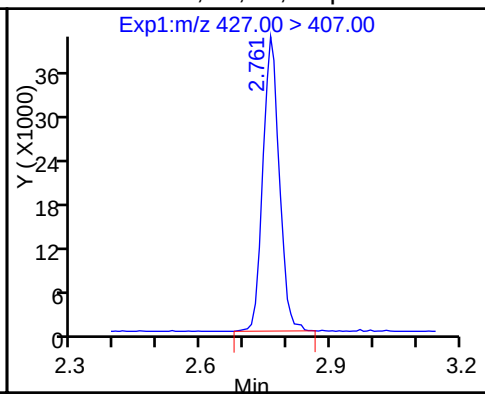
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

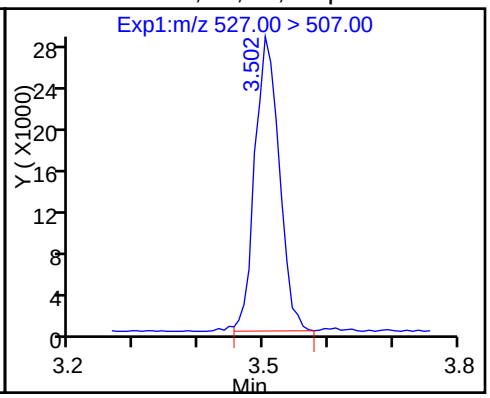
D 47 M2-6:2FTS



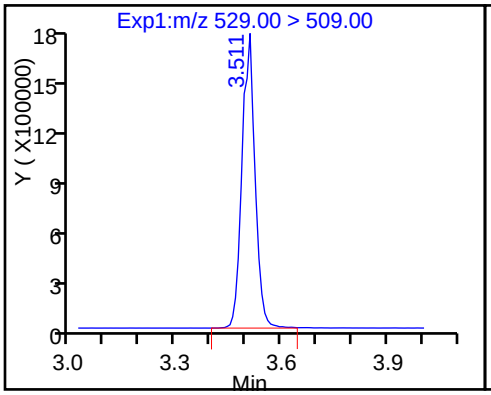
48 Sodium 1H,1H,2H,2H-perfluorooctane



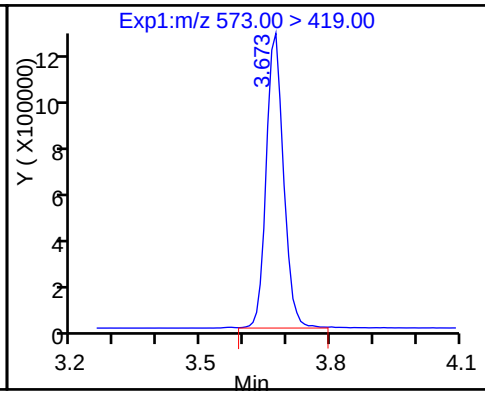
43 Sodium 1H,1H,2H,2H-perfluorooctane



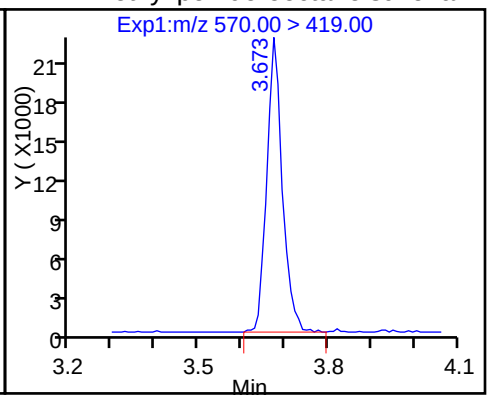
D 42 M2-8:2FTS



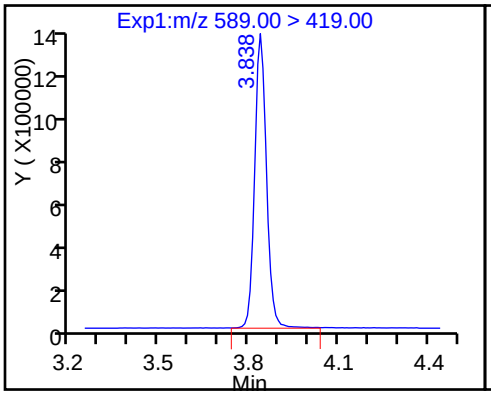
D 45 d3-NMeFOSAA



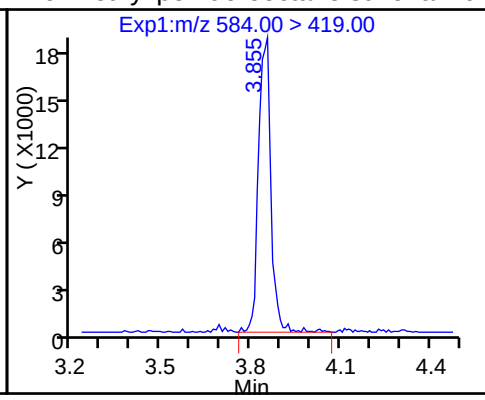
44 N-methyl perfluorooctane sulfonami



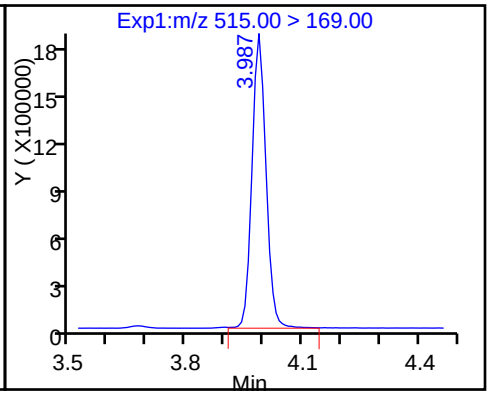
D 46 d5-NEtFOSAA



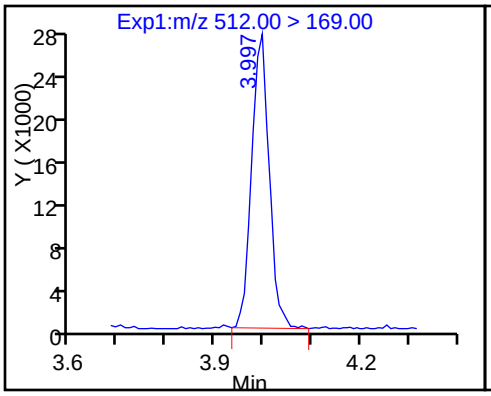
49 N-ethyl perfluorooctane sulfonamid



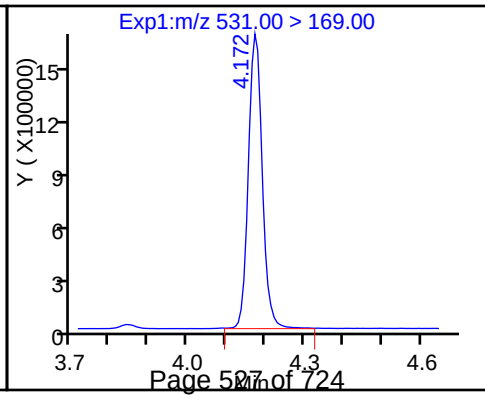
D 52 d-N-MeFOSA-M



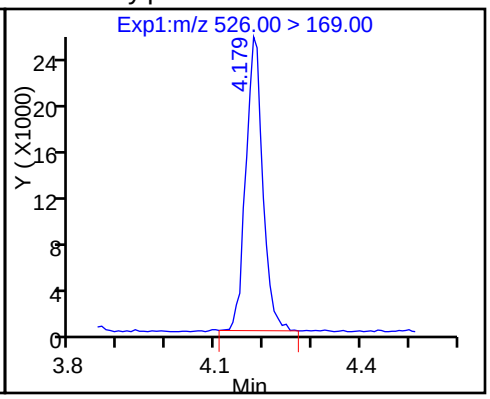
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d
Lims ID: IC L3 Add-on
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 15-Dec-2016 13:56:03 ALS Bottle#: 48 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:48 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.768	2.767	0.001		5570739	47.6		100		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.768	2.768	0.0	1.000	405060	3.87		81.7		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.511	3.511	0.0	1.000	398457	4.22		88.0		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		5342826	49.7		104		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.673	3.676	-0.003		4014623	53.3		107		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.683	3.681	0.002	1.003	285665	4.02		80.4		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.838	3.842	-0.004		4235352	54.1		108		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.847	3.854	-0.007	1.002	267721	3.99		79.7		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.987	3.992	-0.005		5121953	53.9		108		
54 MeFOSA										
512.00 > 169.00	3.997	3.999	-0.002	1.000	343493	4.00		80.1		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.179	4.180	-0.001		4561882	53.2		106		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.186	4.187	-0.001	1.000	326877	4.15		82.9		

Reagents:

LCPFC2-L3_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d

Injection Date: 15-Dec-2016 13:56:03 Instrument ID: A8_N

Lims ID: IC L3 Add-on

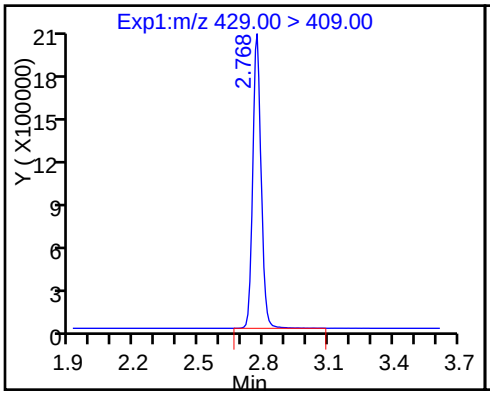
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 15

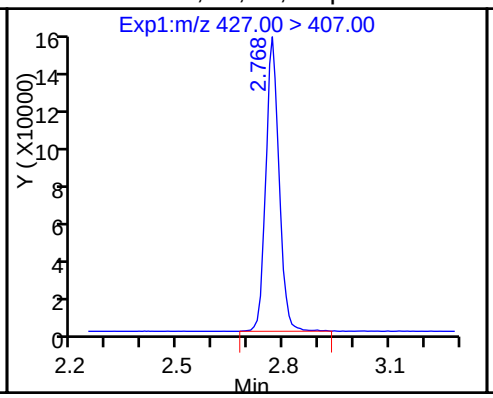
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

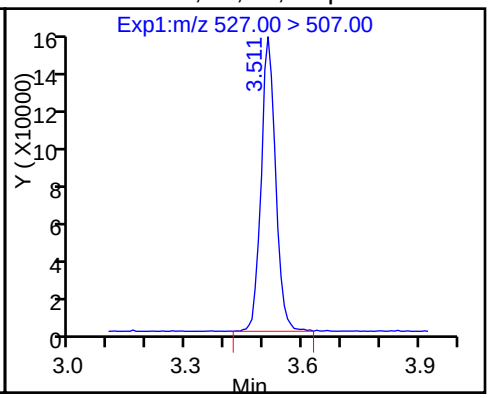
D 47 M2-6:2FTS



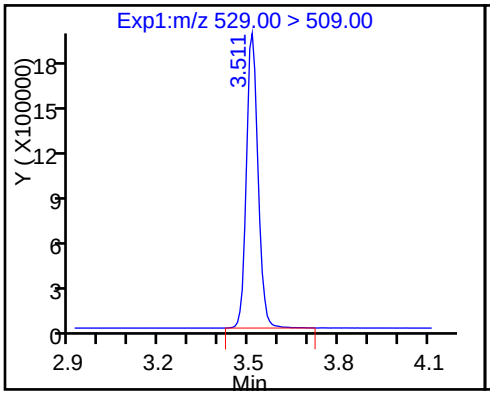
48 Sodium 1H,1H,2H,2H-perfluorooctane



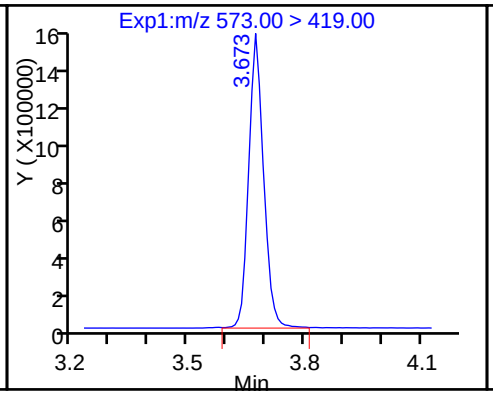
43 Sodium 1H,1H,2H,2H-perfluorooctane



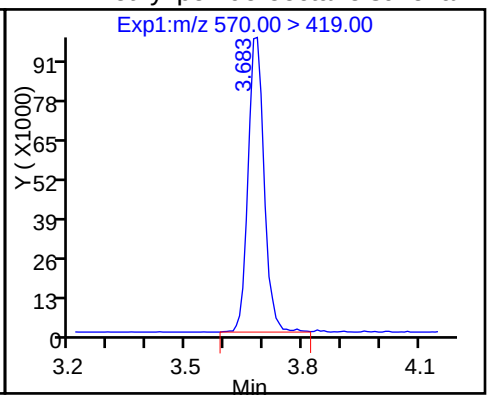
D 42 M2-8:2FTS



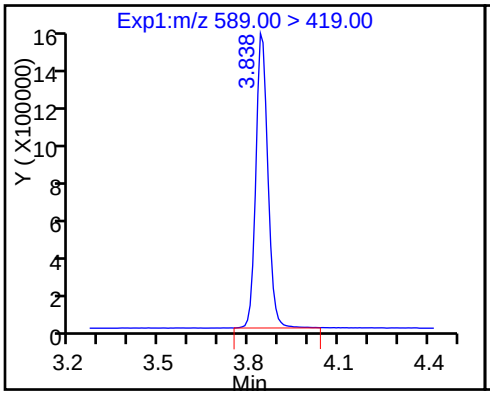
D 45 d3-NMeFOSAA



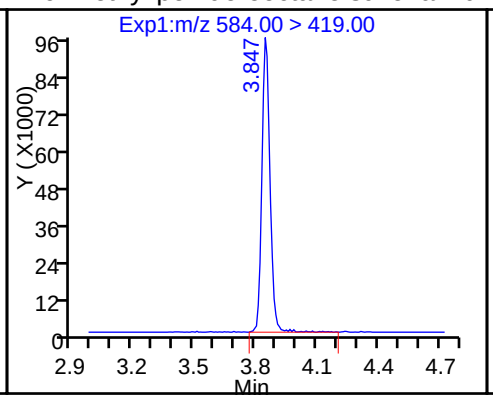
44 N-methyl perfluorooctane sulfonami



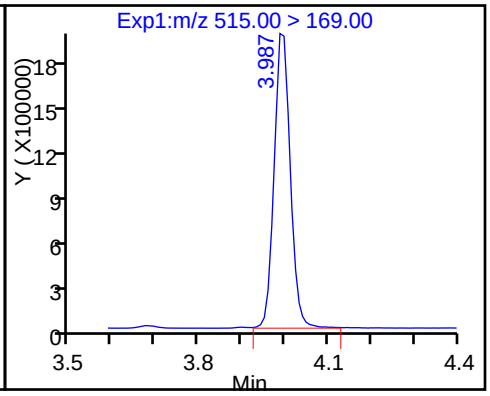
D 46 d5-NEtFOSAA



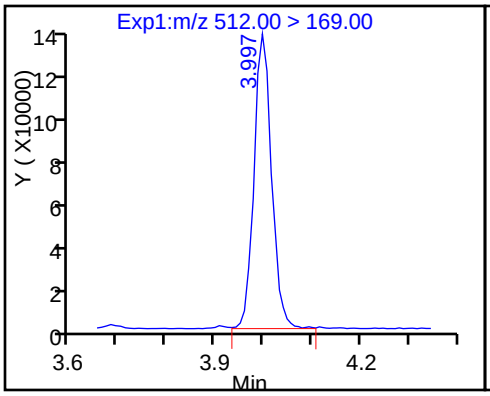
49 N-ethyl perfluorooctane sulfonamid



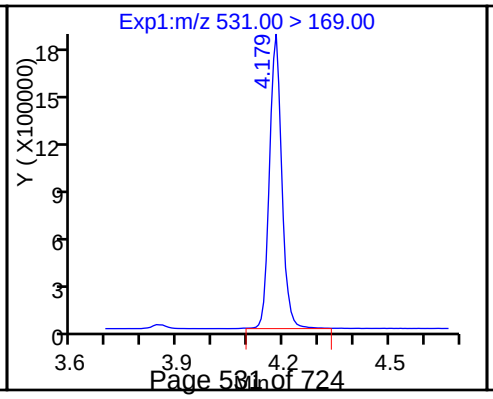
D 52 d-N-MeFOSA-M



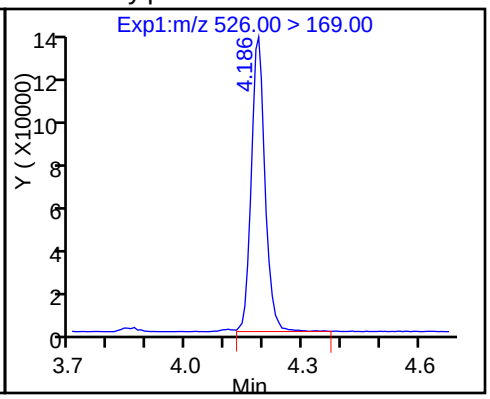
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_016.d
Lims ID: IC L4 Add-on
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 15-Dec-2016 14:03:33 ALS Bottle#: 49 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:49 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:37:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.767	2.767	0.0		6471813	55.3		116		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.767	2.768	-0.001	1.000	2416384	19.9		105		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.511	3.511	0.0	1.000	2224381	21.0		110		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		5984276	55.7		116		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.673	3.676	-0.003		4379131	58.1		116		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.683	3.681	0.002	1.003	1708231	22.0		110		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.838	3.842	-0.004		4410456	56.3		113		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.847	3.854	-0.007	1.002	1518918	21.7		109		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.997	3.992	0.005		5263980	55.4		111		
54 MeFOSA										
512.00 > 169.00	3.997	3.999	-0.002	1.000	1946985	22.1		110		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.179	4.180	-0.001		4672820	54.5		109		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.186	4.187	-0.001	1.000	1813178	22.5		112		

Reagents:

LCPFC2-L4_00003 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_016.d

Injection Date: 15-Dec-2016 14:03:33 Instrument ID: A8_N

Lims ID: IC L4 Add-on

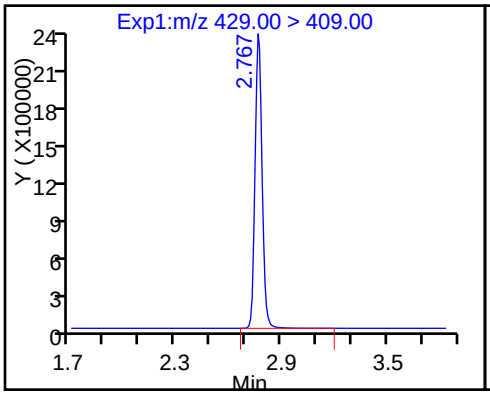
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 16

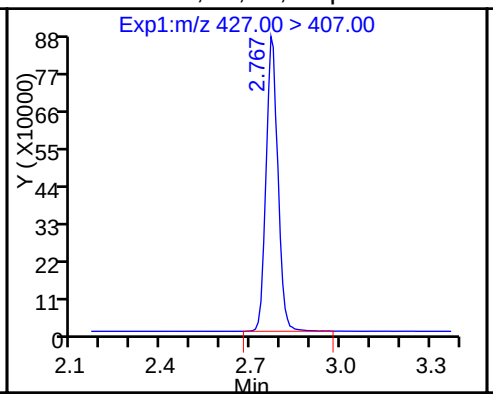
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

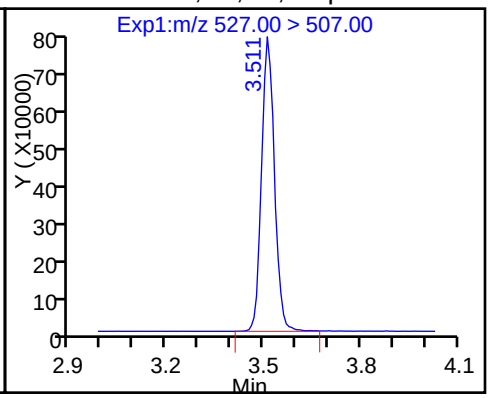
D 47 M2-6:2FTS



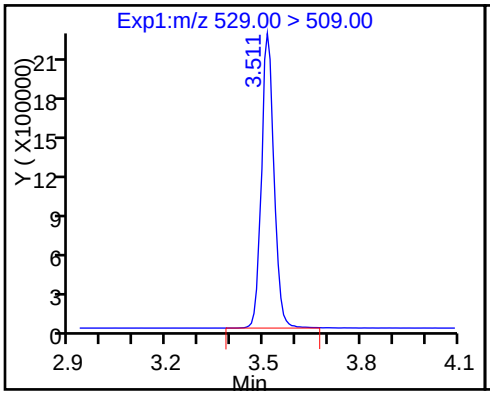
48 Sodium 1H,1H,2H,2H-perfluorooctane



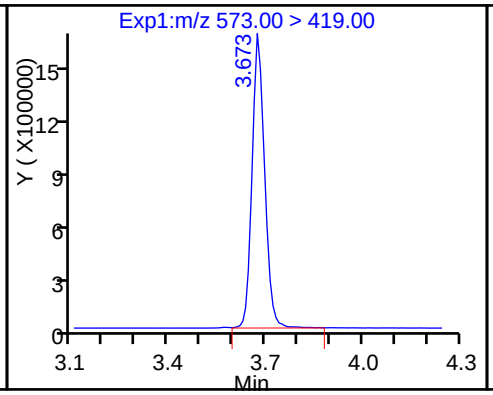
43 Sodium 1H,1H,2H,2H-perfluorooctane



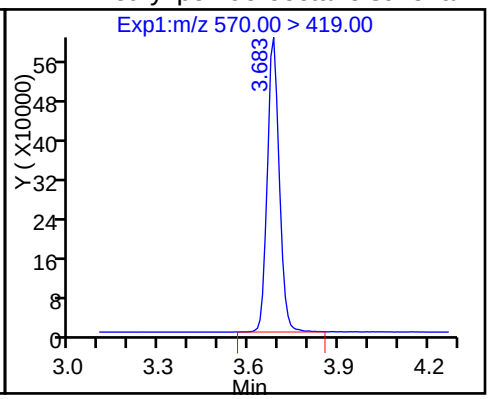
D 42 M2-8:2FTS



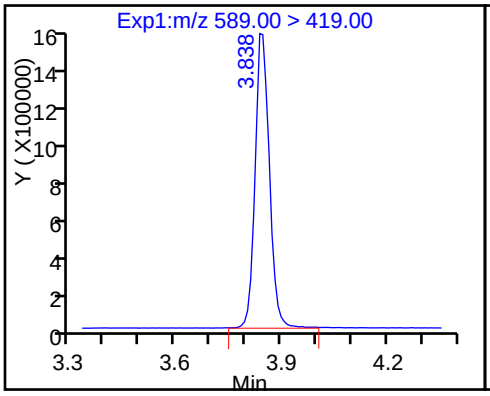
D 45 d3-NMeFOSAA



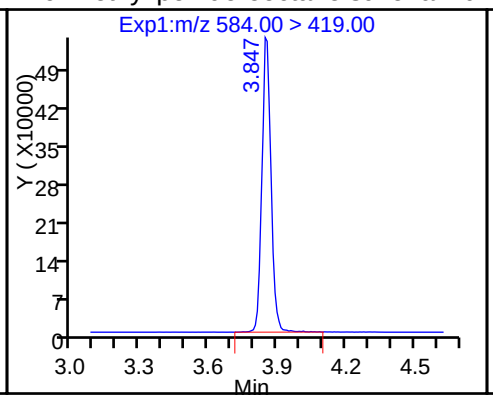
44 N-methyl perfluorooctane sulfonami



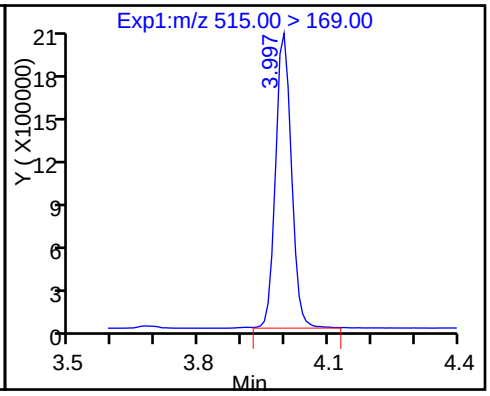
D 46 d5-NEtFOSAA



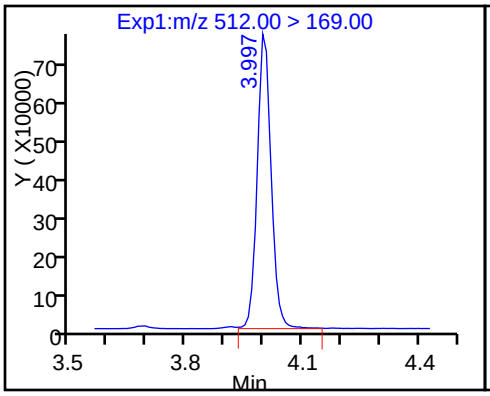
49 N-ethyl perfluorooctane sulfonamid



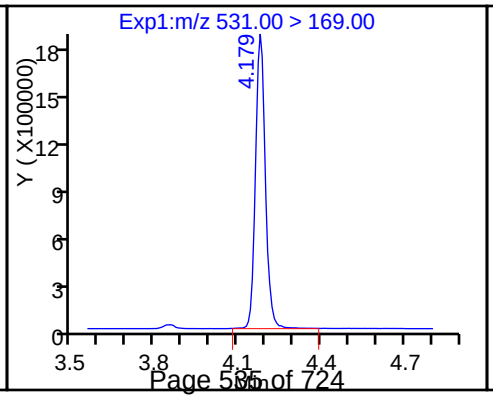
D 52 d-N-MeFOSA-M



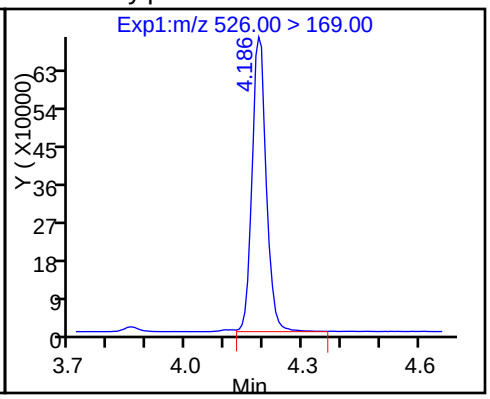
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_017.d
Lims ID: IC L5 Add-on
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 15-Dec-2016 14:11:03 ALS Bottle#: 50 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:51 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.767	2.767	0.0		5259120	45.0		94.6		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.767	2.768	-0.001	1.000	5166665	52.3		110		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.512	3.511	0.001	0.998	4815680	56.9		119		
D 42 M2-8:2FTS										
529.00 > 509.00	3.520	3.513	0.007		4786038	44.5		93.0		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.675	3.676	-0.001		3422485	45.4		90.9		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.684	3.681	0.003	1.003	3741936	61.8		124		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.848	3.842	0.006		3486329	44.5		89.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.857	3.854	0.003	1.002	3414301	61.8		124		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.999	3.992	0.007		4512300	47.5		94.9		
54 MeFOSA										
512.00 > 169.00	3.999	3.999	0.0	1.000	4407328	58.3		117		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.182	4.180	0.002		4149228	48.4		96.7		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.189	4.187	0.002	1.000	4264314	59.5		119		

Reagents:

LCPFC2-L5_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_017.d

Injection Date: 15-Dec-2016 14:11:03 Instrument ID: A8_N

Lims ID: IC L5 Add-on

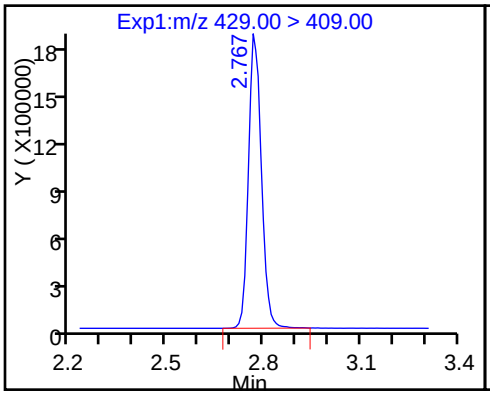
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 17

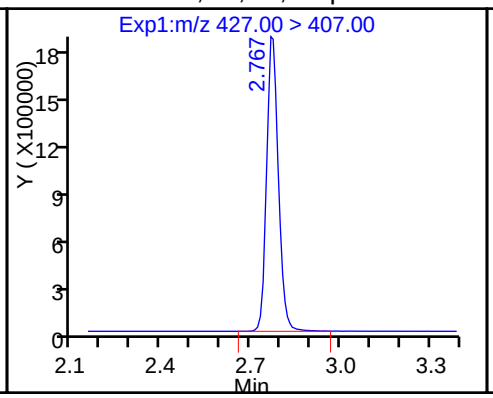
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

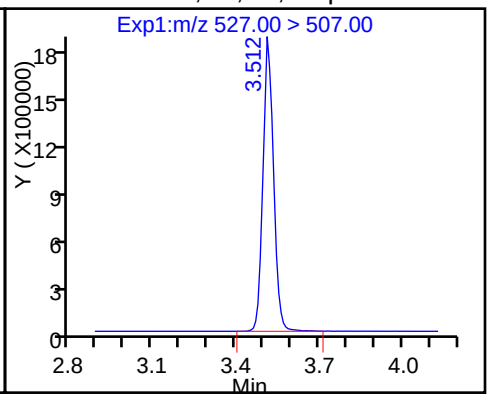
D 47 M2-6:2FTS



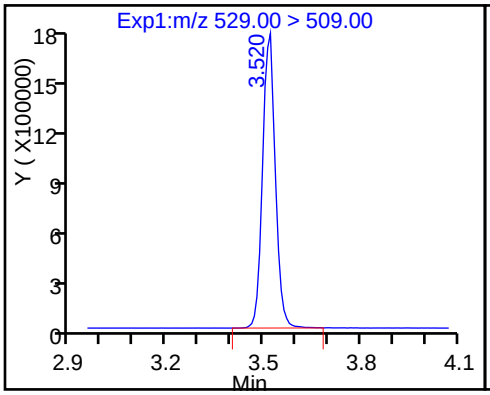
48 Sodium 1H,1H,2H,2H-perfluorooctane



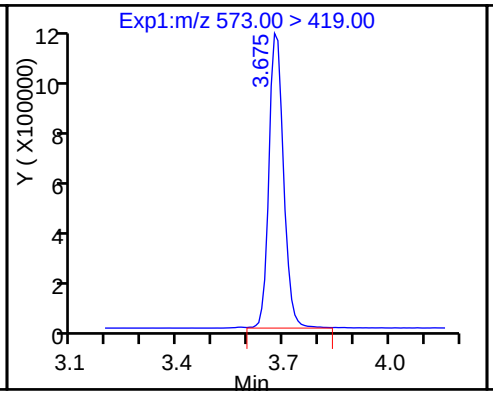
43 Sodium 1H,1H,2H,2H-perfluorooctane



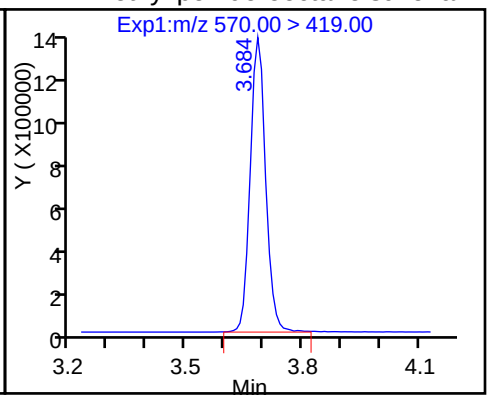
D 42 M2-8:2FTS



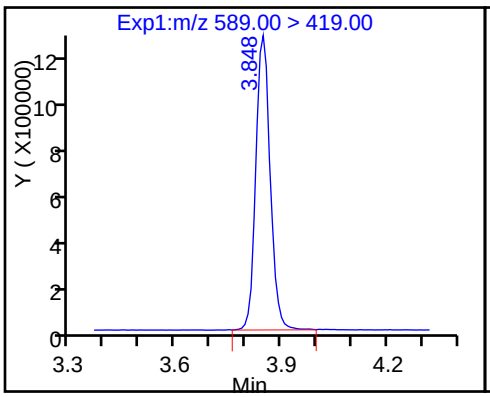
D 45 d3-NMeFOSAA



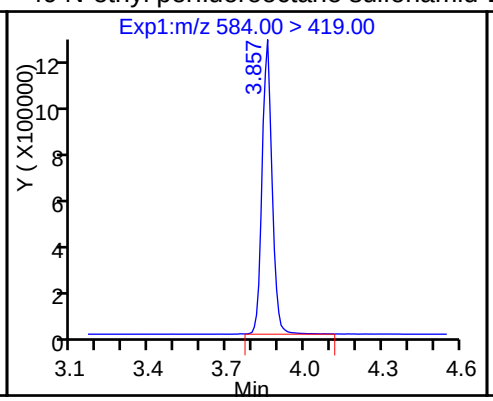
44 N-methyl perfluorooctane sulfonami



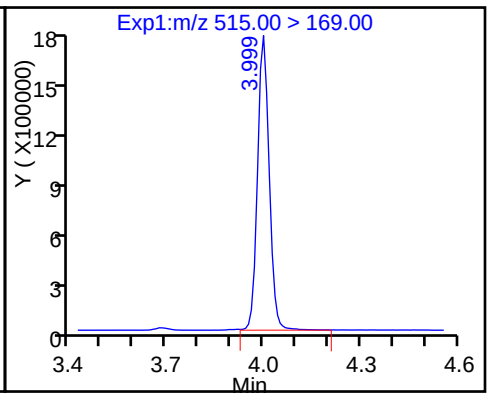
D 46 d5-NEtFOSAA



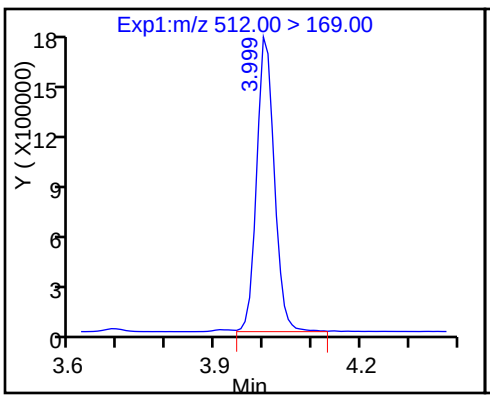
49 N-ethyl perfluorooctane sulfonamid



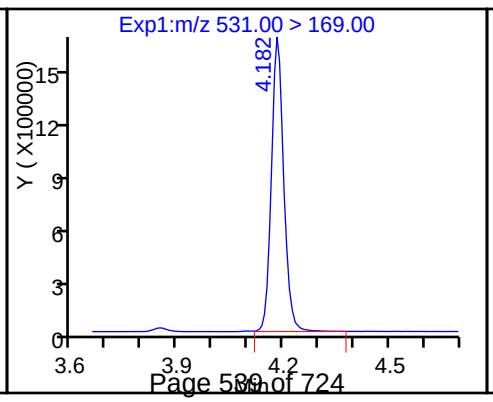
D 52 d-N-MeFOSA-M



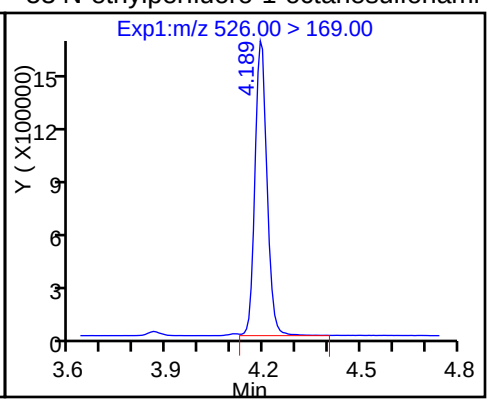
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d
Lims ID: IC L6 Add-on
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 15-Dec-2016 14:18:33 ALS Bottle#: 51 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:52 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.776	2.767	0.009		5576967	47.7		100		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.769	2.768	0.001	1.000	16907459	161.5		85.2		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.516	3.511	0.005	1.000	16111959	170.3		88.9		
D 42 M2-8:2FTS										
529.00 > 509.00	3.516	3.513	0.003		5348797	49.8		104		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.680	3.676	0.004		3587176	47.6		95.2		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.680	3.681	-0.001	1.000	12924122	203.6		102		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.845	3.842	0.003		3725902	47.6		95.1		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.853	3.854	-0.001	1.002	11938061	202.0		101		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.995	3.992	0.003		4658153	49.0		98.0		
54 MeFOSA										
512.00 > 169.00	4.004	3.999	0.005	1.000	16114020	206.5		103		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.186	4.180	0.006		4448546	51.9		104		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.193	4.187	0.006	1.000	15780196	205.3		103		

Reagents:

LCPFC2-L6_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Injection Date: 15-Dec-2016 14:18:33 Instrument ID: A8_N

Lims ID: IC L6 Add-on

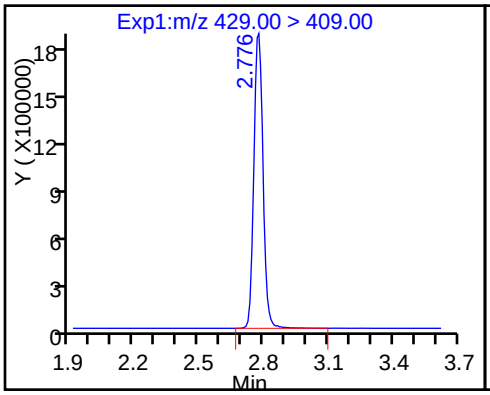
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 51 Worklist Smp#: 18

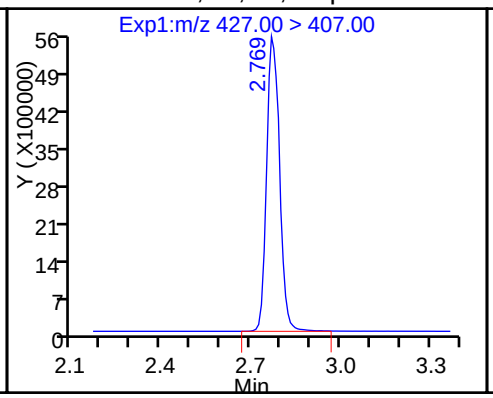
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

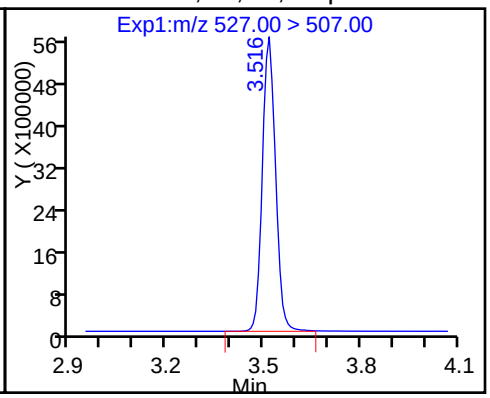
D 47 M2-6:2FTS



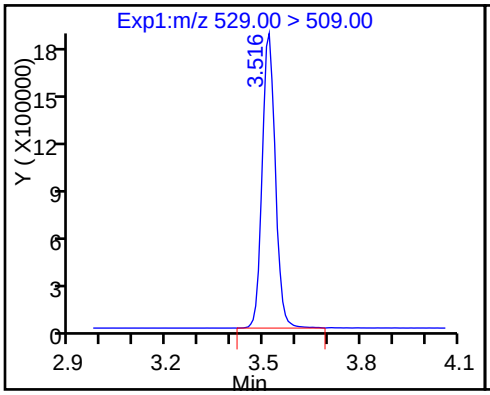
48 Sodium 1H,1H,2H,2H-perfluorooctane



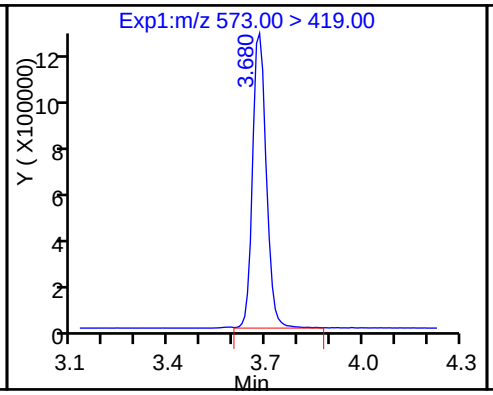
43 Sodium 1H,1H,2H,2H-perfluorooctane



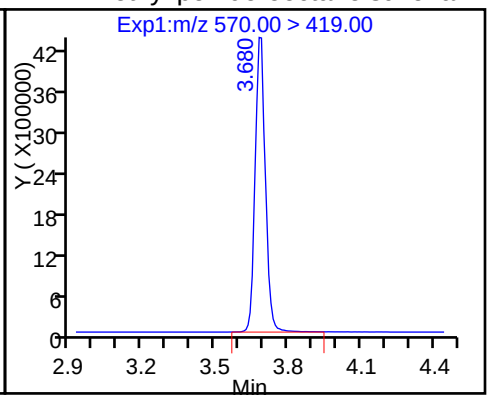
D 42 M2-8:2FTS



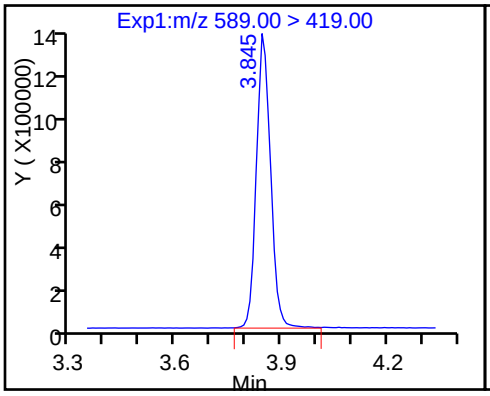
D 45 d3-NMeFOSAA



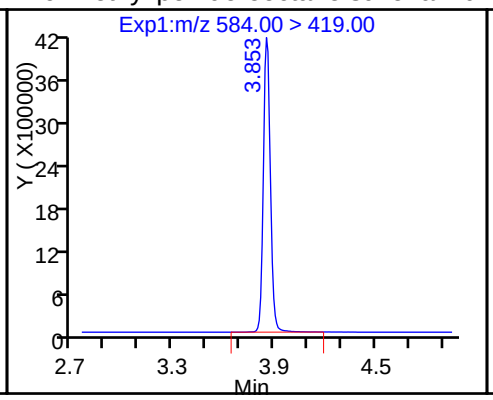
44 N-methyl perfluorooctane sulfonami



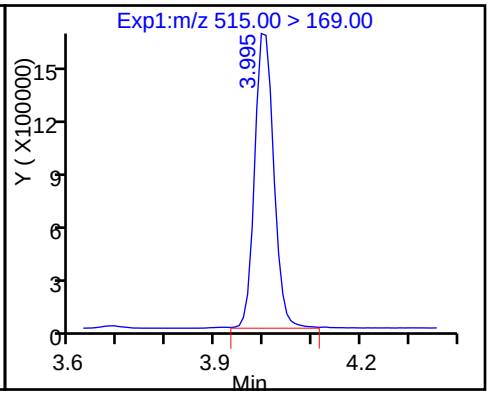
D 46 d5-NEtFOSAA



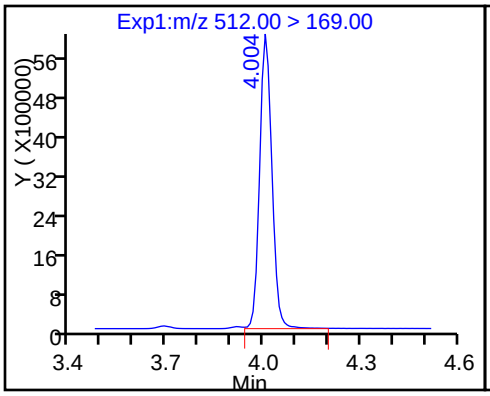
49 N-ethyl perfluorooctane sulfonamid



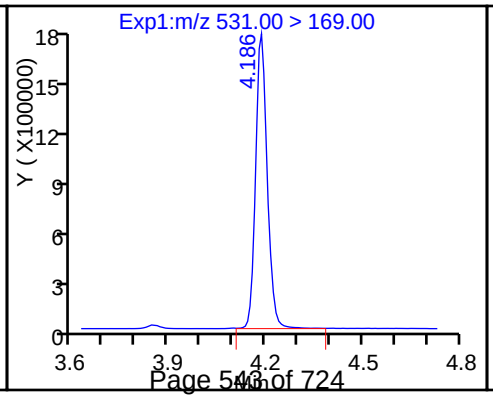
D 52 d-N-MeFOSA-M



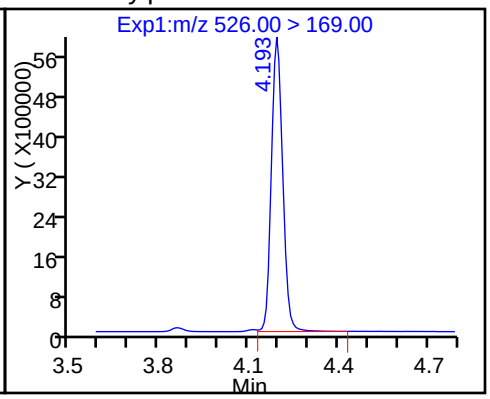
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: ICV 320-142379/11 Calibration Date: 12/15/2016 13:21

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 15DEC2016B_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.8479		49.7	50.0	-0.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	0.9654		48.9	50.0	-2.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.478		46.2	44.3	4.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9123		49.1	50.0	-1.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9679		49.4	50.0	-1.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	0.9556		43.8	47.3	-7.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.000		49.9	50.0	-0.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.160		50.1	47.6	5.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9360		49.2	50.0	-1.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.9040		43.4	47.8	-9.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9182		49.2	50.0	-1.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9109		48.3	50.0	-3.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.5921		48.9	48.3	1.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9285		48.5	50.0	-2.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8958		48.8	50.0	-2.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9189		50.7	50.0	1.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.555		49.1	50.0	-1.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9309		48.2	50.0	-3.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8547		41.5	50.0	-17.0	25.0
13C4 PFBA	Ave	347743	335296		48.2	50.0	-3.6	50.0
13C5-PFPeA	Ave	266072	251719		47.3	50.0	-5.4	50.0
13C2 PFHxA	Ave	245110	240514		49.1	50.0	-1.9	50.0
13C4-PFHpA	Ave	226344	215455		47.6	50.0	-4.8	50.0
18O2 PFHxS	Ave	326976	320282		46.3	47.3	-2.0	50.0
13C4 PFOA	Ave	230362	219488		47.6	50.0	-4.7	50.0
13C4 PFOS	Ave	248847	244549		47.0	47.8	-1.7	50.0
13C5 PFNA	Ave	177687	171464		48.2	50.0	-3.5	50.0
13C8 FOSA	Ave	384141	381142		49.6	50.0	-0.8	50.0
13C2 PFDA	Ave	157302	151370		48.1	50.0	-3.8	50.0
13C2 PFUnA	Ave	117250	116265		49.6	50.0	-0.8	50.0
13C2 PFDoA	Ave	110957	105818		47.7	50.0	-4.6	50.0
13C2-PFTeDA	Ave	227387	214066		47.1	50.0	-5.9	50.0
13C2-PFHxDA	Ave	124568	118207		47.4	50.0	-5.1	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 15-Dec-2016 13:21:44 ALS Bottle#: 44 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:41:15 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:56:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.533	1.534	-0.001		16764776	48.2		96.4	1068457	
1 Perfluorobutyric acid										
212.90 > 169.00	1.541	1.535	0.006	1.000	14214515	49.7			107570	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		12585925	47.3		94.6	1186150	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	12149802	48.9			115067	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.848	1.848	0.0	1.000	20951066	46.2				
298.90 > 99.00	1.848	1.848	0.0	1.000	9653760		2.17(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.100	2.096	0.004	1.000	10971106	49.1			243419	
D 6 13C2 PFHxA										
315.00 > 270.00	2.100	2.097	0.003		12025693	49.1		98.1	480449	
D 11 13C4-PFHpA										
367.00 > 322.00	2.425	2.426	-0.001		10772772	47.6		95.2	728689	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.433	2.428	0.005	1.000	10426957	49.4			97176	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.449	2.431	0.018	1.000	14462013	43.8				
D 10 18O2 PFHxS										
403.00 > 84.00	2.449	2.446	0.003		15149334	46.3		98.0	878432	
D 14 13C4 PFOA										
417.00 > 372.00	2.785	2.783	0.002		10974392	47.6		95.3	756643	

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	2.785	2.783	0.002	1.000	10976634	49.9			90975	
413.00 > 169.00	2.793	2.783	0.010	1.003	6473539		1.70(0.90-1.10)		241007	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.793	2.790	0.003	1.000	13497259	50.1				
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.162	3.118	0.044	1.000	10556247	43.4			368282	
499.00 > 99.00	3.154	3.118	0.036	0.997	2582918		4.09(0.90-1.10)		118191	
D 17 13C4 PFOS										
503.00 > 80.00	3.162	3.151	0.011		11689450	47.0		98.3	325285	
D 19 13C5 PFNA										
468.00 > 423.00	3.162	3.153	0.009		8573219	48.2		96.5	485749	
20 Perfluorononanoic acid										
463.00 > 419.00	3.162	3.155	0.007	1.000	8024621	49.2			123355	
D 21 13C8 FOSA										
506.00 > 78.00	3.495	3.488	0.007		19057117	49.6		99.2	610709	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.495	3.491	0.004	1.000	17498900	49.2			383568	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.520	3.510	0.010	1.000	6894043	48.3			189508	
D 23 13C2 PFDA										
515.00 > 470.00	3.520	3.513	0.007		7568491	48.1		96.2	377092	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.830	3.822	0.008	1.000	6986242	48.9				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.848	3.839	0.009	1.000	5397748	48.5			115044	
D 27 13C2 PFUnA										
565.00 > 520.00	3.848	3.842	0.006		5813248	49.6		99.2	413801	
D 30 13C2 PFDoA										
615.00 > 570.00	4.139	4.132	0.007		5290885	47.7		95.4	272661	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.139	4.136	0.003	1.000	4739775	48.8			99907	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.411	4.400	0.011	1.000	4861713	50.7			113110	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.642	4.641	0.001		10703301	47.1		94.1	614243	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.652	4.642	0.010	1.000	8229099	49.1			142471	
713.00 > 169.00	4.642	4.642	0.0	0.998	1339943		6.14(0.00-0.00)		99778	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.058	5.057	0.001		5910325	47.4		94.9	128290	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.059	-0.001	1.000	4925242	48.2			4012	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.421	5.414	0.007	1.000	4522136	41.5			4448	

Reagents:

LCPFCIC_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:41:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d

Injection Date: 15-Dec-2016 13:21:44 Instrument ID: A8_N

Lims ID: ICV

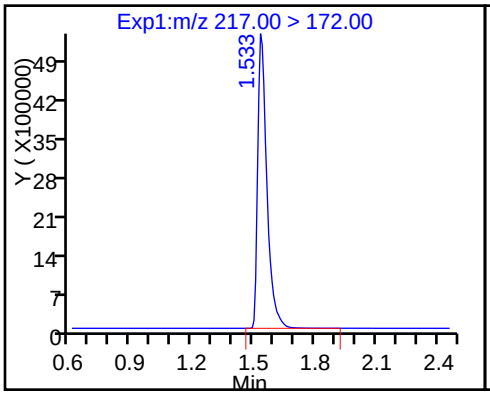
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 44 Worklist Smp#: 11

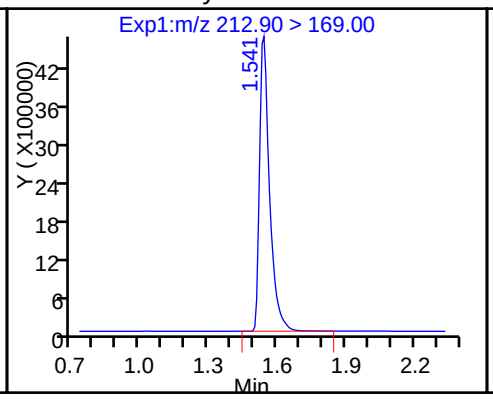
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

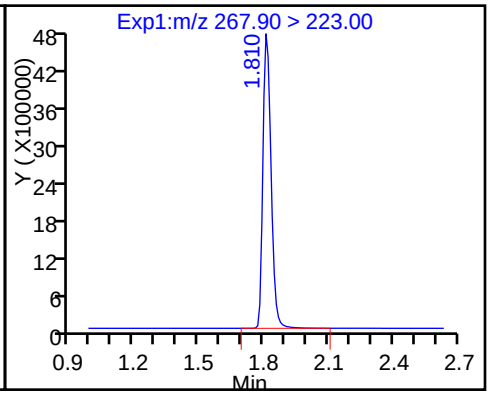
D 2 13C4 PFBA



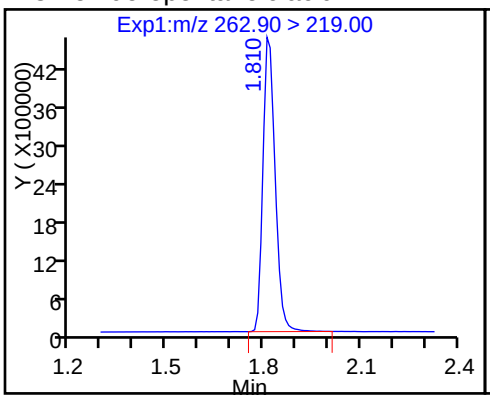
1 Perfluorobutyric acid



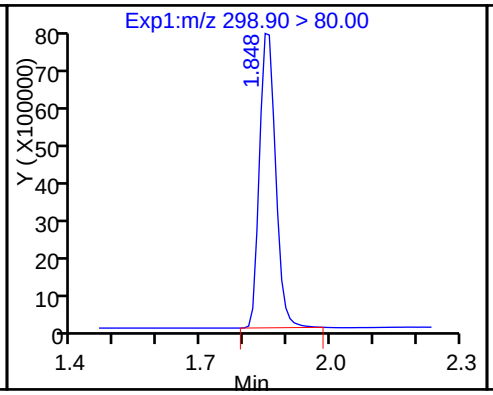
D 4 13C5-PFPeA



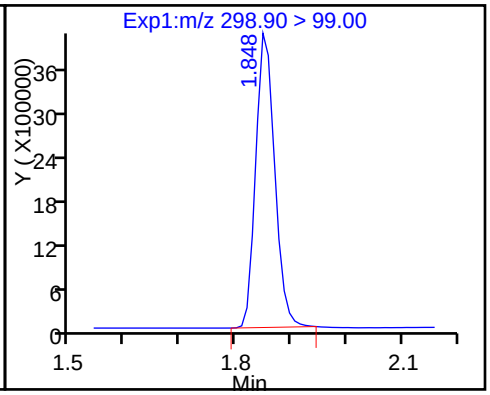
3 Perfluoropentanoic acid



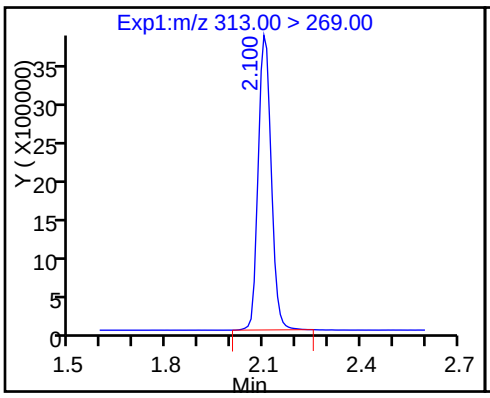
5 Perfluorobutanesulfonic acid



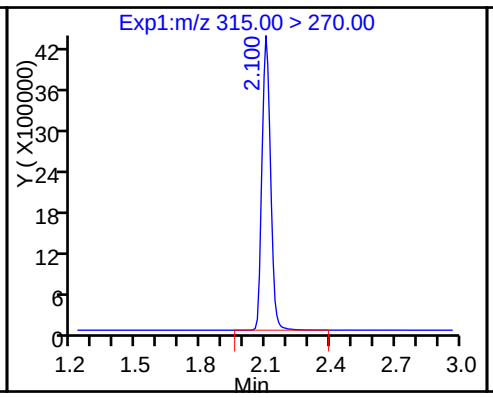
5 Perfluorobutanesulfonic acid



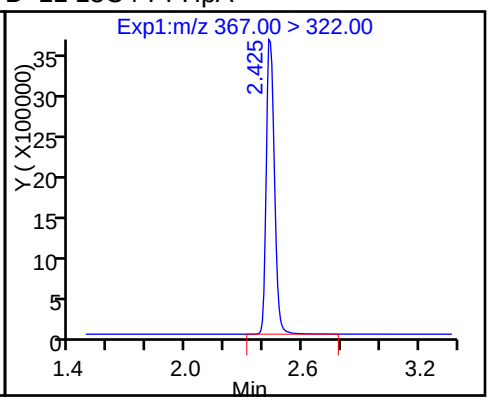
7 Perfluorohexanoic acid



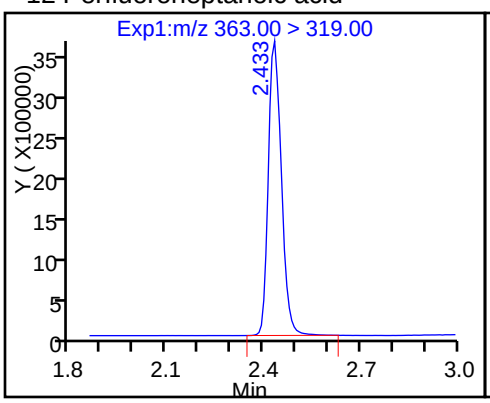
D 6 13C2 PFHxA



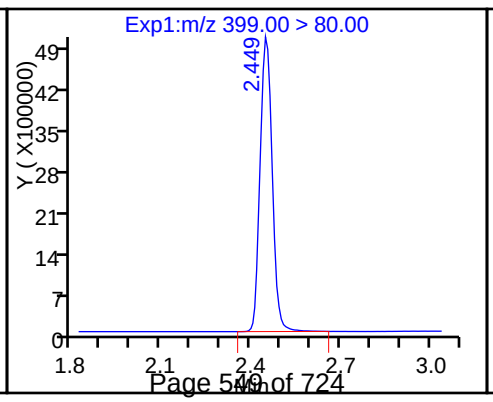
D 11 13C4-PFHpA



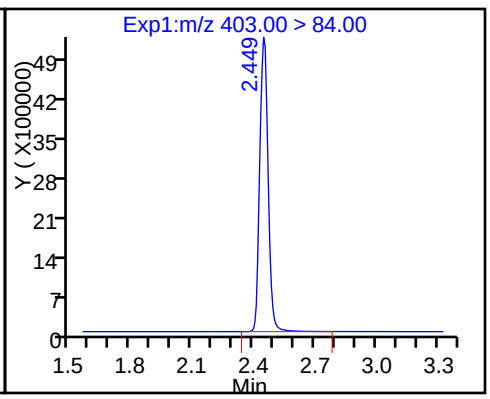
12 Perfluoroheptanoic acid



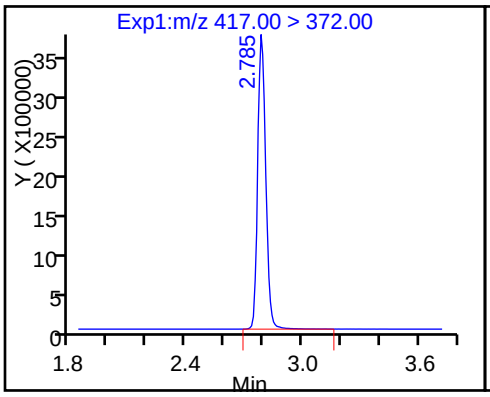
9 Perfluorohexanesulfonic acid



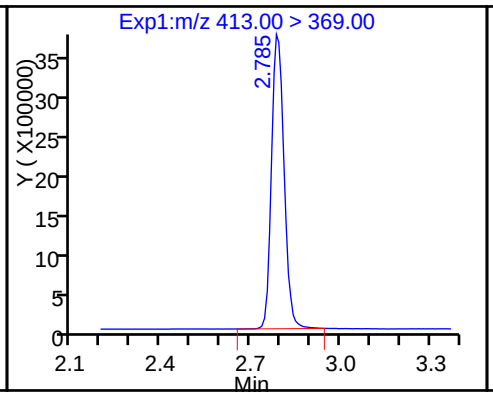
D 10 18O2 PFHxS



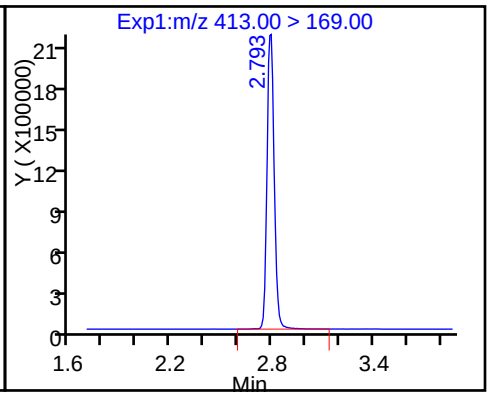
D 14 13C4 PFOA



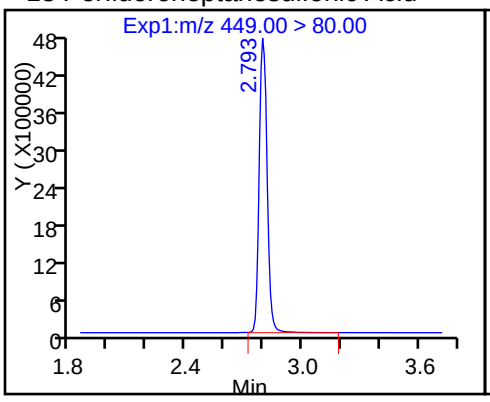
15 Perfluorooctanoic acid



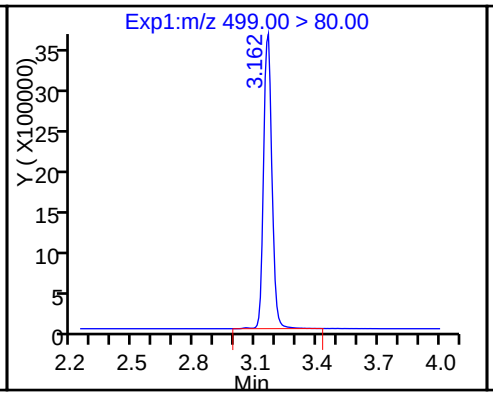
15 Perfluorooctanoic acid



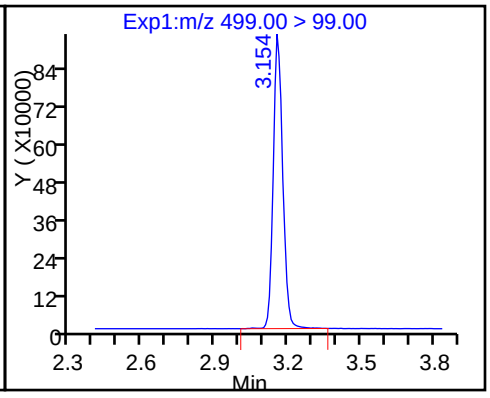
13 Perfluoroheptanesulfonic Acid



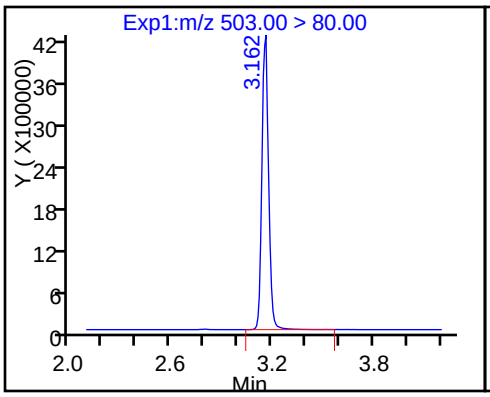
18 Perfluorooctane sulfonic acid



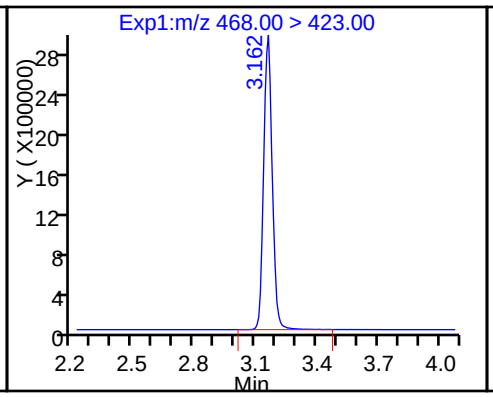
18 Perfluorooctane sulfonic acid



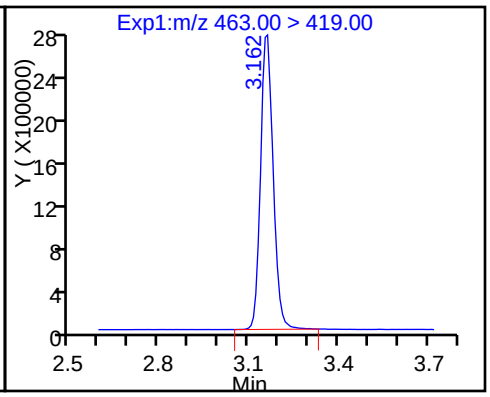
D 17 13C4 PFOS



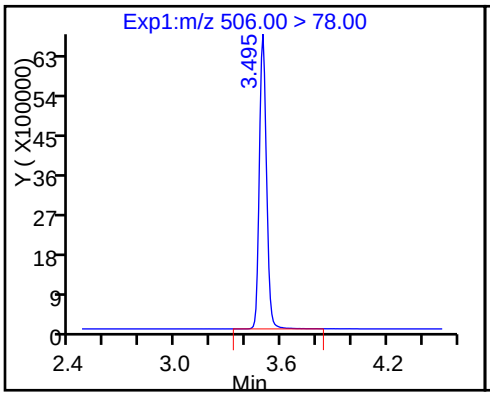
D 19 13C5 PFNA



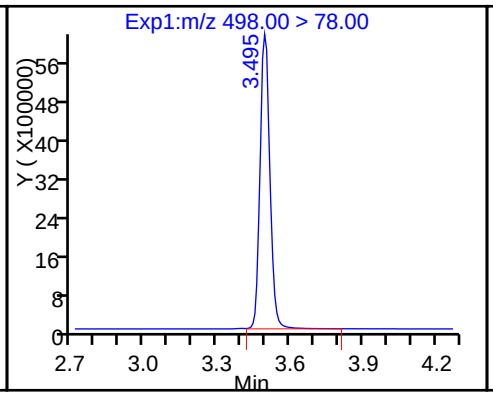
20 Perfluorononanoic acid



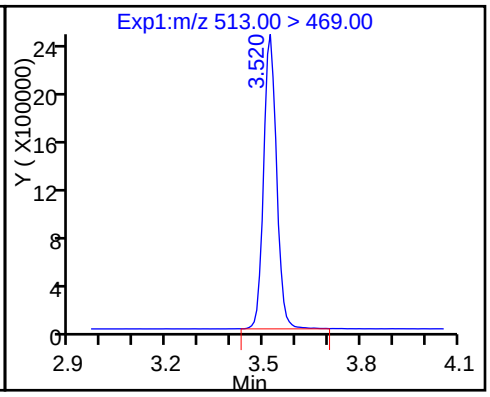
D 21 13C8 FOSA



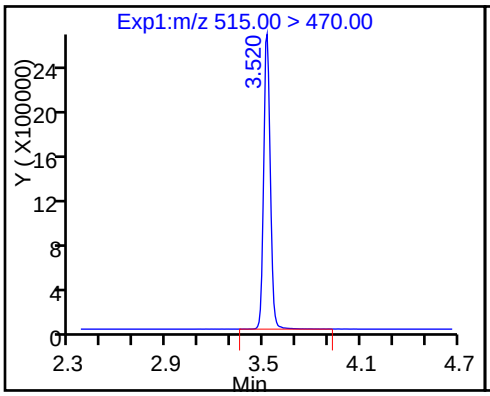
22 Perfluorooctane Sulfonamide



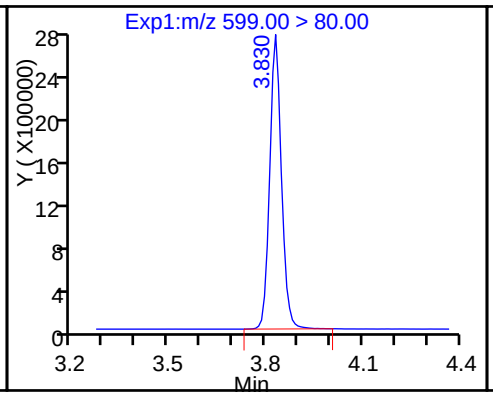
24 Perfluorodecanoic acid



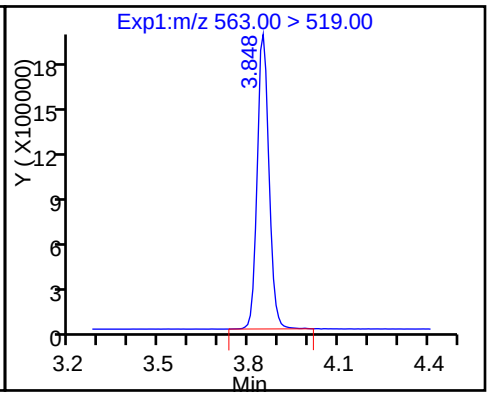
D 23 13C2 PFDA



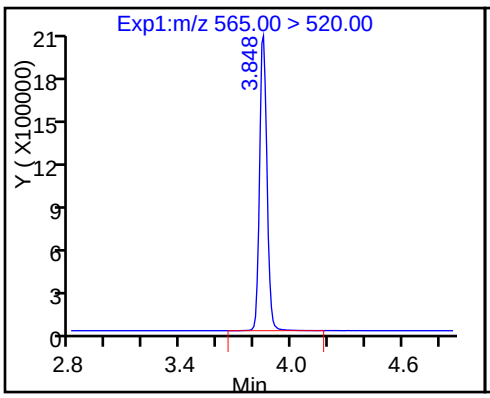
26 Perfluorodecane Sulfonic acid



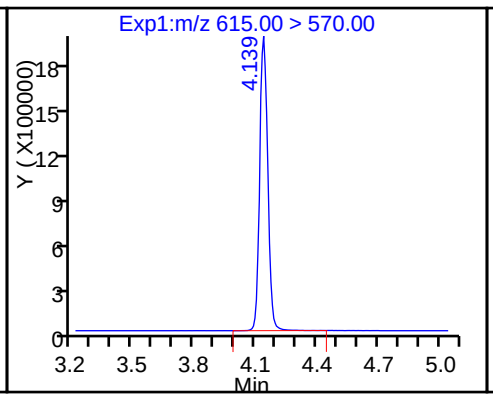
28 Perfluoroundecanoic acid



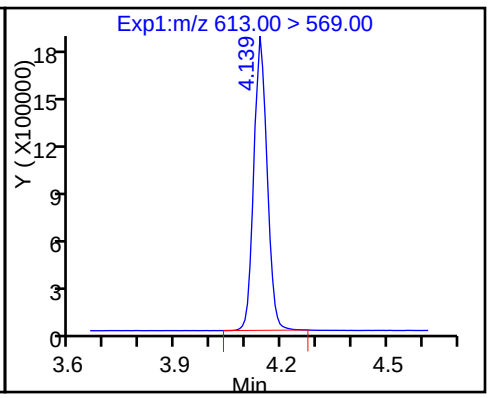
D 27 13C2 PFUnA



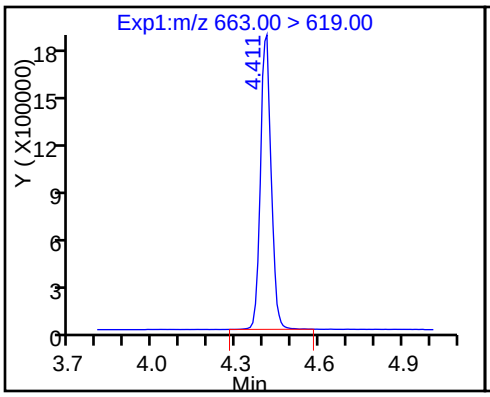
D 30 13C2 PFDoA



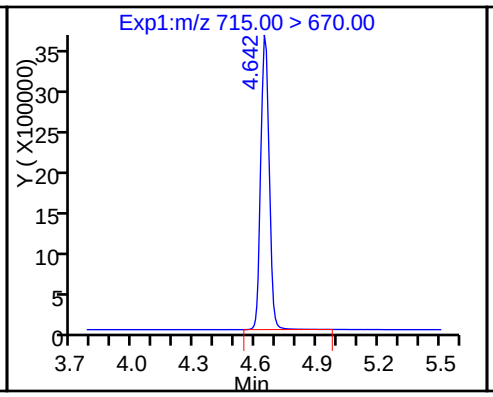
29 Perfluorododecanoic acid



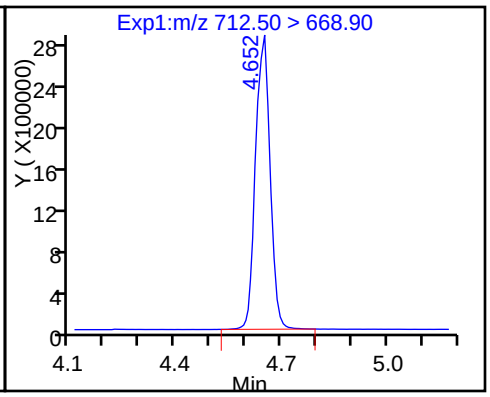
31 Perfluorotridecanoic acid



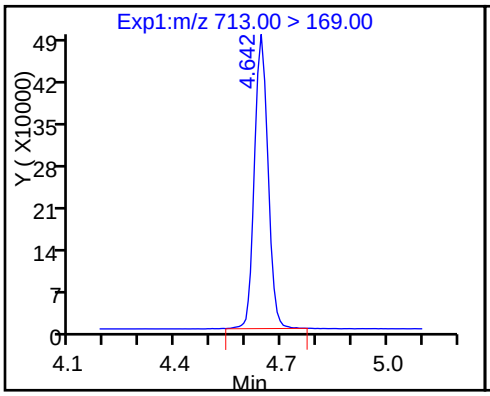
D 32 13C2-PFTeDA



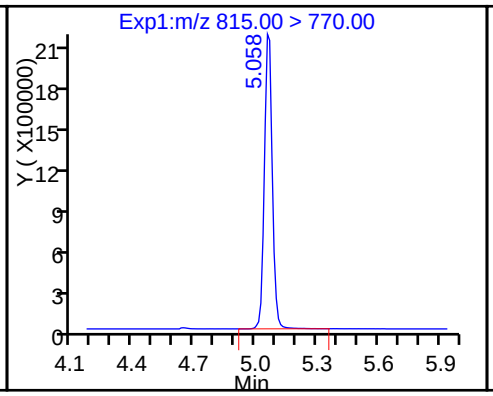
33 Perfluorotetradecanoic acid



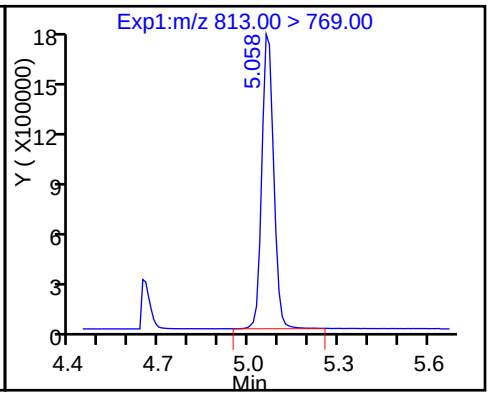
33 Perfluorotetradecanoic acid



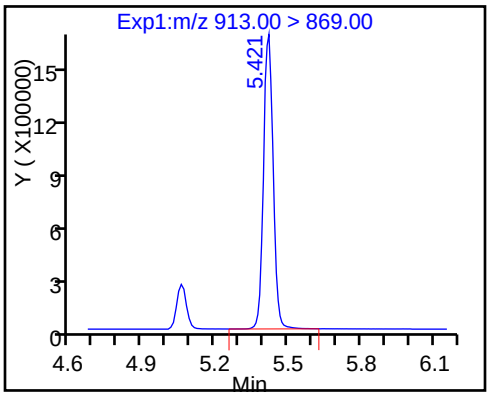
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144213/5 Calibration Date: 12/28/2016 16:51

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 28DEC2016A_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	0.8537	0.8656		1.01	1.00	1.4	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.001		1.01	1.00	1.4	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.456		0.908	0.884	2.7	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9272		0.998	1.00	-0.2	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.064		1.09	1.00	8.7	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.125		0.994	0.910	9.2	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.002		0.998	1.00	-0.2	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.048		0.906	0.952	-4.9	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.8790		0.820	0.928	-11.6	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9848		1.03	1.00	3.5	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9365		1.00	1.00	0.4	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9439		1.00	1.00	0.0	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.5550		0.916	0.964	-5.0	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9717		1.02	1.00	1.6	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9171		0.999	1.00	-0.1	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.8522		0.940	1.00	-6.0	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.712		1.08	1.00	8.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.417		0.884	1.00	-11.6	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7315		0.710	1.00	-29.0	50.0
13C4 PFBA	Ave	347743	355066		51.1	50.0	2.1	50.0
13C5-PFPeA	Ave	266072	270624		50.9	50.0	1.7	50.0
13C2 PFHxA	Ave	245110	240678		49.1	50.0	-1.8	50.0
13C4-PFHpA	Ave	226344	220126		48.6	50.0	-2.7	50.0
18O2 PFHxS	Ave	326976	329704		47.7	47.3	0.8	50.0
13C4 PFOA	Ave	230362	245518		53.3	50.0	6.6	50.0
13C4 PFOS	Ave	248847	263177		50.6	47.8	5.8	50.0
13C5 PFNA	Ave	177687	180751		50.9	50.0	1.7	50.0
13C8 FOSA	Ave	384141	395895		51.5	50.0	3.1	50.0
13C2 PFDA	Ave	157302	168440		53.5	50.0	7.1	50.0
13C2 PFUnA	Ave	117250	126785		54.1	50.0	8.1	50.0
13C2 PFDoA	Ave	110957	118866		53.6	50.0	7.1	50.0
13C2-PFTeDA	Ave	227387	227697		50.1	50.0	0.1	50.0
13C2-PFHxDA	Ave	124568	120137		48.2	50.0	-3.6	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161228-38280.b\28DEC2016A_005.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 28-Dec-2016 16:51:42 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161228-38280.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Dec-2016 08:18:58 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 08:08:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.542	1.542	0.0		17753284	51.1		102	833839	
1 Perfluorobutyric acid										
212.90 > 169.00	1.550	1.542	0.008	1.000	307354	1.01		101	2672	
D 4 13C5-PFPeA										
267.90 > 223.00	1.829	1.820	0.009		13531215	50.9		102	1085895	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.829	1.820	0.009	1.000	270830	1.01		101	2562	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.868	1.858	0.010	1.000	424261	0.9081		103		
298.90 > 99.00	1.868	1.858	0.010	1.000	178637		2.37(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.127	2.119	0.008		12033921	49.1		98.2	683858	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.127	2.119	0.008	1.000	223163	1.00		99.8	8261	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.488	2.388	0.100	1.000	337485	0.99		109		
D 11 13C4-PFHpA										
367.00 > 322.00	2.465	2.456	0.009		11006279	48.6		97.3	1075770	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.465	2.456	0.009	1.000	234263	1.09		109	2097	
D 10 18O2 PFHxS										
403.00 > 84.00	2.481	2.471	0.010		15594977	47.7		101	1959657	
D 14 13C4 PFOA										
417.00 > 372.00	2.828	2.817	0.011		12275919	53.3		107	932197	

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	2.828	2.817	0.011	1.000	245886	1.00		99.8	2401	
413.00 > 169.00	2.828	2.817	0.011	1.000	156155		1.57(0.90-1.10)		12227	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.836	2.817	0.019	1.000	262642	0.9057		95.1		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.206	3.079	0.127	1.000	214680	0.8203		88.4	12042	M
499.00 > 99.00	3.206	3.079	0.127	1.000	51818		4.14(0.90-1.10)		2851	M
D 17 13C4 PFOS										
503.00 > 80.00	3.206	3.185	0.021		12579869	50.6		106	336319	
20 Perfluorononanoic acid										
463.00 > 419.00	3.214	3.194	0.020	1.000	177998	1.03		103	3453	
D 19 13C5 PFNA										
468.00 > 423.00	3.206	3.194	0.012		9037543	50.9		102	752908	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.504	3.492	0.012	1.000	370736	1.00		100	35031	
D 21 13C8 FOSA										
506.00 > 78.00	3.504	3.492	0.012		19794760	51.5		103	663074	
D 23 13C2 PFDA										
515.00 > 470.00	3.571	3.551	0.020		8422000	53.5		107	302155	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.571	3.551	0.020	1.000	158994	1.00		100	5153	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.885	3.864	0.021	1.000	140805	0.9162		95.0		
D 27 13C2 PFUnA										
565.00 > 520.00	3.902	3.881	0.021		6339241	54.1		108	377702	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.902	3.890	0.012	1.000	123194	1.02		102	2930	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.199	4.182	0.017	1.000	109006	1.00		99.9	2470	
D 30 13C2 PFDoA										
615.00 > 570.00	4.199	4.182	0.017		5943315	53.6		107	136723	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.474	4.455	0.019	1.000	101293	0.9397		94.0	1670	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.718	4.688	0.030		11384865	50.1		100	1071639	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.718	4.705	0.013	1.000	203447	1.08		108	163	
713.00 > 169.00	4.709	4.705	0.004	0.998	33649		6.05(0.00-0.00)		6782	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.142	5.123	0.020		6006834	48.2		96.4	82597	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.142	5.123	0.020	1.000	168382	0.8841		88.4	139	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.522	5.492	0.030	1.000	86951	0.7100		71.0	97.5	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 29-Dec-2016 08:18:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161228-38280.b\28DEC2016A_005.d

Injection Date: 28-Dec-2016 16:51:42 Instrument ID: A8_N

Lims ID: CCV L2

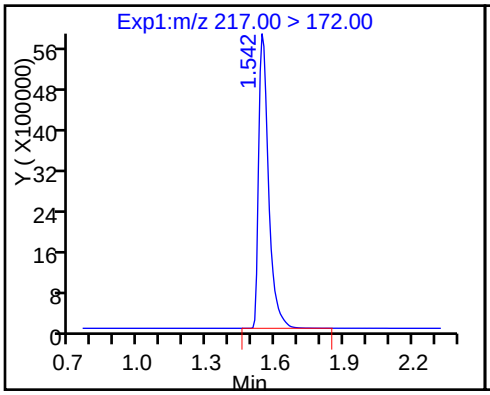
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

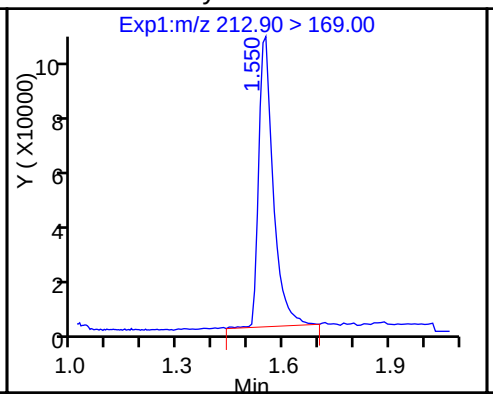
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

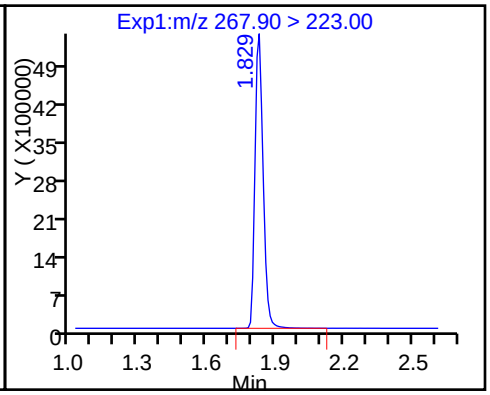
D 2 13C4 PFBA



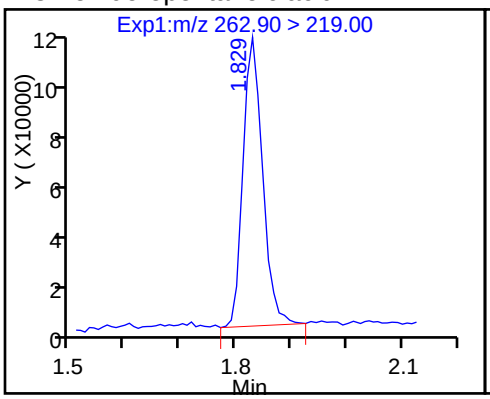
1 Perfluorobutyric acid



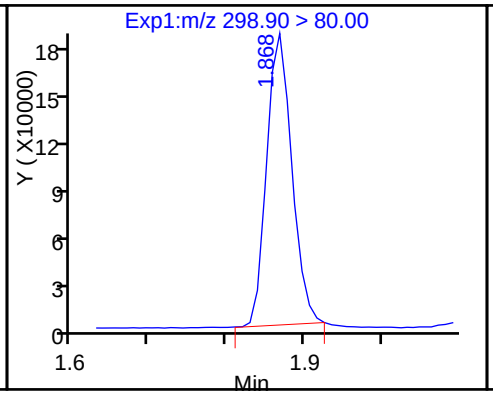
D 4 13C5-PFPeA



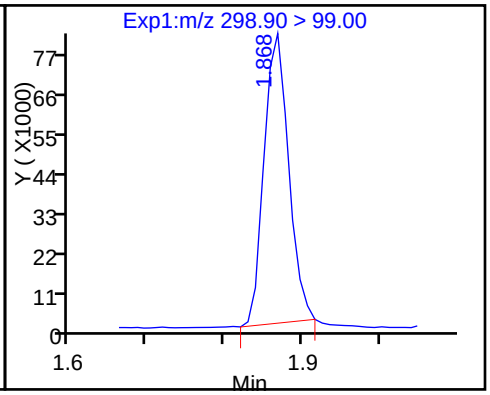
3 Perfluoropentanoic acid



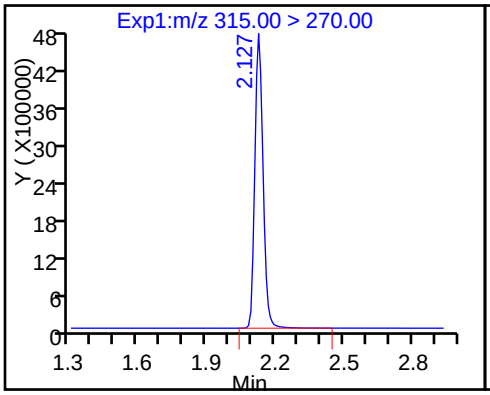
5 Perfluorobutanesulfonic acid



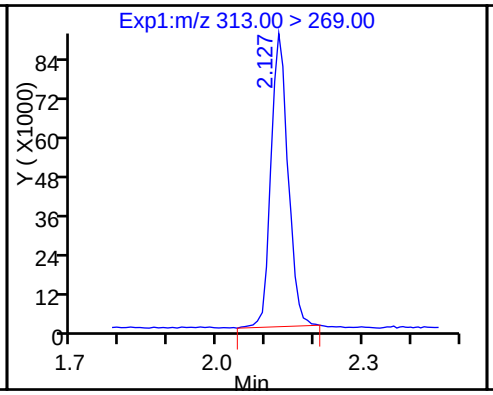
5 Perfluorobutanesulfonic acid



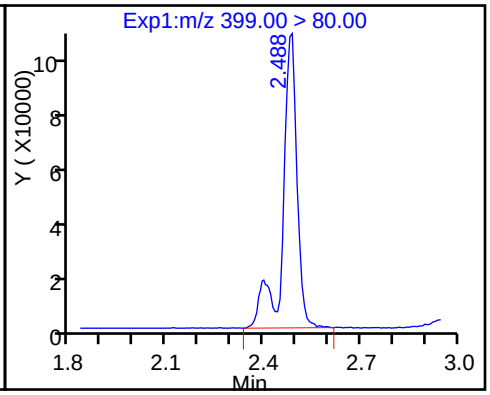
D 6 13C2 PFHxA



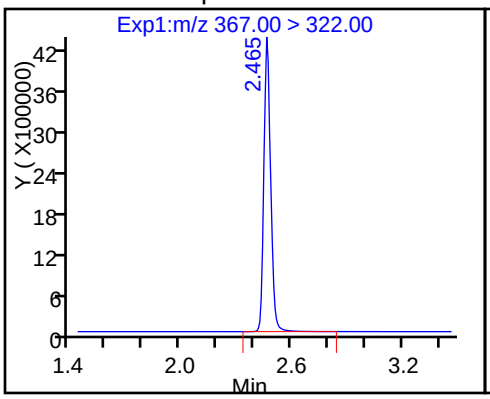
7 Perfluorohexanoic acid



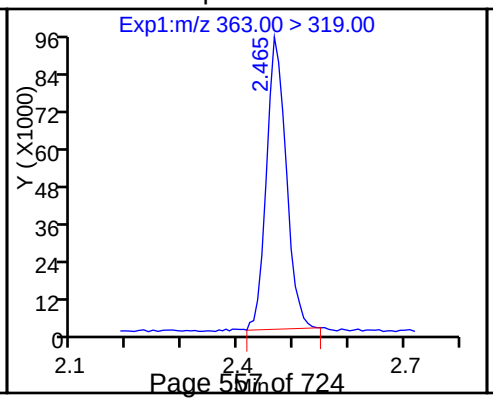
9 Perfluorohexanesulfonic acid



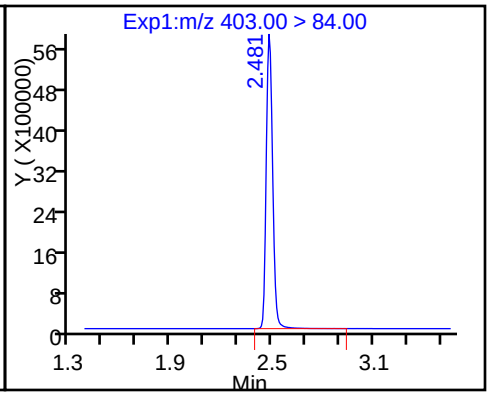
D 11 13C4-PFHpA



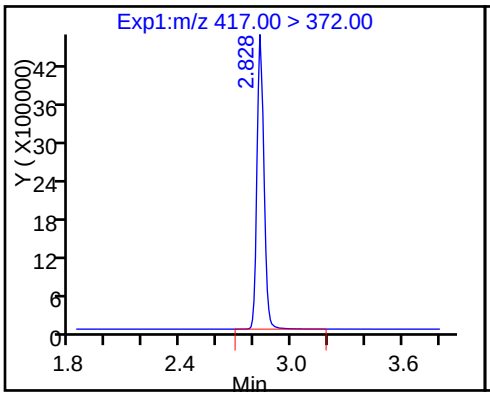
12 Perfluoroheptanoic acid



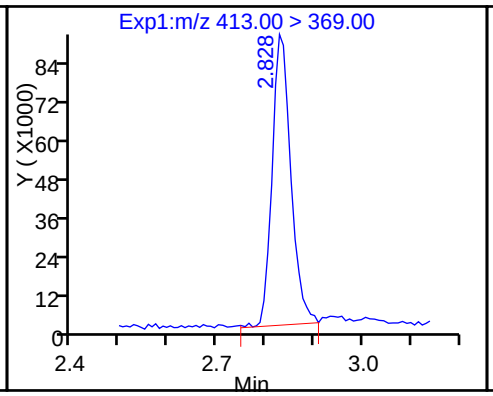
D 10 18O2 PFHxS



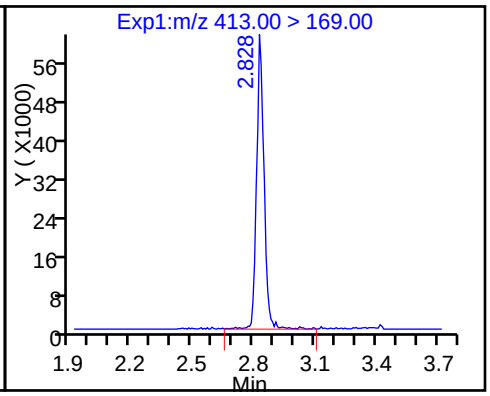
D 14 13C4 PFOA



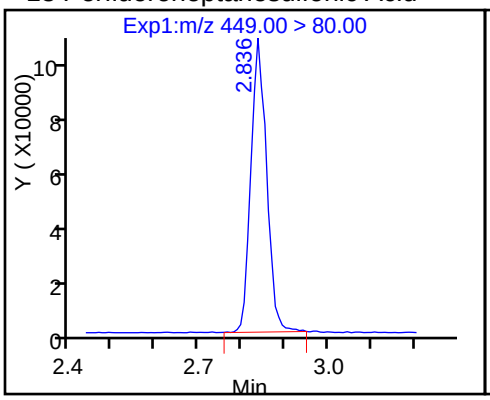
15 Perfluorooctanoic acid



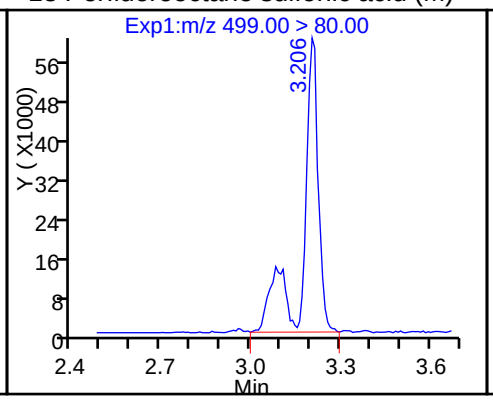
15 Perfluorooctanoic acid



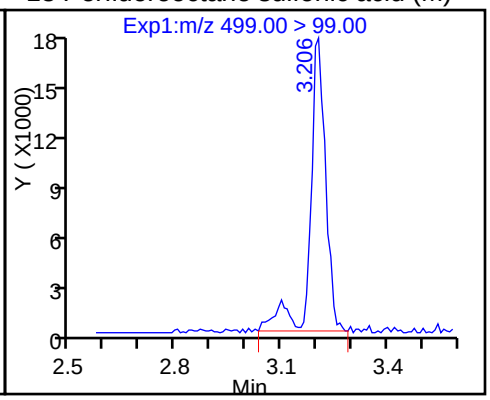
13 Perfluoroheptanesulfonic Acid



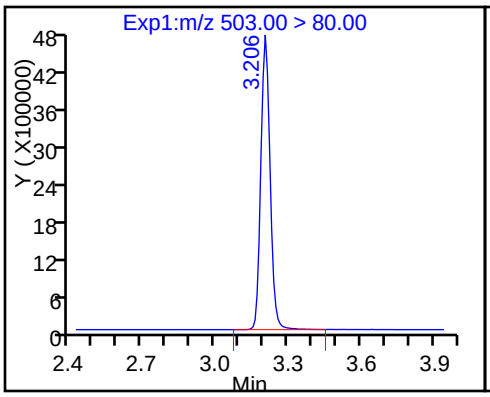
18 Perfluorooctane sulfonic acid (M)



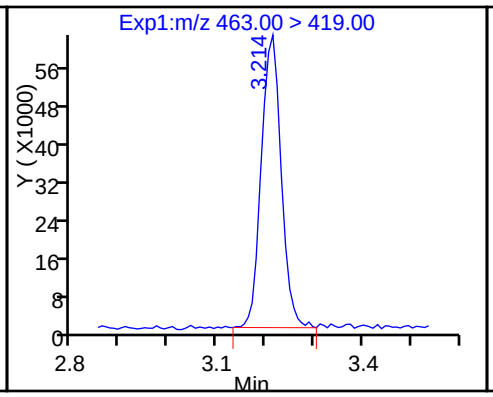
18 Perfluorooctane sulfonic acid (M)



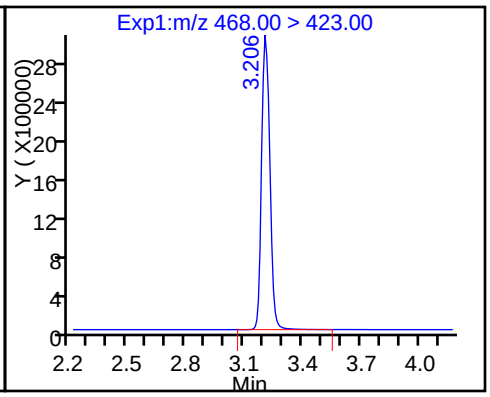
D 17 13C4 PFOS



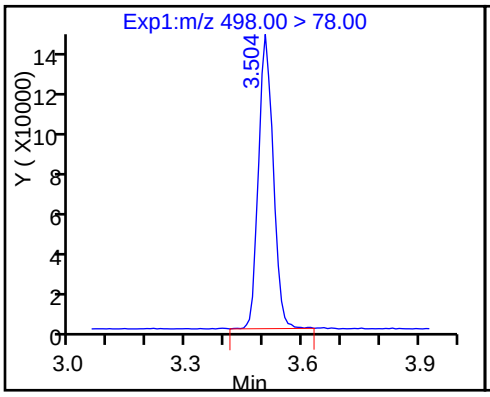
20 Perfluorononanoic acid



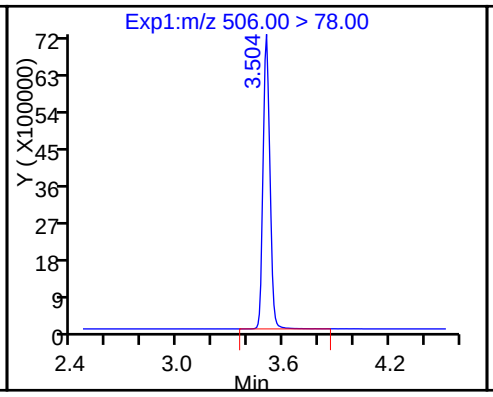
D 19 13C5 PFNA



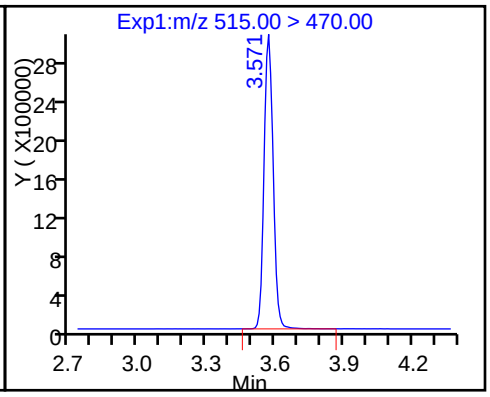
22 Perfluorooctane Sulfonamide



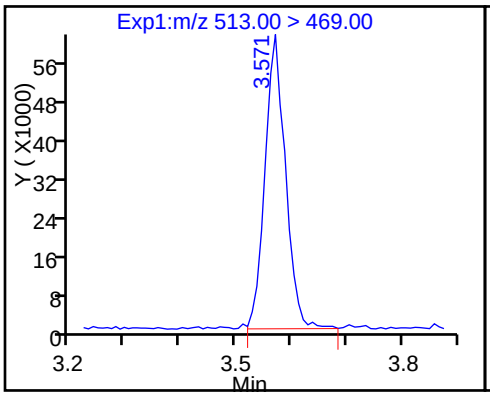
D 21 13C8 FOSA



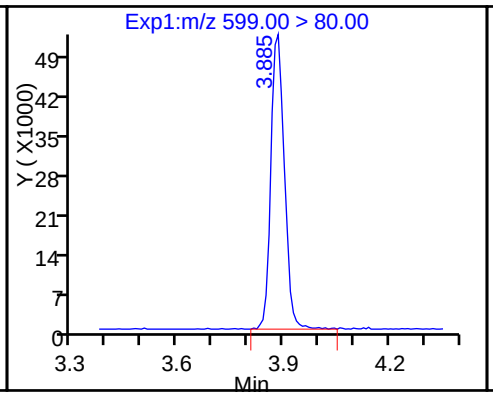
D 23 13C2 PFDA



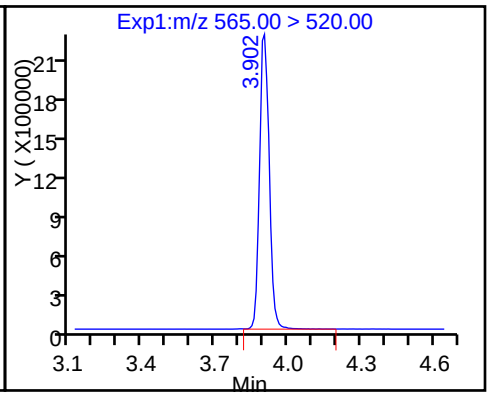
24 Perfluorodecanoic acid



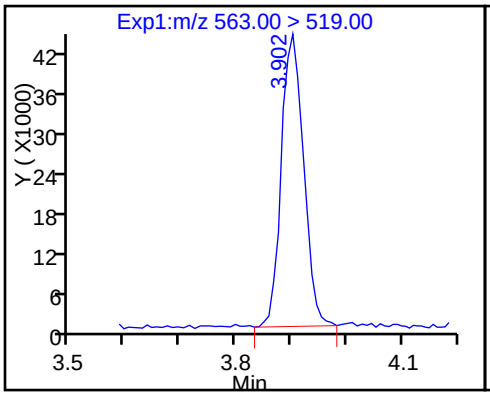
26 Perfluorodecane Sulfonic acid



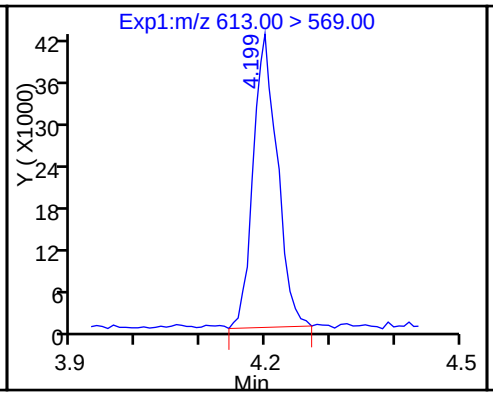
D 27 13C2 PFUnA



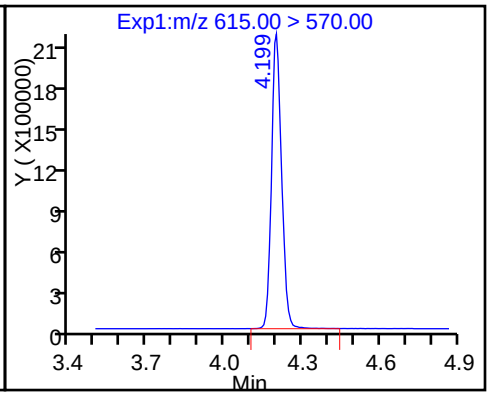
28 Perfluoroundecanoic acid



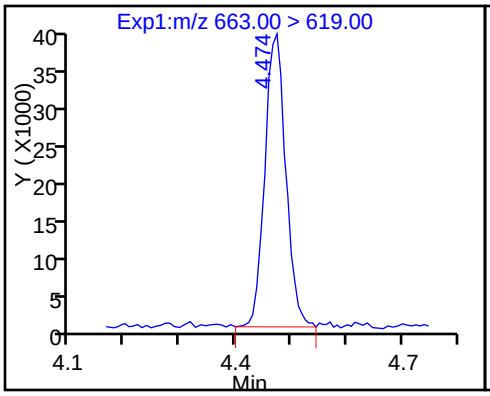
29 Perfluorododecanoic acid



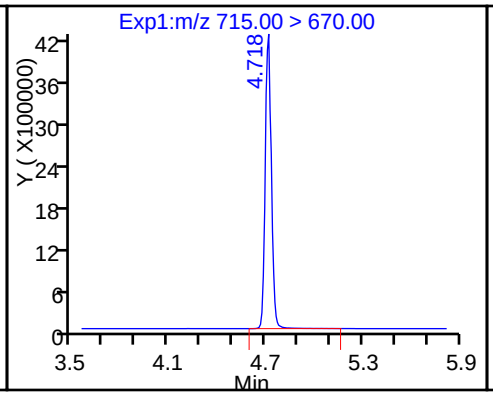
D 30 13C2 PFDoA



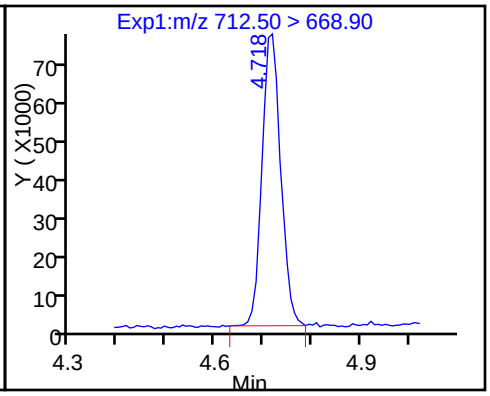
31 Perfluorotridecanoic acid



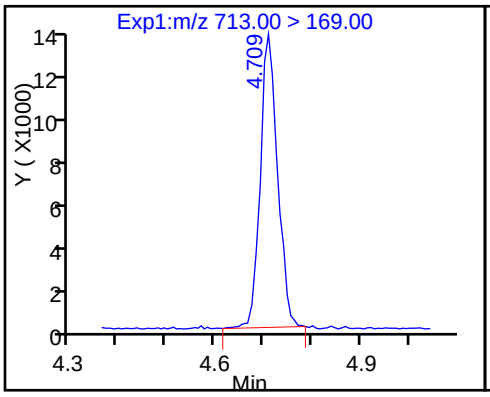
D 32 13C2-PFTeDA



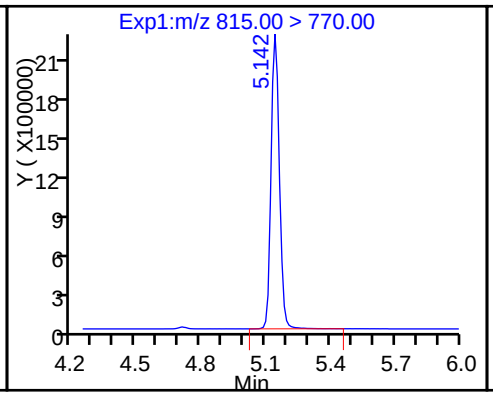
33 Perfluorotetradecanoic acid



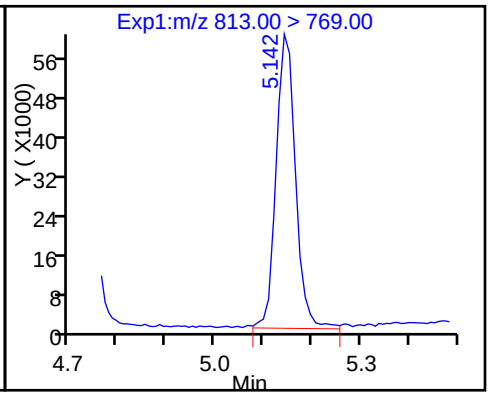
33 Perfluorotetradecanoic acid



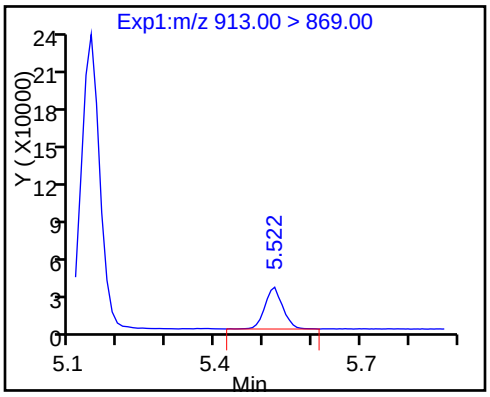
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

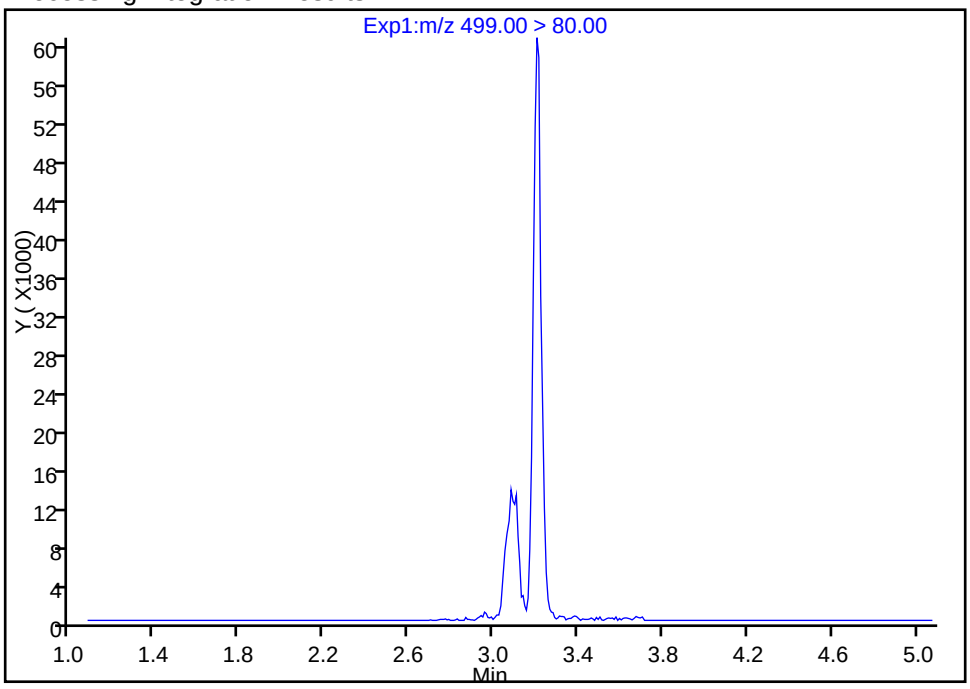
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161228-38280.b\28DEC2016A_005.d
Injection Date: 28-Dec-2016 16:51:42 Instrument ID: A8_N
Lims ID: CCV L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

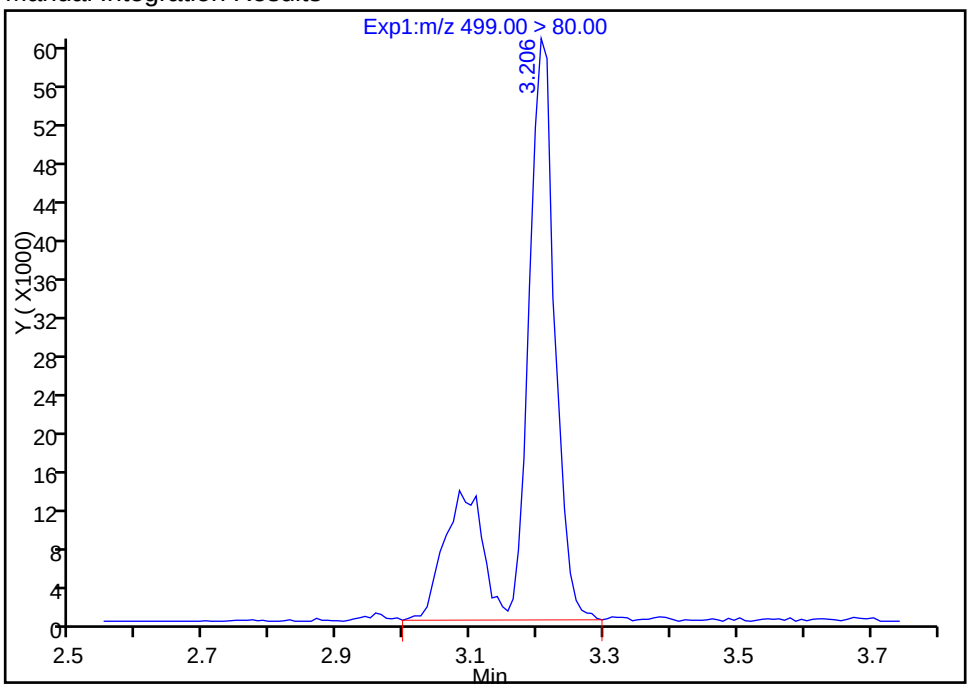
Not Detected
Expected RT: 3.08

Processing Integration Results



Manual Integration Results

RT: 3.21
Area: 214680
Amount: 0.820274
Amount Units: ng/ml



Reviewer: phomsophat, 29-Dec-2016 08:10:27
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

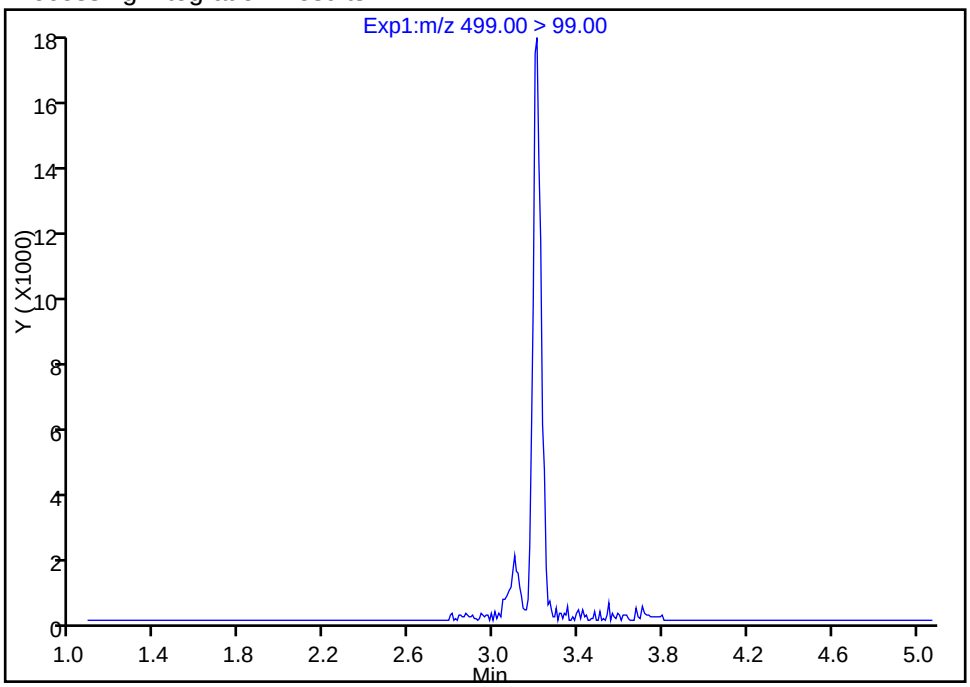
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161228-38280.b\28DEC2016A_005.d
Injection Date: 28-Dec-2016 16:51:42 Instrument ID: A8_N
Lims ID: CCV L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

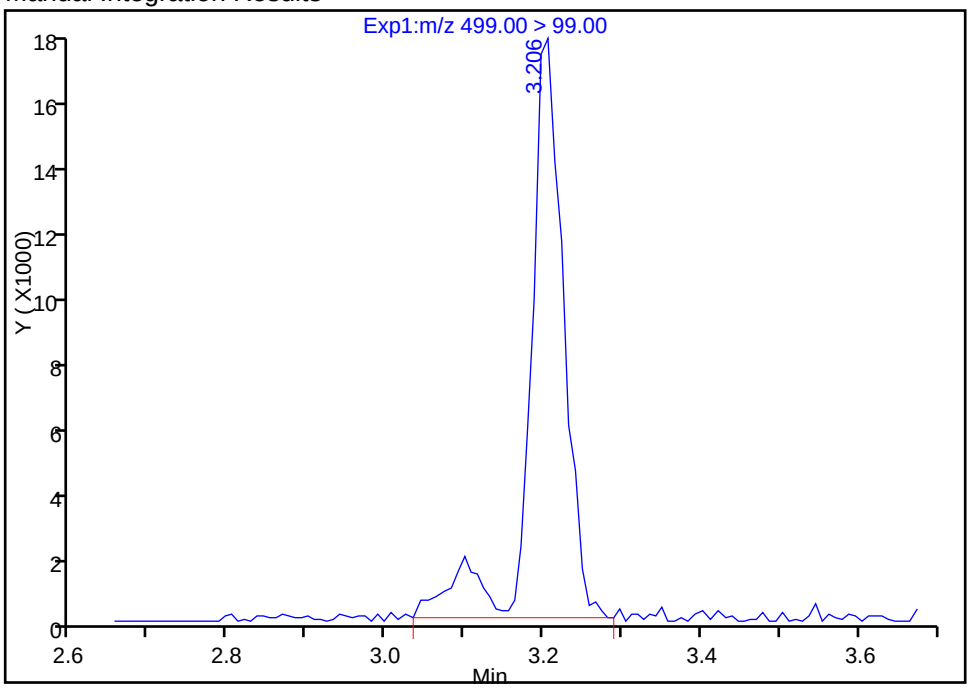
Processing Integration Results

Not Detected
Expected RT: 3.08



Manual Integration Results

RT: 3.21
Area: 51818
Amount: 0.820274
Amount Units: ng/ml



Reviewer: phomsophat, 29-Dec-2016 08:10:27
Audit Action: Manually Integrated Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144253/1 Calibration Date: 12/28/2016 23:51

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 28DEC2016C_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9184		53.8	50.0	7.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.004		50.9	50.0	1.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.571		49.0	44.2	10.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9262		49.9	50.0	-0.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.039		45.9	45.5	0.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9668		49.4	50.0	-1.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.014		50.5	50.0	1.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.159		50.1	47.6	5.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.020		47.6	46.4	2.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9429		49.5	50.0	-0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9367		50.2	50.0	0.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9134		48.4	50.0	-3.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6145		50.7	48.2	5.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9734		50.9	50.0	1.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9555		52.0	50.0	4.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9470		52.2	50.0	4.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.767		55.7	50.0	11.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9675		50.1	50.0	0.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.9509		46.1	50.0	-7.7	25.0
13C4 PFBA	Ave	347743	332486		47.8	50.0	-4.4	50.0
13C5-PFPeA	Ave	266072	256668		48.2	50.0	-3.5	50.0
13C2 PFHxA	Ave	245110	233864		47.7	50.0	-4.6	50.0
13C4-PFHpA	Ave	226344	205873		45.5	50.0	-9.0	50.0
18O2 PFHxS	Ave	326976	311153		45.0	47.3	-4.8	50.0
13C4 PFOA	Ave	230362	203726		44.2	50.0	-11.6	50.0
13C4 PFOS	Ave	248847	241553		46.4	47.8	-2.9	50.0
13C5 PFNA	Ave	177687	158038		44.5	50.0	-11.1	50.0
13C8 FOSA	Ave	384141	368886		48.0	50.0	-4.0	50.0
13C2 PFDA	Ave	157302	145119		46.1	50.0	-7.7	50.0
13C2 PFUnA	Ave	117250	102694		43.8	50.0	-12.4	50.0
13C2 PFDoA	Ave	110957	94764		42.7	50.0	-14.6	50.0
13C2-PFTeDA	Ave	227387	193811		42.6	50.0	-14.8	50.0
13C2-PFHxDA	Ave	124568	104139		41.8	50.0	-16.4	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_001.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 28-Dec-2016 23:51:58 ALS Bottle#: 41 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Dec-2016 17:01:08 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:01:08

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		16624320	47.8		95.6	925377	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	15266981	53.8		108	110446	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		12833423	48.2		96.5	1316019	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	12888689	50.9		102	177404	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	21604204	49.0		111		
298.90 > 99.00	1.849	1.849	0.0	1.000	10146627		2.13(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.097	2.097	0.0		11693176	47.7		95.4	619154	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.097	2.097	0.0	1.000	10830616	49.9		99.7	231755	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.422	2.422	0.0	1.000	14709912	45.9		101		
D 11 13C4-PFHpA										
367.00 > 322.00	2.429	2.429	0.0		10293642	45.5		91.0	624414	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.429	2.429	0.0	1.000	9952085	49.4		98.8	82047	
D 10 18O2 PFHxS										
403.00 > 84.00	2.452	2.452	0.0		14717535	45.0		95.2	2635796	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.790	2.790	0.0	1.000	10327177	50.5		101	125041	
413.00 > 169.00	2.790	2.790	0.0	1.000	6394459		1.62(0.90-1.10)		334298	
D 14 13C4 PFOA										
417.00 > 372.00	2.790	2.790	0.0		10186279	44.2		88.4	494871	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.798	2.798	0.0	1.000	13327794	50.1		105		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.134	3.134	0.0	1.000	11428139	47.6		103	102690	
499.00 > 99.00	3.126	3.134	-0.008	0.997	2551692		4.48(0.90-1.10)		25550	
D 17 13C4 PFOS										
503.00 > 80.00	3.158	3.158	0.0		11546223	46.4		97.1	228118	
20 Perfluorononanoic acid										
463.00 > 419.00	3.158	3.158	0.0	1.000	7450382	49.5		99.1	133158	
D 19 13C5 PFNA										
468.00 > 423.00	3.166	3.166	0.0		7901917	44.5		88.9	333521	
D 21 13C8 FOSA										
506.00 > 78.00	3.481	3.481	0.0		18444294	48.0		96.0	492872	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.481	3.481	0.0	1.000	17276703	50.2		100	384812	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.523	3.523	0.0	1.000	6627751	48.4		96.8	219166	
D 23 13C2 PFDA										
515.00 > 470.00	3.523	3.523	0.0		7255928	46.1		92.3	267881	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.834	3.834	0.0	1.000	7154348	50.7		105		
D 27 13C2 PFUnA										
565.00 > 520.00	3.851	3.851	0.0		5134724	43.8		87.6	381125	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.851	3.851	0.0	1.000	4997905	50.9		102	127088	
D 30 13C2 PFDoA										
615.00 > 570.00	4.134	4.134	0.0		4738189	42.7		85.4	135575	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.141	4.141	0.0	1.000	4527542	52.0		104	111125	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.404	4.404	0.0	1.000	4486883	52.2		104	95678	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.652	4.652	0.0		9690572	42.6		85.2	825947	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.652	4.652	0.0	1.000	8371714	55.7		111	135933	
713.00 > 169.00	4.643	4.652	-0.009	0.998	1282949		6.53(0.00-0.00)		116932	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.069	5.069	0.0		5206932	41.8		83.6	88741	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.069	5.069	0.0	1.000	4584090	50.1		100	4999	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.421	5.421	0.0	1.000	4505672	46.1		92.3	5951	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 29-Dec-2016 17:01:09 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_001.d

Injection Date: 28-Dec-2016 23:51:58 Instrument ID: A8_N

Lims ID: CCV L5

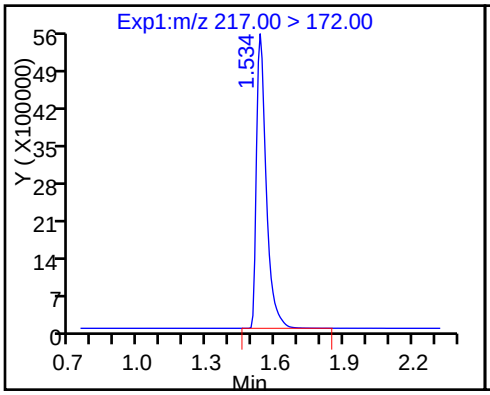
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 1

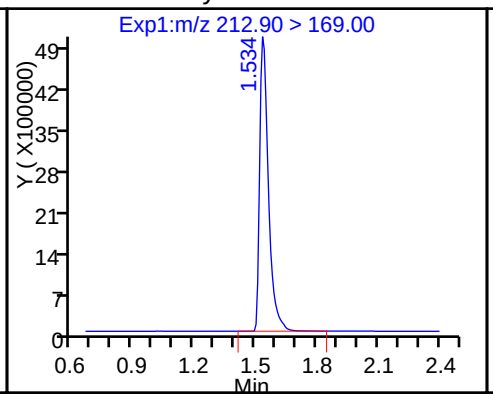
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

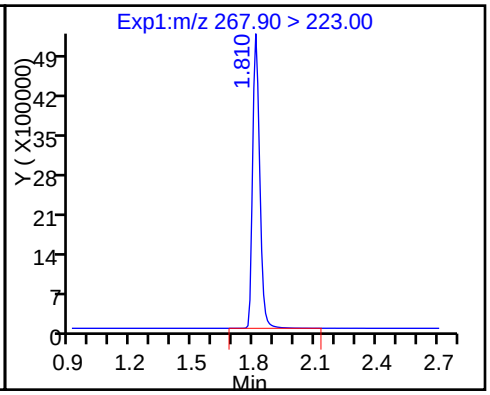
D 2 13C4 PFBA



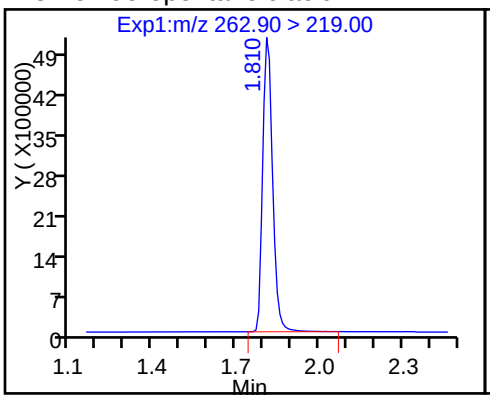
1 Perfluorobutyric acid



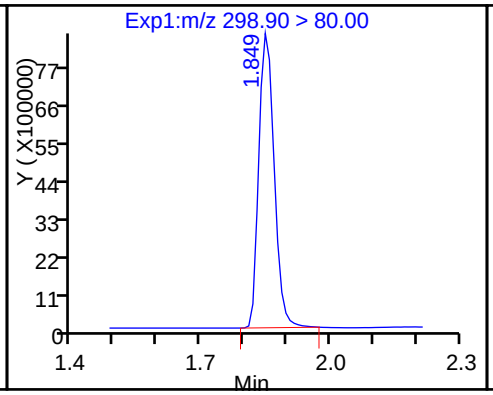
D 4 13C5-PFPeA



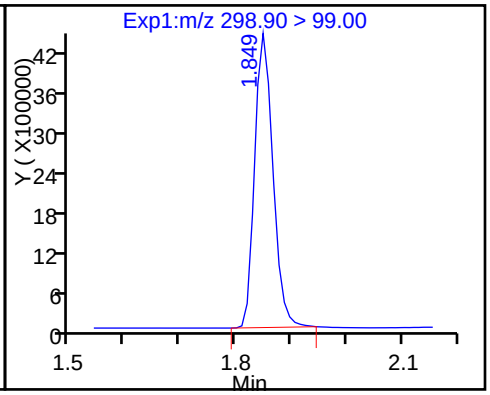
3 Perfluoropentanoic acid



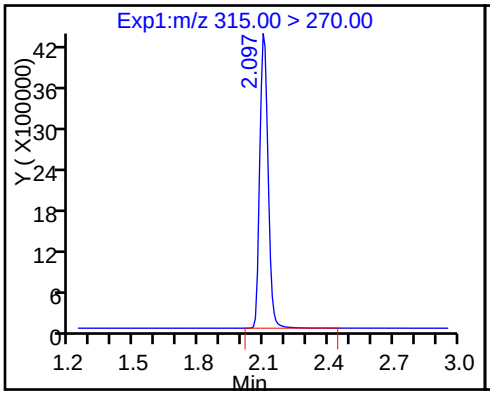
5 Perfluorobutanesulfonic acid



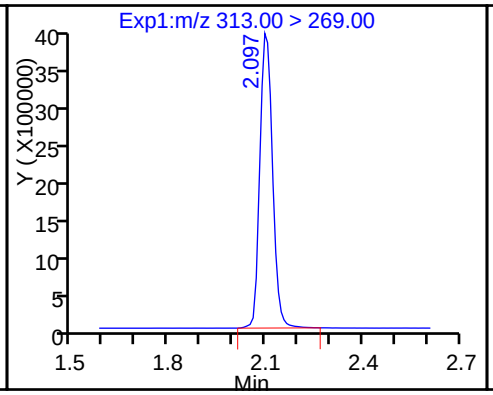
5 Perfluorobutanesulfonic acid



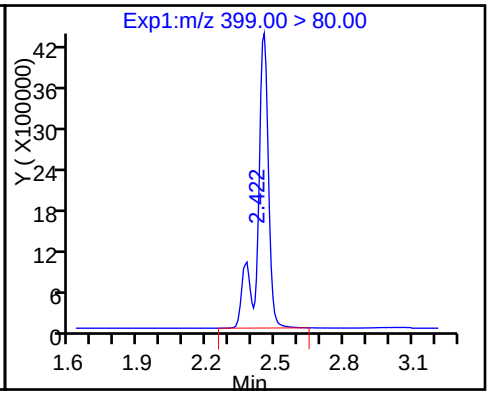
D 6 13C2 PFHxA



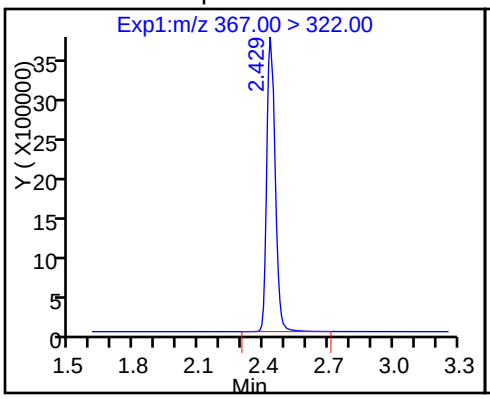
7 Perfluorohexanoic acid



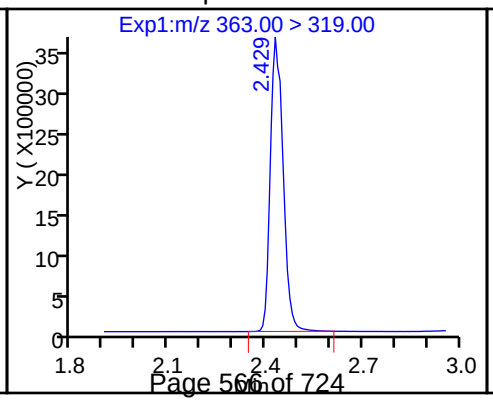
9 Perfluorohexanesulfonic acid



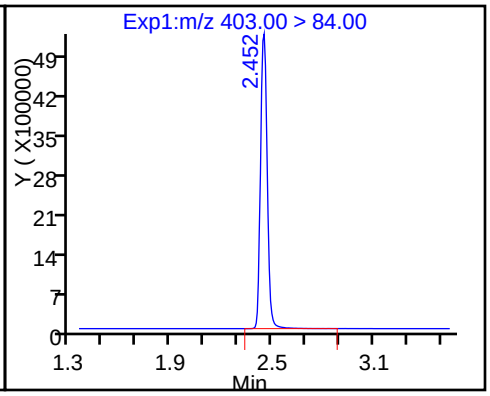
D 11 13C4-PFHpA



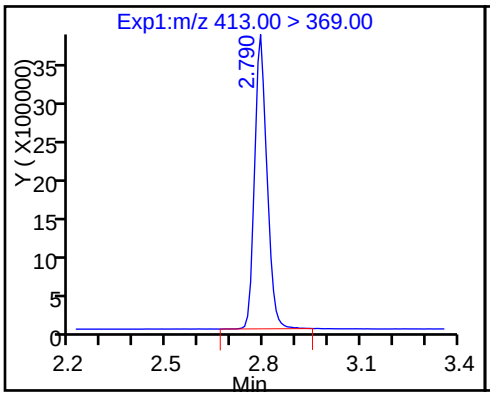
12 Perfluoroheptanoic acid



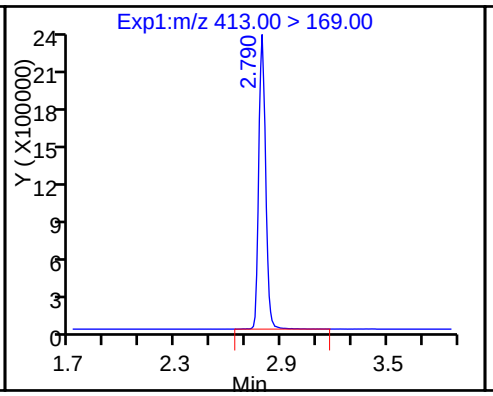
D 10 18O2 PFHxS



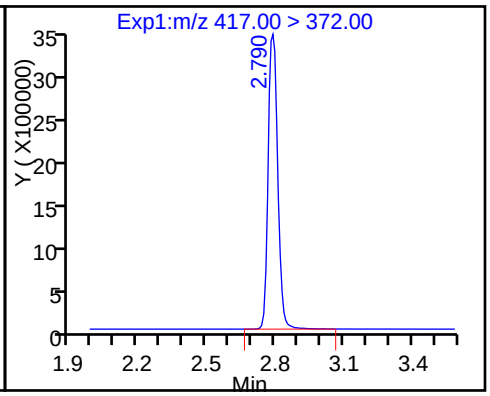
15 Perfluorooctanoic acid



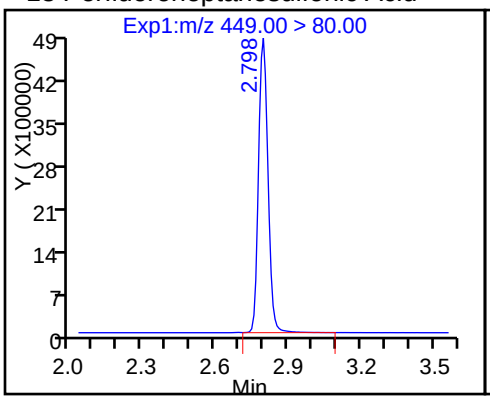
15 Perfluorooctanoic acid



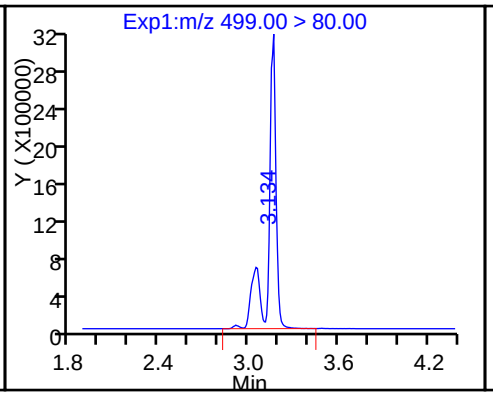
D 14 13C4 PFOA



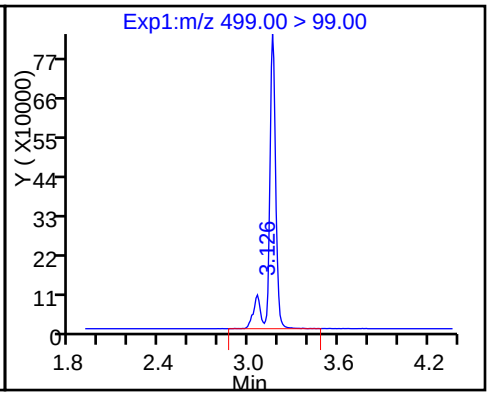
13 Perfluoroheptanesulfonic Acid



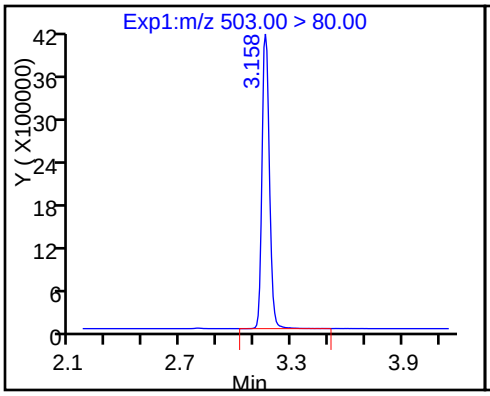
18 Perfluorooctane sulfonic acid



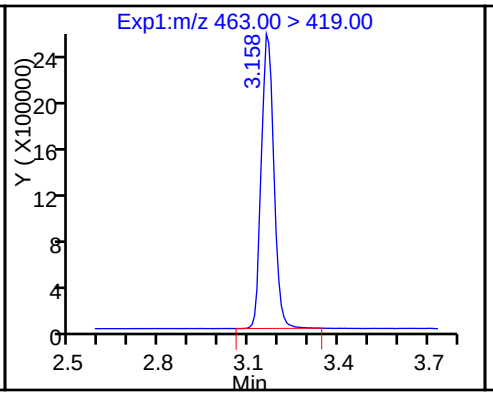
18 Perfluorooctane sulfonic acid



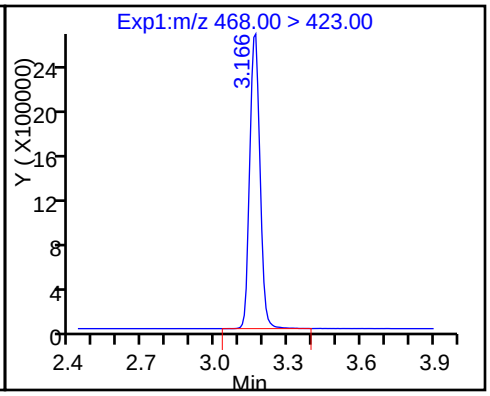
D 17 13C4 PFOS



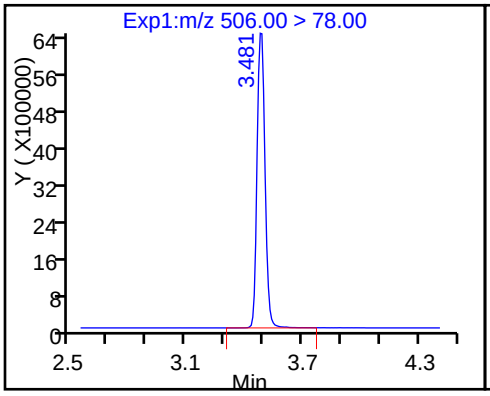
20 Perfluorononanoic acid



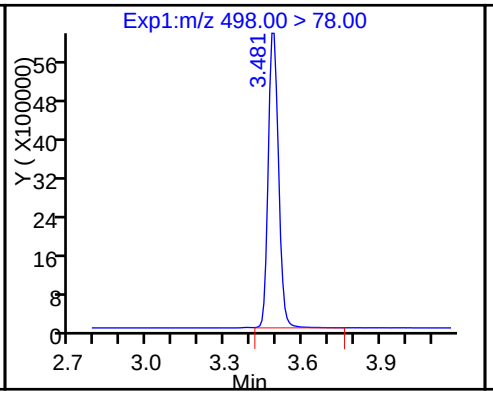
D 19 13C5 PFNA



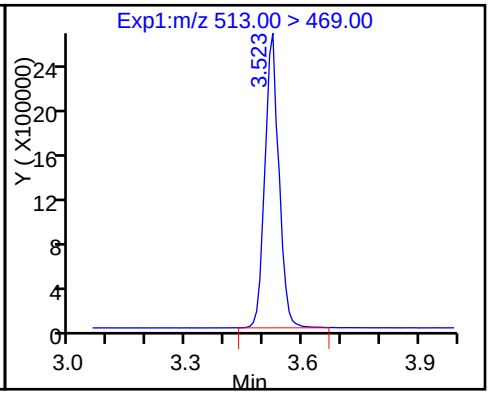
D 21 13C8 FOSA



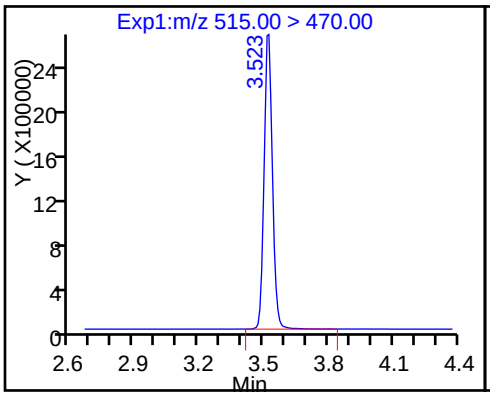
22 Perfluorooctane Sulfonamide



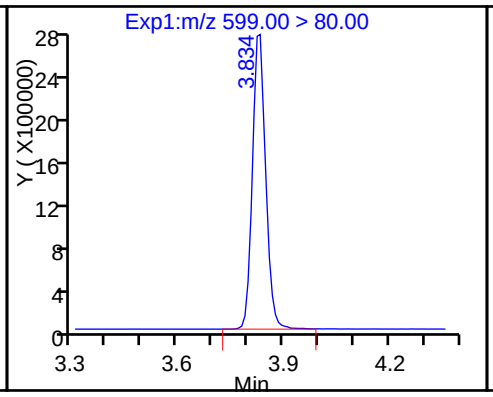
24 Perfluorodecanoic acid



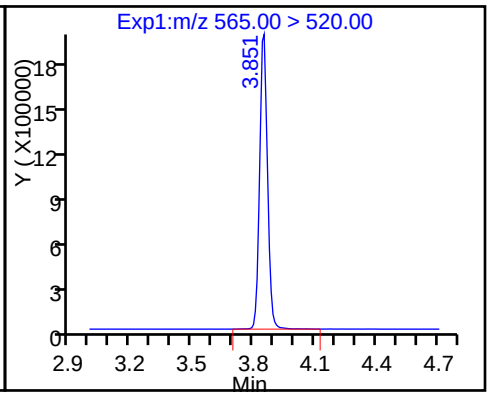
D 23 13C2 PFDA



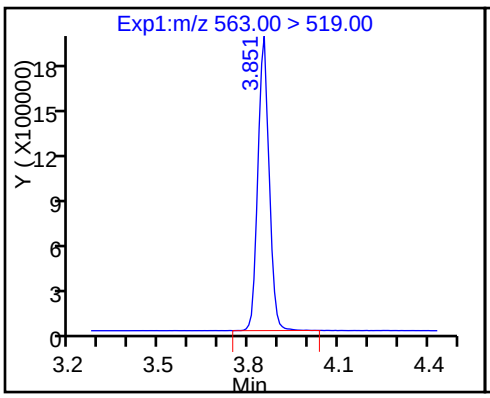
26 Perfluorodecane Sulfonic acid



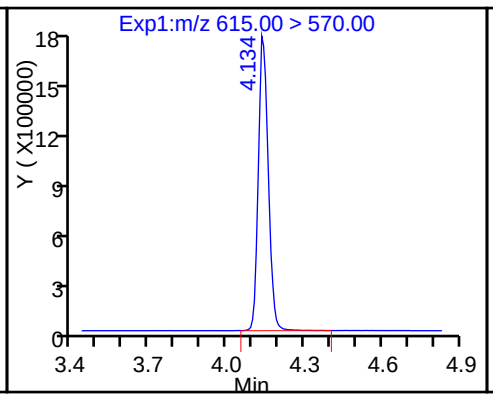
D 27 13C2 PFUnA



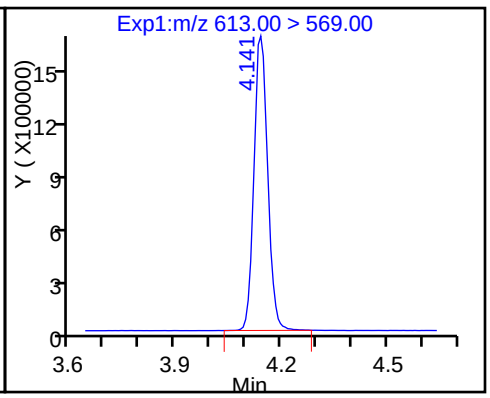
28 Perfluoroundecanoic acid



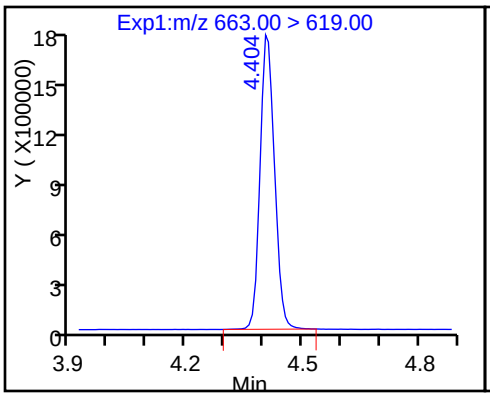
D 30 13C2 PFDoA



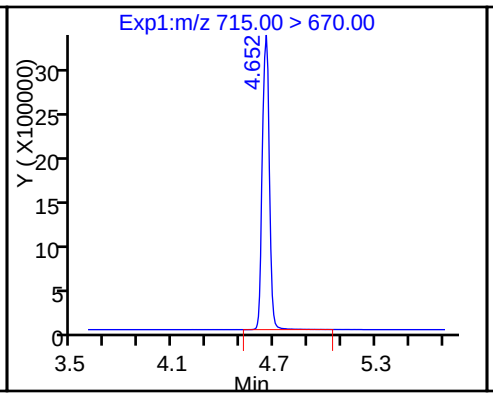
29 Perfluorododecanoic acid



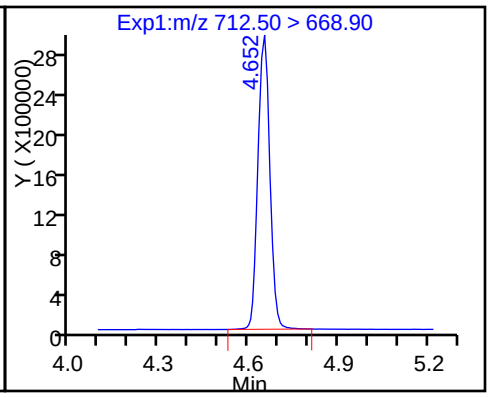
31 Perfluorotridecanoic acid



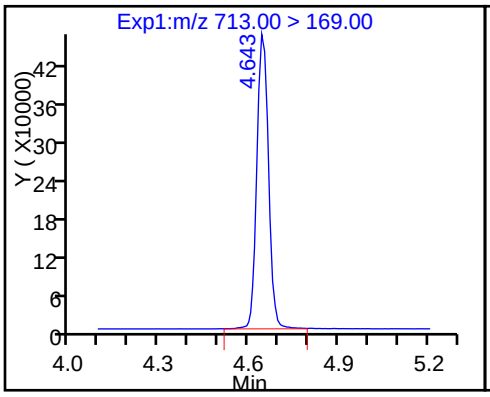
D 32 13C2-PFTeDA



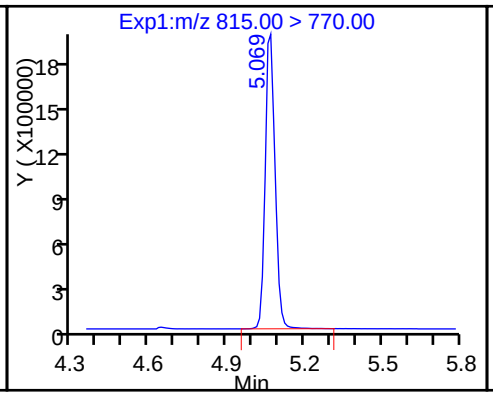
33 Perfluorotetradecanoic acid



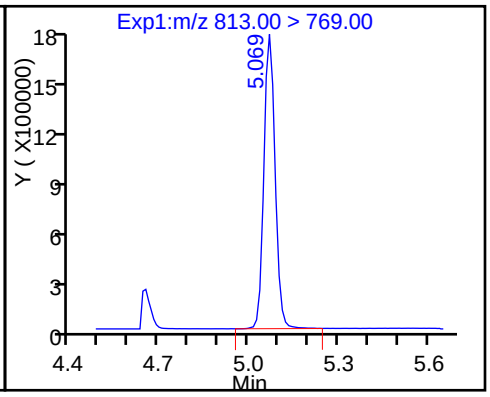
33 Perfluorotetradecanoic acid



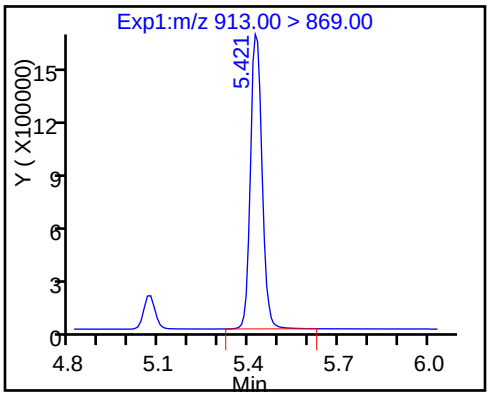
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144253/13 Calibration Date: 12/29/2016 01:22

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 28DEC2016C_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9514		22.3	20.0	11.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.068		21.6	20.0	8.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.668		20.8	17.7	17.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9850		21.2	20.0	6.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.124		19.9	18.2	9.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.016		20.8	20.0	3.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.272		22.0	19.0	15.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.090		21.7	20.0	8.6	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.254		23.4	18.6	26.1*	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9750		20.5	20.0	2.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9669		20.7	20.0	3.7	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9733		20.6	20.0	3.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6138		20.3	19.3	5.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9948		20.8	20.0	4.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9697		21.1	20.0	5.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9223		20.3	20.0	1.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.902		24.0	20.0	20.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.009		20.5	20.0	2.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.9673		18.8	20.0	-6.1	25.0
13C4 PFBA	Ave	347743	342518		49.2	50.0	-1.5	50.0
13C5-PFPeA	Ave	266072	262744		49.4	50.0	-1.3	50.0
13C2 PFHxA	Ave	245110	238568		48.7	50.0	-2.7	50.0
13C4-PFHpA	Ave	226344	211766		46.8	50.0	-6.4	50.0
18O2 PFHxS	Ave	326976	335196		48.5	47.3	2.5	50.0
13C4 PFOA	Ave	230362	214043		46.5	50.0	-7.1	50.0
13C4 PFOS	Ave	248847	245728		47.2	47.8	-1.3	50.0
13C5 PFNA	Ave	177687	162840		45.8	50.0	-8.4	50.0
13C8 FOSA	Ave	384141	381422		49.6	50.0	-0.7	50.0
13C2 PFDA	Ave	157302	144495		45.9	50.0	-8.1	50.0
13C2 PFUnA	Ave	117250	107091		45.7	50.0	-8.7	50.0
13C2 PFDoA	Ave	110957	97562		44.0	50.0	-12.1	50.0
13C2-PFTeDA	Ave	227387	208904		45.9	50.0	-8.1	50.0
13C2-PFHxDA	Ave	124568	110672		44.4	50.0	-11.2	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_013.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 29-Dec-2016 01:22:01 ALS Bottle#: 40 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Dec-2016 17:46:41 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:46:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.525	1.525	0.0		17125907	49.2		98.5	1448463	
1 Perfluorobutyric acid										
212.90 > 169.00	1.525	1.525	0.0	1.000	6517453	22.3		111	41917	
D 4 13C5-PFPeA										
267.90 > 223.00	1.800	1.800	0.0		13137184	49.4		98.7	1037768	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.800	1.800	0.0	1.000	5610971	21.6		108	57269	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.839	1.839	0.0	1.000	9886492	20.8		118		
298.90 > 99.00	1.839	1.839	0.0	1.000	4160873		2.38(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.091	2.091	0.0		11928405	48.7		97.3	722281	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.091	2.091	0.0	1.000	4699929	21.2		106	50077	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.409	2.409	0.0	1.000	6855996	19.9		109		
D 11 13C4-PFHpA										
367.00 > 322.00	2.420	2.420	0.0		10588317	46.8		93.6	426500	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.420	2.420	0.0	1.000	4303153	20.8		104	35744	
D 10 18O2 PFHxS										
403.00 > 84.00	2.440	2.440	0.0		15854752	48.5		103	1155901	
D 14 13C4 PFOA										
417.00 > 372.00	2.776	2.776	0.0		10702171	46.5		92.9	543495	

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	2.783	2.783	0.0	1.000	4665690	21.7		109	40841	
413.00 > 169.00	2.783	2.783	0.0	1.000	2835945		1.65(0.90-1.10)		87156	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.783	2.783	0.0	1.000	5949735	22.0		115		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.040	3.040	0.0	1.000	5718911	23.4		126	22893	
499.00 > 99.00	3.153	3.040	0.113	1.037	1268366		4.51(0.90-1.10)		31102	
D 17 13C4 PFOS										
503.00 > 80.00	3.145	3.145	0.0		11745822	47.2		98.7	426441	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.153	0.0	1.000	3175364	20.5		102	69260	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0		8141980	45.8		91.6	371980	
D 21 13C8 FOSA										
506.00 > 78.00	3.475	3.475	0.0		19071099	49.6		99.3	1404916	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.475	3.475	0.0	1.000	7376087	20.7		104	209667	
D 23 13C2 PFDA										
515.00 > 470.00	3.509	3.509	0.0		7224747	45.9		91.9	167612	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.509	3.509	0.0	1.000	2812790	20.6		103	79992	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.825	3.825	0.0	1.000	2907866	20.3		105		
D 27 13C2 PFUnA										
565.00 > 520.00	3.834	3.834	0.0		5354567	45.7		91.3	281959	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.834	3.834	0.0	1.000	2130686	20.8		104	39405	
D 30 13C2 PFDoA										
615.00 > 570.00	4.126	4.126	0.0		4878096	44.0		87.9	160960	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.133	4.133	0.0	1.000	1892015	21.1		106	44644	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.404	4.404	0.0	1.000	1799712	20.3		102	45896	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.644	4.644	0.0		10445200	45.9		91.9	888356	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.644	4.644	0.0	1.000	3710429	24.0		120	48436	
713.00 > 169.00	4.634	4.644	-0.010	0.998	564729		6.57(0.00-0.00)		72644	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.058	5.058	0.0		5533616	44.4		88.8	97966	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.058	0.0	1.000	1968416	20.5		103	2410	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.414	5.414	0.0	1.000	1887512	18.8		93.9	2374	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 29-Dec-2016 17:46:42 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_013.d

Injection Date: 29-Dec-2016 01:22:01 Instrument ID: A8_N

Lims ID: CCV L4

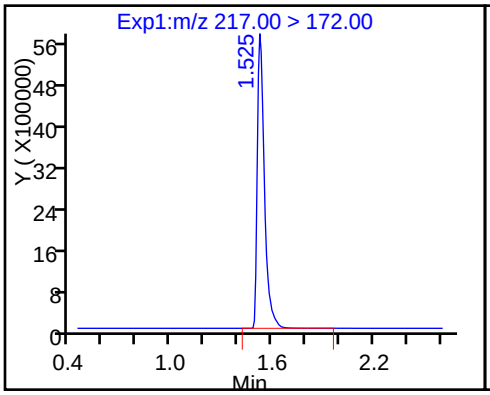
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 13

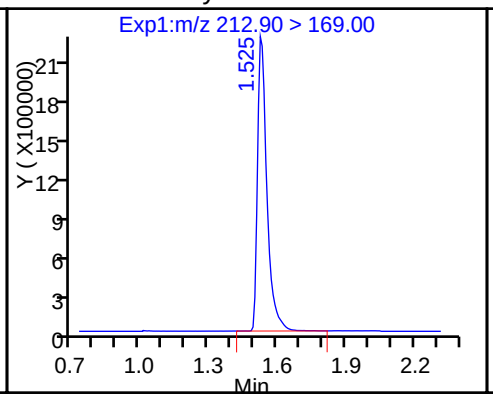
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

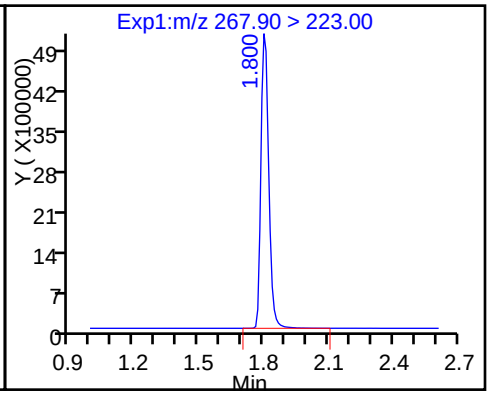
D 2 13C4 PFBA



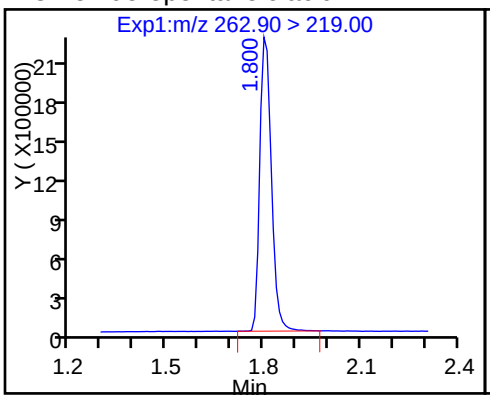
1 Perfluorobutyric acid



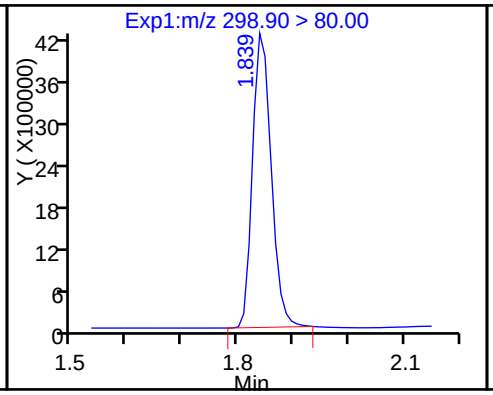
D 4 13C5-PFPeA



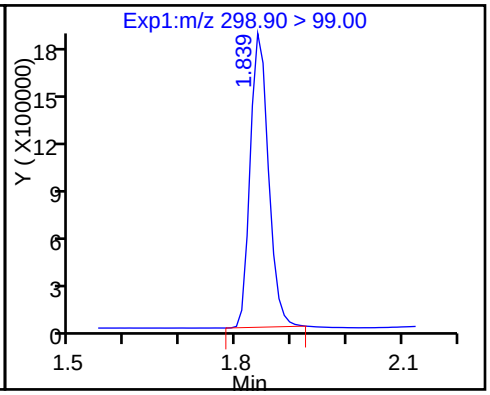
3 Perfluoropentanoic acid



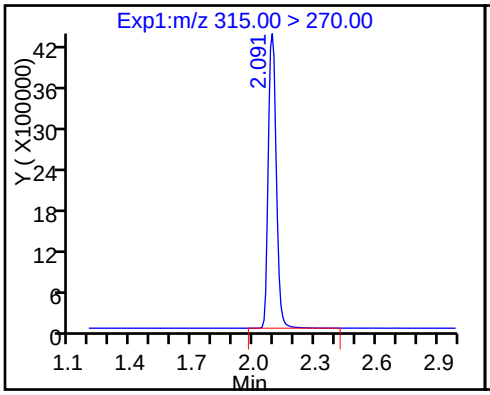
5 Perfluorobutanesulfonic acid



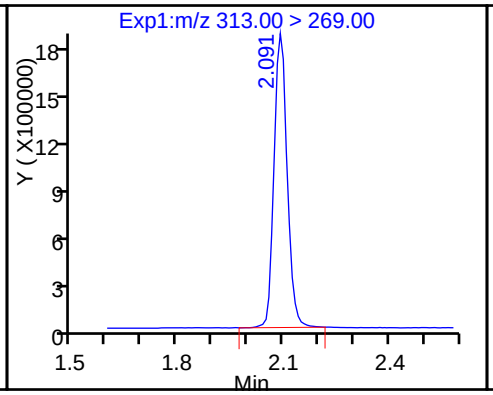
5 Perfluorobutanesulfonic acid



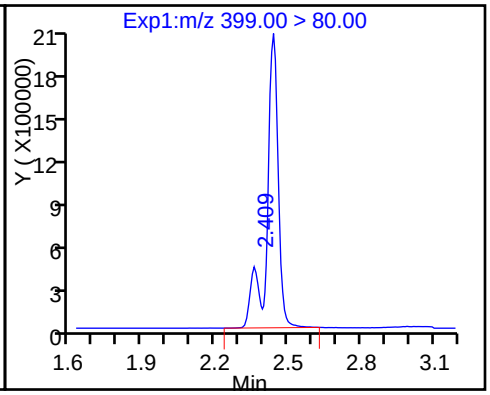
D 6 13C2 PFHxA



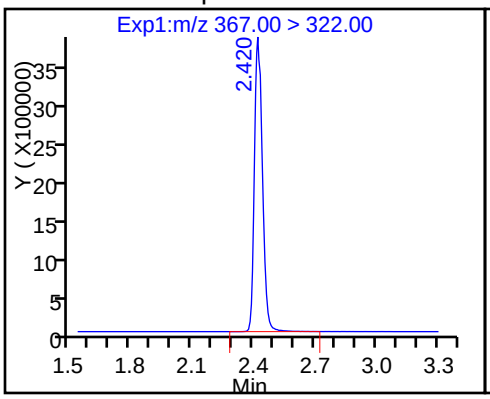
7 Perfluorohexanoic acid



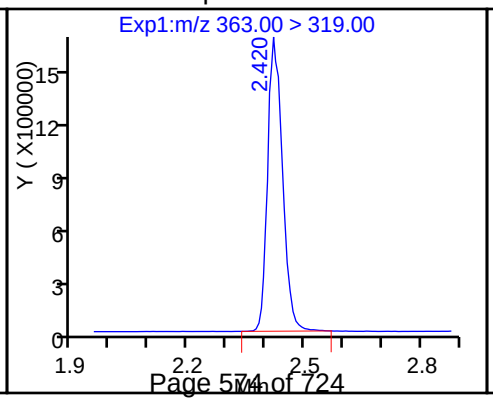
9 Perfluorohexanesulfonic acid



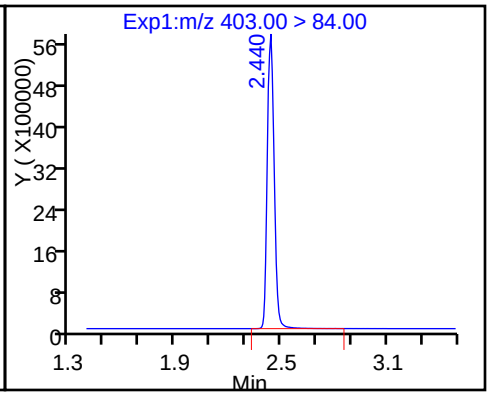
D 11 13C4-PFHpA



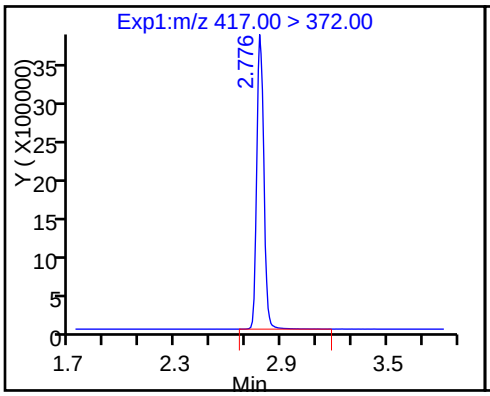
12 Perfluoroheptanoic acid



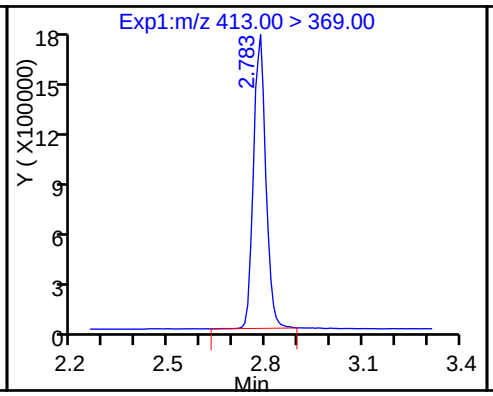
D 10 18O2 PFHxS



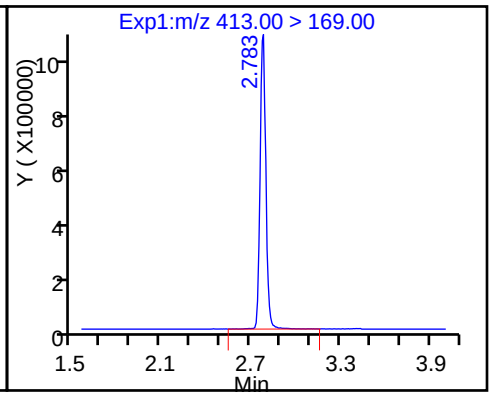
D 14 13C4 PFOA



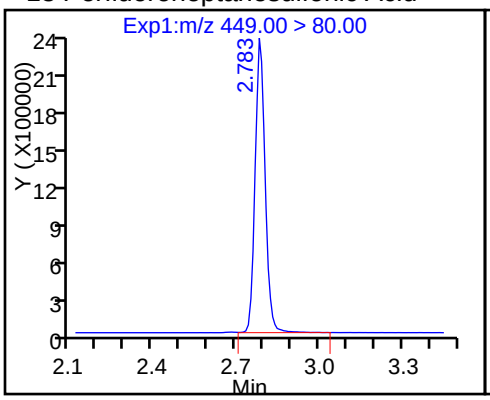
15 Perfluorooctanoic acid



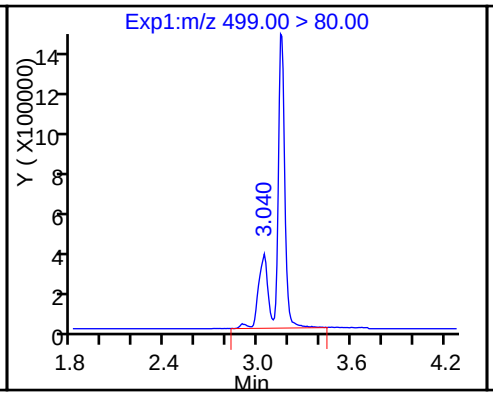
15 Perfluorooctanoic acid



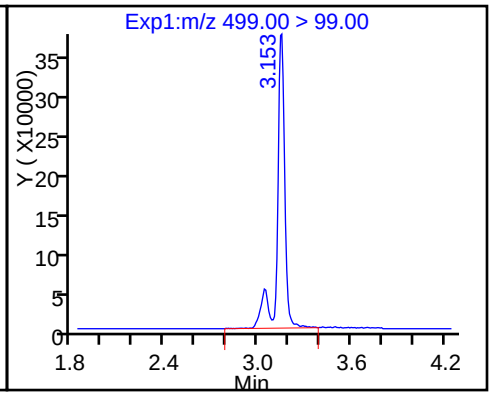
13 Perfluoroheptanesulfonic Acid



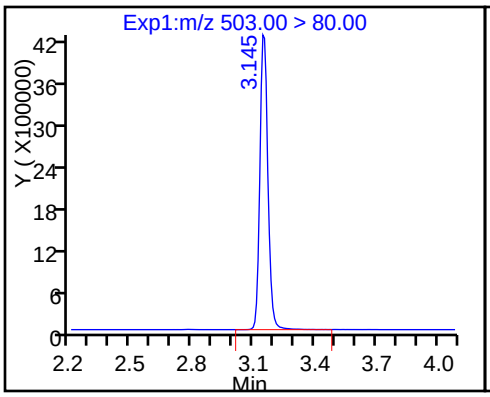
18 Perfluorooctane sulfonic acid



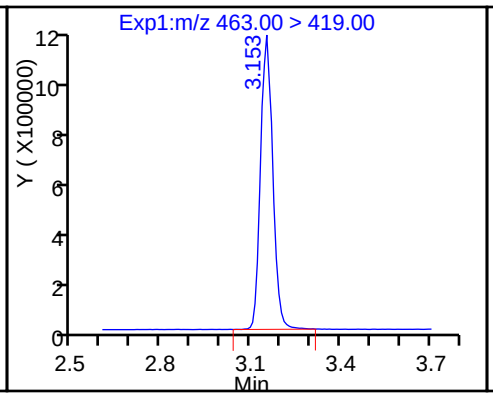
18 Perfluorooctane sulfonic acid



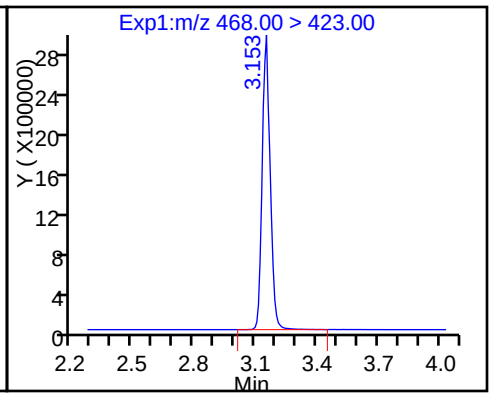
D 17 13C4 PFOS



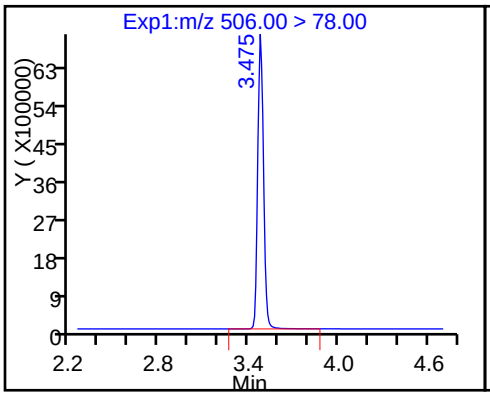
20 Perfluorononanoic acid



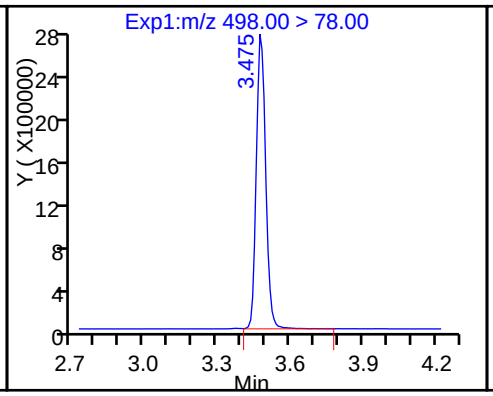
D 19 13C5 PFNA



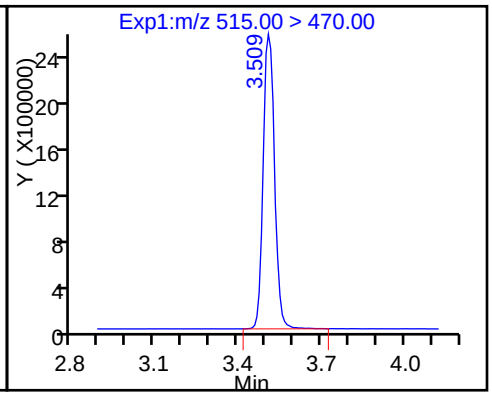
D 21 13C8 FOSA



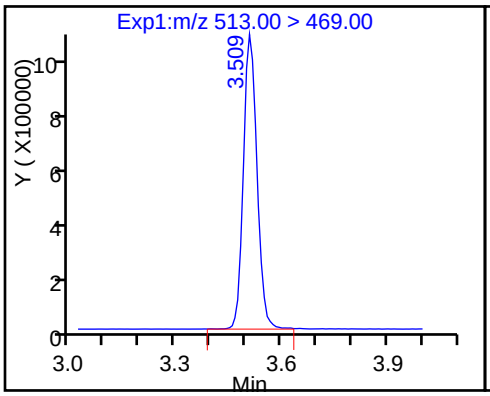
22 Perfluorooctane Sulfonamide



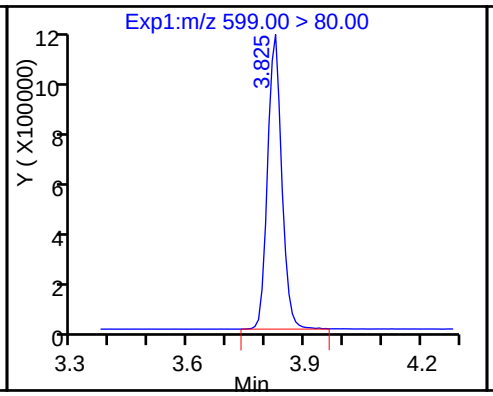
D 23 13C2 PFDA



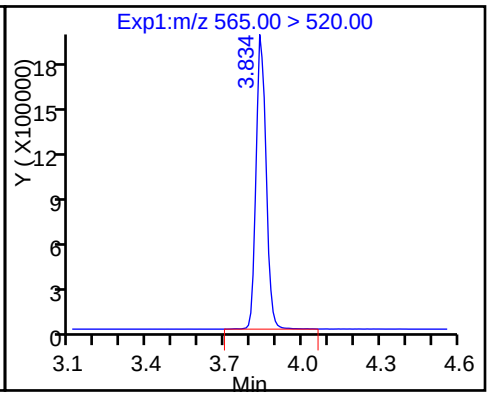
24 Perfluorodecanoic acid



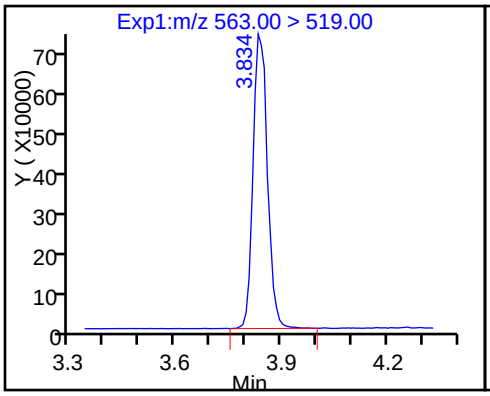
26 Perfluorodecane Sulfonic acid



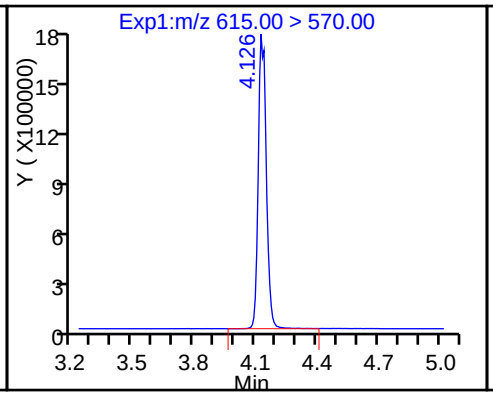
D 27 13C2 PFUnA



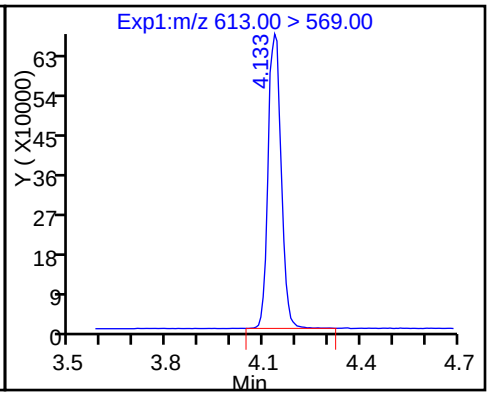
28 Perfluoroundecanoic acid



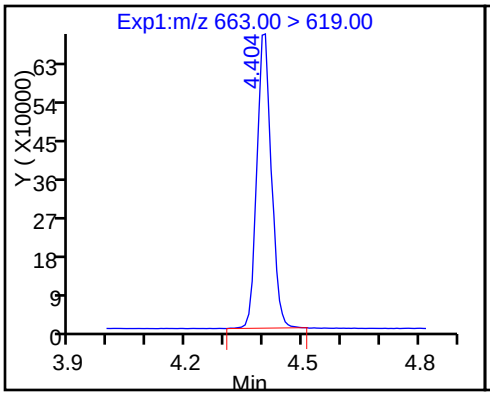
D 30 13C2 PFDoA



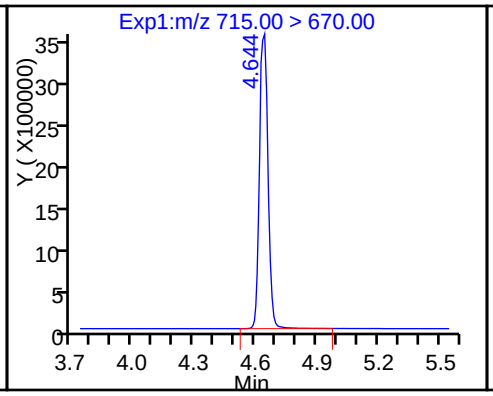
29 Perfluorododecanoic acid



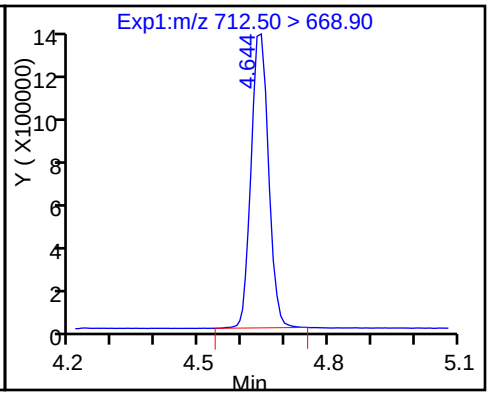
31 Perfluorotridecanoic acid



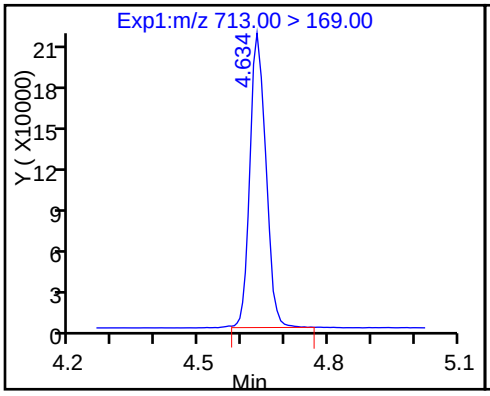
D 32 13C2-PFTeDA



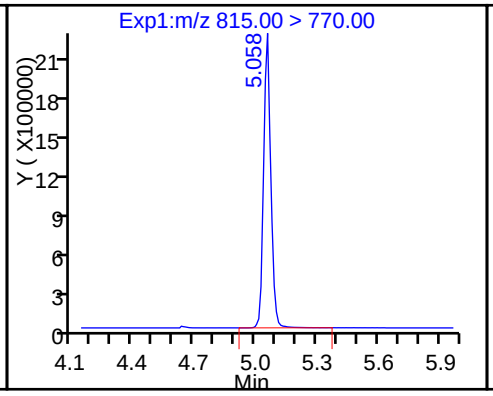
33 Perfluorotetradecanoic acid



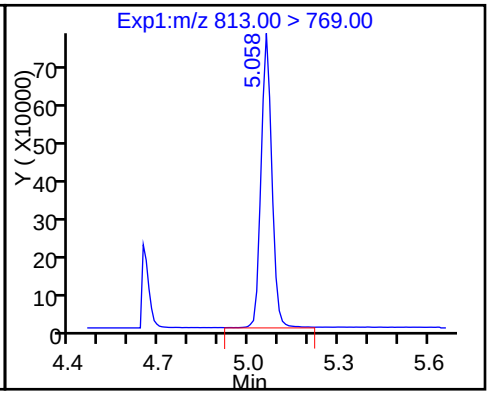
33 Perfluorotetradecanoic acid



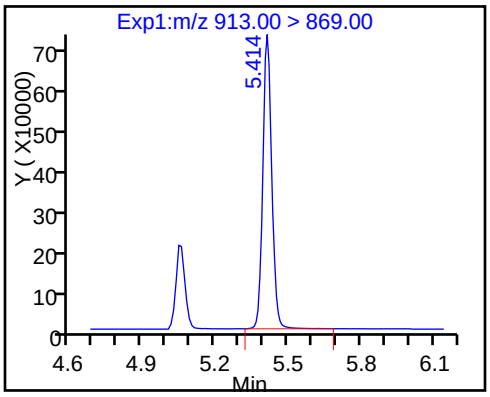
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144253/24 Calibration Date: 12/29/2016 02:44

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 28DEC2016C_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9103		53.3	50.0	6.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.002		50.8	50.0	1.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.518		47.4	44.2	7.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9373		50.5	50.0	0.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9872		50.4	50.0	0.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.017		44.9	45.5	-1.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.014		50.5	50.0	1.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.146		49.5	47.6	4.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.039		48.5	46.4	4.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9749		51.2	50.0	2.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9299		49.9	50.0	-0.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9310		49.3	50.0	-1.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6145		50.7	48.2	5.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9649		50.4	50.0	0.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9297		50.6	50.0	1.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9277		51.1	50.0	2.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.822		57.5	50.0	14.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9504		49.2	50.0	-1.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8968		43.5	50.0	-13.0	25.0
13C4 PFBA	Ave	347743	325636		46.8	50.0	-6.4	50.0
13C5-PFPeA	Ave	266072	251309		47.2	50.0	-5.5	50.0
13C2 PFHxA	Ave	245110	229354		46.8	50.0	-6.4	50.0
13C4-PFHpA	Ave	226344	198107		43.8	50.0	-12.5	50.0
18O2 PFHxS	Ave	326976	316319		45.8	47.3	-3.3	50.0
13C4 PFOA	Ave	230362	201878		43.8	50.0	-12.4	50.0
13C4 PFOS	Ave	248847	239275		46.0	47.8	-3.8	50.0
13C5 PFNA	Ave	177687	153674		43.2	50.0	-13.5	50.0
13C8 FOSA	Ave	384141	369122		48.0	50.0	-3.9	50.0
13C2 PFDA	Ave	157302	142705		45.4	50.0	-9.3	50.0
13C2 PFUnA	Ave	117250	102236		43.6	50.0	-12.8	50.0
13C2 PFDoA	Ave	110957	95597		43.1	50.0	-13.8	50.0
13C2-PFTeDA	Ave	227387	200570		44.1	50.0	-11.8	50.0
13C2-PFHxDA	Ave	124568	107082		43.0	50.0	-14.0	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_024.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 29-Dec-2016 02:44:36 ALS Bottle#: 41 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Dec-2016 18:19:26 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 18:19:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		16281815	46.8		93.6	677597	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	14820494	53.3		107	95898	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		12565456	47.2		94.5	999938	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	12587077	50.8		102	156965	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	21225697	47.4		107		
298.90 > 99.00	1.849	1.849	0.0	1.000	9866236		2.15(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.097	2.097	0.0		11467711	46.8		93.6	833422	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.097	2.097	0.0	1.000	10749072	50.5		101	178961	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.444	2.444	0.0	1.000	14631165	44.9		98.7		
D 11 13C4-PFHpA										
367.00 > 322.00	2.429	2.429	0.0		9905365	43.8		87.5	699380	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.429	2.429	0.0	1.000	9778298	50.4		101	78576	
D 10 18O2 PFHxS										
403.00 > 84.00	2.444	2.444	0.0		14961866	45.8		96.7	1088399	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.782	0.0		10093908	43.8		87.6	720484	

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	2.782	2.782	0.0	1.000	10236784	50.5		101	108198	
413.00 > 169.00	2.782	2.782	0.0	1.000	6391113		1.60(0.90-1.10)		294563	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.790	2.790	0.0	1.000	13050163	49.5		104		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.134	3.134	0.0	1.000	11536175	48.5		104	89792	
499.00 > 99.00	3.150	3.134	0.016	1.005	2519405		4.58(0.90-1.10)		111514	
D 17 13C4 PFOS										
503.00 > 80.00	3.150	3.150	0.0		11437346	46.0		96.2	317387	
20 Perfluorononanoic acid										
463.00 > 419.00	3.150	3.150	0.0	1.000	7491071	51.2		102	153620	
D 19 13C5 PFNA										
468.00 > 423.00	3.150	3.150	0.0		7683680	43.2		86.5	264525	
D 21 13C8 FOSA										
506.00 > 78.00	3.481	3.481	0.0		18456100	48.0		96.1	510613	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.481	3.481	0.0	1.000	17162031	49.9		99.7	561871	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.515	3.515	0.0	1.000	6642927	49.3		98.6	149068	
D 23 13C2 PFDA										
515.00 > 470.00	3.515	3.515	0.0		7135273	45.4		90.7	262734	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.825	3.825	0.0	1.000	7086922	50.7		105		
D 27 13C2 PFUnA										
565.00 > 520.00	3.842	3.842	0.0		5111813	43.6		87.2	231347	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.842	3.842	0.0	1.000	4932270	50.4		101	129727	
D 30 13C2 PFDoA										
615.00 > 570.00	4.134	4.134	0.0		4779865	43.1		86.2	192636	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.134	4.134	0.0	1.000	4443824	50.6		101	121756	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.396	4.396	0.0	1.000	4434488	51.1		102	103218	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.643	4.643	0.0		10028507	44.1		88.2	508850	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.643	4.643	0.0	1.000	8707596	57.5		115	154088	
713.00 > 169.00	4.633	4.643	-0.010	0.998	1309974		6.65(0.00-0.00)		161247	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.058	5.058	0.0		5354087	43.0		86.0	107062	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.058	0.0	1.000	4542769	49.2		98.4	4862	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.413	0.0	1.000	4286501	43.5		87.0	5637	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 29-Dec-2016 18:19:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_024.d

Injection Date: 29-Dec-2016 02:44:36 Instrument ID: A8_N

Lims ID: CCV L5

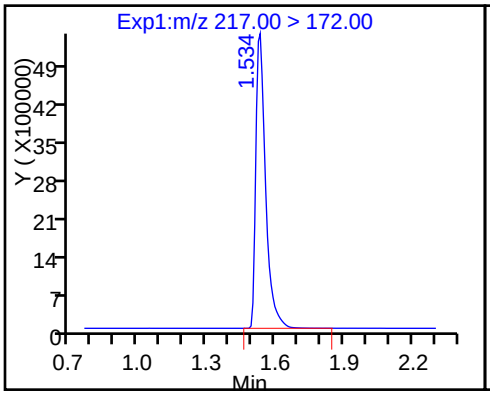
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 24

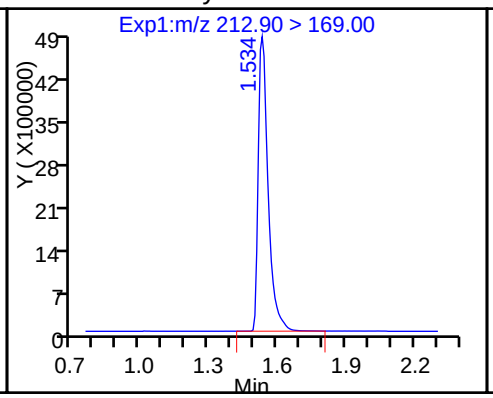
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

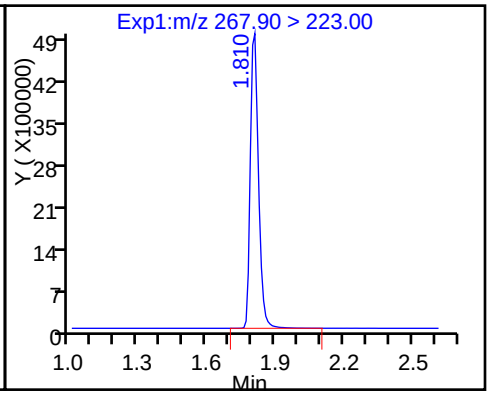
D 2 13C4 PFBA



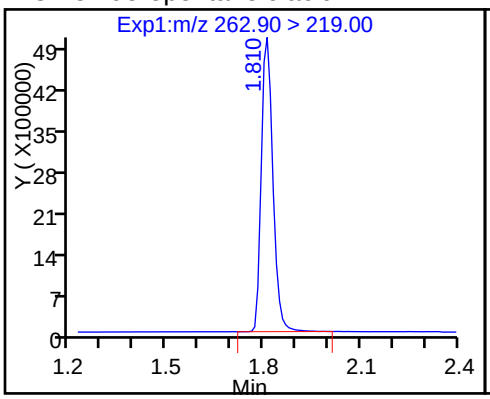
1 Perfluorobutyric acid



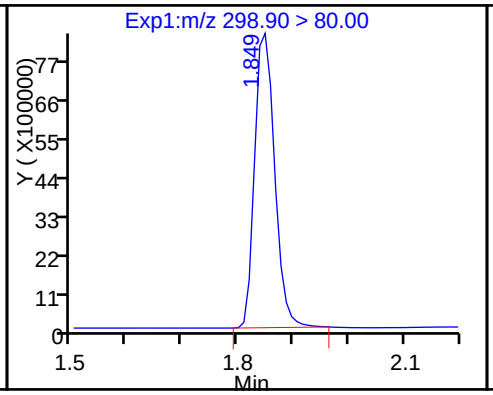
D 4 13C5-PFPeA



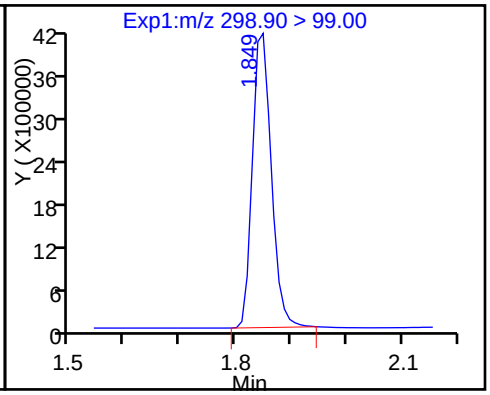
3 Perfluoropentanoic acid



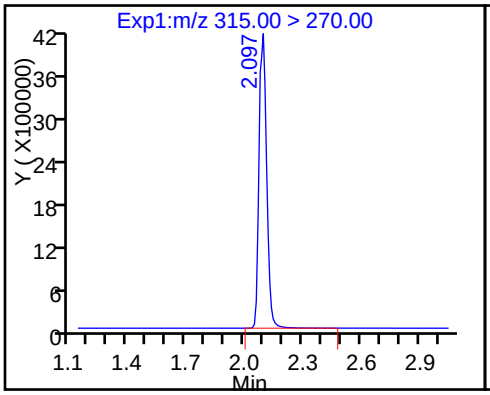
5 Perfluorobutanesulfonic acid



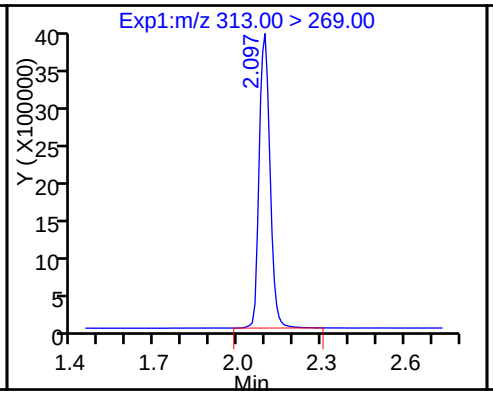
5 Perfluorobutanesulfonic acid



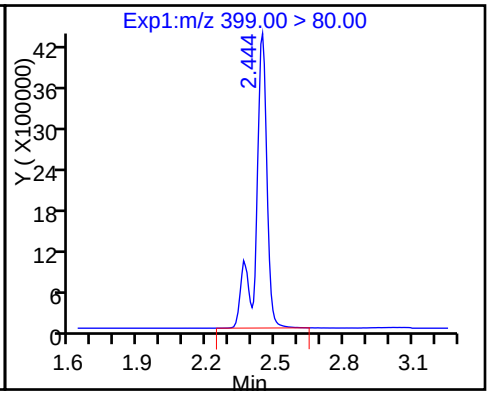
D 6 13C2 PFHxA



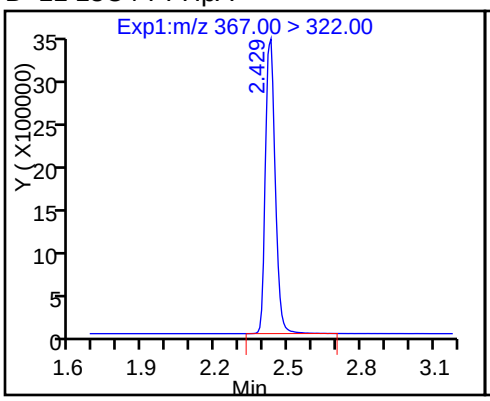
7 Perfluorohexanoic acid



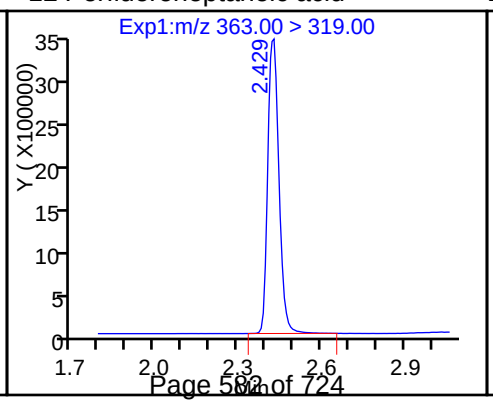
9 Perfluorohexanesulfonic acid



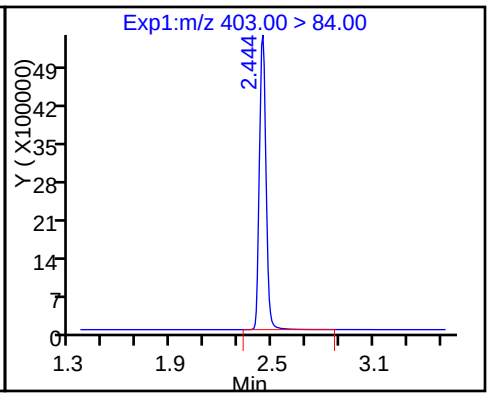
D 11 13C4-PFHpA



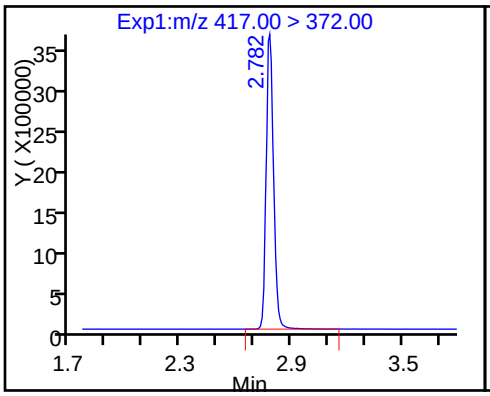
12 Perfluoroheptanoic acid



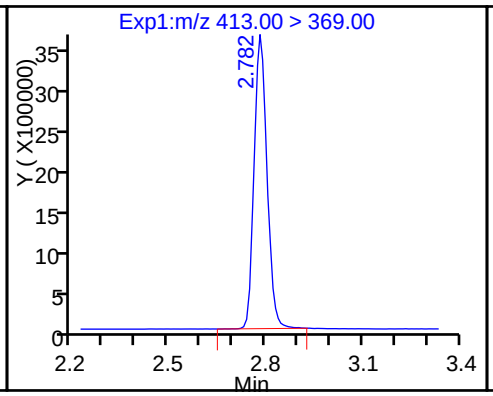
D 10 18O2 PFHxS



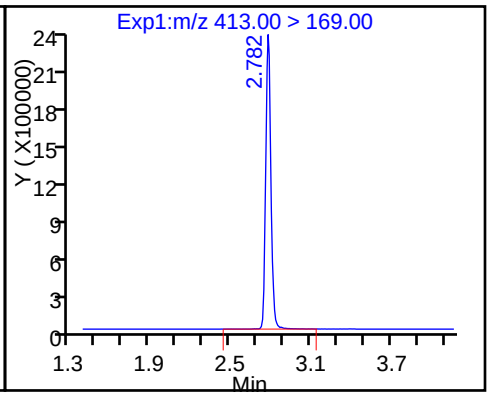
D 14 13C4 PFOA



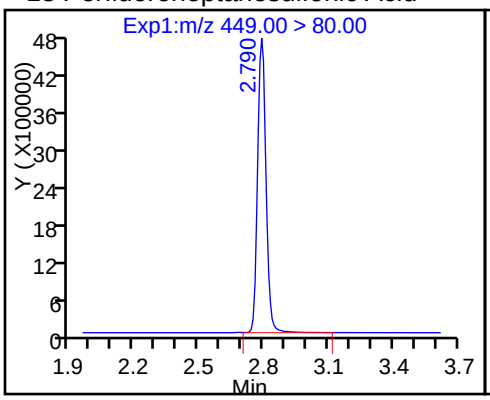
15 Perfluorooctanoic acid



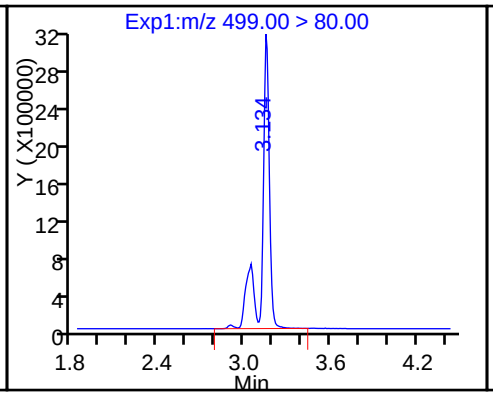
15 Perfluorooctanoic acid



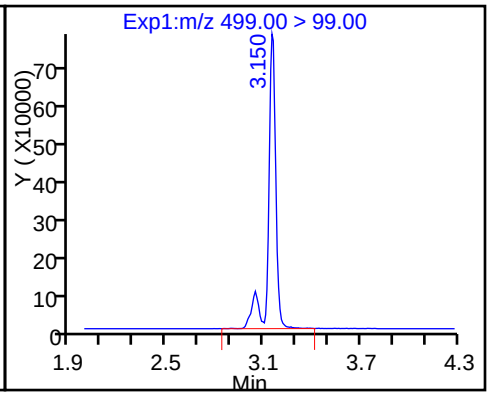
13 Perfluoroheptanesulfonic Acid



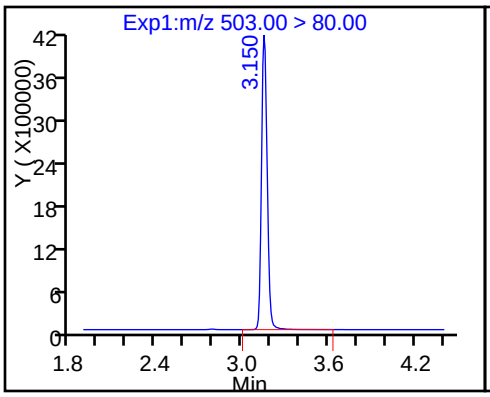
18 Perfluorooctane sulfonic acid



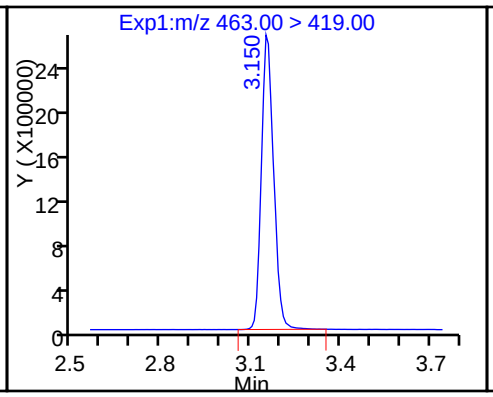
18 Perfluorooctane sulfonic acid



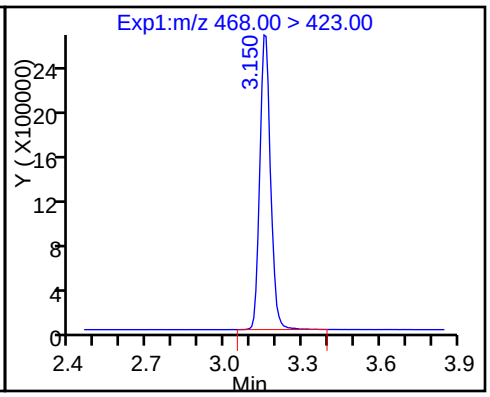
D 17 13C4 PFOS



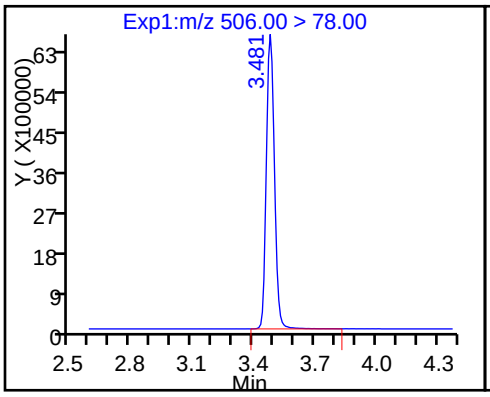
20 Perfluorononanoic acid



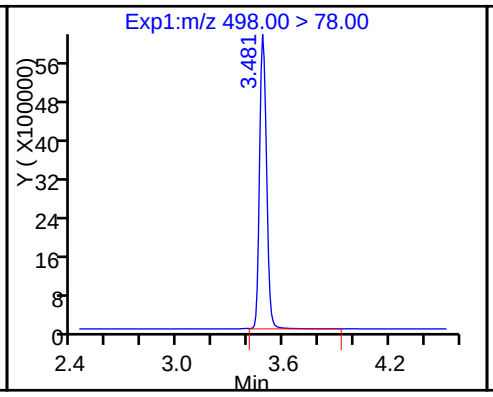
D 19 13C5 PFNA



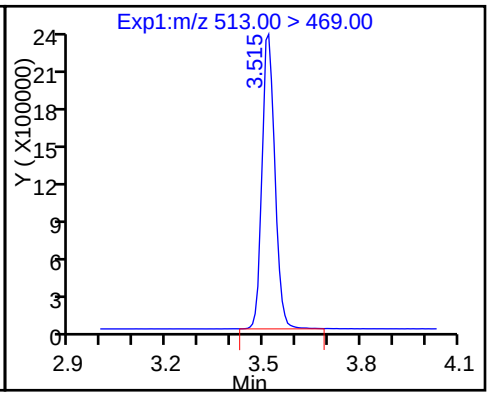
D 21 13C8 FOSA



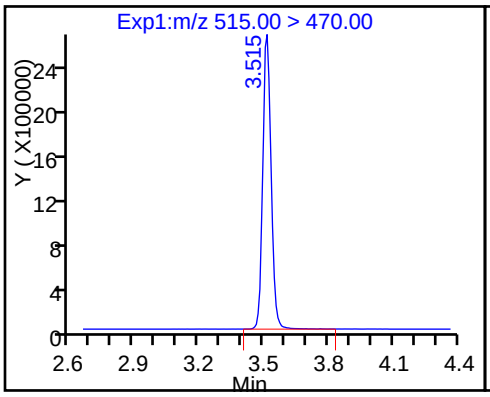
22 Perfluorooctane Sulfonamide



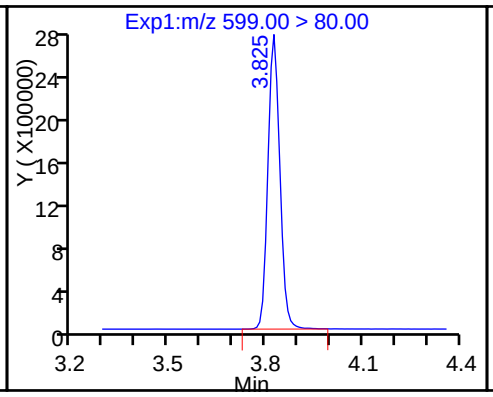
24 Perfluorodecanoic acid



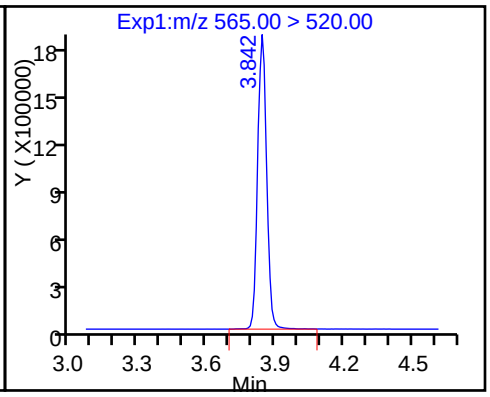
D 23 13C2 PFDA



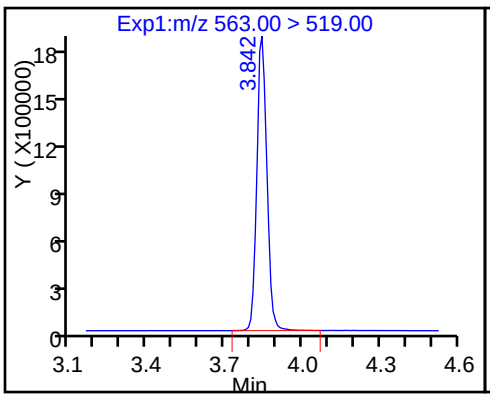
26 Perfluorodecane Sulfonic acid



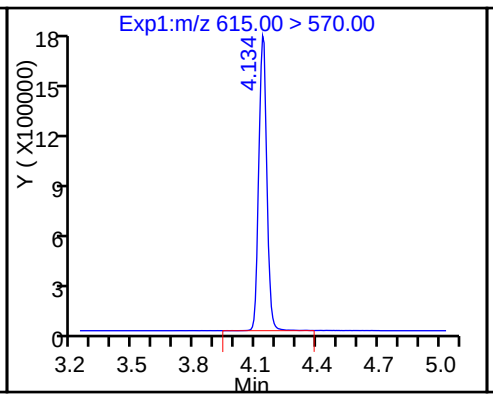
D 27 13C2 PFUnA



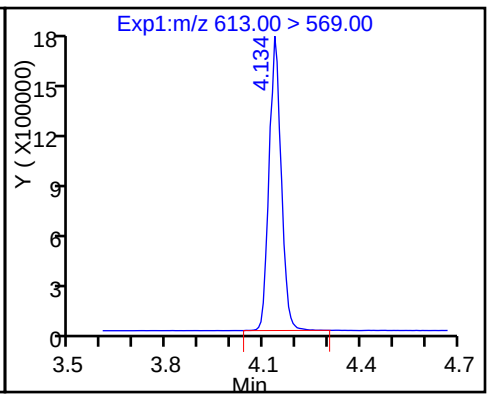
28 Perfluoroundecanoic acid



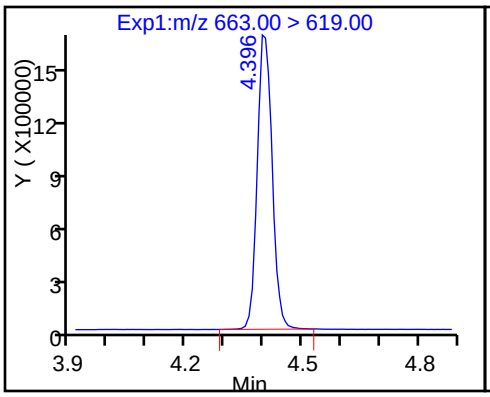
D 30 13C2 PFDoA



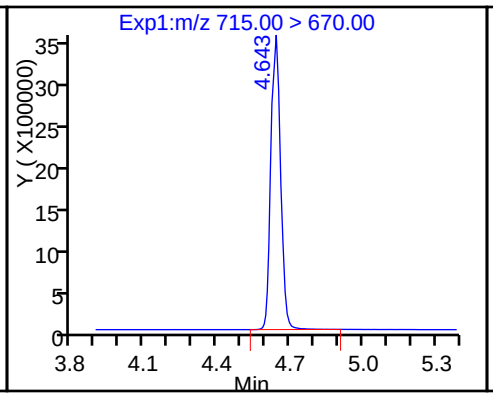
29 Perfluorododecanoic acid



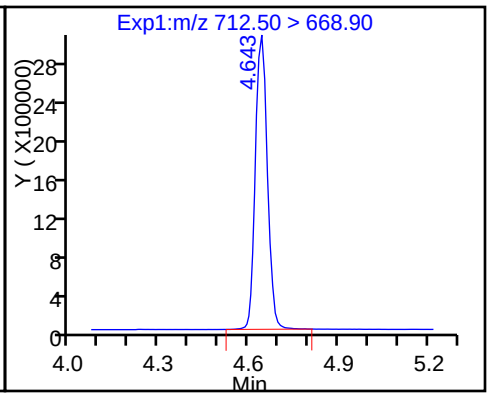
31 Perfluorotridecanoic acid



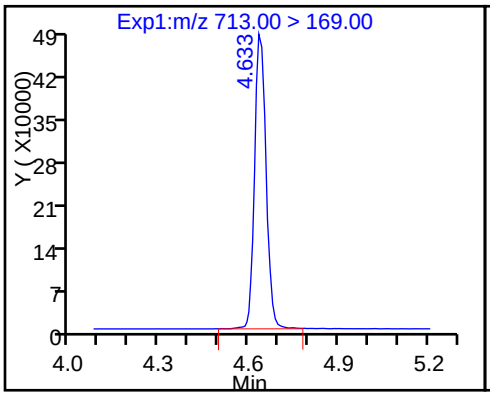
D 32 13C2-PFTeDA



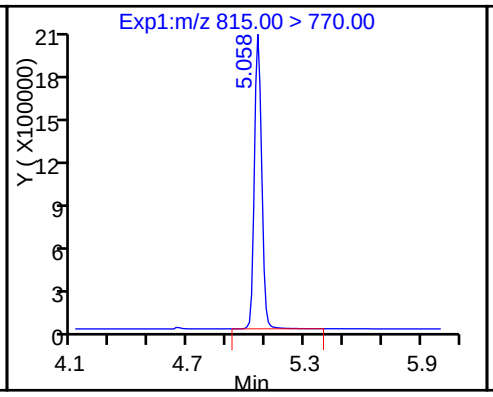
33 Perfluorotetradecanoic acid



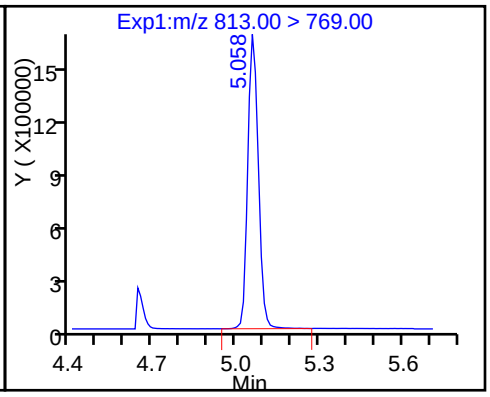
33 Perfluorotetradecanoic acid



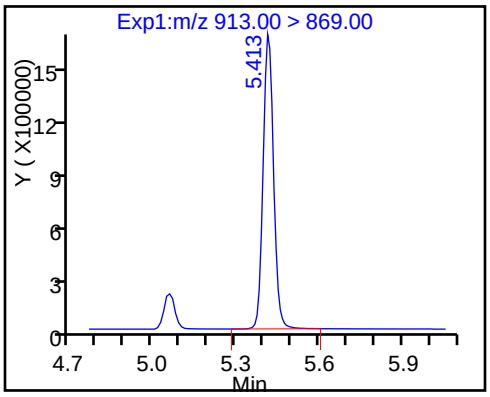
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144510/5 Calibration Date: 12/30/2016 11:26

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016A_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	0.8537	0.8643		1.01	1.00	1.2	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.009		1.02	1.00	2.3	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.429		0.892	0.884	0.9	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9073		0.977	1.00	-2.3	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.013		1.04	1.00	3.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.157		1.02	0.910	12.3	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.014		1.01	1.00	1.1	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.030		0.890	0.952	-6.6	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.149		1.07	0.928	15.6	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9818		1.03	1.00	3.1	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9433		1.01	1.00	1.1	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9103		0.965	1.00	-3.5	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.5594		0.923	0.964	-4.2	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9808		1.03	1.00	2.6	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8913		0.971	1.00	-2.9	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.8794		0.970	1.00	-3.0	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.765		1.11	1.00	11.3	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.482		0.953	1.00	-4.7	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8004		0.777	1.00	-22.3	50.0
13C4 PFBA	Ave	347743	348590		50.1	50.0	0.2	50.0
13C5-PFPeA	Ave	266072	269109		50.6	50.0	1.1	50.0
13C2 PFHxA	Ave	245110	231169		47.2	50.0	-5.7	50.0
13C4-PFHpA	Ave	226344	212196		46.9	50.0	-6.3	50.0
18O2 PFHxS	Ave	326976	321838		46.6	47.3	-1.6	50.0
13C4 PFOA	Ave	230362	226735		49.2	50.0	-1.6	50.0
13C4 PFOS	Ave	248847	259288		49.8	47.8	4.2	50.0
13C5 PFNA	Ave	177687	175863		49.5	50.0	-1.0	50.0
13C8 FOSA	Ave	384141	399484		52.0	50.0	4.0	50.0
13C2 PFDA	Ave	157302	161458		51.3	50.0	2.6	50.0
13C2 PFUnA	Ave	117250	123160		52.5	50.0	5.0	50.0
13C2 PFDoA	Ave	110957	113101		51.0	50.0	1.9	50.0
13C2-PFTeDA	Ave	227387	227042		49.9	50.0	-0.2	50.0
13C2-PFHxDA	Ave	124568	117083		47.0	50.0	-6.0	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 30-Dec-2016 11:26:29 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 10:09:31 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 03-Jan-2017 10:09:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		17429482	50.1		100	1192878	
1 Perfluorobutyric acid										
212.90 > 169.00	1.542	1.542	0.0	1.000	301293	1.01		101	1576	
D 4 13C5-PFPeA										
267.90 > 223.00	1.820	1.820	0.0		13455441	50.6		101	1077202	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.820	1.820	0.0	1.000	271656	1.02		102	3384	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.859	1.849	0.010	1.000	406676	0.8918		101		
298.90 > 99.00	1.849	1.849	0.0	0.995	167755		2.42(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.106	2.107	-0.001		11558452	47.2		94.3	491471	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.106	2.107	-0.001	1.000	209736	0.9769		97.7	6314	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.458	2.379	0.079	1.000	338751	1.02		112		M
D 11 13C4-PFHpA										
367.00 > 322.00	2.443	2.443	0.0		10609801	46.9		93.7	644950	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.443	2.443	0.0	1.000	214982	1.04		104	2231	
D 10 18O2 PFHxS										
403.00 > 84.00	2.458	2.458	0.0		15222930	46.6		98.4	710820	
D 14 13C4 PFOA										
417.00 > 372.00	2.805	2.796	0.009		11336736	49.2		98.4	1041700	

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	2.805	2.796	0.009	1.000	229992	1.01		101	2890	
413.00 > 169.00	2.805	2.796	0.009	1.000	142324		1.62(0.90-1.10)		6313	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.813	2.805	0.008	1.000	254153	0.8895		93.4		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.173	3.054	0.119	1.000	276496	1.07		116	11754	M
499.00 > 99.00	3.173	3.054	0.119	1.000	58719		4.71(0.90-1.10)		2679	M
D 17 13C4 PFOS										
503.00 > 80.00	3.173	3.172	0.001		12393983	49.8		104	1457588	
D 19 13C5 PFNA										
468.00 > 423.00	3.181	3.172	0.009		8793150	49.5		99.0	810272	
20 Perfluorononanoic acid										
463.00 > 419.00	3.181	3.172	0.009	1.000	172658	1.03		103	3650	
D 21 13C8 FOSA										
506.00 > 78.00	3.480	3.478	0.002		19974201	52.0		104	715848	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.489	3.478	0.011	1.000	376845	1.01		101	27717	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.539	3.529	0.010	1.000	146974	0.9645		96.5	7151	
D 23 13C2 PFDA										
515.00 > 470.00	3.539	3.537	0.002		8072885	51.3		103	338129	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.850	3.848	0.002	1.000	139829	0.9235		95.8		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.876	3.857	0.019	1.000	120798	1.03		103	4769	
D 27 13C2 PFUnA										
565.00 > 520.00	3.876	3.866	0.010		6158011	52.5		105	247557	
D 30 13C2 PFDoA										
615.00 > 570.00	4.170	4.160	0.010		5655073	51.0		102	236100	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.170	4.160	0.010	1.000	100811	0.9710		97.1	3925	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.442	4.433	0.009	1.000	99462	0.9697		97.0	2636	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.681	4.670	0.011		11352096	49.9		99.8	824753	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.689	4.670	0.019	1.000	199589	1.11		111	1614	
713.00 > 169.00	4.681	4.670	0.011	0.998	33300		5.99(0.00-0.00)		12401	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.113	5.090	0.023		5854167	47.0		94.0	132204	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.113	5.101	0.012	1.000	167625	0.9527		95.3	192	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.475	5.459	0.016	1.000	90527	0.7768		77.7	106	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 10:09:32 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d

Injection Date: 30-Dec-2016 11:26:29 Instrument ID: A8_N

Lims ID: CCV L2

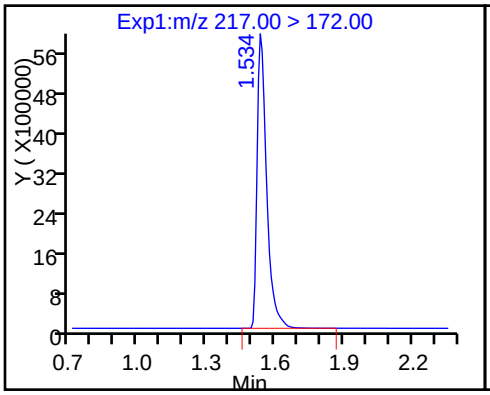
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

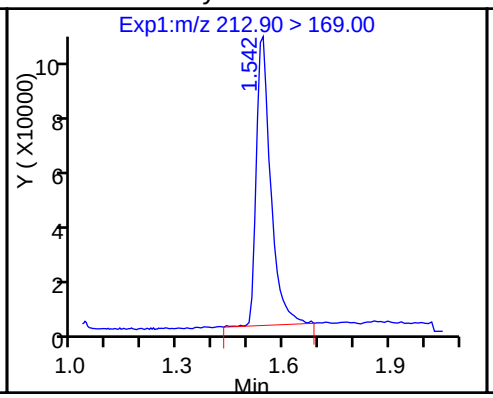
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

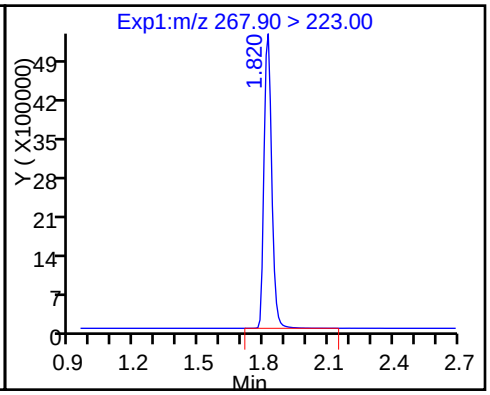
D 2 13C4 PFBA



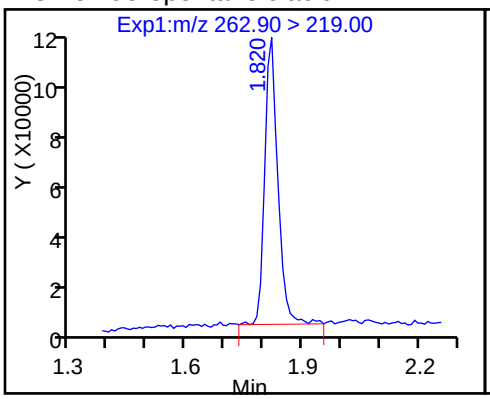
1 Perfluorobutyric acid



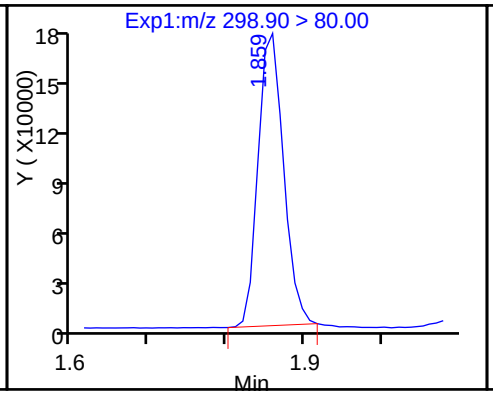
D 4 13C5-PFPeA



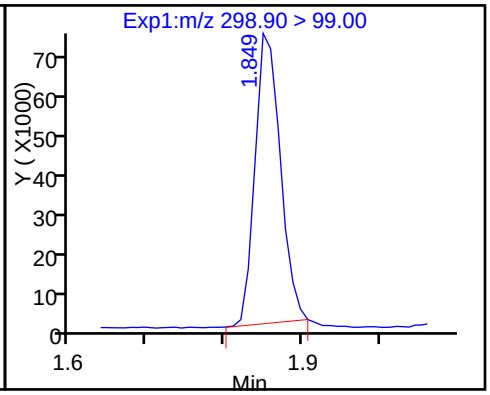
3 Perfluoropentanoic acid



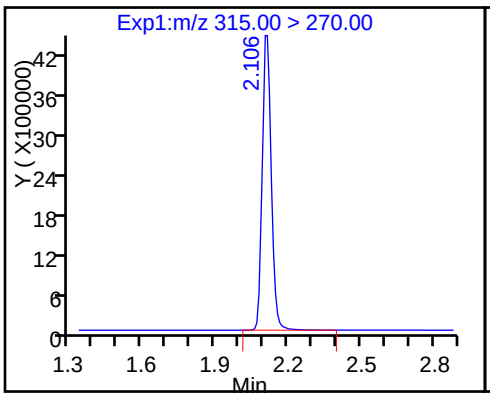
5 Perfluorobutanesulfonic acid



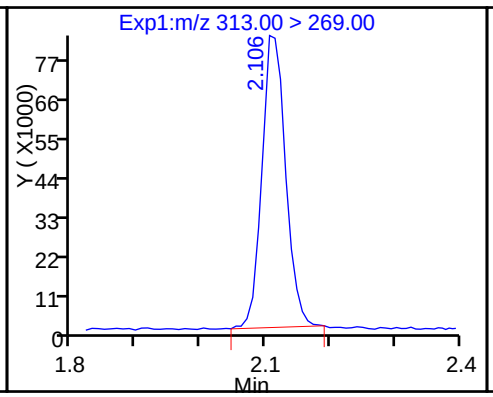
5 Perfluorobutanesulfonic acid



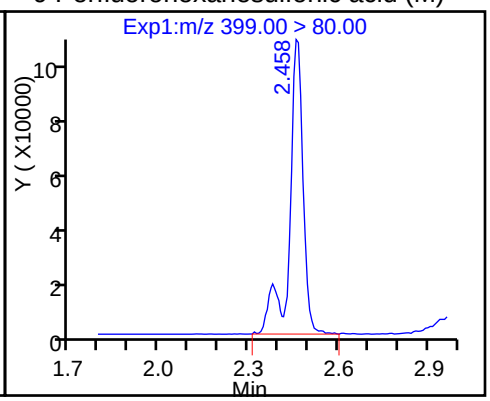
D 6 13C2 PFHxA



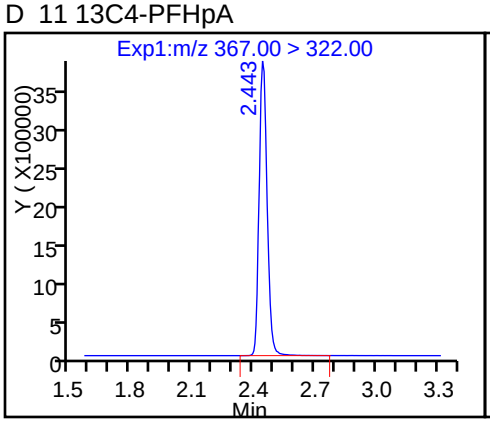
7 Perfluorohexanoic acid



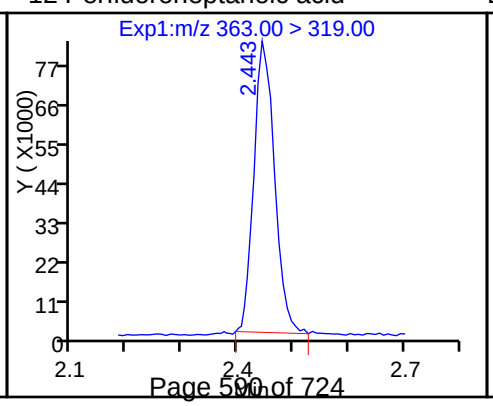
9 Perfluorohexanesulfonic acid (M)



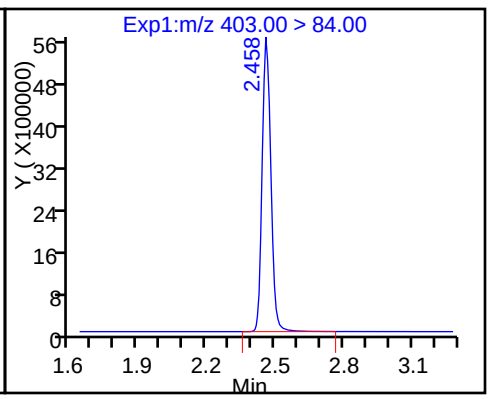
D 11 13C4-PFHpA



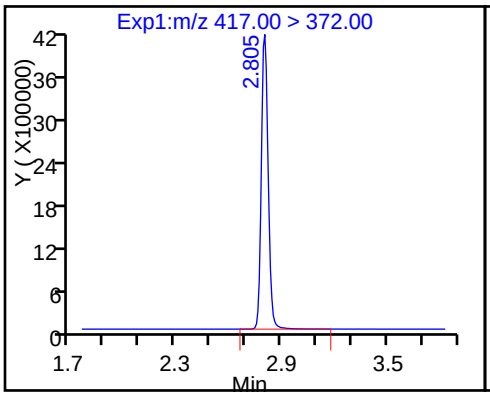
12 Perfluoroheptanoic acid



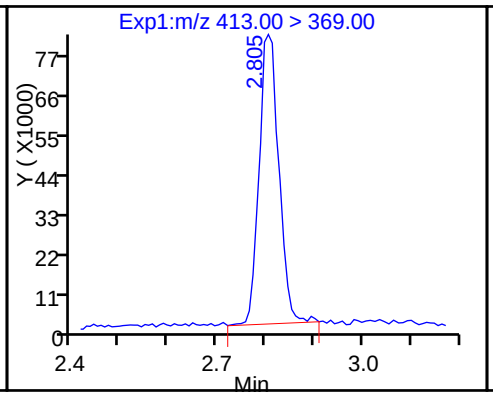
D 10 18O2 PFHxS



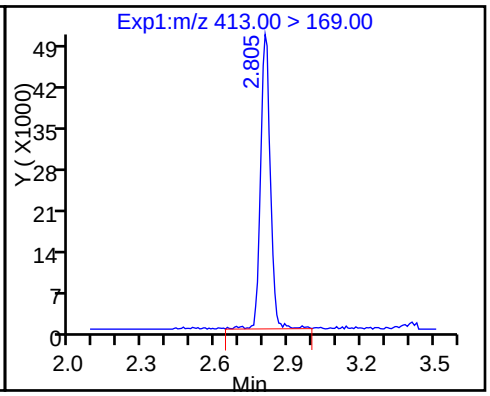
D 14 13C4 PFOA



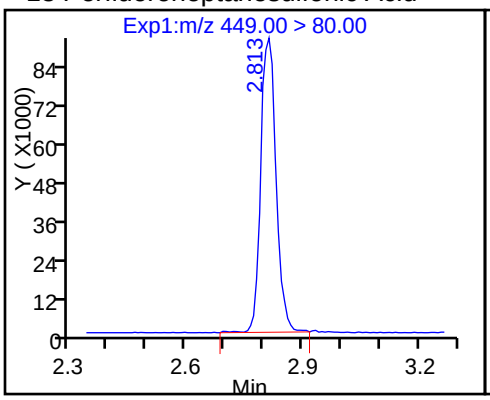
15 Perfluorooctanoic acid



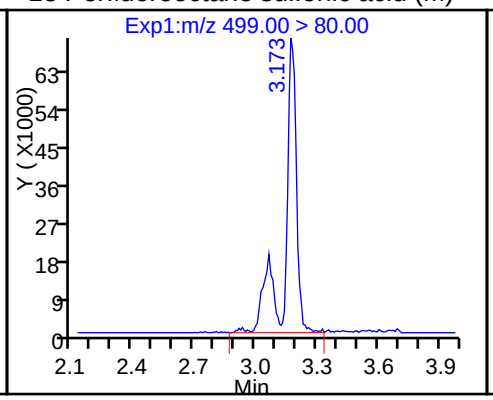
15 Perfluorooctanoic acid



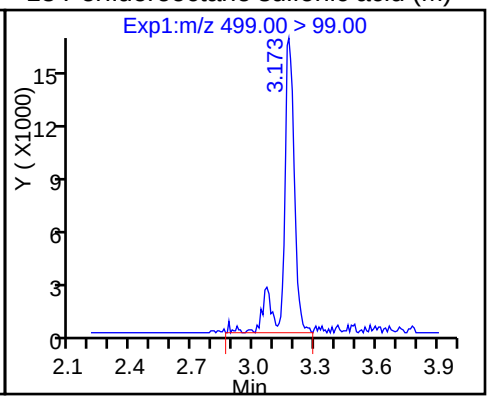
13 Perfluoroheptanesulfonic Acid



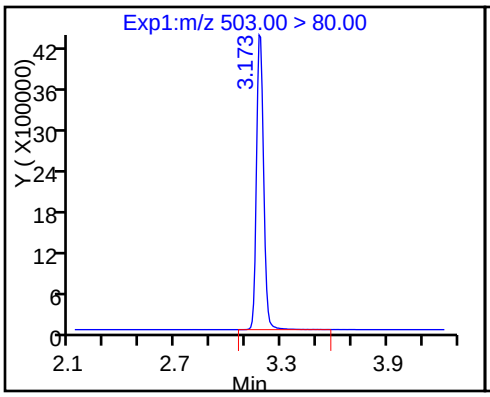
18 Perfluorooctane sulfonic acid (M)



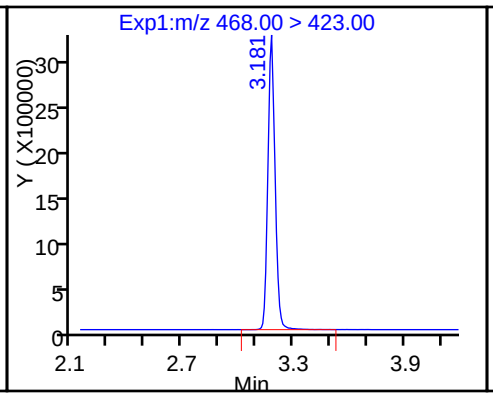
18 Perfluorooctane sulfonic acid (M)



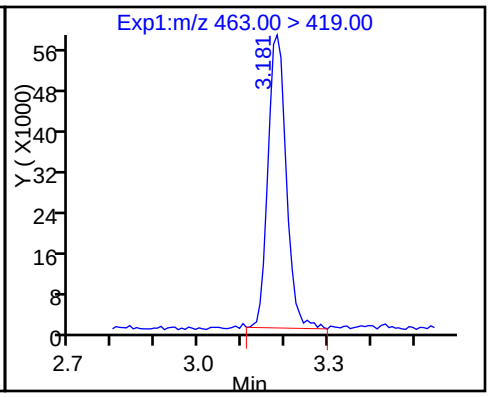
D 17 13C4 PFOS



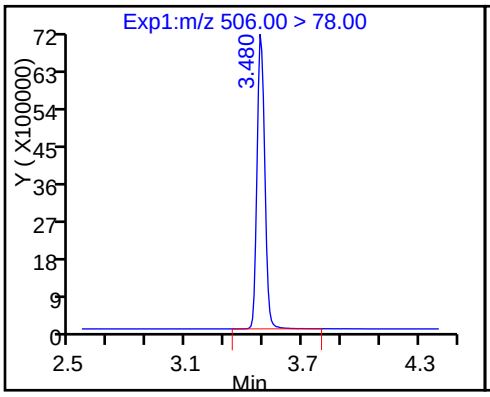
D 19 13C5 PFNA



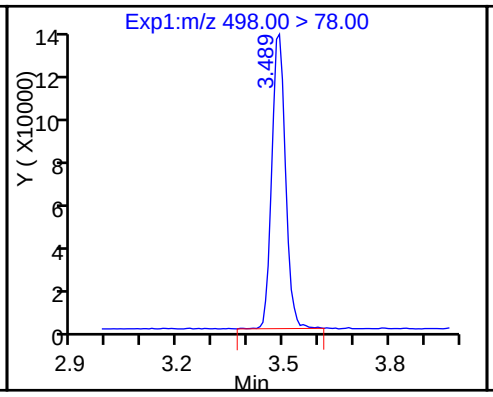
20 Perfluorononanoic acid



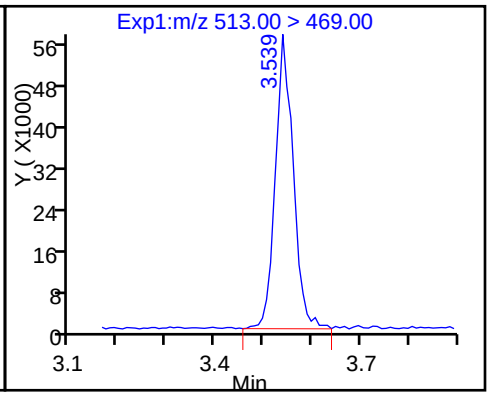
D 21 13C8 FOSA



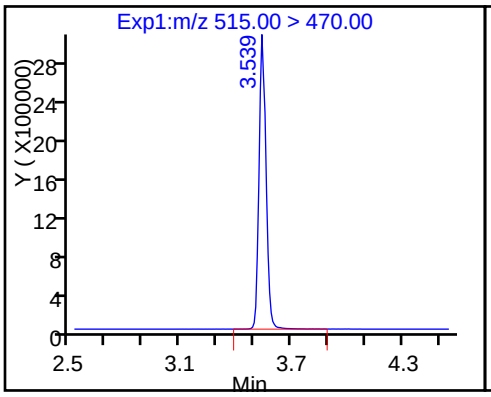
22 Perfluorooctane Sulfonamide



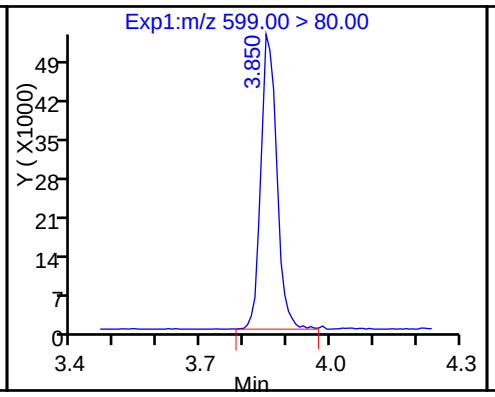
24 Perfluorodecanoic acid



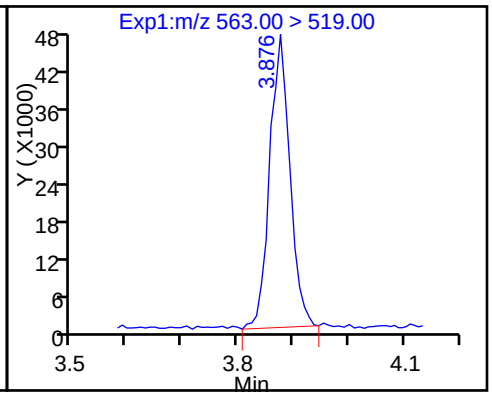
D 23 13C2 PFDA



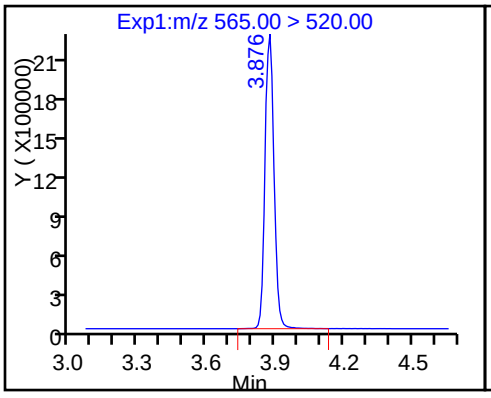
26 Perfluorodecane Sulfonic acid



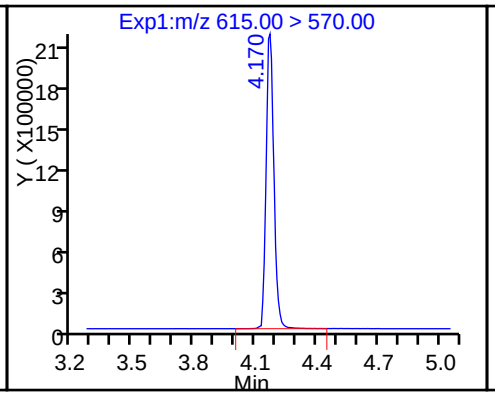
28 Perfluoroundecanoic acid



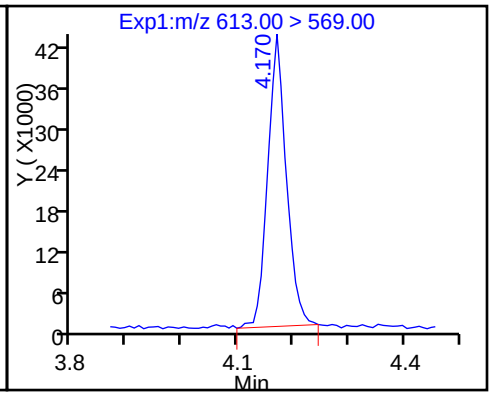
D 27 13C2 PFUnA



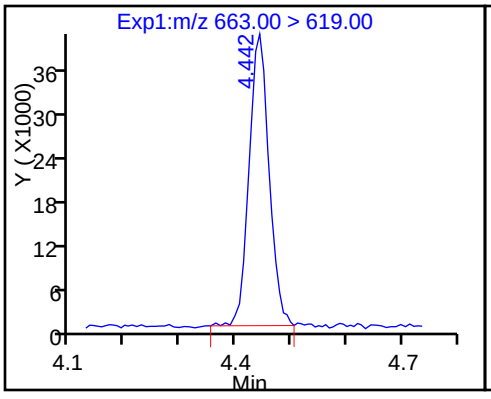
D 30 13C2 PFDoA



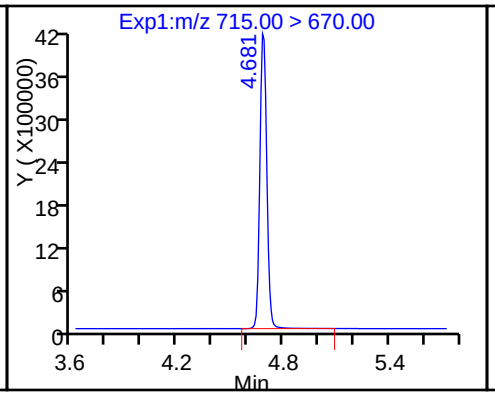
29 Perfluorododecanoic acid



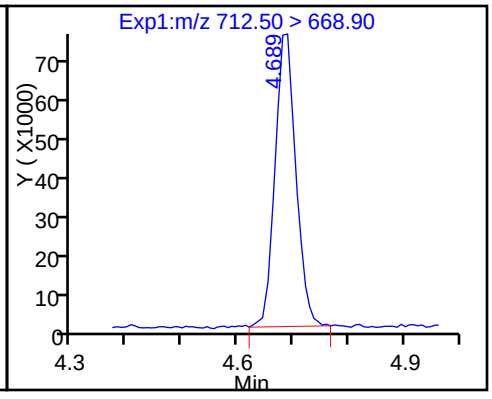
31 Perfluorotridecanoic acid



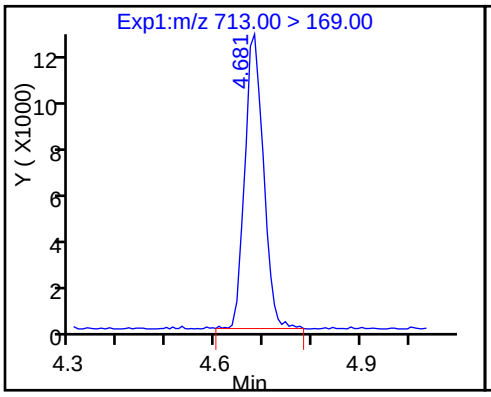
D 32 13C2-PFTeDA



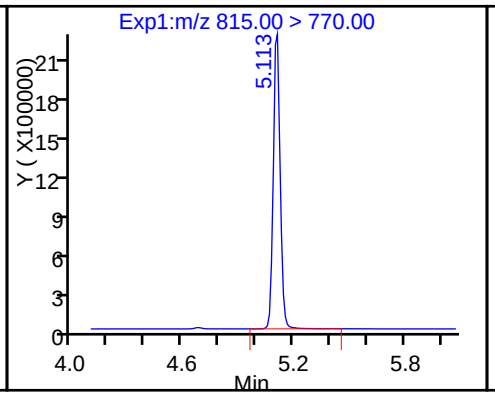
33 Perfluorotetradecanoic acid



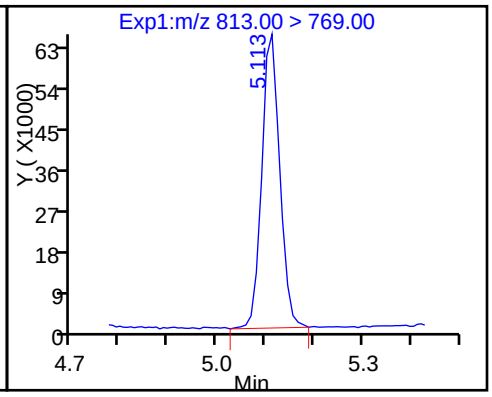
33 Perfluorotetradecanoic acid



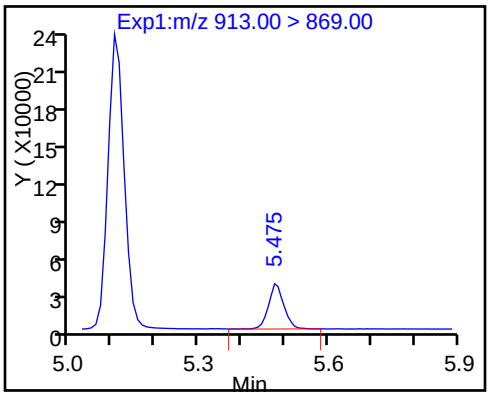
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

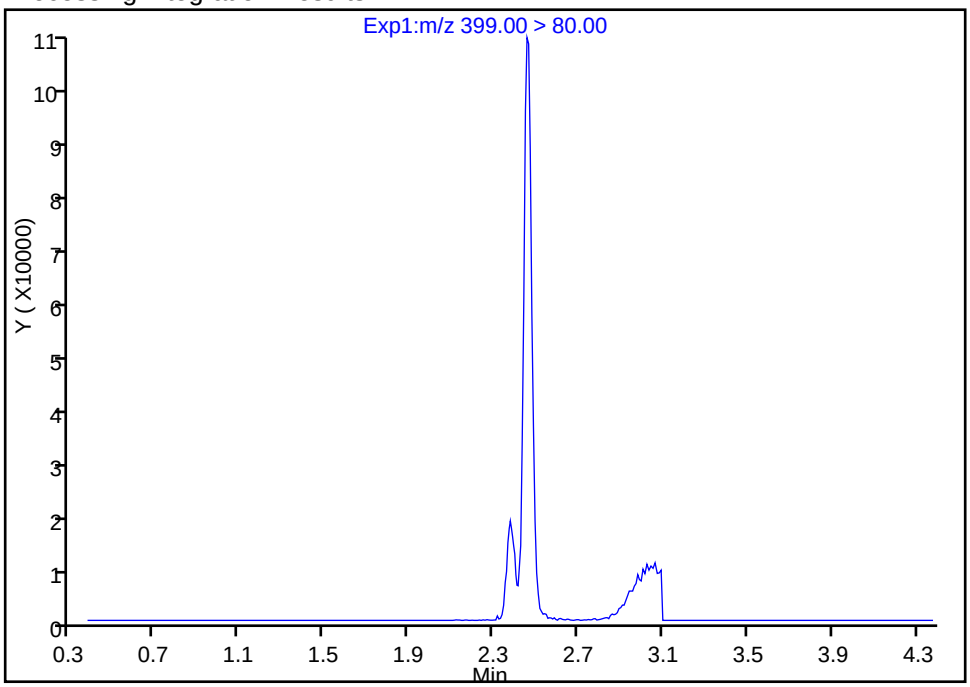
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d				
Injection Date:	30-Dec-2016 11:26:29	Instrument ID:	A8_N		
Lims ID:	CCV L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

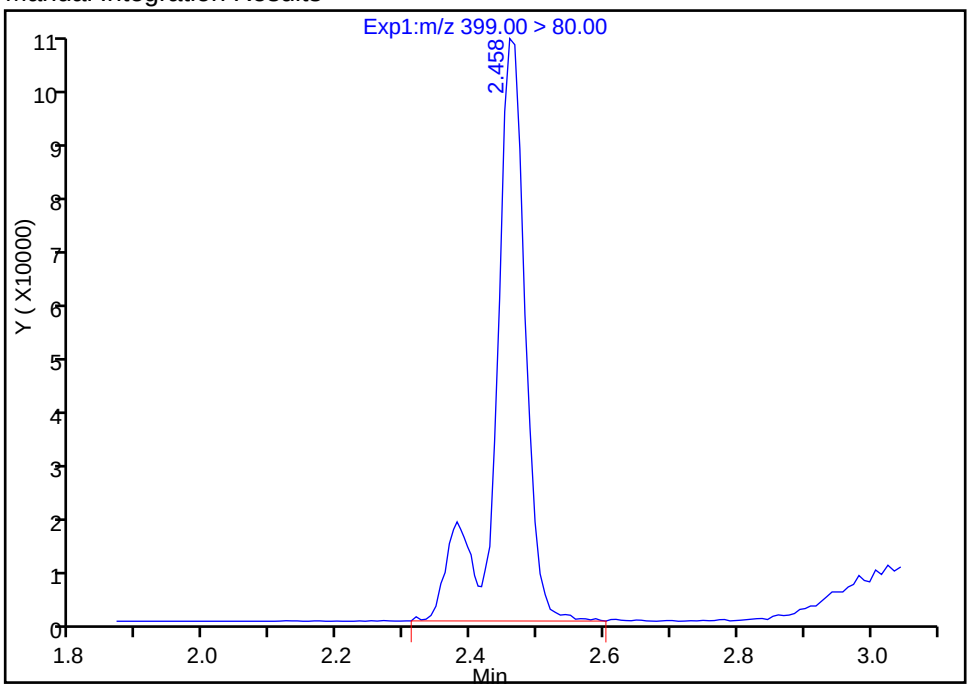
Processing Integration Results

Not Detected
Expected RT: 2.38



Manual Integration Results

RT: 2.46
Area: 338751
Amount: 1.021926
Amount Units: ng/ml



Reviewer: chandrasenas, 03-Jan-2017 10:09:16
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

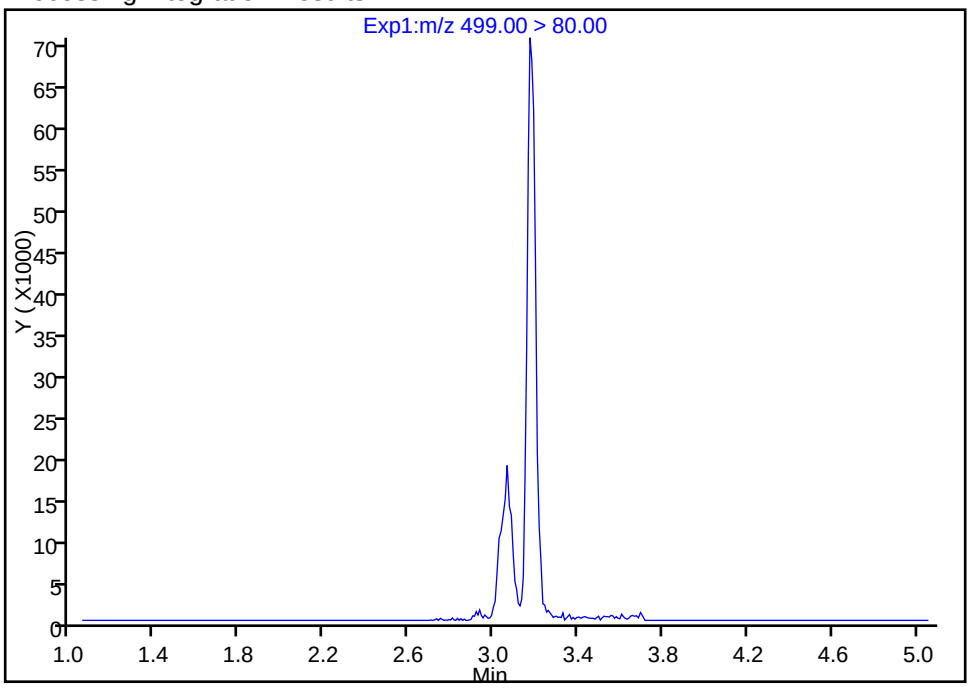
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d				
Injection Date:	30-Dec-2016 11:26:29	Instrument ID:	A8_N		
Lims ID:	CCV L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

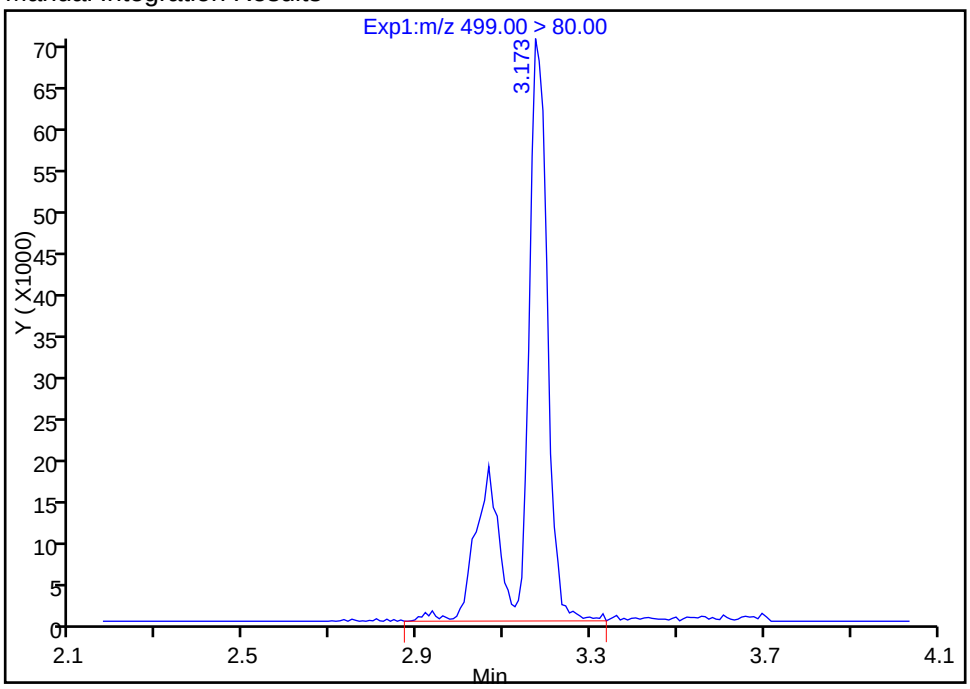
Processing Integration Results

Not Detected
Expected RT: 3.05



Manual Integration Results

RT: 3.17
Area: 276496
Amount: 1.072313
Amount Units: ng/ml



Reviewer: chandrasenas, 03-Jan-2017 10:09:16
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

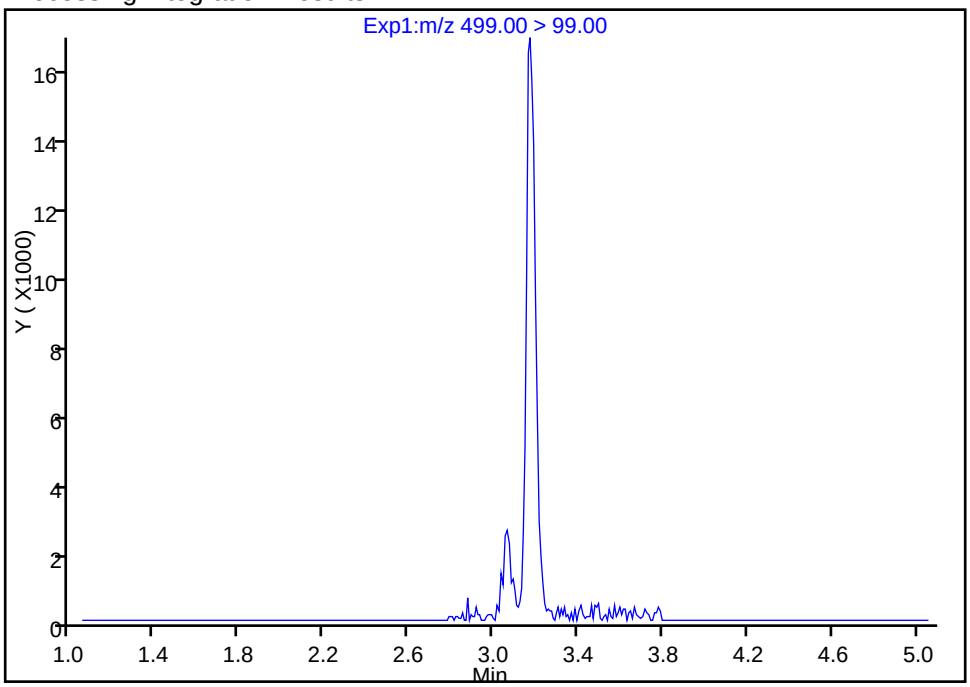
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016A_005.d
Injection Date: 30-Dec-2016 11:26:29 Instrument ID: A8_N
Lims ID: CCV L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

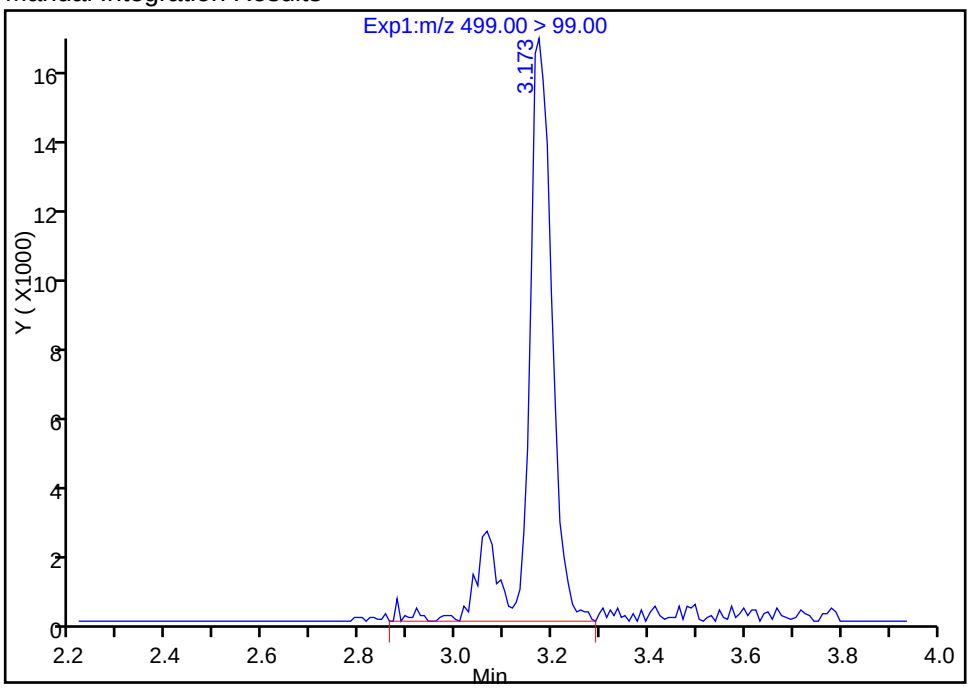
Processing Integration Results

Not Detected
Expected RT: 3.05



Manual Integration Results

RT: 3.17
Area: 58719
Amount: 1.072313
Amount Units: ng/ml



Reviewer: chandrasenas, 03-Jan-2017 10:09:16
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144510/11 Calibration Date: 12/30/2016 12:18

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9150		53.6	50.0	7.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.002		50.8	50.0	1.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.519		47.4	44.2	7.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9327		50.2	50.0	0.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.032		45.6	45.5	0.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9805		50.1	50.0	0.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	0.997		49.7	50.0	-0.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.158		50.0	47.6	5.1	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.051		49.0	46.4	5.6	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9590		50.4	50.0	0.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9380		50.3	50.0	0.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9600		50.9	50.0	1.7	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6245		51.5	48.2	6.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9844		51.5	50.0	2.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9512		51.8	50.0	3.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9195		50.7	50.0	1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.738		54.8	50.0	9.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9588		49.6	50.0	-0.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8949		43.4	50.0	-13.1	25.0
13C4 PFBA	Ave	347743	324883		46.7	50.0	-6.6	50.0
13C5-PFPeA	Ave	266072	242051		45.5	50.0	-9.0	50.0
13C2 PFHxA	Ave	245110	217750		44.4	50.0	-11.2	50.0
13C4-PFHpA	Ave	226344	191733		42.4	50.0	-15.3	50.0
18O2 PFHxS	Ave	326976	295171		42.7	47.3	-9.7	50.0
13C4 PFOA	Ave	230362	196038		42.5	50.0	-14.9	50.0
13C4 PFOS	Ave	248847	237649		45.6	47.8	-4.5	50.0
13C5 PFNA	Ave	177687	149415		42.0	50.0	-15.9	50.0
13C8 FOSA	Ave	384141	372821		48.5	50.0	-2.9	50.0
13C2 PFDA	Ave	157302	143393		45.6	50.0	-8.8	50.0
13C2 PFUnA	Ave	117250	105103		44.8	50.0	-10.4	50.0
13C2 PFDoA	Ave	110957	100899		45.5	50.0	-9.1	50.0
13C2-PFTeDA	Ave	227387	207725		45.7	50.0	-8.6	50.0
13C2-PFHxDA	Ave	124568	111894		44.9	50.0	-10.2	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_001.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 30-Dec-2016 12:18:55 ALS Bottle#: 41 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:00 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:45:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		16244137	46.7		93.4	921797	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	14863478	53.6		107	83783	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		12102553	45.5		91.0	1216637	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	12131372	50.8		102	141916	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	19819046	47.4		107		
298.90 > 99.00	1.849	1.849	0.0	1.000	9168809		2.16(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.098	2.098	0.0		10887491	44.4		88.8	1039617	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.098	2.098	0.0	1.000	10154370	50.2		100	252812	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.424	2.424	0.0	1.000	13864224	45.6		100		
D 11 13C4-PFHpA										
367.00 > 322.00	2.431	2.431	0.0		9586637	42.4		84.7	381274	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.431	2.431	0.0	1.000	9399949	50.1		100	82536	
D 10 18O2 PFHxS										
403.00 > 84.00	2.454	2.454	0.0		13961607	42.7		90.3	1017056	
D 14 13C4 PFOA										
417.00 > 372.00	2.791	2.791	0.0		9801886	42.5		85.1	702218	

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	2.791	2.791	0.0	1.000	9771100	49.7		99.4	112119	
413.00 > 169.00	2.791	2.791	0.0	1.000	6157508		1.59(0.90-1.10)		309395	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.799	2.799	0.0	1.000	13100197	50.0		105		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.135	3.135	0.0	1.000	11584220	49.0		106	112621	
499.00 > 99.00	3.128	3.135	-0.007	0.997	2472749		4.68(0.90-1.10)		33641	
D 17 13C4 PFOS										
503.00 > 80.00	3.159	3.159	0.0		11359619	45.6		95.5	224083	
D 19 13C5 PFNA										
468.00 > 423.00	3.167	3.167	0.0		7470749	42.0		84.1	417920	
20 Perfluorononanoic acid										
463.00 > 419.00	3.159	3.159	0.0	1.000	7164116	50.4		101	151222	
D 21 13C8 FOSA										
506.00 > 78.00	3.474	3.474	0.0		18641065	48.5		97.1	545779	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.482	3.482	0.0	1.000	17485990	50.3		101	621296	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.524	3.524	0.0	1.000	6883163	50.9		102	206646	
D 23 13C2 PFDA										
515.00 > 470.00	3.524	3.524	0.0		7169647	45.6		91.2	332690	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.836	3.836	0.0	1.000	7152869	51.5		107		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.853	3.853	0.0	1.000	5173107	51.5		103	160779	
D 27 13C2 PFUnA										
565.00 > 520.00	3.853	3.853	0.0		5255156	44.8		89.6	399741	
D 30 13C2 PFDoA										
615.00 > 570.00	4.149	4.149	0.0		5044964	45.5		90.9	285176	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.149	4.149	0.0	1.000	4798853	51.8		104	127920	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.421	4.421	0.0	1.000	4639071	50.7		101	104461	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.664	4.664	0.0		10386247	45.7		91.4	553285	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.664	4.664	0.0	1.000	8769752	54.8		110	134380	
713.00 > 169.00	4.655	4.664	-0.009	0.998	1358976		6.45(0.00-0.00)		129225	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.081	5.081	0.0		5594701	44.9		89.8	117329	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.081	5.081	0.0	1.000	4837108	49.6		99.2	5263	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.444	5.444	0.0	1.000	4514794	43.4		86.9	4927	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:28:01 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_001.d

Injection Date: 30-Dec-2016 12:18:55 Instrument ID: A8_N

Lims ID: CCV L5

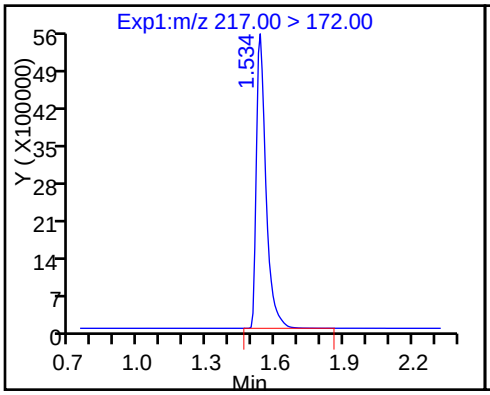
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 11

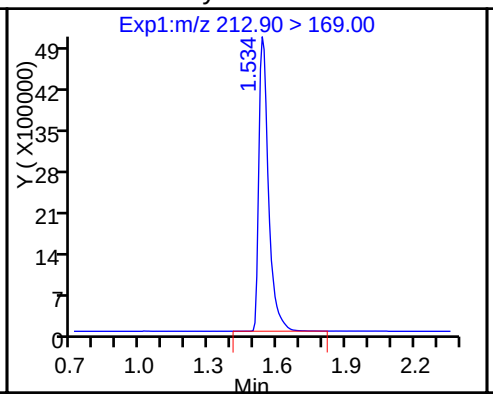
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

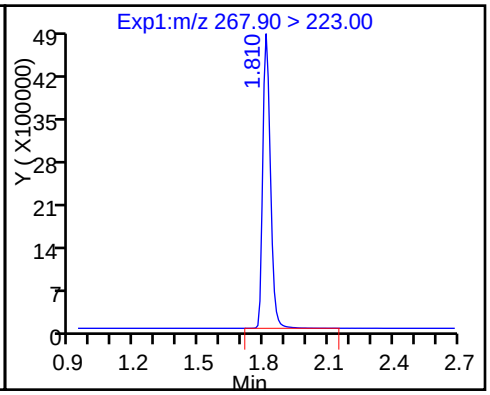
D 2 13C4 PFBA



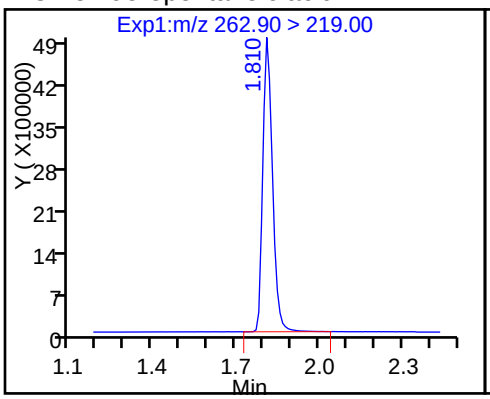
1 Perfluorobutyric acid



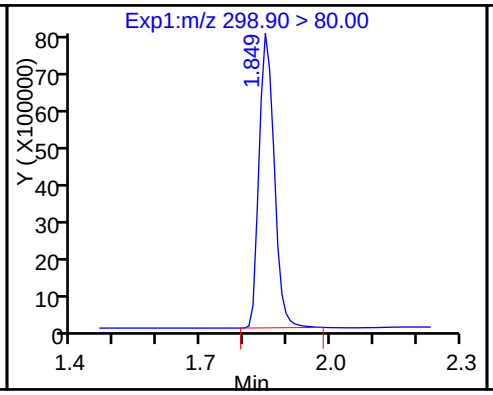
D 4 13C5-PFPeA



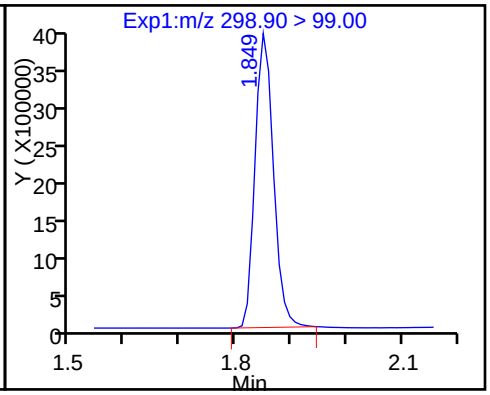
3 Perfluoropentanoic acid



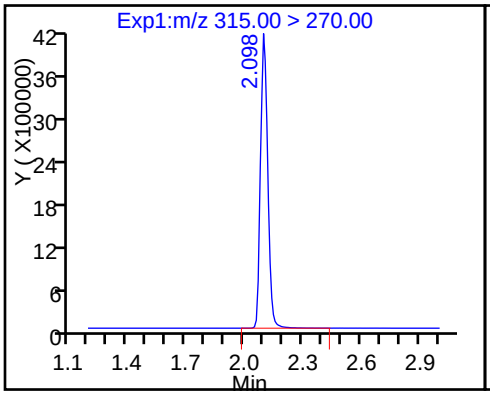
5 Perfluorobutanesulfonic acid



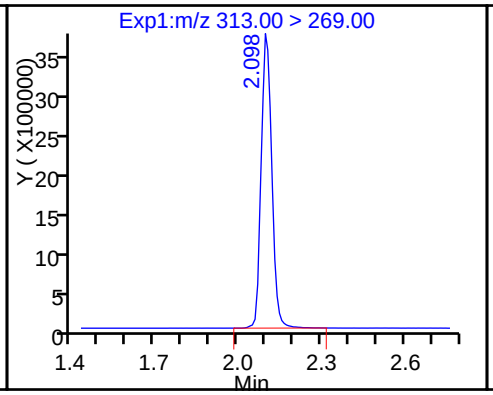
5 Perfluorobutanesulfonic acid



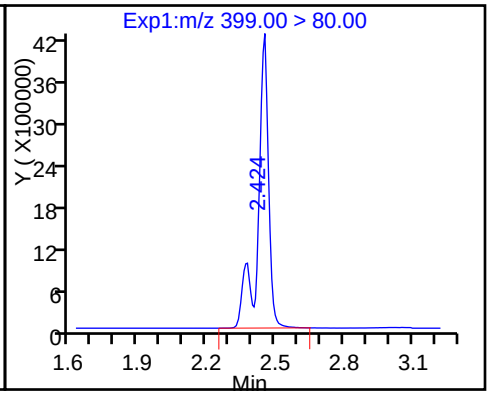
D 6 13C2 PFHxA



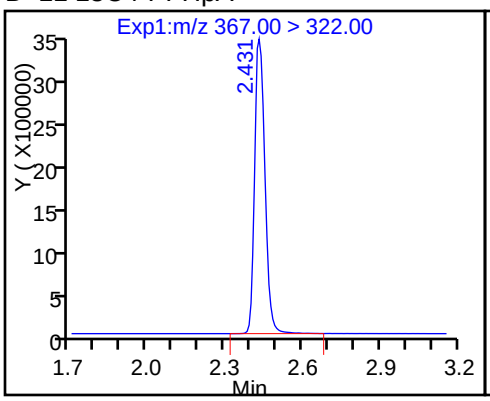
7 Perfluorohexanoic acid



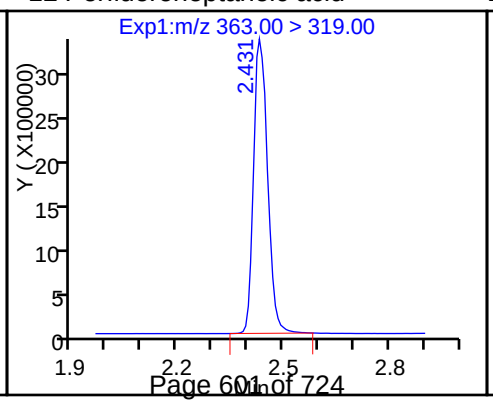
9 Perfluorohexanesulfonic acid



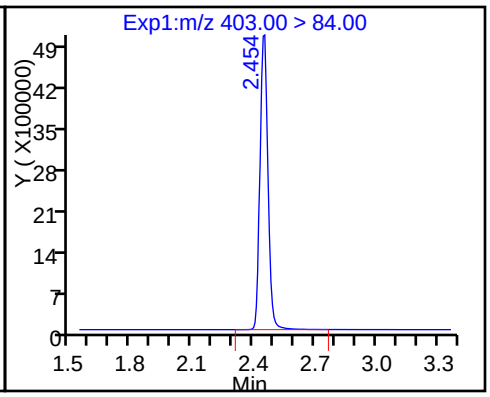
D 11 13C4-PFHpA



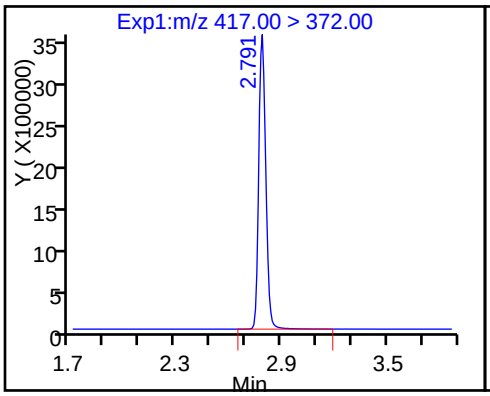
12 Perfluoroheptanoic acid



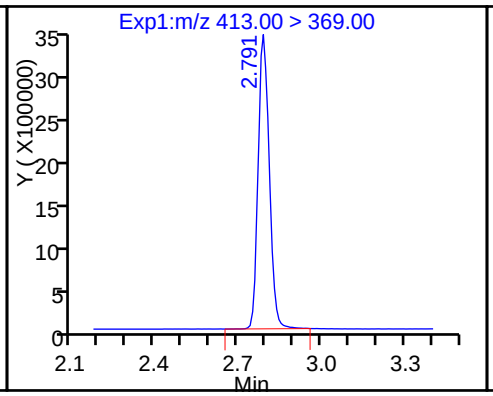
D 10 18O2 PFHxS



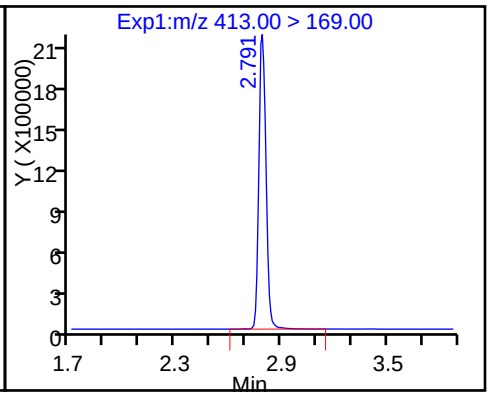
D 14 13C4 PFOA



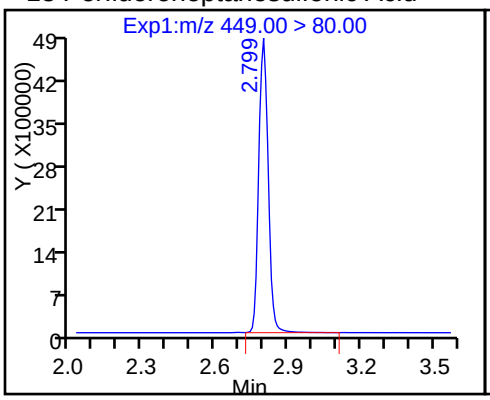
15 Perfluorooctanoic acid



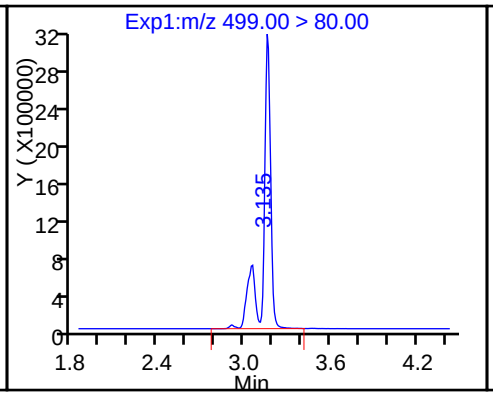
15 Perfluorooctanoic acid



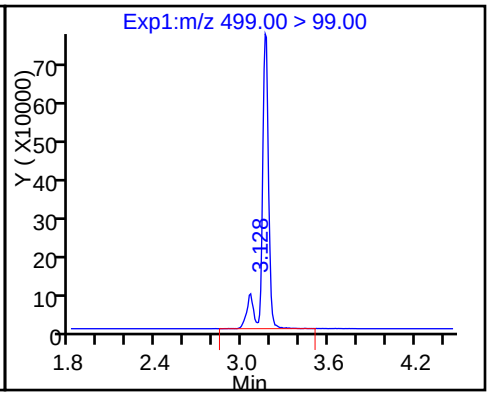
13 Perfluoroheptanesulfonic Acid



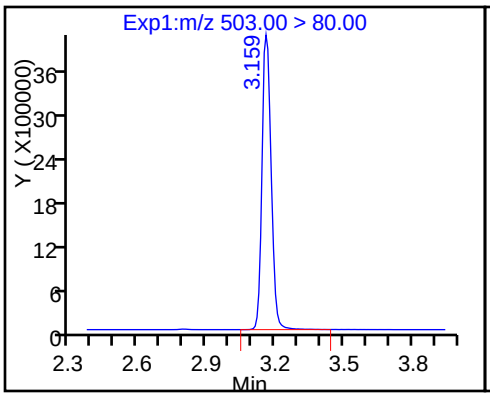
18 Perfluorooctane sulfonic acid



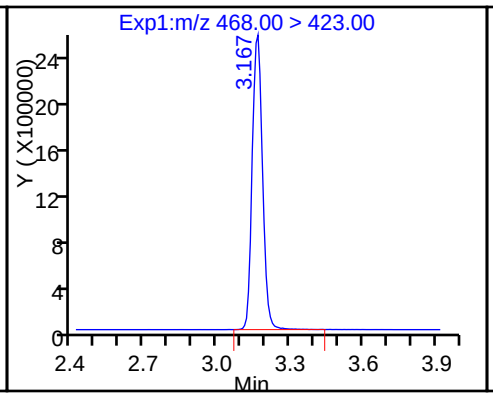
18 Perfluorooctane sulfonic acid



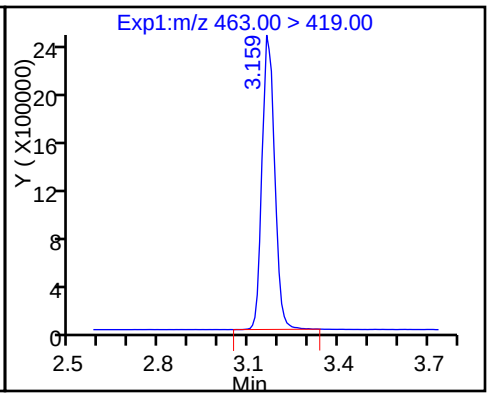
D 17 13C4 PFOS



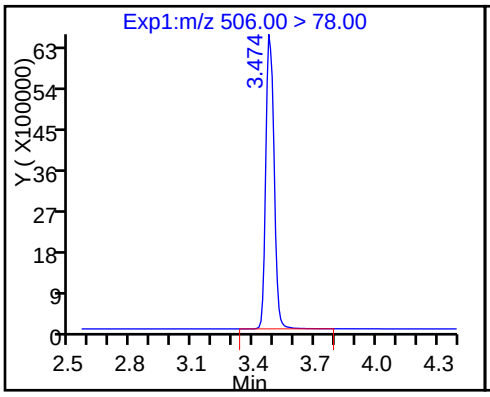
D 19 13C5 PFNA



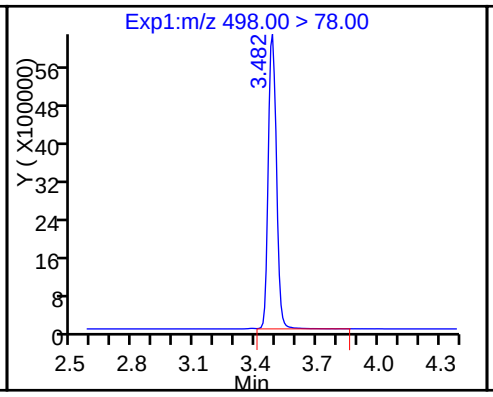
20 Perfluorononanoic acid



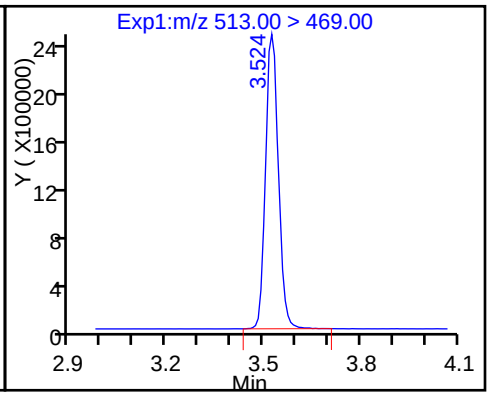
D 21 13C8 FOSA



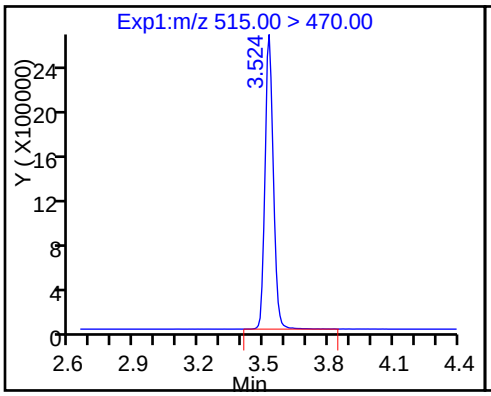
22 Perfluorooctane Sulfonamide



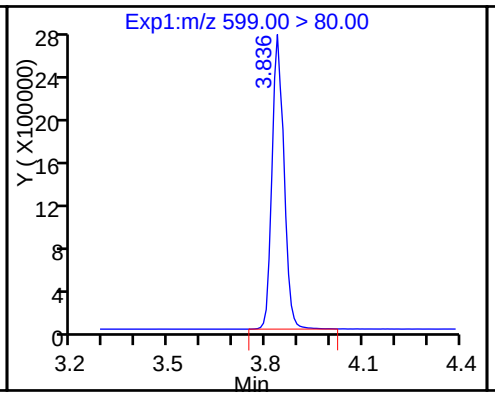
24 Perfluorodecanoic acid



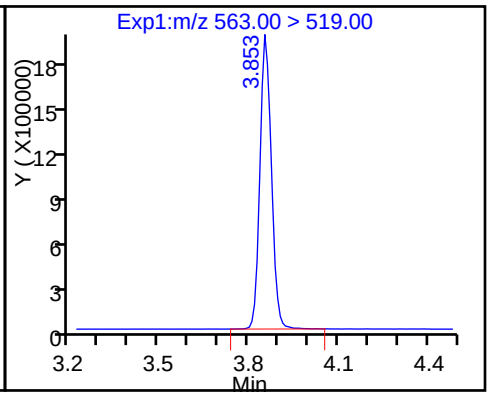
D 23 13C2 PFDA



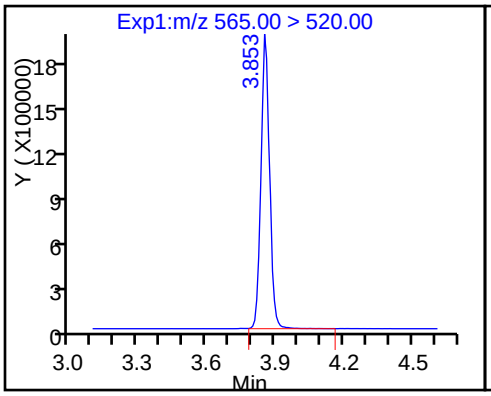
26 Perfluorodecane Sulfonic acid



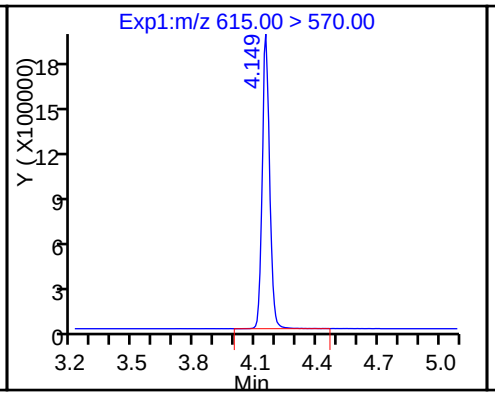
28 Perfluoroundecanoic acid



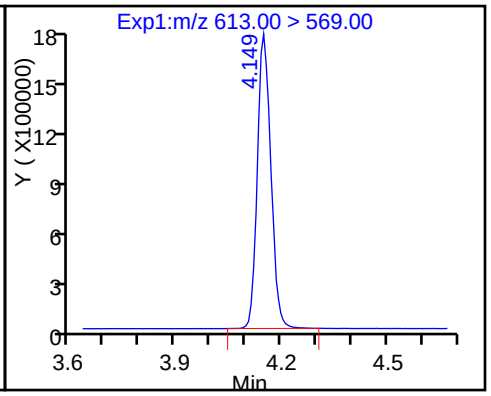
D 27 13C2 PFUnA



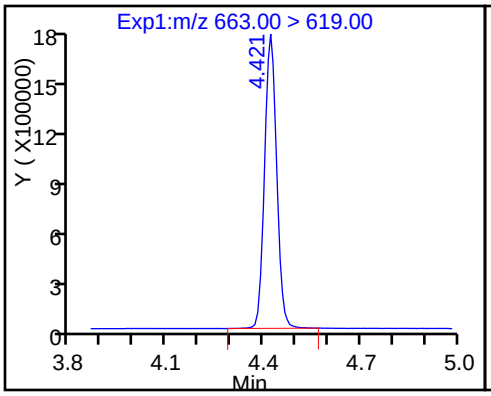
D 30 13C2 PFDoA



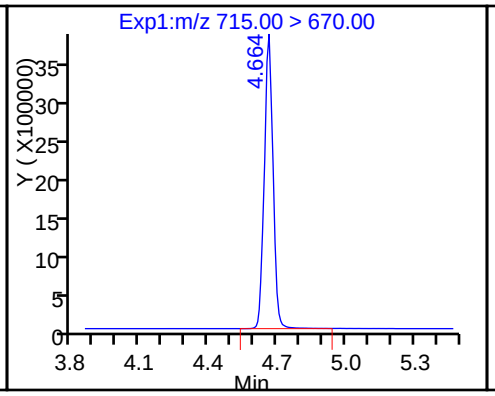
29 Perfluorododecanoic acid



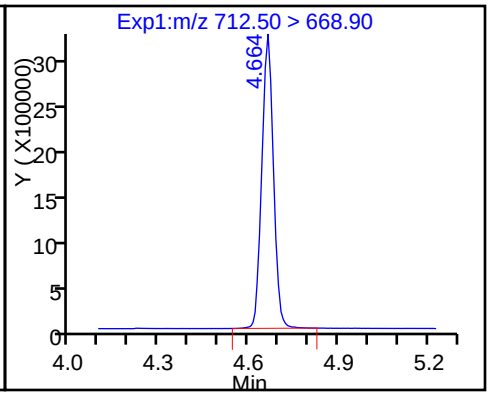
31 Perfluorotridecanoic acid



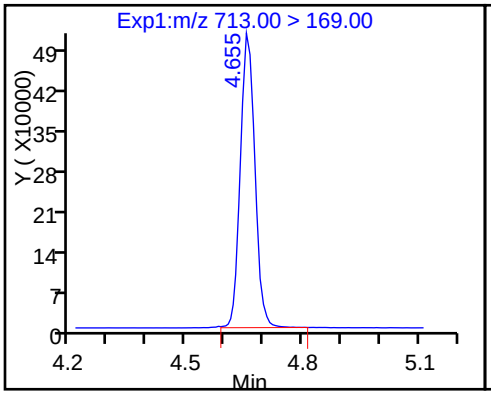
D 32 13C2-PFTeDA



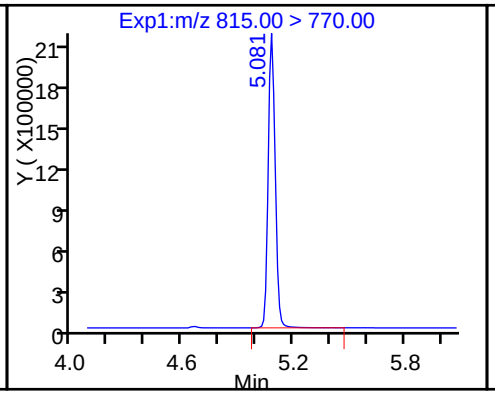
33 Perfluorotetradecanoic acid



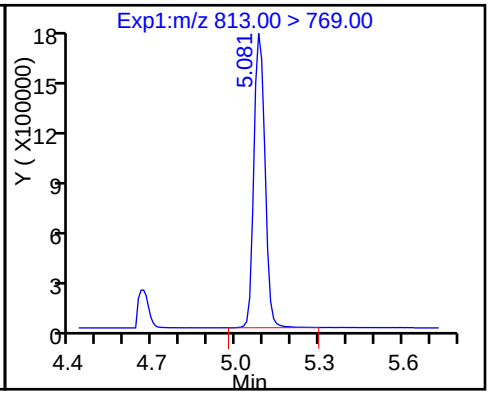
33 Perfluorotetradecanoic acid



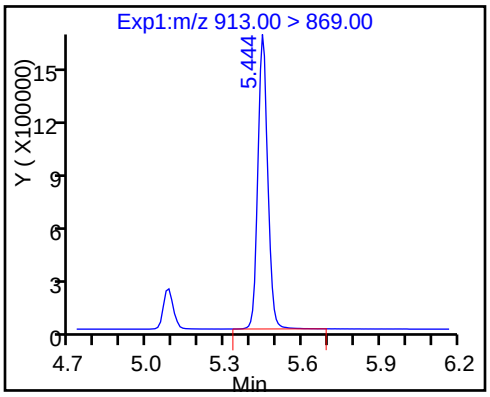
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144510/23 Calibration Date: 12/30/2016 13:48

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9534		22.3	20.0	11.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.069		21.7	20.0	8.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.629		20.3	17.7	15.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9596		20.7	20.0	3.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.093		19.3	18.2	6.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.016		20.8	20.0	3.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.082		21.6	20.0	7.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.256		21.7	19.0	14.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.061		19.8	18.6	6.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9887		20.8	20.0	3.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9949		21.3	20.0	6.7	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9782		20.7	20.0	3.6	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6426		21.2	19.3	10.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9532		19.9	20.0	-0.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9935		21.6	20.0	8.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9813		21.6	20.0	8.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.910		24.1	20.0	20.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9790		19.9	20.0	-0.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8906		17.3	20.0	-13.6	25.0
13C4 PFBA	Ave	347743	347084		49.9	50.0	-0.2	50.0
13C5-PFPeA	Ave	266072	255513		48.0	50.0	-4.0	50.0
13C2 PFHxA	Ave	245110	228632		46.6	50.0	-6.7	50.0
13C4-PFHpA	Ave	226344	205754		45.5	50.0	-9.1	50.0
18O2 PFHxS	Ave	326976	313069		45.3	47.3	-4.3	50.0
13C4 PFOA	Ave	230362	211330		45.9	50.0	-8.3	50.0
13C4 PFOS	Ave	248847	240305		46.2	47.8	-3.4	50.0
13C5 PFNA	Ave	177687	161152		45.3	50.0	-9.3	50.0
13C8 FOSA	Ave	384141	372199		48.4	50.0	-3.1	50.0
13C2 PFDA	Ave	157302	153027		48.6	50.0	-2.7	50.0
13C2 PFUnA	Ave	117250	115232		49.1	50.0	-1.7	50.0
13C2 PFDoA	Ave	110957	102687		46.3	50.0	-7.5	50.0
13C2-PFTeDA	Ave	227387	224263		49.3	50.0	-1.4	50.0
13C2-PFHxDA	Ave	124568	109648		44.0	50.0	-12.0	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_013.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 30-Dec-2016 13:48:58 ALS Bottle#: 40 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:20 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.526	1.526	0.0		17354181	49.9		99.8	1471536	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	6618387	22.3		112	39955	
D 4 13C5-PFPeA										
267.90 > 223.00	1.801	1.801	0.0		12775664	48.0		96.0	1268245	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.811	1.811	0.0	1.000	5461558	21.7		108	70924	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.840	1.840	0.0	1.000	9018675	20.3		115		
298.90 > 99.00	1.840	1.840	0.0	1.000	3803807		2.37(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.092	2.092	0.0		11431607	46.6		93.3	482267	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.092	2.092	0.0	1.000	4387890	20.7		103	123480	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.410	2.410	0.0	1.000	6229504	19.3		106		
D 11 13C4-PFHpA										
367.00 > 322.00	2.421	2.421	0.0		10287724	45.5		90.9	638332	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.421	2.421	0.0	1.000	4180596	20.8		104	43082	
D 10 18O2 PFHxS										
403.00 > 84.00	2.443	2.443	0.0		14808159	45.3		95.7	2749641	
D 14 13C4 PFOA										
417.00 > 372.00	2.773	2.773	0.0		10566500	45.9		91.7	339047	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.780	2.780	0.0	1.000	4574857	21.6		108	57655	
413.00 > 169.00	2.780	2.780	0.0	1.000	2783863		1.64(0.90-1.10)		145611	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.788	2.788	0.0	1.000	5748483	21.7		114		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.044	3.044	0.0	1.000	4730914	19.8		107	35230	
499.00 > 99.00	3.148	3.044	0.104	1.034	1036506		4.56(0.90-1.10)		48186	
D 17 13C4 PFOS										
503.00 > 80.00	3.148	3.148	0.0		11486595	46.2		96.6	327960	
20 Perfluorononanoic acid										
463.00 > 419.00	3.156	3.156	0.0	1.000	3186454	20.8		104	69726	
D 19 13C5 PFNA										
468.00 > 423.00	3.148	3.148	0.0		8057576	45.3		90.7	391742	
D 21 13C8 FOSA										
506.00 > 78.00	3.478	3.478	0.0		18609948	48.4		96.9	945996	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.470	3.470	0.0	1.000	7406316	21.3		107	272228	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.504	3.504	0.0	1.000	2993760	20.7		104	101040	
D 23 13C2 PFDA										
515.00 > 470.00	3.512	3.512	0.0		7651347	48.6		97.3	259633	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.822	3.822	0.0	1.000	2977189	21.2		110		
D 27 13C2 PFUnA										
565.00 > 520.00	3.839	3.839	0.0		5761609	49.1		98.3	320888	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.839	3.839	0.0	1.000	2196888	19.9		99.7	58457	
D 30 13C2 PFDoA										
615.00 > 570.00	4.138	4.138	0.0		5134343	46.3		92.5	165701	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.138	4.138	0.0	1.000	2040304	21.6		108	58082	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.403	4.403	0.0	1.000	2015289	21.6		108	49581	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.641	4.641	0.0		11213172	49.3		98.6	996370	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.651	4.651	0.0	1.000	3921816	24.1		120	66194	
713.00 > 169.00	4.641	4.651	-0.010	0.998	575761		6.81(0.00-0.00)		72601	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.057	5.057	0.0		5482396	44.0		88.0	131410	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.067	5.067	0.0	1.000	2010567	19.9		99.5	2068	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.421	5.421	0.0	1.000	1828964	17.3		86.4	2405	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:28:20 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_013.d

Injection Date: 30-Dec-2016 13:48:58 Instrument ID: A8_N

Lims ID: CCV L4

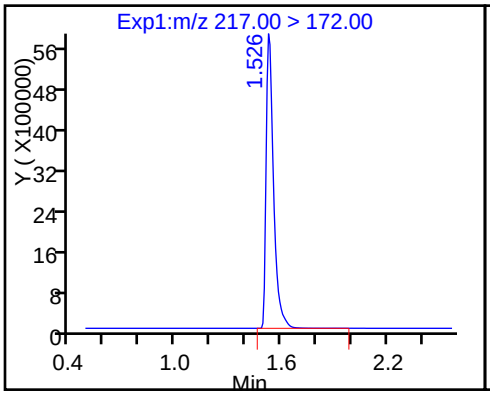
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 23

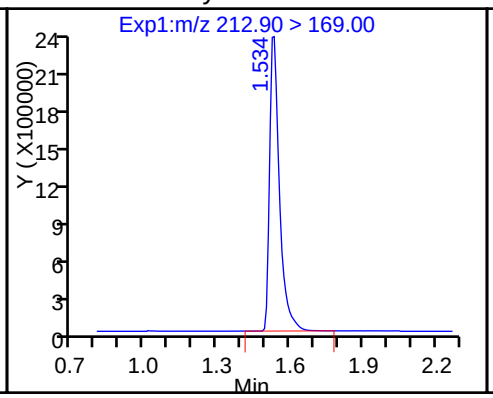
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

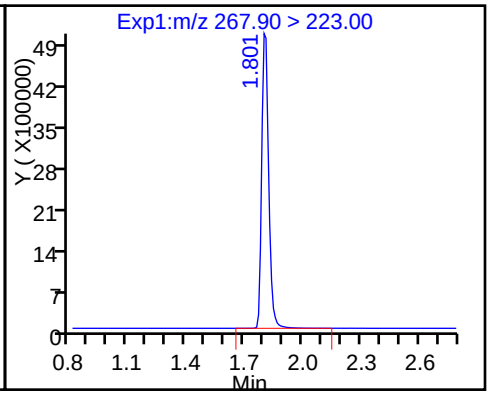
D 2 13C4 PFBA



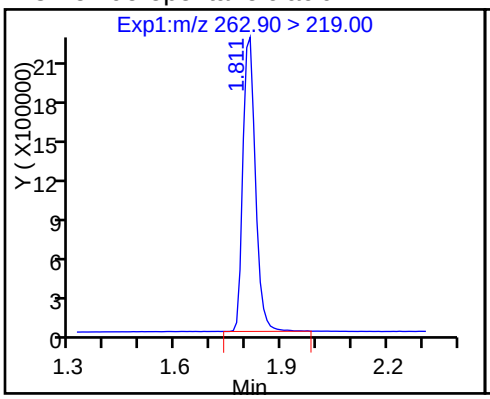
1 Perfluorobutyric acid



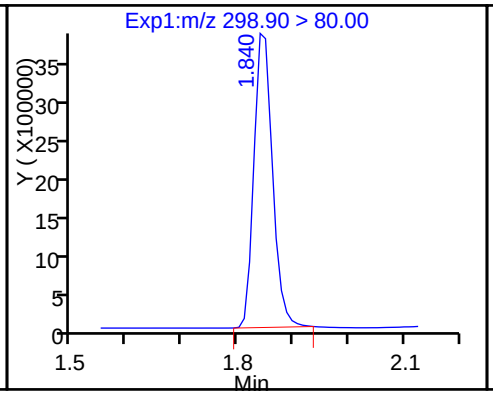
D 4 13C5-PFPeA



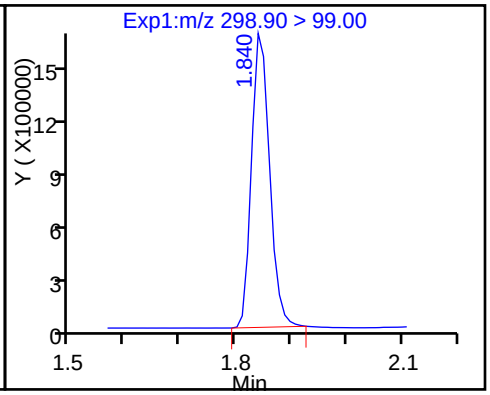
3 Perfluoropentanoic acid



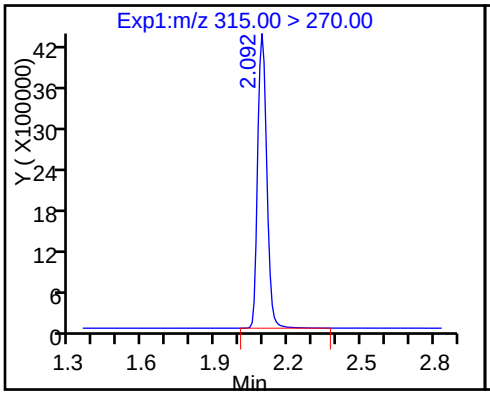
5 Perfluorobutanesulfonic acid



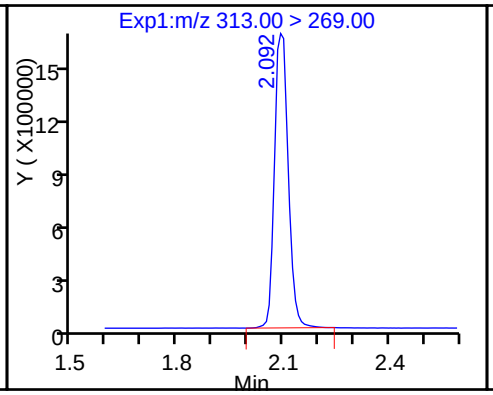
5 Perfluorobutanesulfonic acid



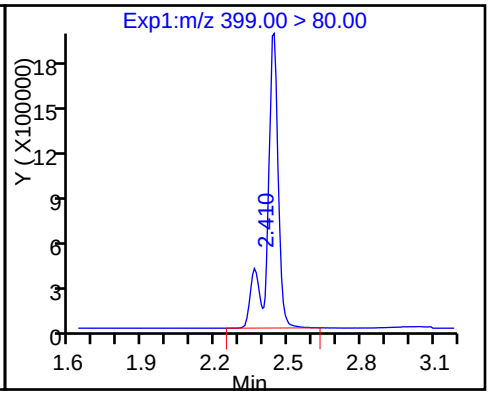
D 6 13C2 PFHxA



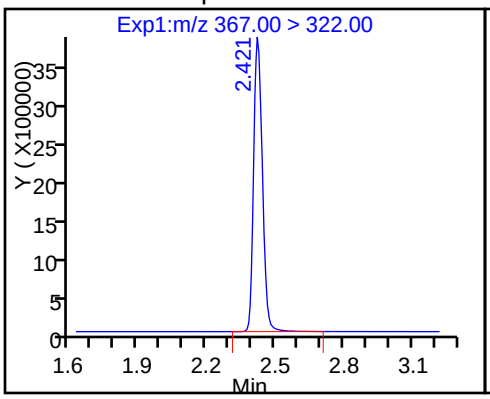
7 Perfluorohexanoic acid



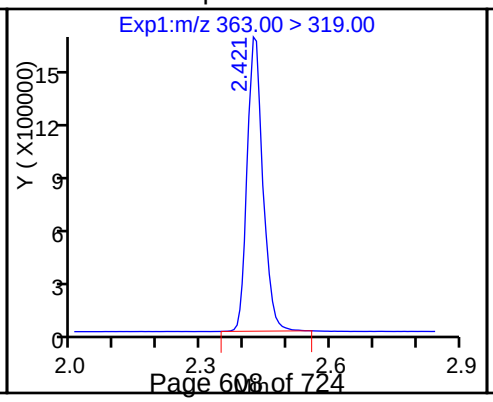
9 Perfluorohexanesulfonic acid



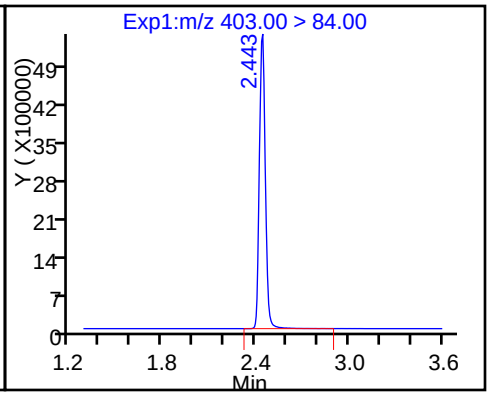
D 11 13C4-PFHpA



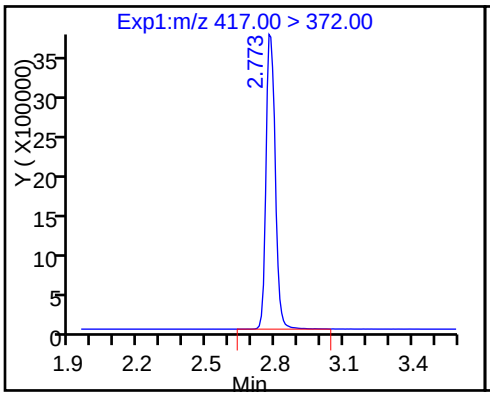
12 Perfluoroheptanoic acid



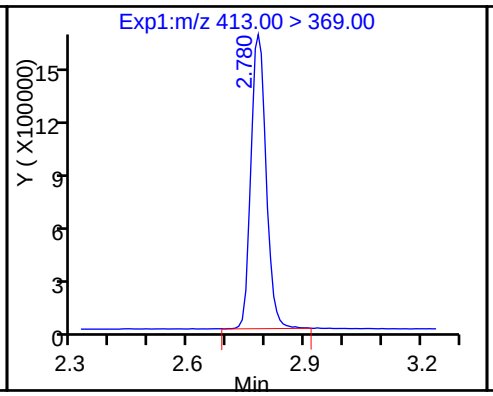
D 10 18O2 PFHxS



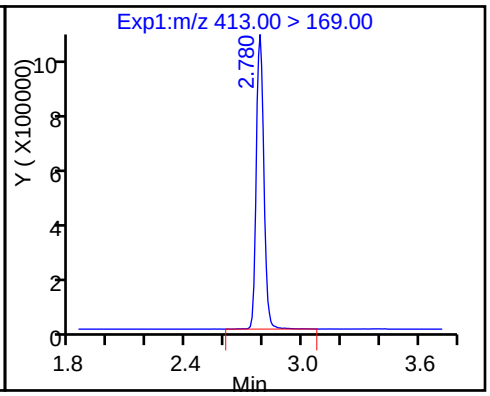
D 14 13C4 PFOA



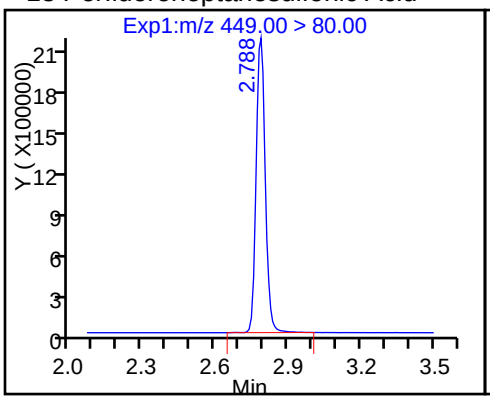
15 Perfluorooctanoic acid



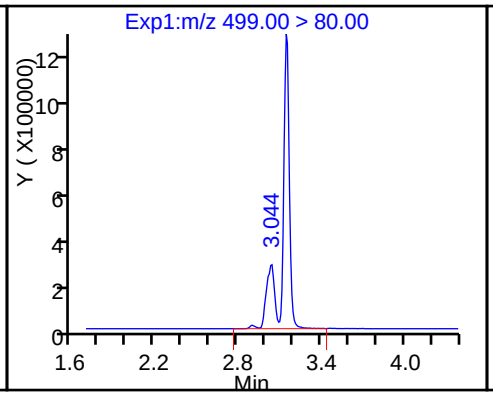
15 Perfluorooctanoic acid



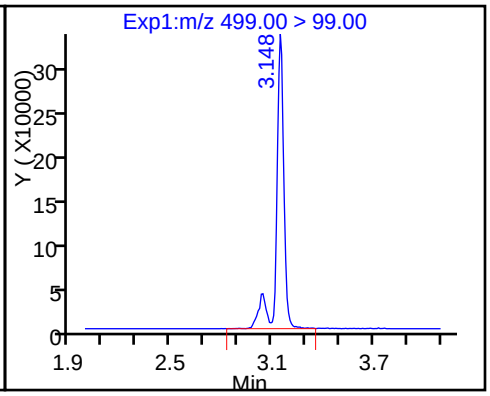
13 Perfluoroheptanesulfonic Acid



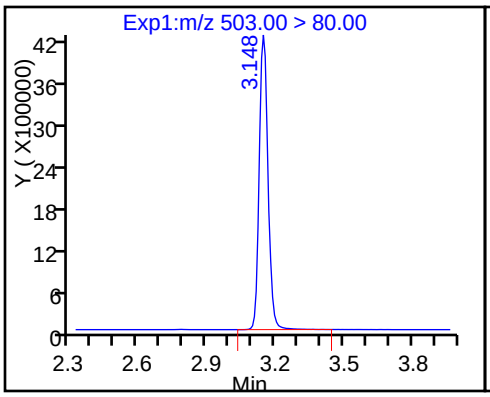
18 Perfluorooctane sulfonic acid



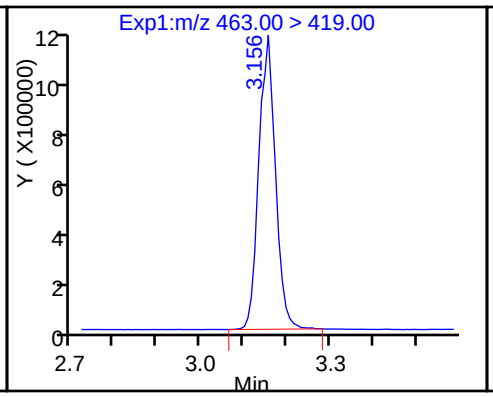
18 Perfluorooctane sulfonic acid



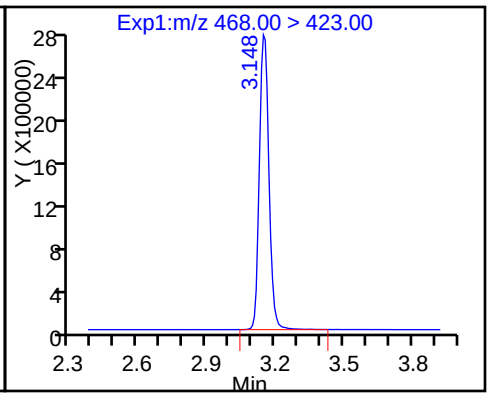
D 17 13C4 PFOS



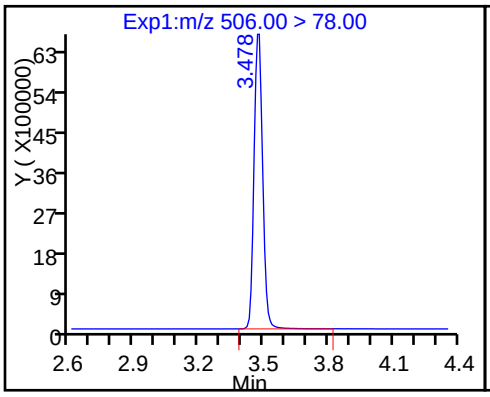
20 Perfluorononanoic acid



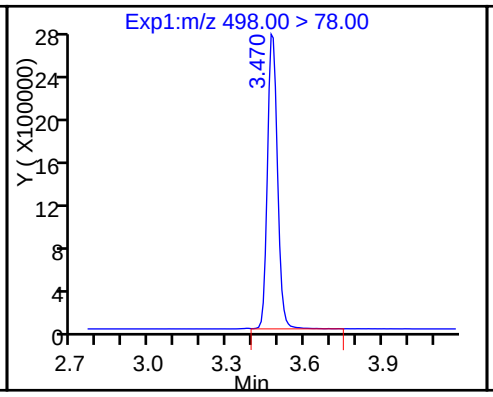
D 19 13C5 PFNA



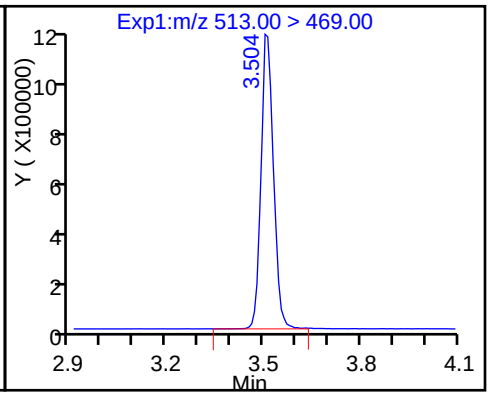
D 21 13C8 FOSA



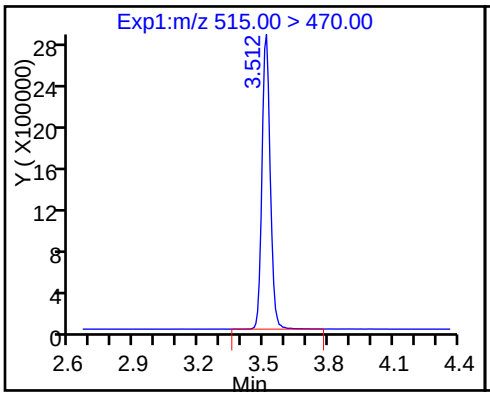
22 Perfluorooctane Sulfonamide



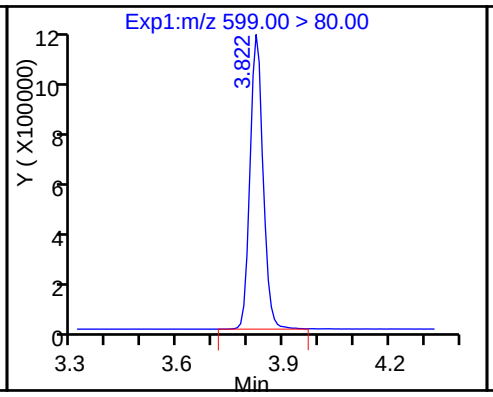
24 Perfluorodecanoic acid



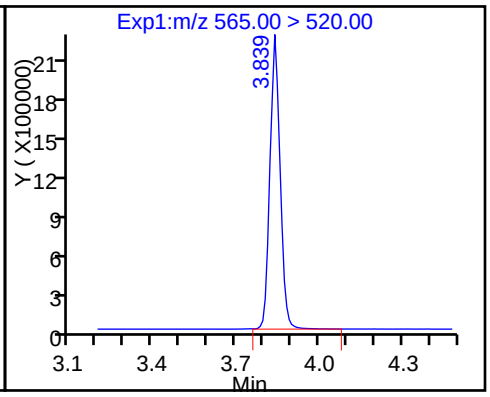
D 23 13C2 PFDA



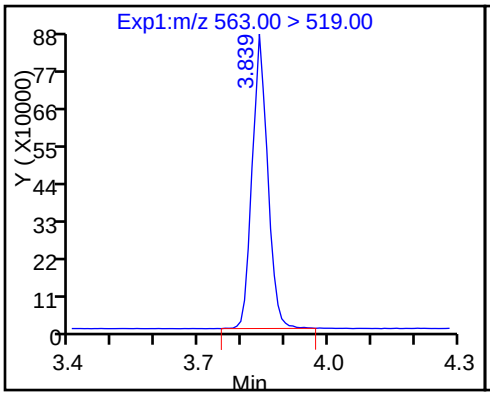
26 Perfluorodecane Sulfonic acid



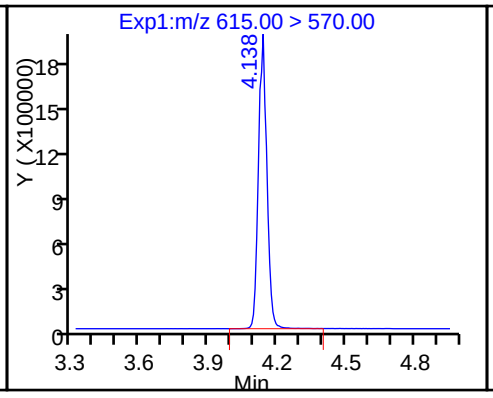
D 27 13C2 PFUnA



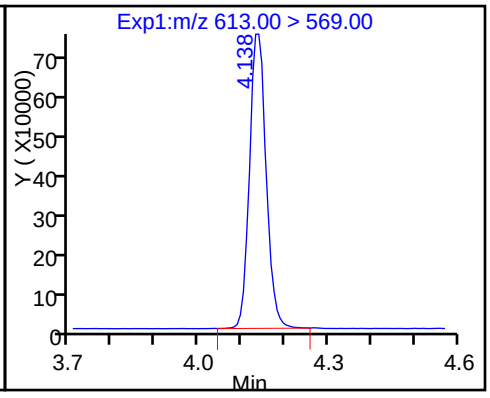
28 Perfluoroundecanoic acid



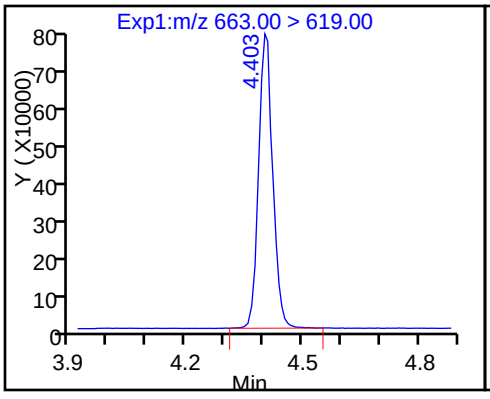
D 30 13C2 PFDoA



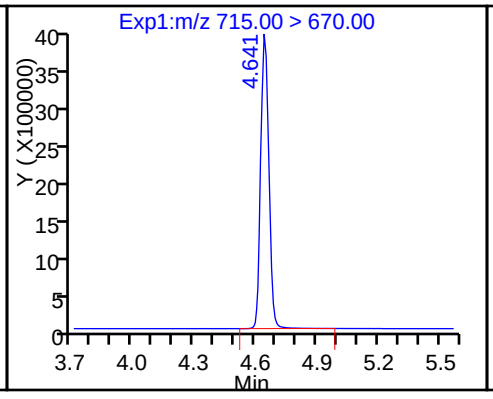
29 Perfluorododecanoic acid



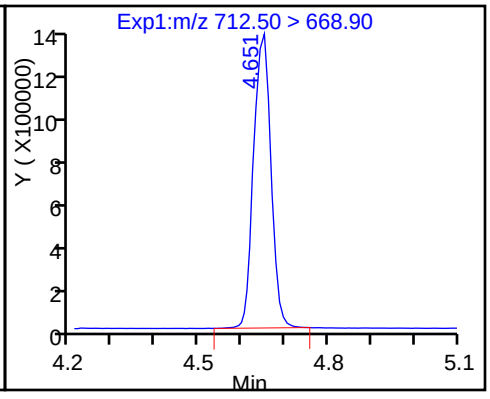
31 Perfluorotridecanoic acid



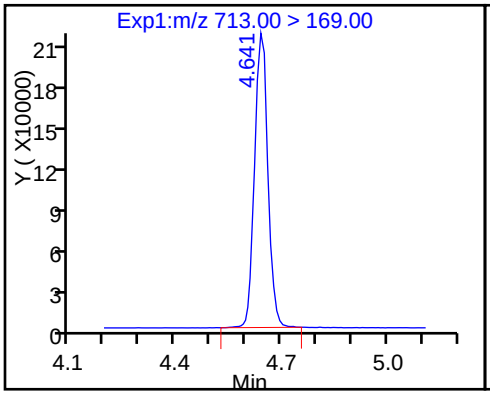
D 32 13C2-PFTeDA



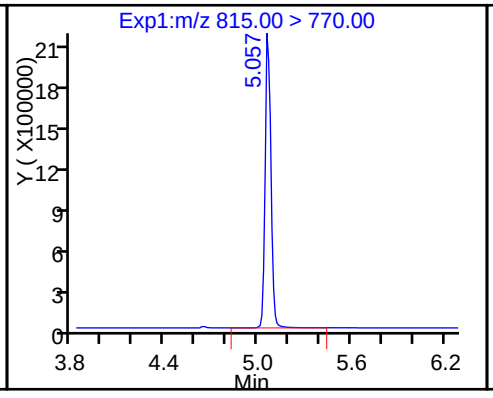
33 Perfluorotetradecanoic acid



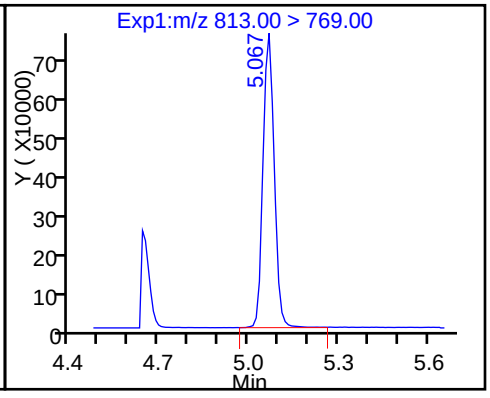
33 Perfluorotetradecanoic acid



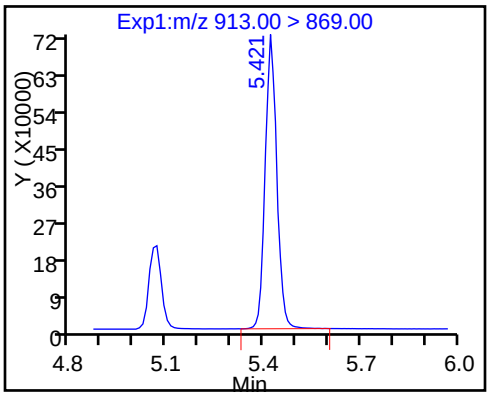
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144510/34 Calibration Date: 12/30/2016 15:11

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_024.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9060		53.1	50.0	6.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.002		50.8	50.0	1.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.492		46.5	44.2	5.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9288		50.0	50.0	0.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9647		49.3	50.0	-1.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.016		44.9	45.5	-1.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.179		50.9	47.6	7.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.024		51.1	50.0	2.1	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9743		51.2	50.0	2.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.035		48.3	46.4	4.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9279		49.7	50.0	-0.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9530		50.5	50.0	1.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6065		50.1	48.2	3.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9788		51.2	50.0	2.4	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9437		51.4	50.0	2.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.8909		49.1	50.0	-1.8	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.778		56.1	50.0	12.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9509		49.2	50.0	-1.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8617		41.8	50.0	-16.4	25.0
13C4 PFBA	Ave	347743	319330		45.9	50.0	-8.2	50.0
13C5-PFPeA	Ave	266072	236584		44.5	50.0	-11.1	50.0
13C2 PFHxA	Ave	245110	209255		42.7	50.0	-14.6	50.0
13C4-PFHpA	Ave	226344	192958		42.6	50.0	-14.8	50.0
18O2 PFHxS	Ave	326976	289218		41.8	47.3	-11.5	50.0
13C4 PFOA	Ave	230362	188480		40.9	50.0	-18.2	50.0
13C4 PFOS	Ave	248847	222836		42.8	47.8	-10.5	50.0
13C5 PFNA	Ave	177687	146822		41.3	50.0	-17.4	50.0
13C8 FOSA	Ave	384141	352469		45.9	50.0	-8.2	50.0
13C2 PFDA	Ave	157302	138409		44.0	50.0	-12.0	50.0
13C2 PFUnA	Ave	117250	104402		44.5	50.0	-11.0	50.0
13C2 PFDoA	Ave	110957	96104		43.3	50.0	-13.4	50.0
13C2-PFTeDA	Ave	227387	199997		44.0	50.0	-12.0	50.0
13C2-PFHxDA	Ave	124568	106062		42.6	50.0	-14.9	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_024.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 30-Dec-2016 15:11:35 ALS Bottle#: 41 Worklist Smp#: 34
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:36 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		15966492	45.9		91.8	889900	
1 Perfluorobutyric acid										
212.90 > 169.00	1.542	1.542	0.0	1.000	14466281	53.1		106	77794	
D 4 13C5-PFPeA										
267.90 > 223.00	1.811	1.811	0.0		11829188	44.5		88.9	1596351	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.811	1.811	0.0	1.000	11852936	50.8		102	180727	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	19068053	46.5		105		
298.90 > 99.00	1.849	1.849	0.0	1.000	8593710		2.22(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.100	2.100	0.0		10462764	42.7		85.4	690688	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.100	2.100	0.0	1.000	9717826	50.0		100	307055	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.448	2.448	0.0	1.000	13369545	44.9		98.6		
D 11 13C4-PFHpA										
367.00 > 322.00	2.420	2.420	0.0		9647918	42.6		85.2	695428	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.426	2.426	0.0	1.000	9306824	49.3		98.6	82233	
D 10 18O2 PFHxS										
403.00 > 84.00	2.448	2.448	0.0		13680031	41.8		88.5	1628958	
D 14 13C4 PFOA										
417.00 > 372.00	2.778	2.778	0.0		9424004	40.9		81.8	471090	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.786	2.786	0.0	1.000	9652878	51.1		102	120863	
413.00 > 169.00	2.778	2.786	-0.008	0.997	5850255		1.65(0.90-1.10)		214127	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.786	2.786	0.0	1.000	12509326	50.9		107		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.153	3.153	0.0	1.000	10699209	48.3		104	376250	
499.00 > 99.00	3.153	3.153	0.0	1.000	2340753		4.57(0.90-1.10)		148153	
D 17 13C4 PFOS										
503.00 > 80.00	3.146	3.146	0.0		10651583	42.8		89.5	206479	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0		7341115	41.3		82.6	307038	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.153	0.0	1.000	7152069	51.2		102	138815	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.476	3.476	0.0	1.000	16352092	49.7		99.5	390206	
D 21 13C8 FOSA										
506.00 > 78.00	3.476	3.476	0.0		17623448	45.9		91.8	910534	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.518	3.518	0.0	1.000	6595460	50.5		101	185377	
D 23 13C2 PFDA										
515.00 > 470.00	3.510	3.510	0.0		6920447	44.0		88.0	229932	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.820	3.820	0.0	1.000	6514108	50.1		104		
D 27 13C2 PFUnA										
565.00 > 520.00	3.837	3.837	0.0		5220103	44.5		89.0	270501	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.837	3.837	0.0	1.000	5109489	51.2		102	160428	
D 30 13C2 PFDoA										
615.00 > 570.00	4.131	4.131	0.0		4805222	43.3		86.6	222994	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.131	4.131	0.0	1.000	4534816	51.4		103	102487	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.403	4.403	0.0	1.000	4280712	49.1		98.2	87982	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.641	4.641	0.0		9999849	44.0		88.0	896418	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.641	4.641	0.0	1.000	8541976	56.1		112	169018	
713.00 > 169.00	4.641	4.641	0.0	1.000	1259708		6.78(0.00-0.00)		120161	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.057	5.057	0.0		5303084	42.6		85.1	117437	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.057	5.057	0.0	1.000	4569254	49.2		98.4	5550	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.413	0.0	1.000	4140756	41.8		83.6	5407	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:28:36 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_024.d

Injection Date: 30-Dec-2016 15:11:35 Instrument ID: A8_N

Lims ID: CCV L5

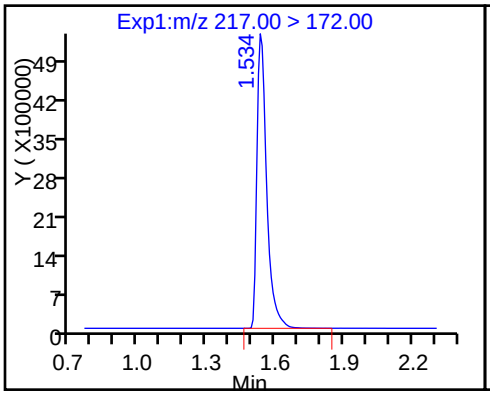
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 34

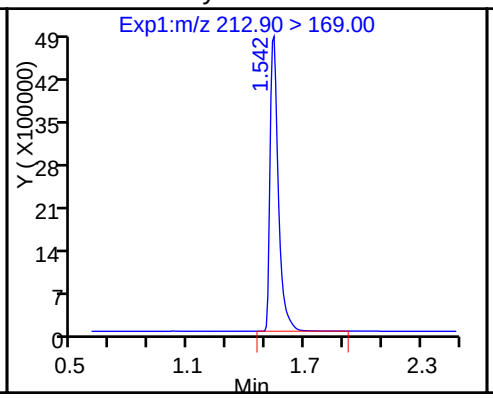
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

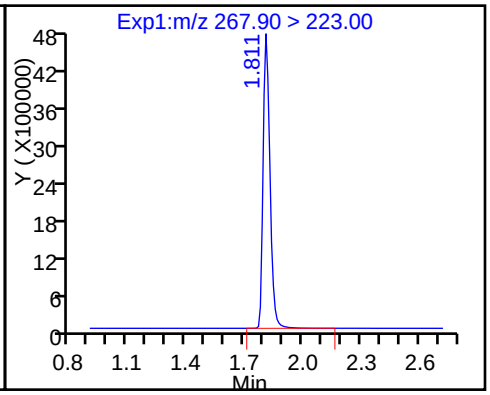
D 2 13C4 PFBA



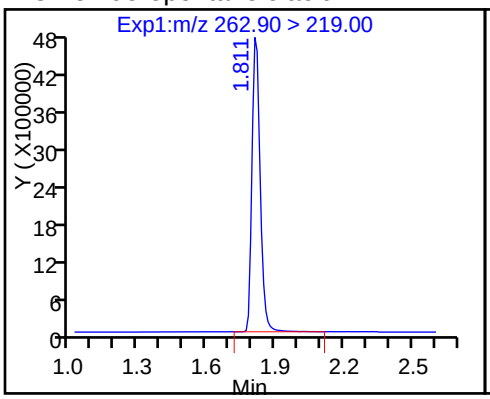
1 Perfluorobutyric acid



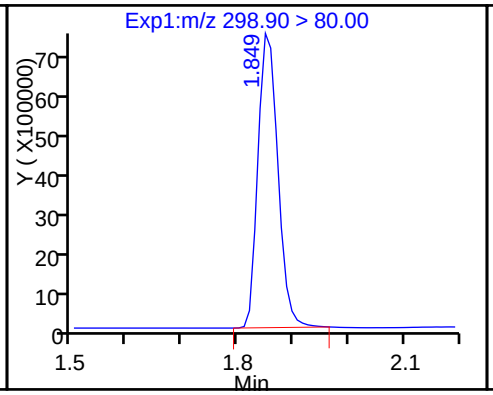
D 4 13C5-PFPeA



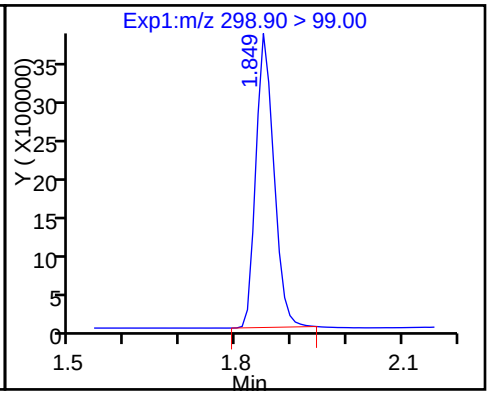
3 Perfluoropentanoic acid



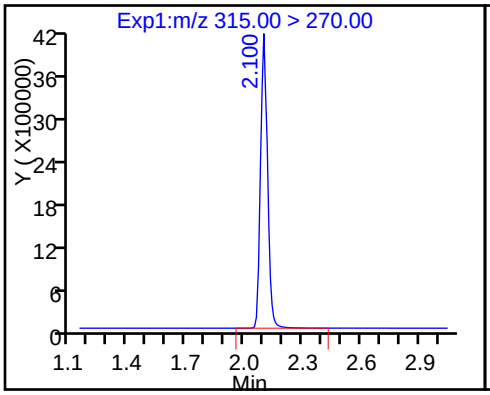
5 Perfluorobutanesulfonic acid



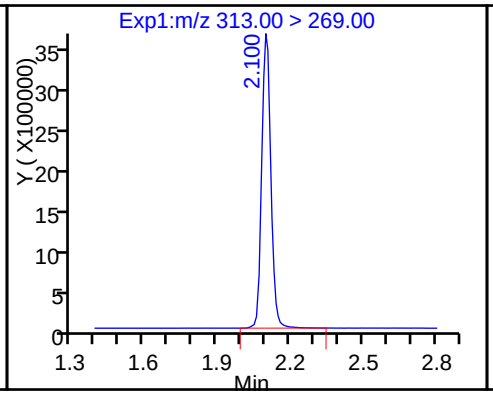
5 Perfluorobutanesulfonic acid



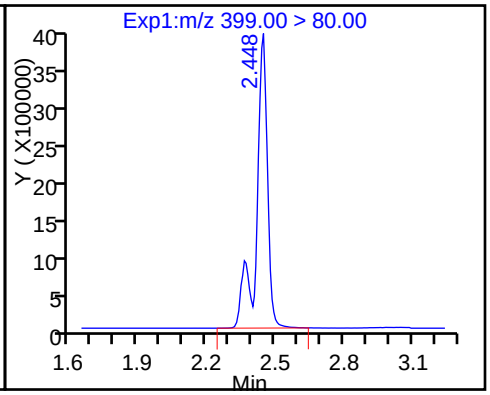
D 6 13C2 PFHxA



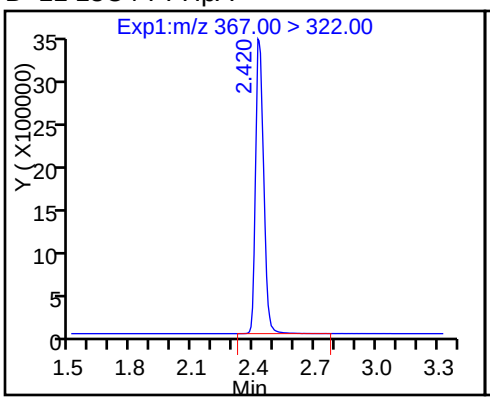
7 Perfluorohexanoic acid



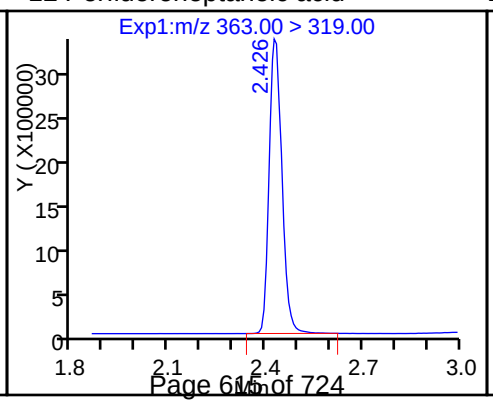
9 Perfluorohexanesulfonic acid



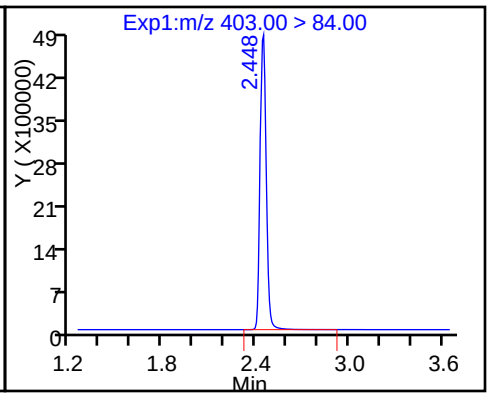
D 11 13C4-PFHpA



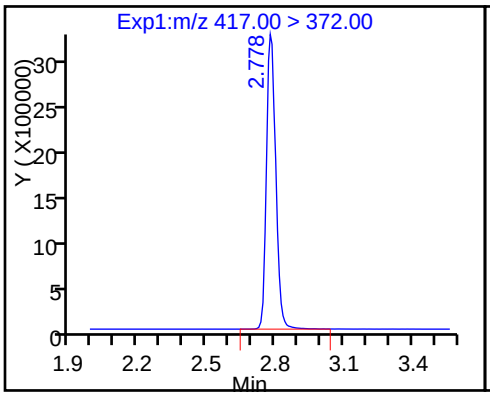
12 Perfluoroheptanoic acid



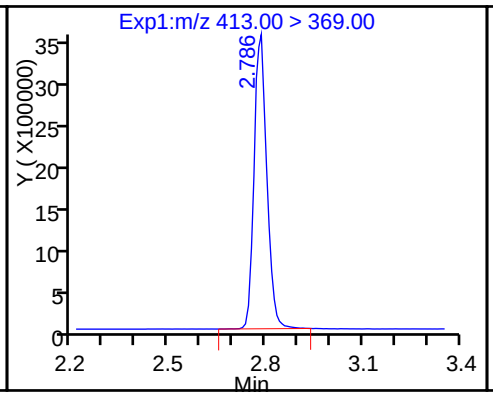
D 10 18O2 PFHxS



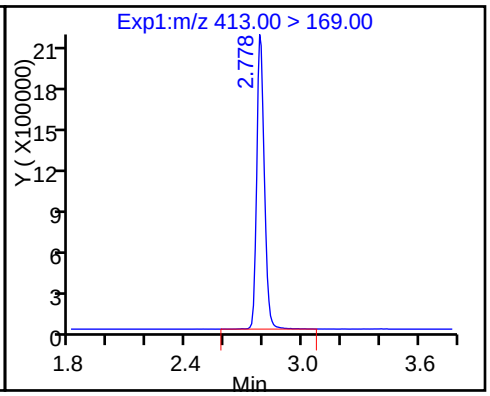
D 14 13C4 PFOA



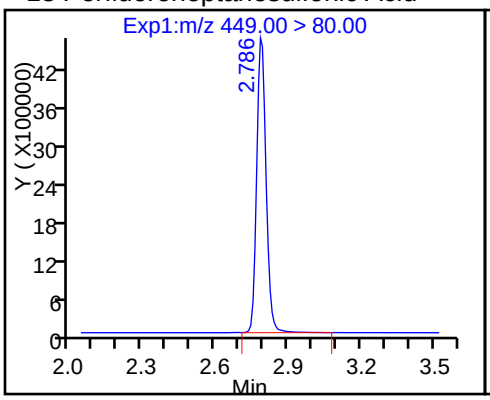
15 Perfluorooctanoic acid



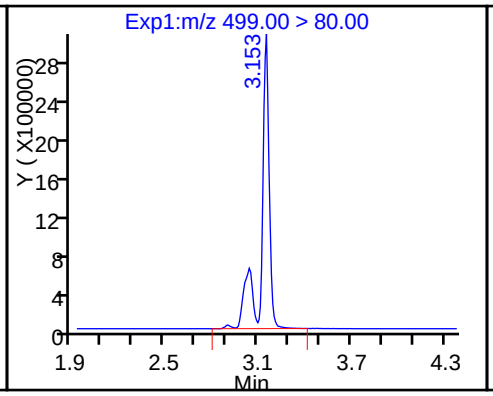
15 Perfluorooctanoic acid



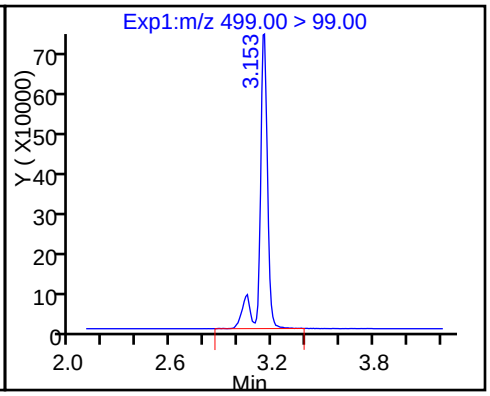
13 Perfluoroheptanesulfonic Acid



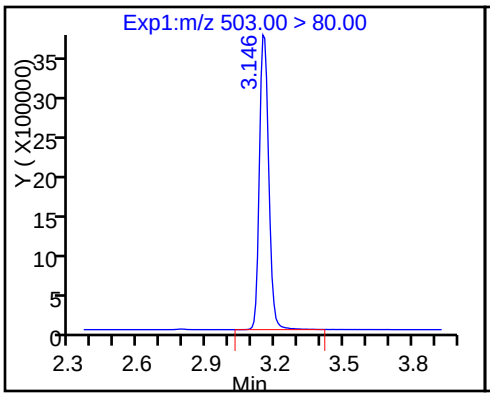
18 Perfluorooctane sulfonic acid



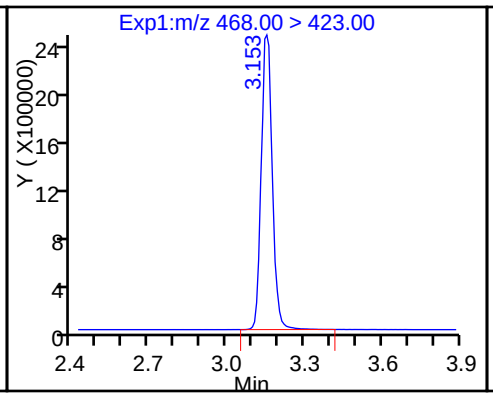
18 Perfluorooctane sulfonic acid



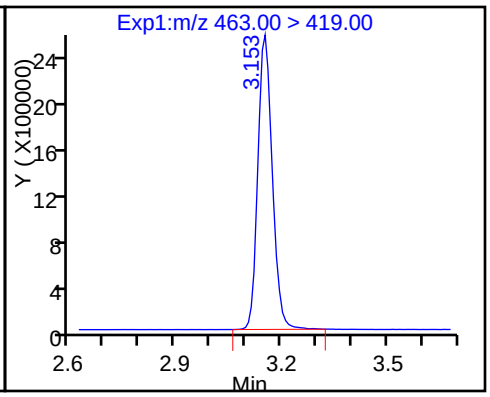
D 17 13C4 PFOS



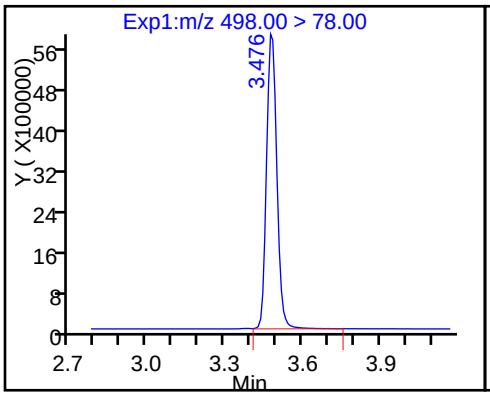
D 19 13C5 PFNA



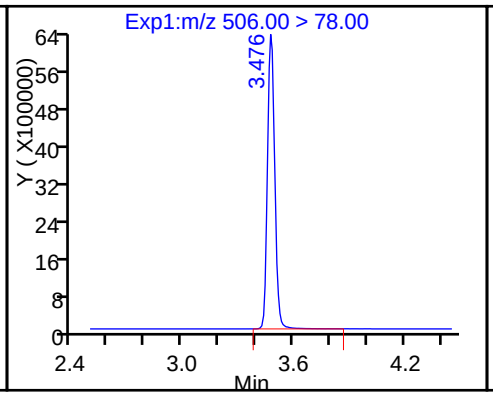
20 Perfluorononanoic acid



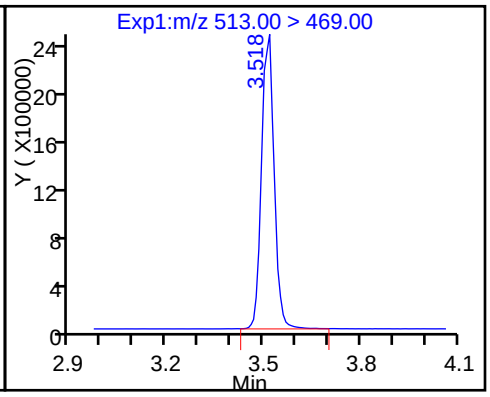
22 Perfluorooctane Sulfonamide



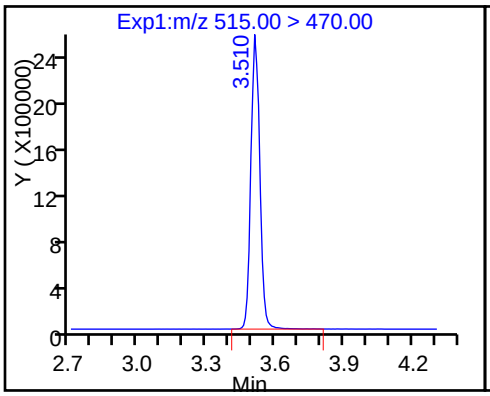
D 21 13C8 FOSA



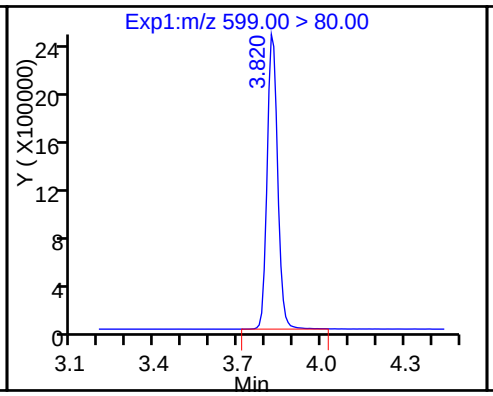
24 Perfluorodecanoic acid



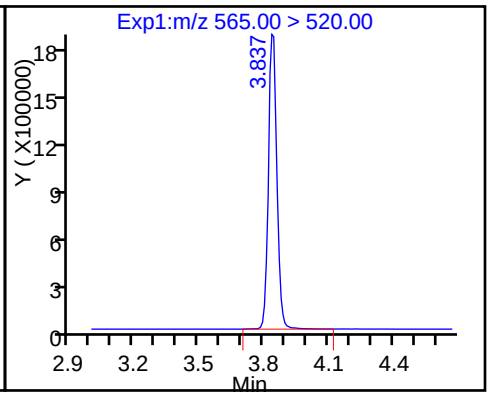
D 23 13C2 PFDA



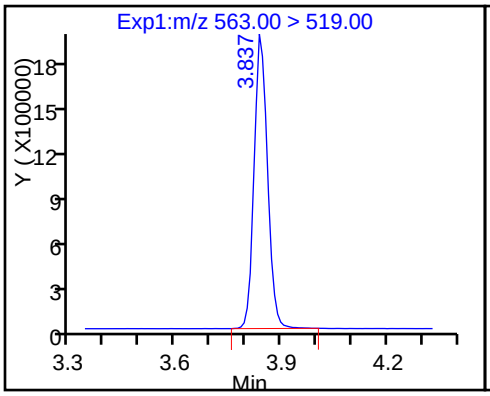
26 Perfluorodecane Sulfonic acid



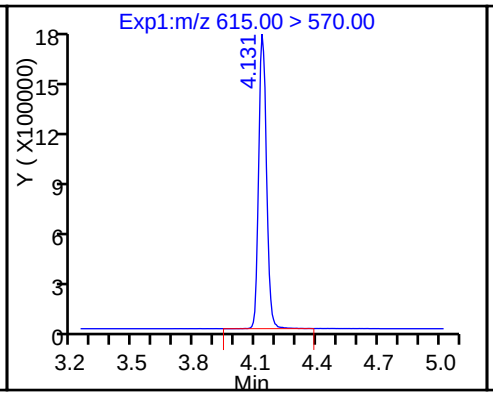
D 27 13C2 PFUnA



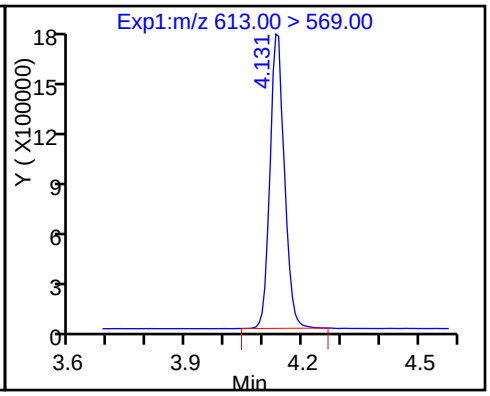
28 Perfluoroundecanoic acid



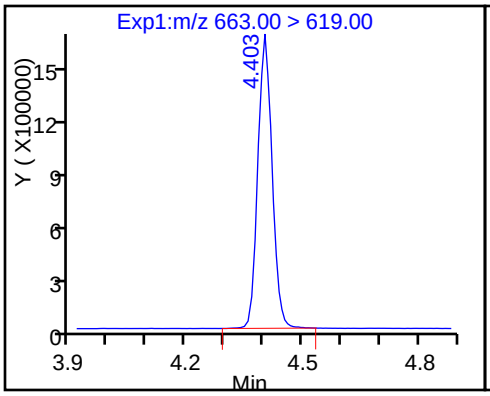
D 30 13C2 PFDoA



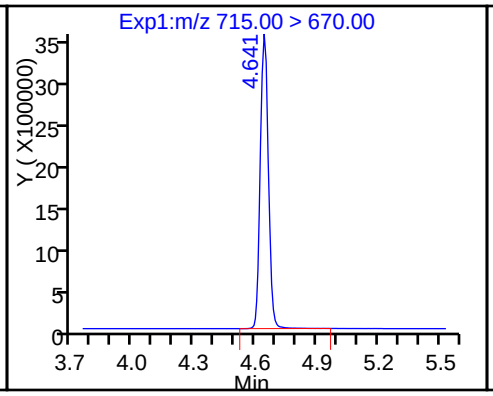
29 Perfluorododecanoic acid



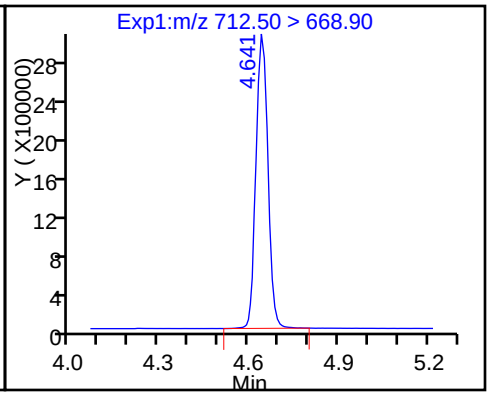
31 Perfluorotridecanoic acid



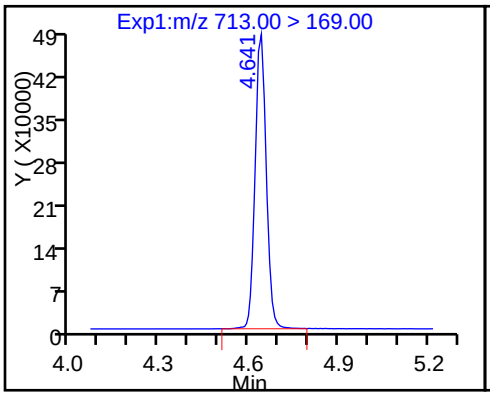
D 32 13C2-PFTeDA



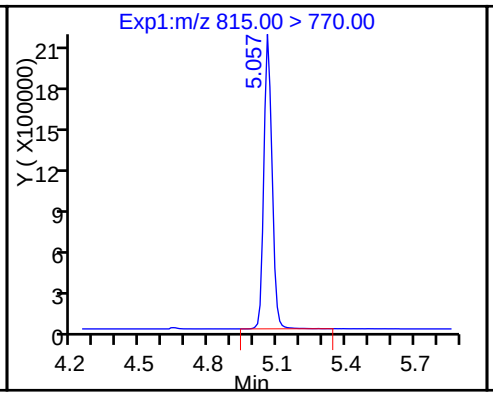
33 Perfluorotetradecanoic acid



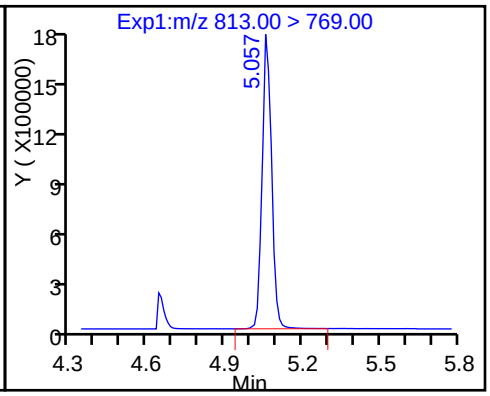
33 Perfluorotetradecanoic acid



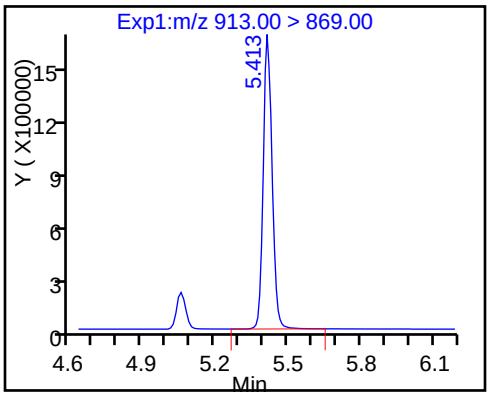
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144510/40 Calibration Date: 12/30/2016 15:56

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_030.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9594		22.5	20.0	12.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.074		21.8	20.0	8.9	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.593		19.9	17.7	12.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9257		19.9	20.0	-0.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.072		18.9	18.2	4.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.000		20.4	20.0	2.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.038		20.7	20.0	3.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.209		20.9	19.0	9.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.039		19.4	18.6	4.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9805		20.6	20.0	3.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	1.007		21.6	20.0	7.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9676		20.5	20.0	2.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6194		20.5	19.3	6.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9441		19.7	20.0	-1.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9531		20.8	20.0	3.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9256		20.4	20.0	2.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.761		22.2	20.0	11.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.999		20.3	20.0	1.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8610		16.7	20.0	-16.4	25.0
13C4 PFBA	Ave	347743	341519		49.1	50.0	-1.8	50.0
13C5-PFPeA	Ave	266072	255380		48.0	50.0	-4.0	50.0
13C2 PFHxA	Ave	245110	226422		46.2	50.0	-7.6	50.0
13C4-PFHpA	Ave	226344	206560		45.6	50.0	-8.7	50.0
18O2 PFHxS	Ave	326976	311209		45.0	47.3	-4.8	50.0
13C4 PFOA	Ave	230362	208805		45.3	50.0	-9.4	50.0
13C4 PFOS	Ave	248847	248442		47.7	47.8	-0.2	50.0
13C5 PFNA	Ave	177687	164227		46.2	50.0	-7.6	50.0
13C8 FOSA	Ave	384141	361910		47.1	50.0	-5.8	50.0
13C2 PFDA	Ave	157302	147175		46.8	50.0	-6.4	50.0
13C2 PFUnA	Ave	117250	114584		48.9	50.0	-2.3	50.0
13C2 PFDoA	Ave	110957	101956		45.9	50.0	-8.1	50.0
13C2-PFTeDA	Ave	227387	211949		46.6	50.0	-6.8	50.0
13C2-PFHxDA	Ave	124568	108148		43.4	50.0	-13.2	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_030.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 30-Dec-2016 15:56:38 ALS Bottle#: 40 Worklist Smp#: 40
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:47 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 14:18:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		17075966	49.1		98.2	1412378	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	6552772	22.5		112	33297	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		12768980	48.0		96.0	1248085	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	5486217	21.8		109	62469	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.849	0.0	1.000	8763438	19.9		112		
298.90 > 99.00	1.849	1.849	0.0	1.000	3745932		2.34(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.093	2.093	0.0		11321091	46.2		92.4	698736	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.093	2.093	0.0	1.000	4191824	19.9		99.7	110478	
D 11 13C4-PFHpA										
367.00 > 322.00	2.424	2.424	0.0		10327993	45.6		91.3	539197	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.432	2.432	0.0	1.000	4132492	20.4		102	45398	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.362	2.362	0.0	1.000	6072620	18.9		104		
D 10 18O2 PFHxS										
403.00 > 84.00	2.447	2.447	0.0		14720183	45.0		95.2	888745	
D 14 13C4 PFOA										
417.00 > 372.00	2.791	2.791	0.0		10440251	45.3		90.6	522217	

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	2.791	2.791	0.0	1.000	4336621	20.7		104	57790	
413.00 > 169.00	2.791	2.791	0.0	1.000	2590932		1.67(0.90-1.10)		106630	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.799	2.799	0.0	1.000	5717047	20.9		110		
D 17 13C4 PFOS										
503.00 > 80.00	3.160	3.160	0.0		11875524	47.7		99.8	479973	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.058	3.058	0.0	1.000	4791996	19.4		105	72778	
499.00 > 99.00	3.160	3.058	0.102	1.033	1071826		4.47(0.90-1.10)		66019	
D 19 13C5 PFNA										
468.00 > 423.00	3.160	3.160	0.0		8211358	46.2		92.4	449488	
20 Perfluorononanoic acid										
463.00 > 419.00	3.167	3.167	0.0	1.000	3220603	20.6		103	69218	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.499	3.499	0.0	1.000	7286394	21.6		108	326460	
D 21 13C8 FOSA										
506.00 > 78.00	3.491	3.491	0.0		18095510	47.1		94.2	833695	
D 23 13C2 PFDA										
515.00 > 470.00	3.524	3.524	0.0		7358769	46.8		93.6	338941	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.524	3.524	0.0	1.000	2848236	20.5		103	96014	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.836	3.836	0.0	1.000	2967013	20.5		106		
D 27 13C2 PFUnA										
565.00 > 520.00	3.853	3.853	0.0		5729203	48.9		97.7	309718	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.853	3.853	0.0	1.000	2163651	19.7		98.7	74794	
D 30 13C2 PFDoA										
615.00 > 570.00	4.144	4.144	0.0		5097778	45.9		91.9	222716	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.144	4.144	0.0	1.000	1943448	20.8		104	68308	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.416	4.416	0.0	1.000	1887364	20.4		102	48163	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.648	4.648	0.0		10597466	46.6		93.2	971253	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.658	4.658	0.0	1.000	3590915	22.2		111	64708	
713.00 > 169.00	4.648	4.658	-0.010	0.998	567305		6.33(0.00-0.00)		75619	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.072	5.072	0.0		5407394	43.4		86.8	138834	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.072	5.072	0.0	1.000	2037936	20.3		102	2633	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.415	5.415	0.0	1.000	1755603	16.7		83.6	2610	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:28:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_030.d

Injection Date: 30-Dec-2016 15:56:38 Instrument ID: A8_N

Lims ID: CCV L4

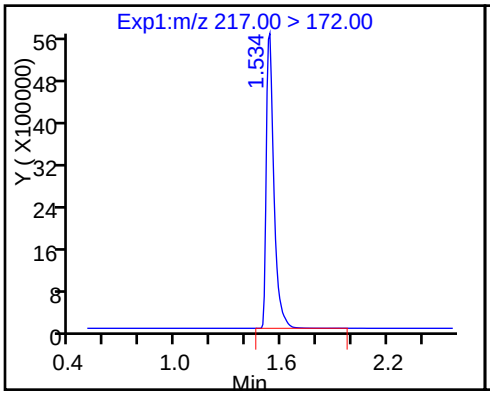
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 40

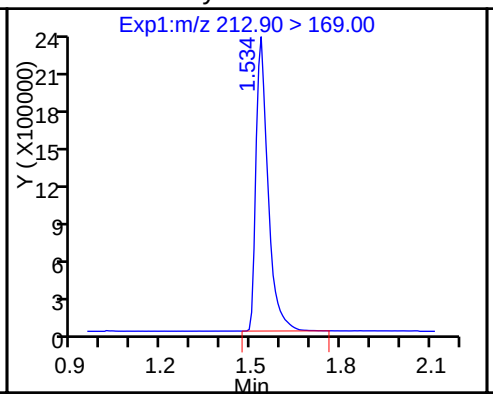
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

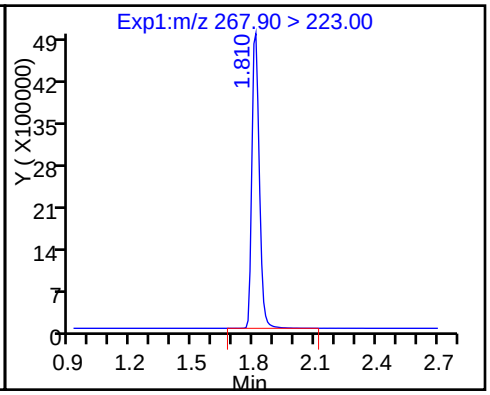
D 2 13C4 PFBA



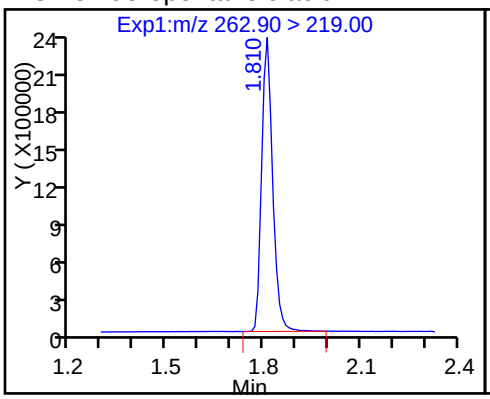
1 Perfluorobutyric acid



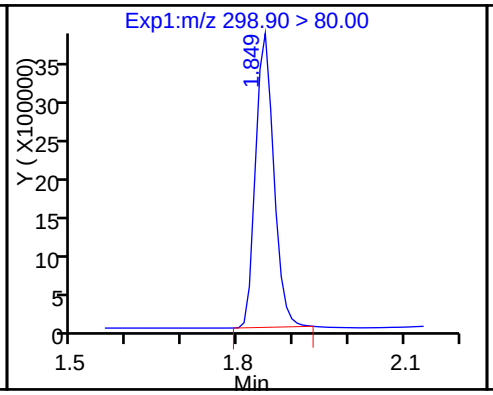
D 4 13C5-PFPeA



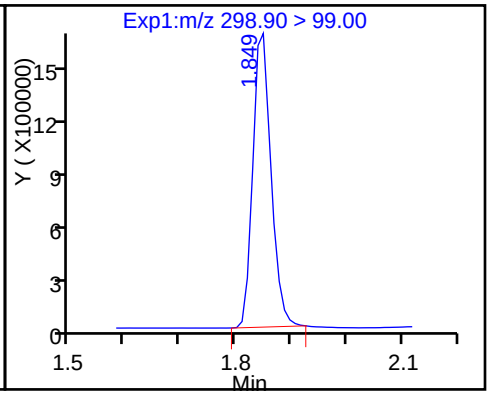
3 Perfluoropentanoic acid



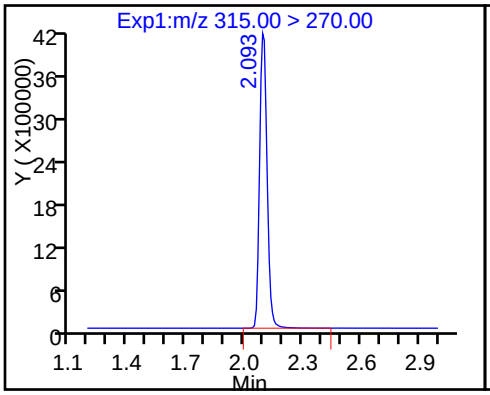
5 Perfluorobutanesulfonic acid



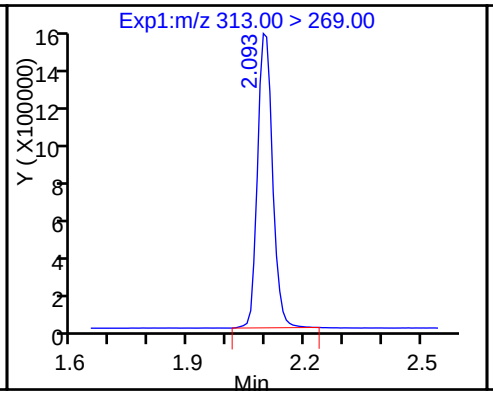
5 Perfluorobutanesulfonic acid



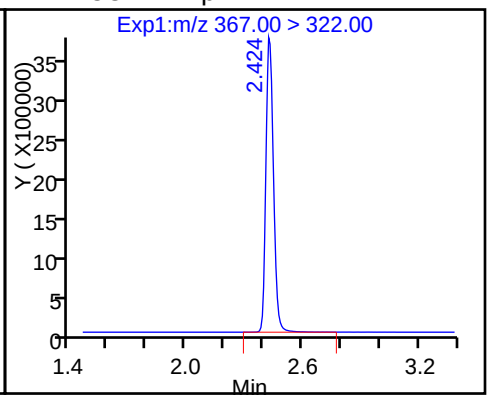
D 6 13C2 PFHxA



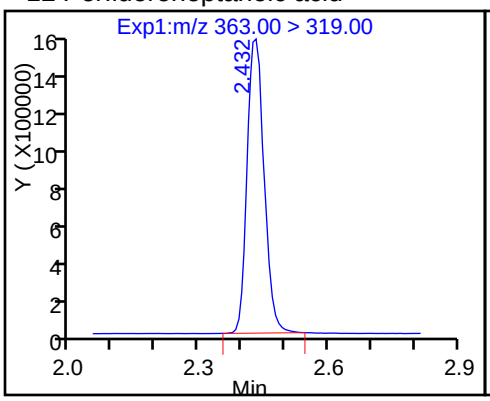
7 Perfluorohexanoic acid



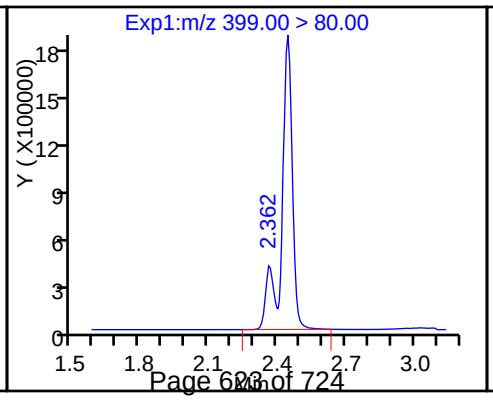
D 11 13C4-PFHpA



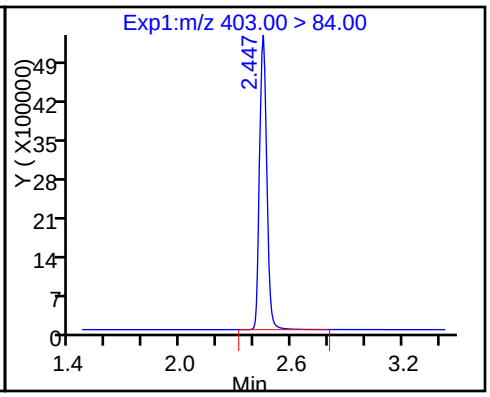
12 Perfluoroheptanoic acid



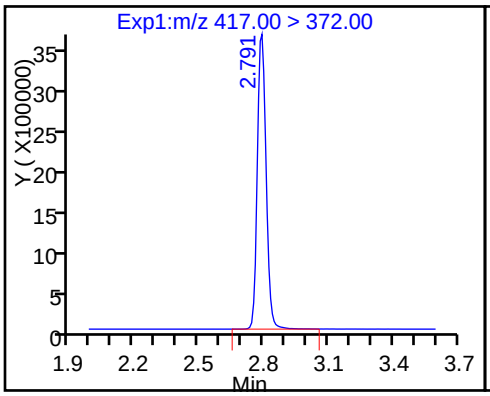
9 Perfluorohexanesulfonic acid



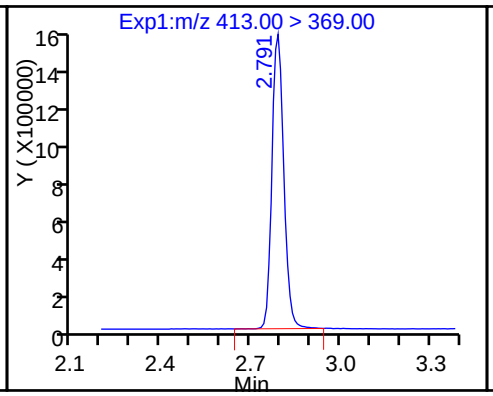
D 10 18O2 PFHxS



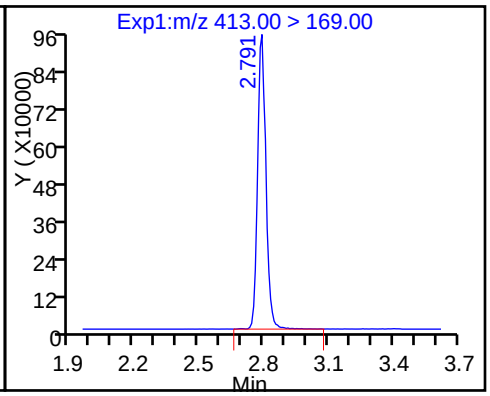
D 14 13C4 PFOA



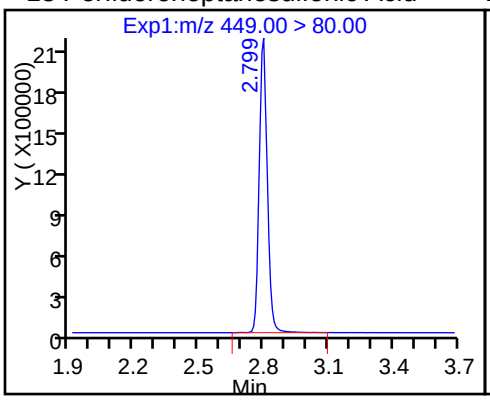
15 Perfluorooctanoic acid



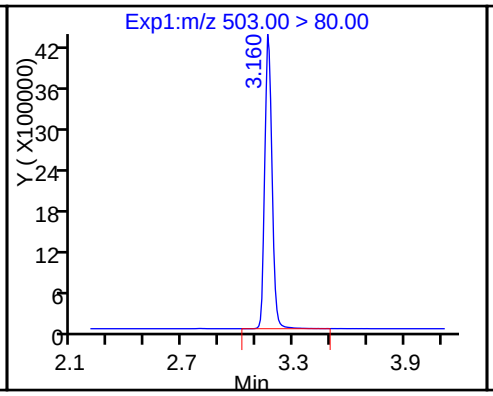
15 Perfluorooctanoic acid



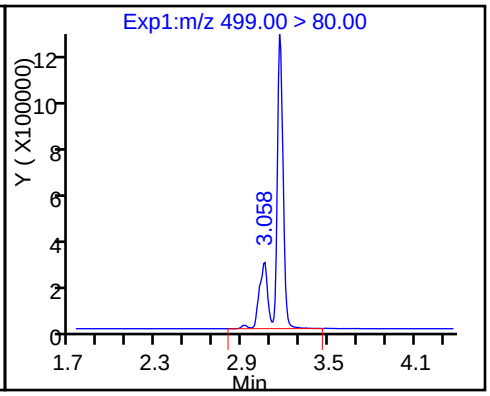
13 Perfluoroheptanesulfonic Acid



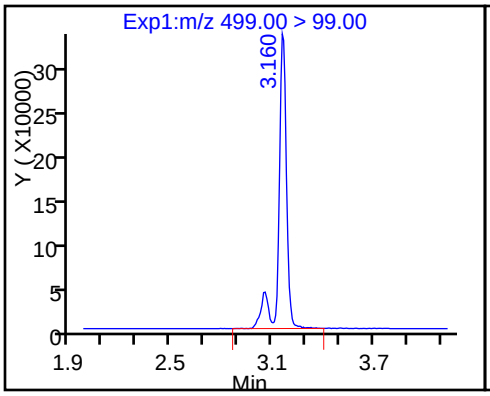
D 17 13C4 PFOS



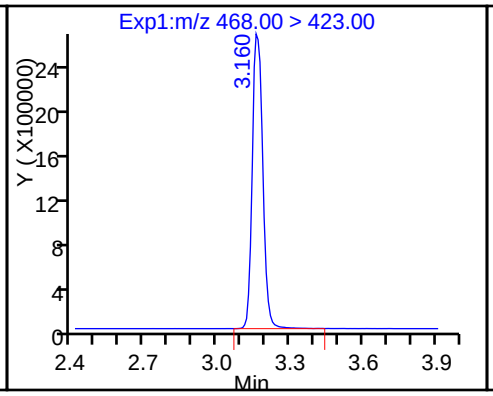
18 Perfluorooctane sulfonic acid



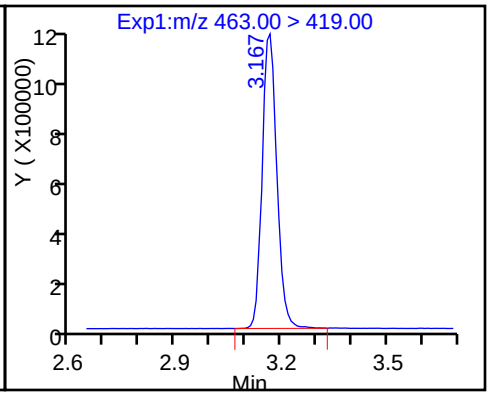
18 Perfluorooctane sulfonic acid



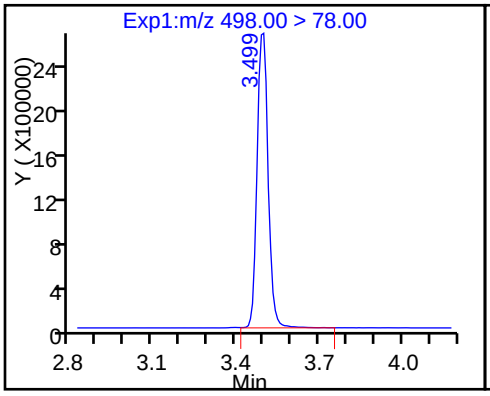
D 19 13C5 PFNA



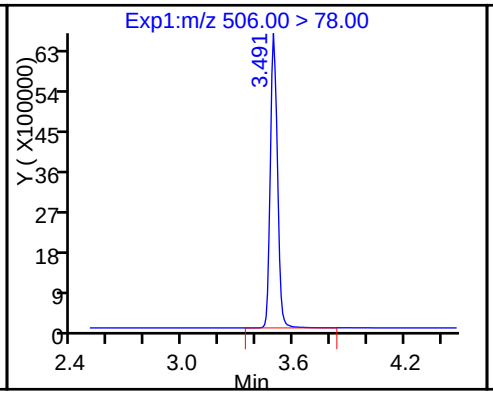
20 Perfluorononanoic acid



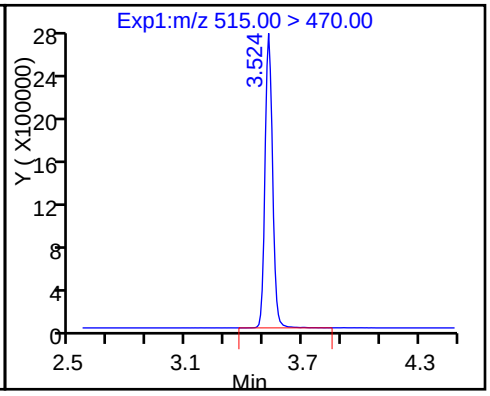
22 Perfluorooctane Sulfonamide



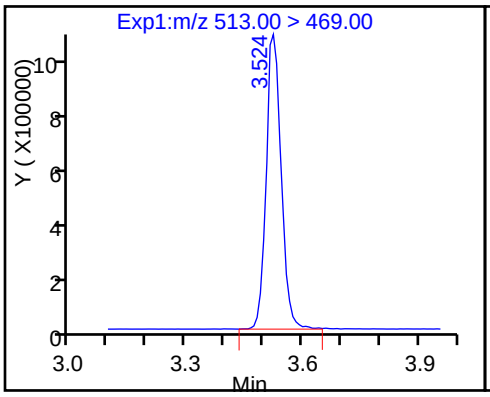
D 21 13C8 FOSA



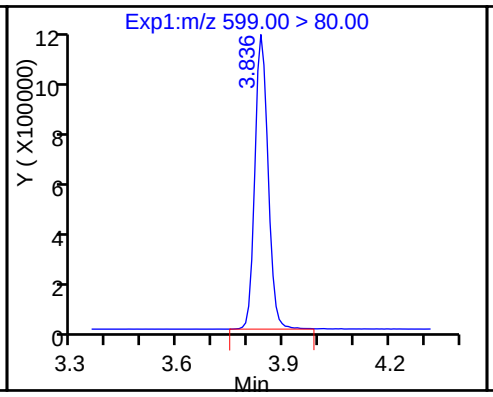
D 23 13C2 PFDA



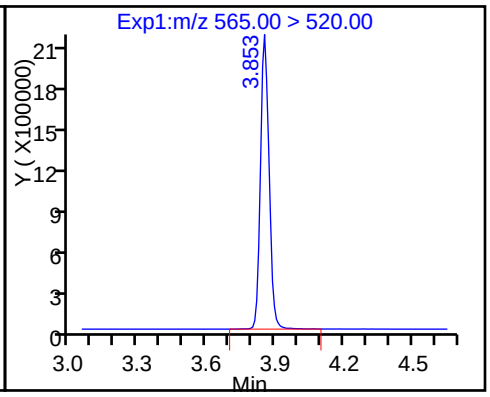
24 Perfluorodecanoic acid



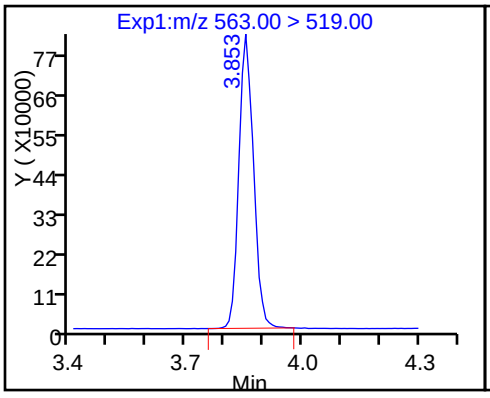
26 Perfluorodecane Sulfonic acid



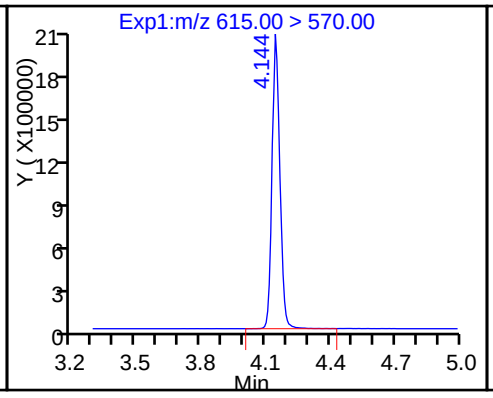
D 27 13C2 PFUnA



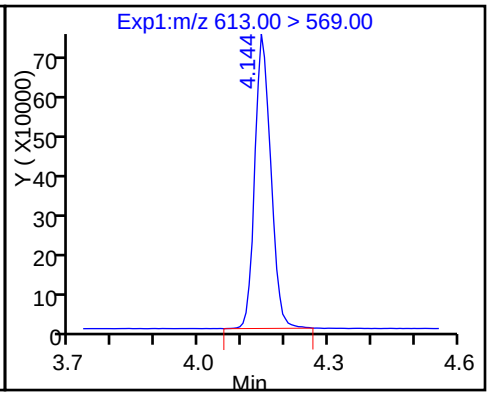
28 Perfluoroundecanoic acid



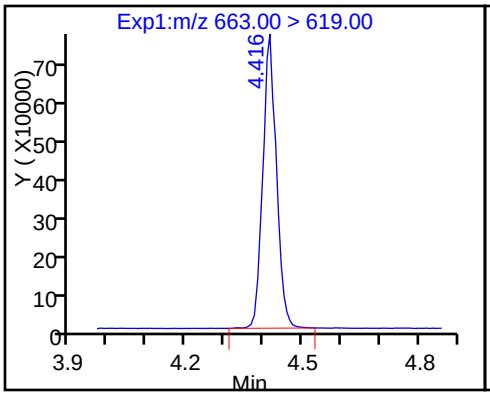
D 30 13C2 PFDoA



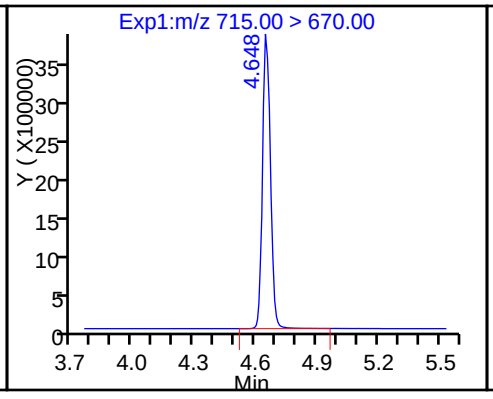
29 Perfluorododecanoic acid



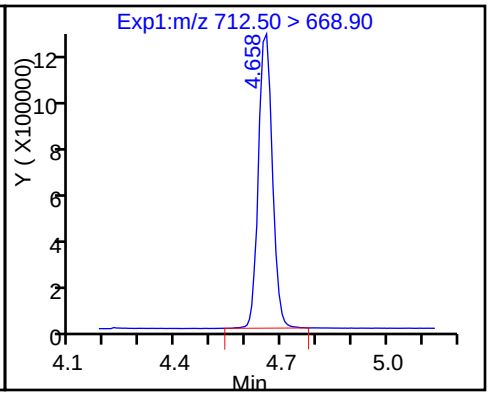
31 Perfluorotridecanoic acid



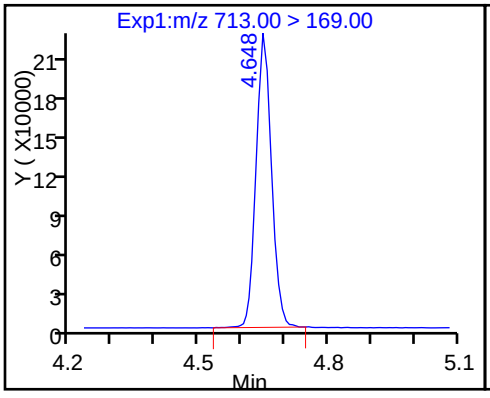
D 32 13C2-PFTeDA



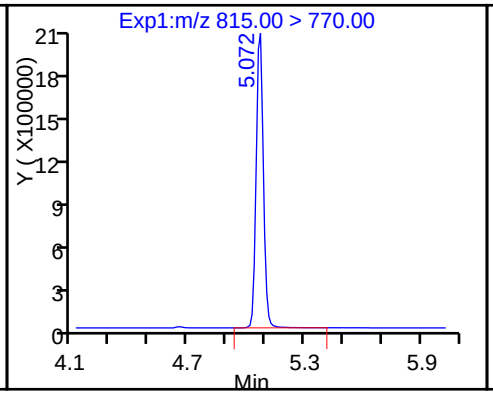
33 Perfluorotetradecanoic acid



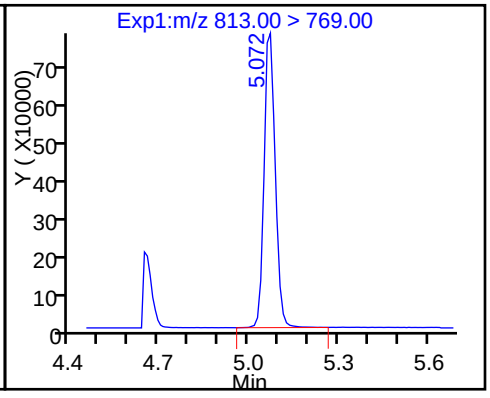
33 Perfluorotetradecanoic acid



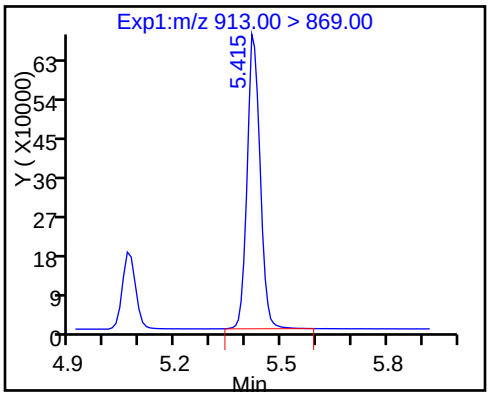
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-144510/49 Calibration Date: 12/30/2016 17:04

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 30DEC2016B_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9164		53.7	50.0	7.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.000		50.6	50.0	1.3	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.507		47.0	44.2	6.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9591		51.6	50.0	3.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.025		45.3	45.5	-0.5	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9808		50.1	50.0	0.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.022		51.0	50.0	1.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.164		50.3	47.6	5.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.032		48.1	46.4	3.8	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9463		49.7	50.0	-0.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9704		52.0	50.0	4.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9340		49.5	50.0	-1.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6207		51.2	48.2	6.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9673		50.6	50.0	1.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9182		50.0	50.0	0.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9263		51.1	50.0	2.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.715		54.1	50.0	8.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9745		50.4	50.0	0.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8764		42.5	50.0	-14.9	25.0
13C4 PFBA	Ave	347743	320194		46.0	50.0	-7.9	50.0
13C5-PFPeA	Ave	266072	241278		45.3	50.0	-9.3	50.0
13C2 PFHxA	Ave	245110	210024		42.8	50.0	-14.3	50.0
13C4-PFHpA	Ave	226344	190561		42.1	50.0	-15.8	50.0
18O2 PFHxS	Ave	326976	290267		42.0	47.3	-11.2	50.0
13C4 PFOA	Ave	230362	189989		41.2	50.0	-17.5	50.0
13C4 PFOS	Ave	248847	229944		44.2	47.8	-7.6	50.0
13C5 PFNA	Ave	177687	149963		42.2	50.0	-15.6	50.0
13C8 FOSA	Ave	384141	346067		45.0	50.0	-9.9	50.0
13C2 PFDA	Ave	157302	137352		43.7	50.0	-12.7	50.0
13C2 PFUnA	Ave	117250	103045		43.9	50.0	-12.1	50.0
13C2 PFDoA	Ave	110957	95867		43.2	50.0	-13.6	50.0
13C2-PFTeDA	Ave	227387	196571		43.2	50.0	-13.6	50.0
13C2-PFHxDA	Ave	124568	103963		41.7	50.0	-16.5	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_039.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 30-Dec-2016 17:04:13 ALS Bottle#: 41 Worklist Smp#: 49
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:59 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 14:26:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.528	1.528	0.0		16009719	46.0		92.1	903423	
1 Perfluorobutyric acid										
212.90 > 169.00	1.528	1.528	0.0	1.000	14671667	53.7		107	75038	
D 4 13C5-PFPeA										
267.90 > 223.00	1.803	1.803	0.0		12063917	45.3		90.7	976521	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.803	1.803	0.0	1.000	12059305	50.6		101	178809	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.842	1.842	0.0	1.000	19329899	47.0		106		
298.90 > 99.00	1.842	1.842	0.0	1.000	8798573		2.20(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.090	2.090	0.0		10501207	42.8		85.7	483955	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.090	2.090	0.0	1.000	10071498	51.6		103	272120	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.415	2.415	0.0	1.000	13541179	45.3		99.5		
D 11 13C4-PFHpA										
367.00 > 322.00	2.420	2.420	0.0		9528041	42.1		84.2	892988	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.420	2.420	0.0	1.000	9344962	50.1		100	79338	
D 10 18O2 PFHxS										
403.00 > 84.00	2.440	2.440	0.0		13729613	42.0		88.8	621387	
D 14 13C4 PFOA										
417.00 > 372.00	2.784	2.784	0.0		9499469	41.2		82.5	575488	

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	2.784	2.784	0.0	1.000	9711530	51.0		102	111933	
413.00 > 169.00	2.784	2.784	0.0	1.000	5918630		1.64(0.90-1.10)		231815	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.792	2.792	0.0	1.000	12742346	50.3		106		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.049	3.049	0.0	1.000	11010160	48.1		104	65083	
499.00 > 99.00	3.153	3.049	0.104	1.034	2437905		4.52(0.90-1.10)		123587	
D 17 13C4 PFOS										
503.00 > 80.00	3.161	3.161	0.0		10991329	44.2		92.4	260466	
D 19 13C5 PFNA										
468.00 > 423.00	3.161	3.161	0.0		7498138	42.2		84.4	530697	
20 Perfluorononanoic acid										
463.00 > 419.00	3.161	3.161	0.0	1.000	7095077	49.7		99.4	156672	
D 21 13C8 FOSA										
506.00 > 78.00	3.492	3.492	0.0		17303363	45.0		90.1	512626	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.492	3.492	0.0	1.000	16791762	52.0		104	514139	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.518	3.518	0.0	1.000	6414580	49.5		99.0	198376	
D 23 13C2 PFDA										
515.00 > 470.00	3.518	3.518	0.0		6867607	43.7		87.3	281914	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.837	3.837	0.0	1.000	6879630	51.2		106		
D 27 13C2 PFUnA										
565.00 > 520.00	3.854	3.854	0.0		5152261	43.9		87.9	276866	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.854	3.854	0.0	1.000	4983936	50.6		101	126359	
D 30 13C2 PFDoA										
615.00 > 570.00	4.144	4.144	0.0		4793333	43.2		86.4	132765	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.144	4.144	0.0	1.000	4401414	50.0		100	111491	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.415	4.415	0.0	1.000	4440147	51.1		102	94370	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.647	4.647	0.0		9828535	43.2		86.4	1202145	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.647	4.647	0.0	1.000	8222522	54.1		108	120682	
713.00 > 169.00	4.647	4.647	0.0	1.000	1286223		6.39(0.00-0.00)		127368	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.060	5.060	0.0		5198148	41.7		83.5	115546	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.060	5.060	0.0	1.000	4671297	50.4		101	6128	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.415	5.415	0.0	1.000	4200954	42.5		85.1	5503	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 03-Jan-2017 14:28:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_039.d

Injection Date: 30-Dec-2016 17:04:13 Instrument ID: A8_N

Lims ID: CCV L5

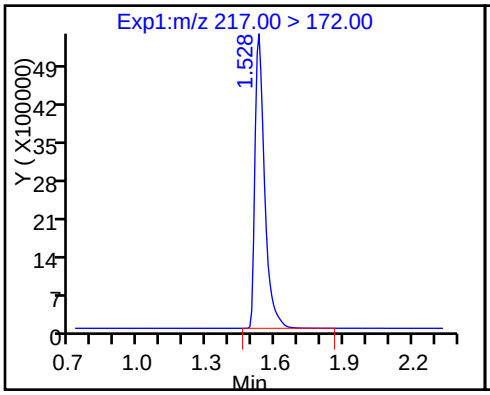
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 49

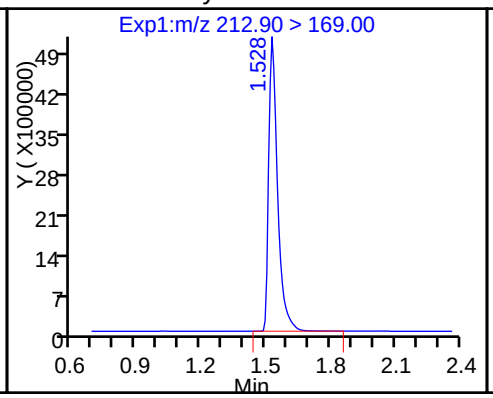
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

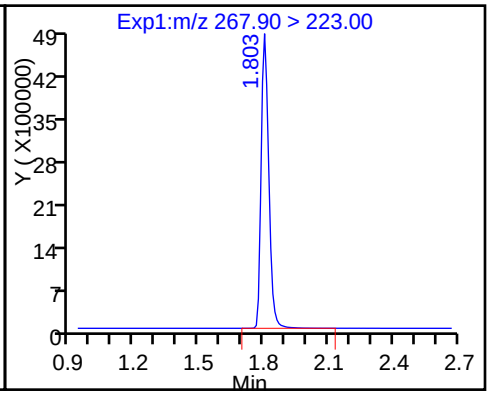
D 2 13C4 PFBA



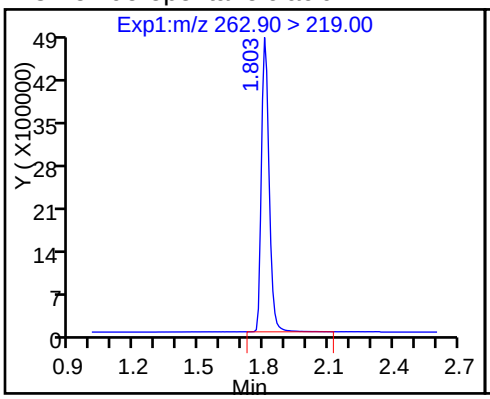
1 Perfluorobutyric acid



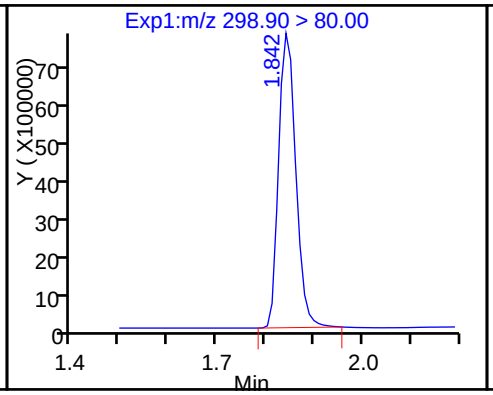
D 4 13C5-PFPeA



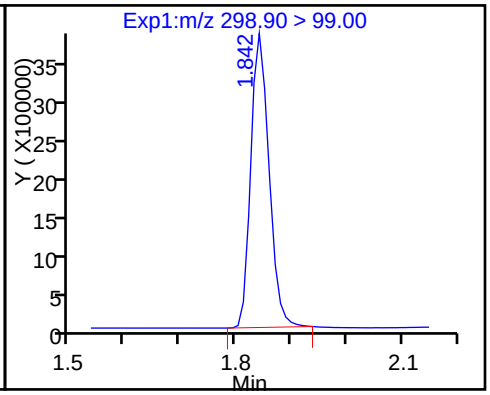
3 Perfluoropentanoic acid



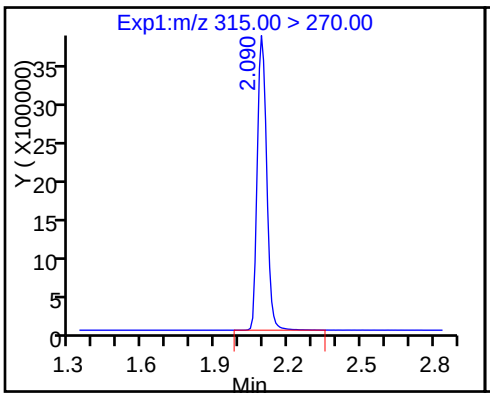
5 Perfluorobutanesulfonic acid



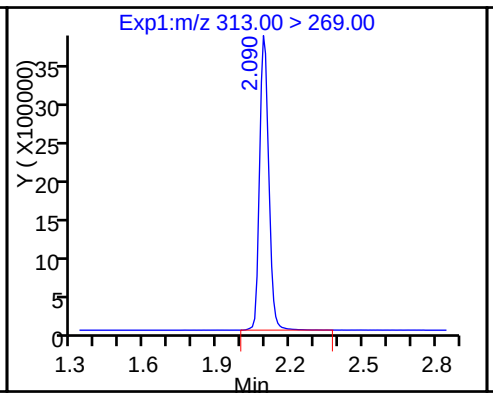
5 Perfluorobutanesulfonic acid



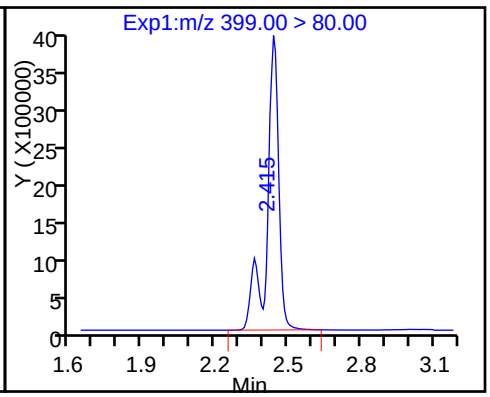
D 6 13C2 PFHxA



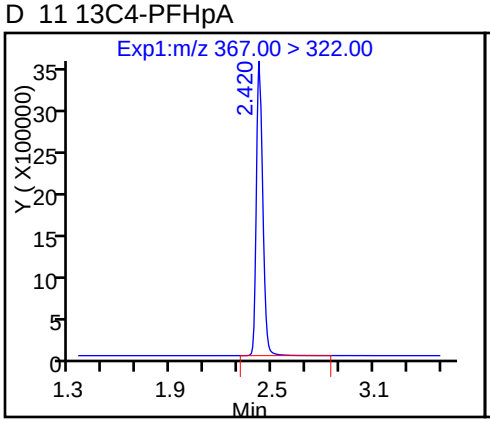
7 Perfluorohexanoic acid



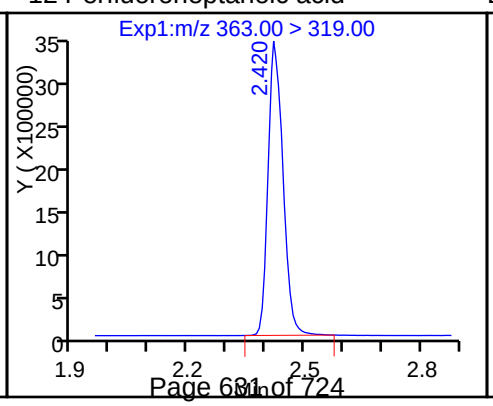
9 Perfluorohexanesulfonic acid



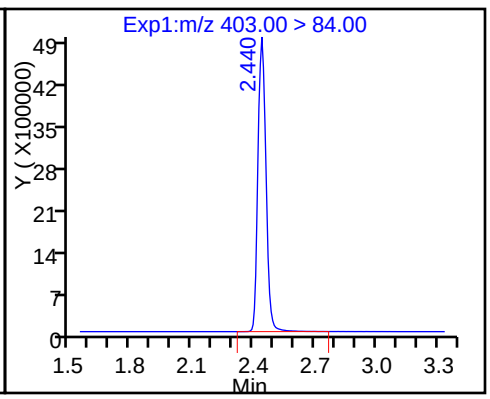
D 11 13C4-PFHpA



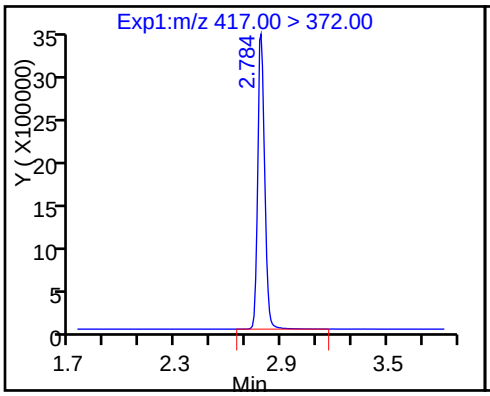
12 Perfluoroheptanoic acid



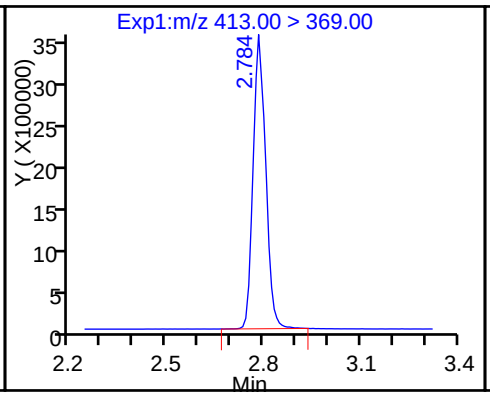
D 10 18O2 PFHxS



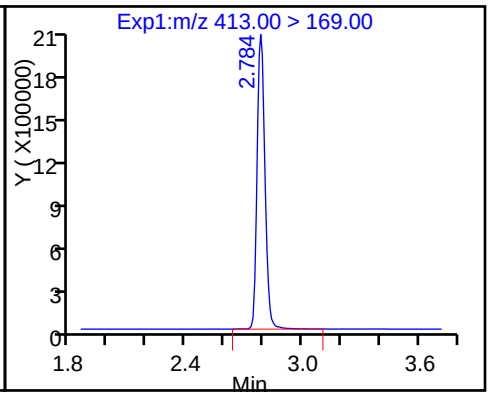
D 14 13C4 PFOA



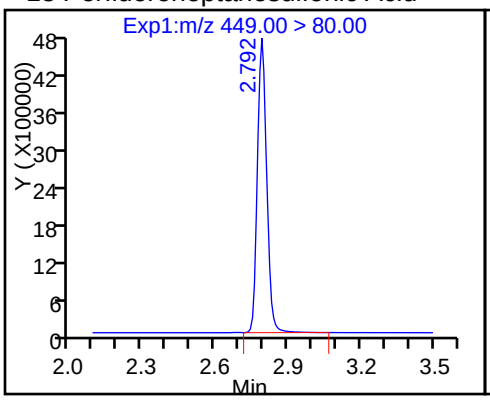
15 Perfluorooctanoic acid



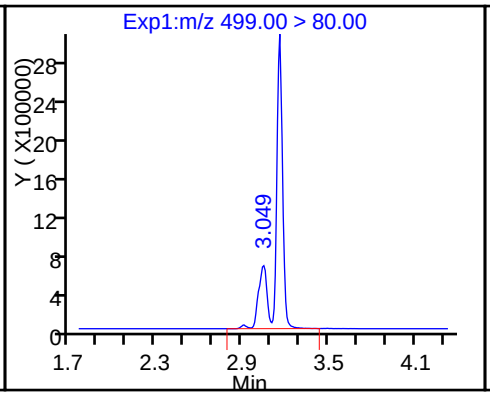
15 Perfluorooctanoic acid



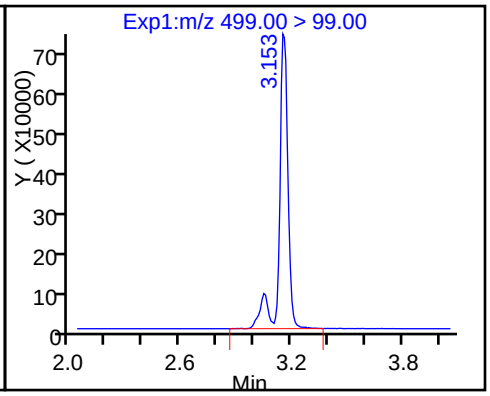
13 Perfluoroheptanesulfonic Acid



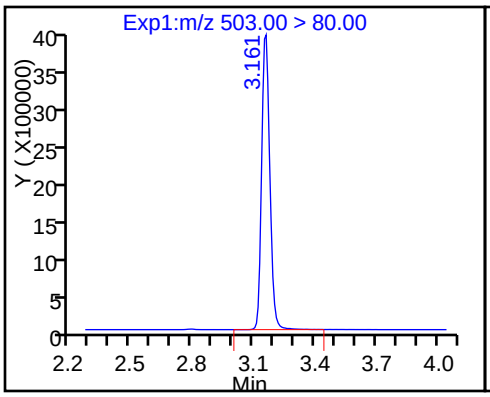
18 Perfluorooctane sulfonic acid



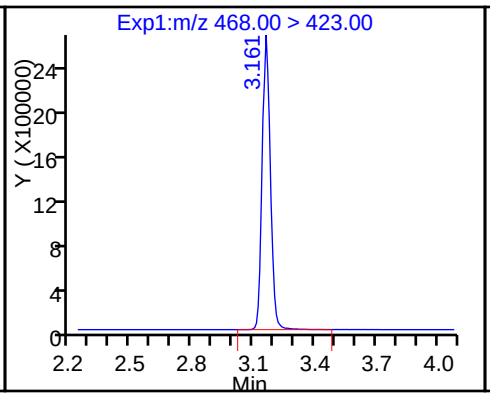
18 Perfluorooctane sulfonic acid



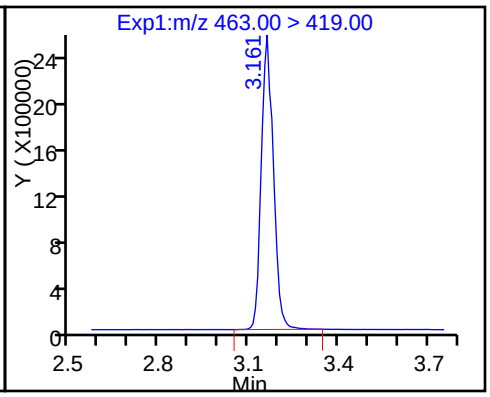
D 17 13C4 PFOS



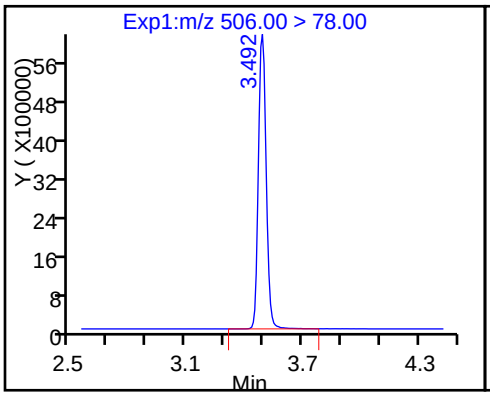
D 19 13C5 PFNA



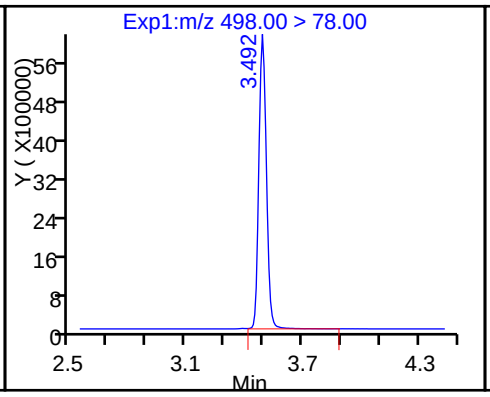
20 Perfluorononanoic acid



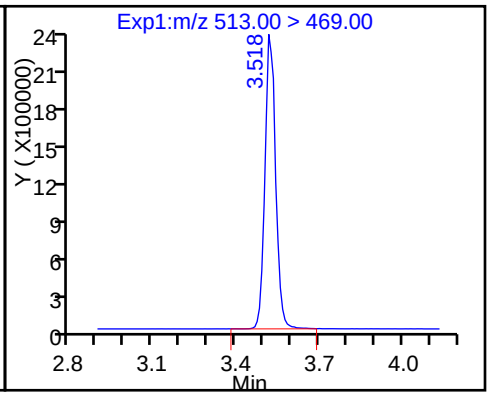
D 21 13C8 FOSA



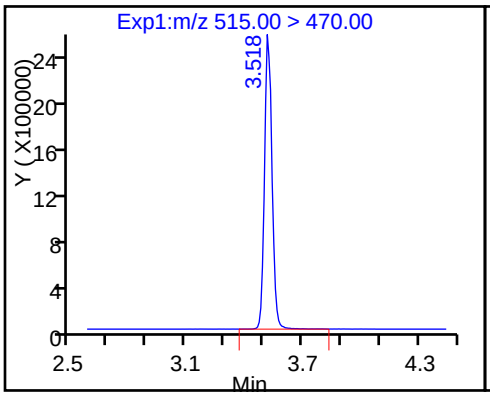
22 Perfluorooctane Sulfonamide



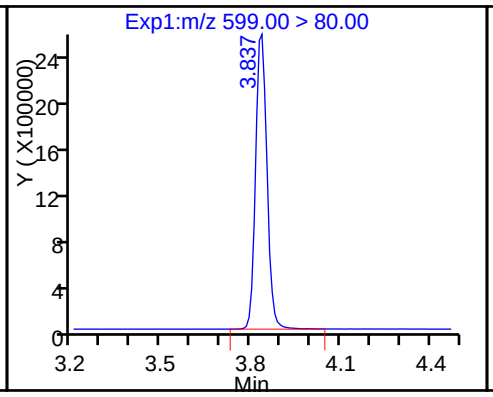
24 Perfluorodecanoic acid



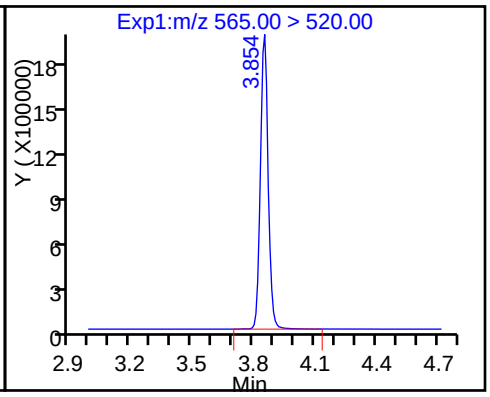
D 23 13C2 PFDA



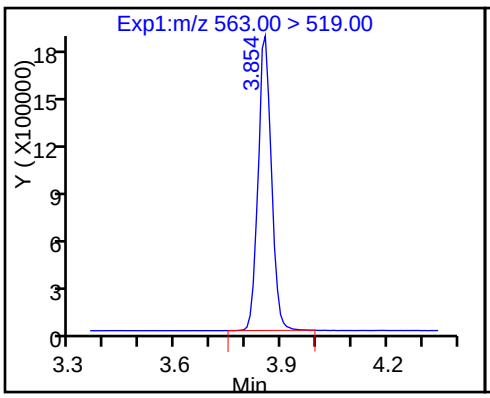
26 Perfluorodecane Sulfonic acid



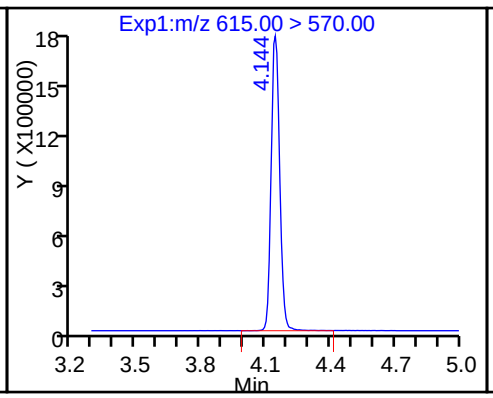
D 27 13C2 PFUnA



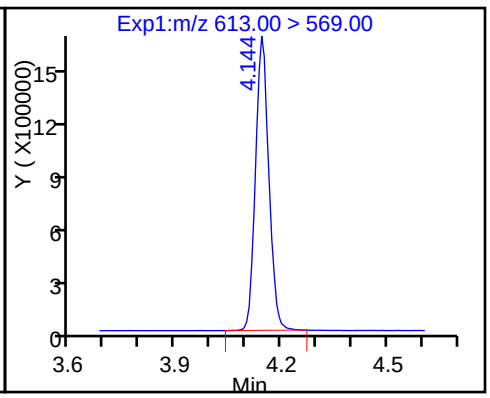
28 Perfluoroundecanoic acid



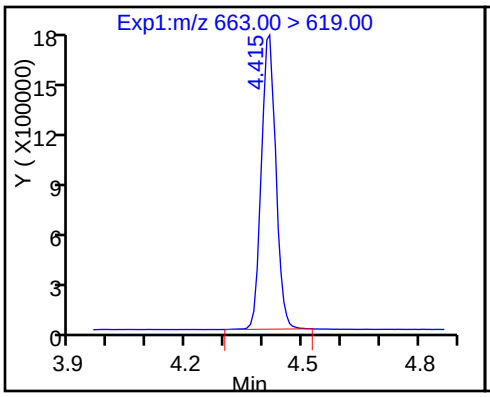
D 30 13C2 PFDoA



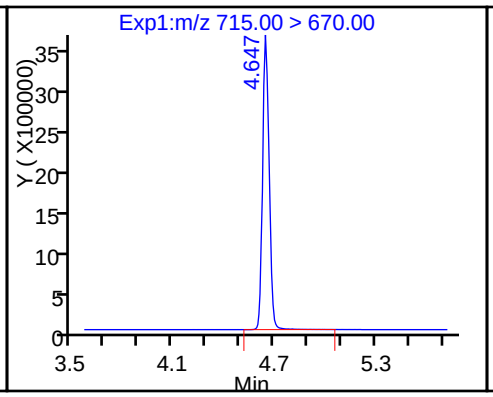
29 Perfluorododecanoic acid



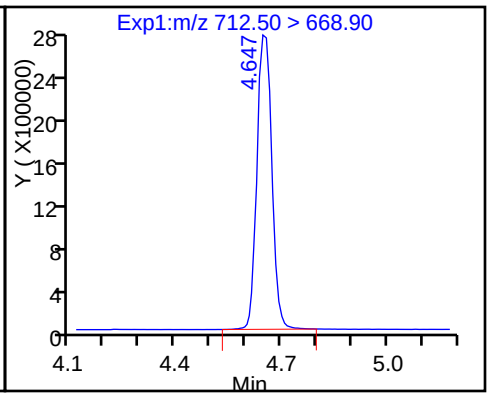
31 Perfluorotridecanoic acid



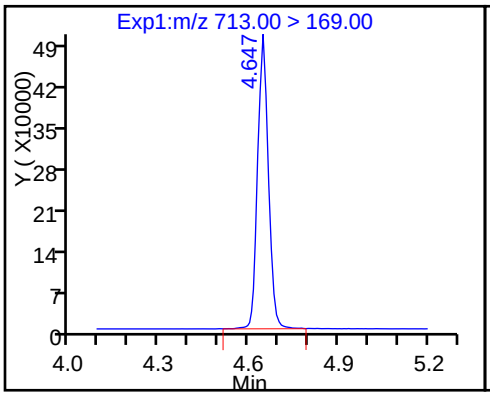
D 32 13C2-PFTeDA



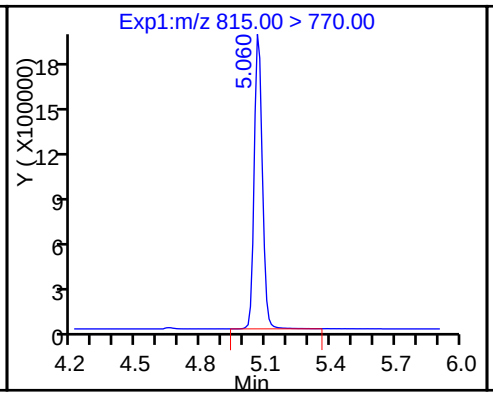
33 Perfluorotetradecanoic acid



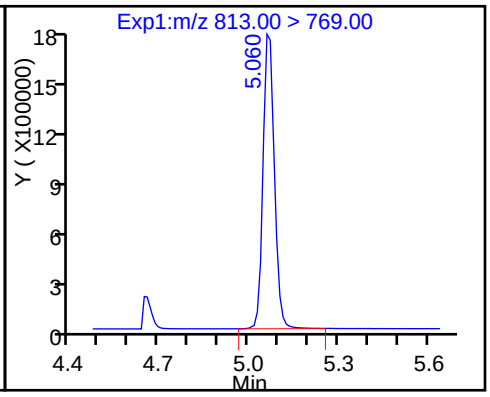
33 Perfluorotetradecanoic acid



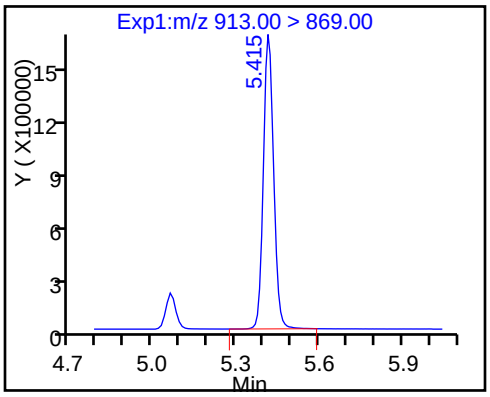
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-145022/5 Calibration Date: 01/04/2017 16:33

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 04JAN2017A_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	0.8537	0.8636		1.01	1.00	1.2	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	0.9645		0.977	1.00	-2.3	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.509		0.941	0.884	6.5	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9092		0.979	1.00	-2.1	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9904		1.01	1.00	1.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.126		0.995	0.910	9.3	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.016		0.878	0.952	-7.8	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.064		1.06	1.00	6.1	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9221		0.969	1.00	-3.1	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.9802		0.915	0.928	-1.4	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9608		1.03	1.00	3.0	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9301		0.985	1.00	-1.5	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6368		1.05	0.964	9.0	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9470		0.990	1.00	-1.0	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8506		0.927	1.00	-7.3	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9022		0.995	1.00	-0.5	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.622		1.02	1.00	2.4	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.452		0.921	1.00	-7.9	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7664		0.744	1.00	-25.6	50.0
13C4 PFBA	Ave	347743	369981		53.2	50.0	6.4	50.0
13C5-PFPeA	Ave	266072	290939		54.7	50.0	9.3	50.0
13C2 PFHxA	Ave	245110	275813		56.3	50.0	12.5	50.0
13C4-PFHpA	Ave	226344	243310		53.7	50.0	7.5	50.0
18O2 PFHxS	Ave	326976	335997		48.6	47.3	2.8	50.0
13C4 PFOA	Ave	230362	259754		56.4	50.0	12.8	50.0
13C4 PFOS	Ave	248847	267176		51.3	47.8	7.4	50.0
13C5 PFNA	Ave	177687	198032		55.7	50.0	11.4	50.0
13C8 FOSA	Ave	384141	414261		53.9	50.0	7.8	50.0
13C2 PFDA	Ave	157302	193976		61.7	50.0	23.3	50.0
13C2 PFUnA	Ave	117250	149637		63.8	50.0	27.6	50.0
13C2 PFDoA	Ave	110957	139645		62.9	50.0	25.9	50.0
13C2-PFTeDA	Ave	227387	258482		56.8	50.0	13.7	50.0
13C2-PFHxDA	Ave	124568	138561		55.6	50.0	11.2	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_005.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 04-Jan-2017 16:33:05 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Jan-2017 09:08:05 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: chandrasenas Date: 05-Jan-2017 09:05:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.614	1.614	0.0		18499065	53.2		106	1134120	
1 Perfluorobutyric acid										
212.90 > 169.00	1.622	1.622	0.0	1.000	319502	1.01		101	2230	
D 4 13C5-PFPeA										
267.90 > 223.00	1.916	1.906	0.010		14546928	54.7		109	1030058	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.916	1.916	0.0	1.000	280611	0.9774		97.7	2894	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.954	1.945	0.009	1.000	448064	0.9411		106		
298.90 > 99.00	1.945	1.945	0.0	0.995	177691		2.52(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.221	2.215	0.006		13790655	56.3		113	1209461	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.221	2.224	-0.003	1.000	250780	0.9790		97.9	10022	
D 11 13C4-PFHpA										
367.00 > 322.00	2.571	2.560	0.011		12165517	53.7		107	1038114	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.571	2.568	0.003	1.000	240963	1.01		101	2810	
D 10 18O2 PFHxS										
403.00 > 84.00	2.586	2.575	0.011		15892642	48.6		103	1801270	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.578	2.583	-0.005	1.000	344252	0.99		109		
D 14 13C4 PFOA										
417.00 > 372.00	2.940	2.927	0.013		12987692	56.4		113	885490	

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	2.940	2.936	0.004	1.000	276395	1.06		106	2689	
413.00 > 169.00	2.940	2.936	0.004	1.000	154508		1.79(0.90-1.10)		7608	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.940	2.936	0.004	1.000	258440	0.8778		92.2		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.314	3.282	0.032	1.000	243025	0.9147		98.6	16267	M
499.00 > 99.00	3.307	3.282	0.025	0.998	58677		4.14(0.90-1.10)		1932	M
D 17 13C4 PFOS										
503.00 > 80.00	3.307	3.305	0.002		12770994	51.3		107	606987	
D 19 13C5 PFNA										
468.00 > 423.00	3.314	3.312	0.002		9901596	55.7		111	812506	
20 Perfluorononanoic acid										
463.00 > 419.00	3.314	3.320	-0.006	1.000	182596	0.9687		96.9	4450	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.618	3.611	0.007	1.000	398020	1.03		103	28871	
D 21 13C8 FOSA										
506.00 > 78.00	3.618	3.611	0.007		20713068	53.9		108	497303	
D 23 13C2 PFDA										
515.00 > 470.00	3.672	3.673	-0.001		9698776	61.7		123	199231	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.681	3.682	-0.001	1.000	180416	0.9855		98.5	6095	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.990	3.981	0.009	1.000	164007	1.05		109		
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.009	4.000	0.009	1.000	141709	0.99		99.0	3455	
D 27 13C2 PFUnA										
565.00 > 520.00	4.009	4.000	0.009		7481855	63.8		128	274074	
D 30 13C2 PFDoA										
615.00 > 570.00	4.302	4.297	0.005		6982236	62.9		126	124187	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.302	4.297	0.005	1.000	118786	0.9266		92.7	218	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.573	4.567	0.007	1.000	125993	0.99		99.5	100	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.810	4.810	0.0		12924102	56.8		114	581770	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.810	4.810	0.0	1.000	226569	1.02		102	79.5	
713.00 > 169.00	4.802	4.810	-0.008	0.998	35718		6.34(0.00-0.00)		2587	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.240	5.229	0.011		6928038	55.6		111	79131	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.230	5.229	0.001	1.000	202802	0.9215		92.1	139	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.611	5.604	0.007	1.000	107022	0.7438		74.4	90.0	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 05-Jan-2017 09:08:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_005.d

Injection Date: 04-Jan-2017 16:33:05 Instrument ID: A8_N

Lims ID: CCV L2

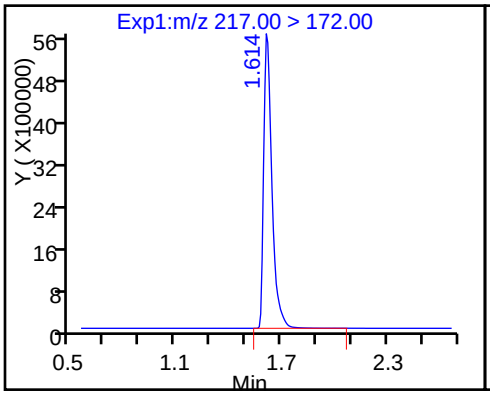
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

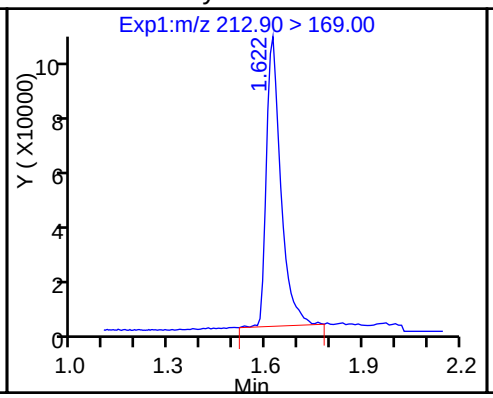
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

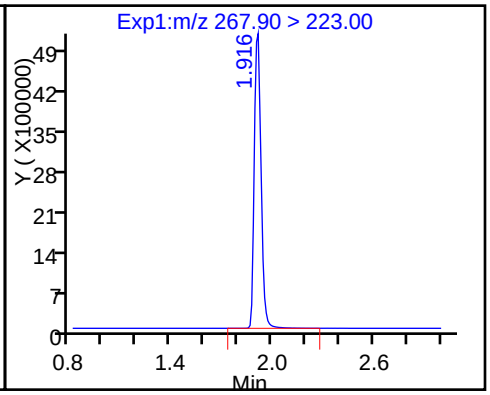
D 2 13C4 PFBA



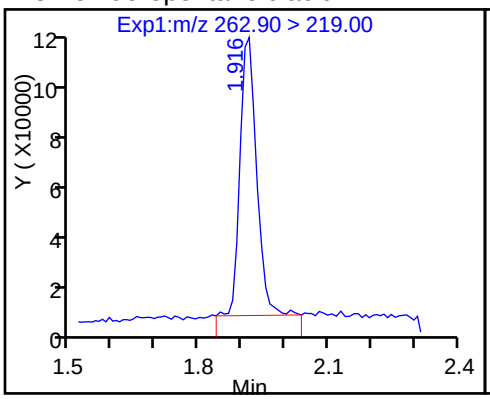
1 Perfluorobutyric acid



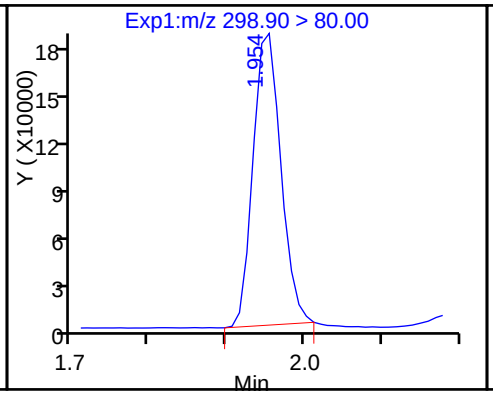
D 4 13C5-PFPeA



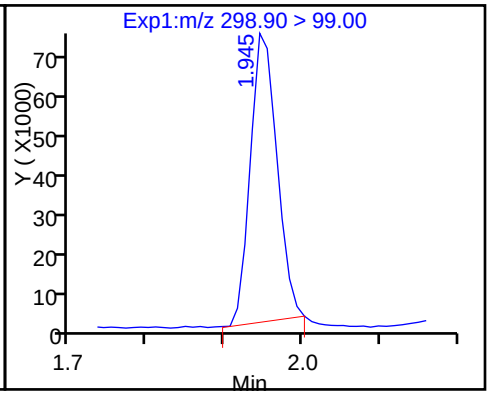
3 Perfluoropentanoic acid



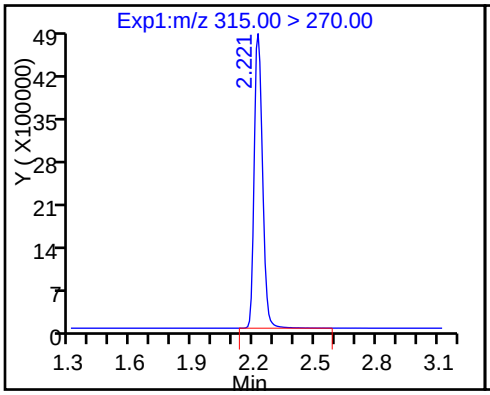
5 Perfluorobutanesulfonic acid



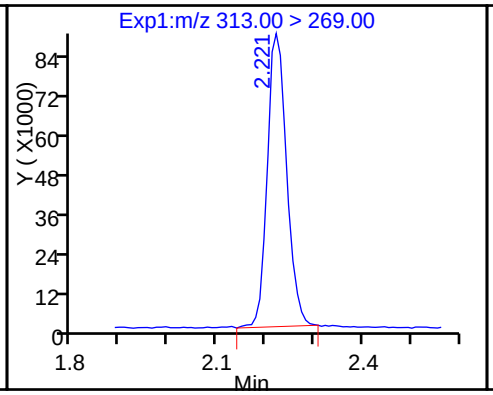
5 Perfluorobutanesulfonic acid



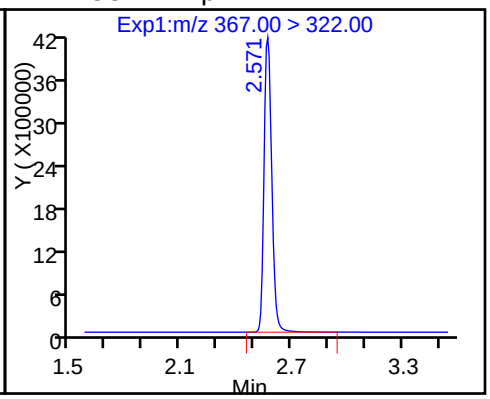
D 6 13C2 PFHxA



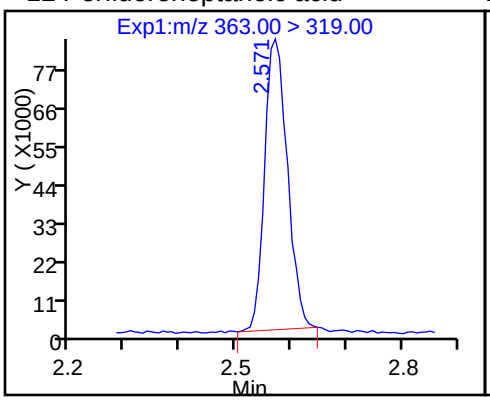
7 Perfluorohexanoic acid



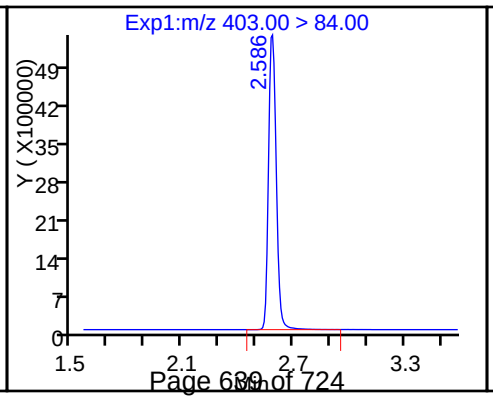
D 11 13C4-PFHpA



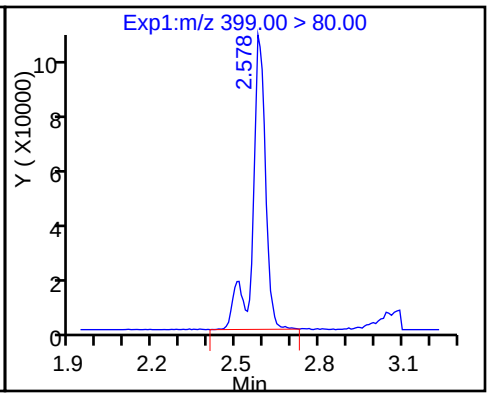
12 Perfluoroheptanoic acid



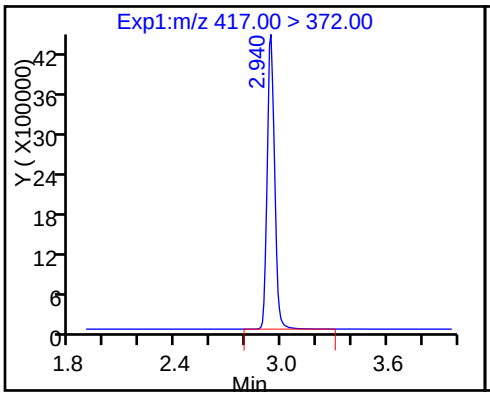
D 10 18O2 PFHxS



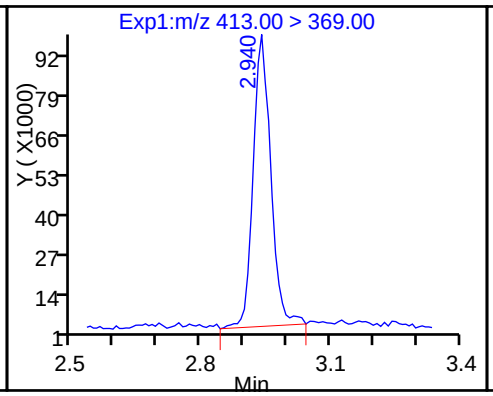
9 Perfluorohexanesulfonic acid



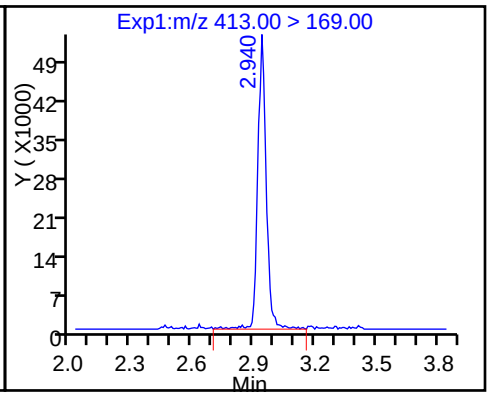
D 14 13C4 PFOA



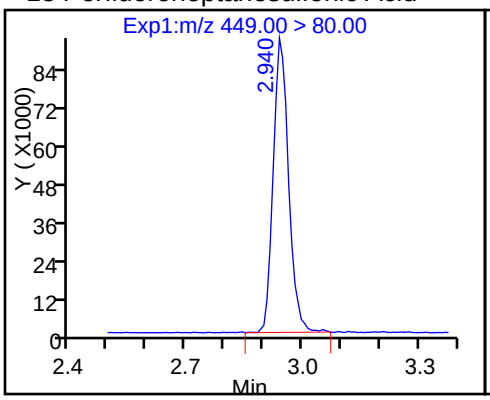
15 Perfluorooctanoic acid



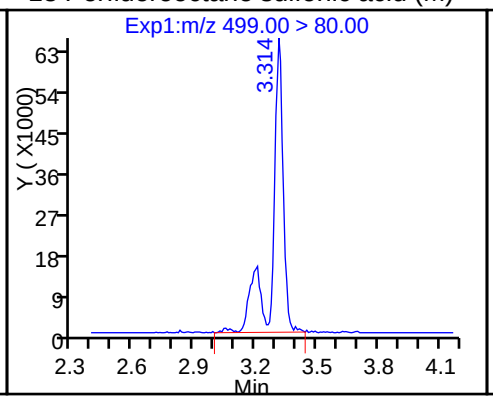
15 Perfluorooctanoic acid



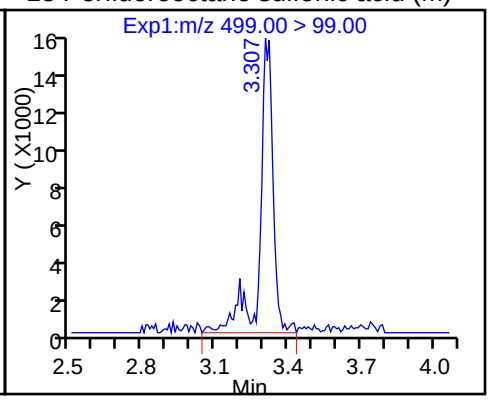
13 Perfluoroheptanesulfonic Acid



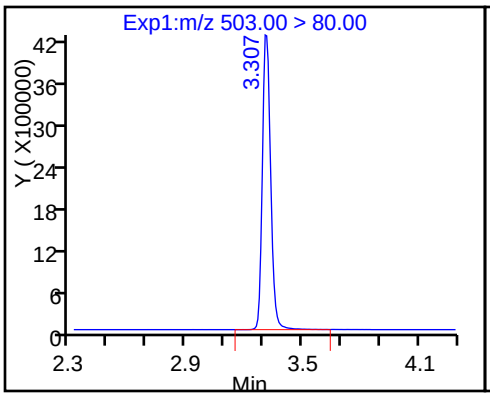
18 Perfluorooctane sulfonic acid (M)



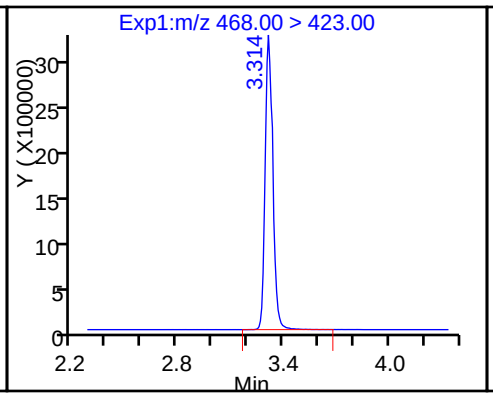
18 Perfluorooctane sulfonic acid (M)



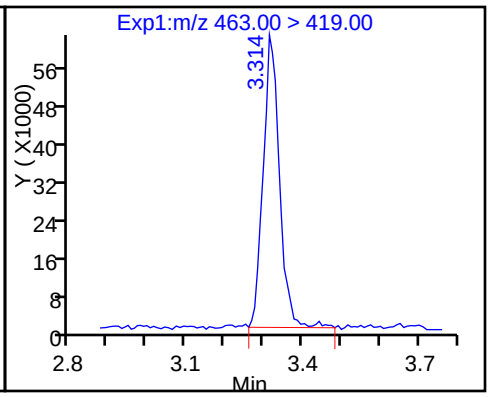
D 17 13C4 PFOS



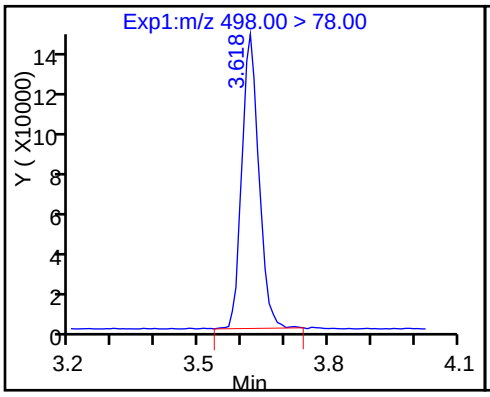
D 19 13C5 PFNA



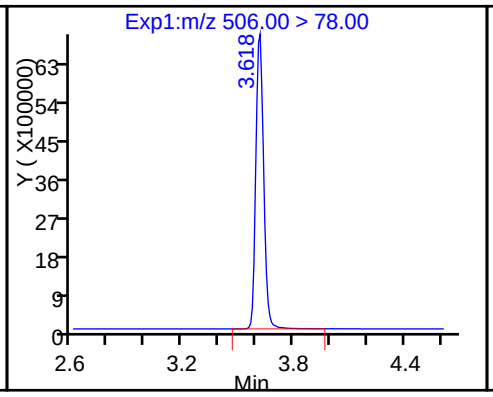
20 Perfluorononanoic acid



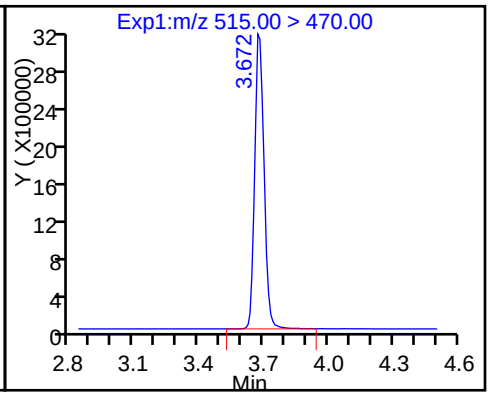
22 Perfluorooctane Sulfonamide



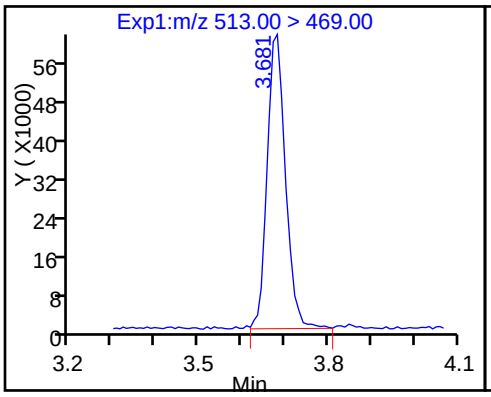
D 21 13C8 FOSA



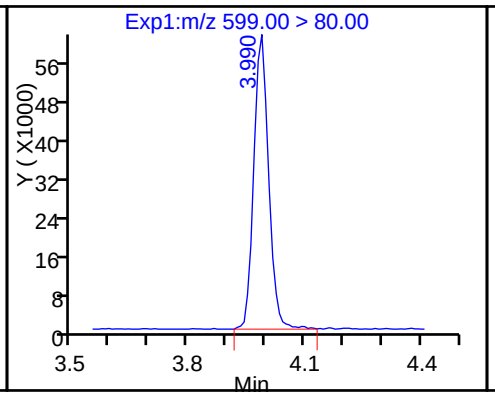
D 23 13C2 PFDA



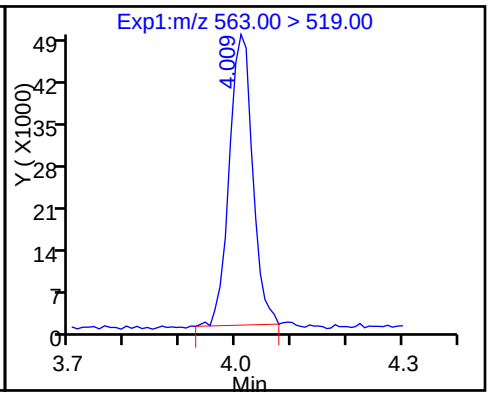
24 Perfluorodecanoic acid



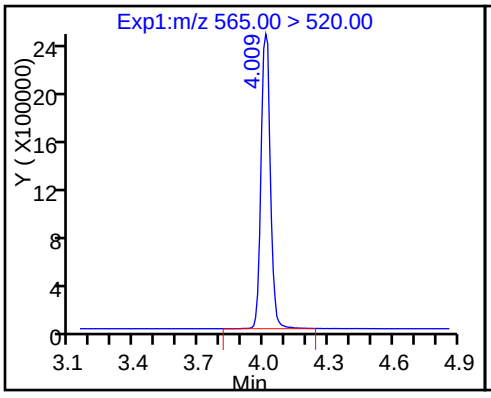
26 Perfluorodecane Sulfonic acid



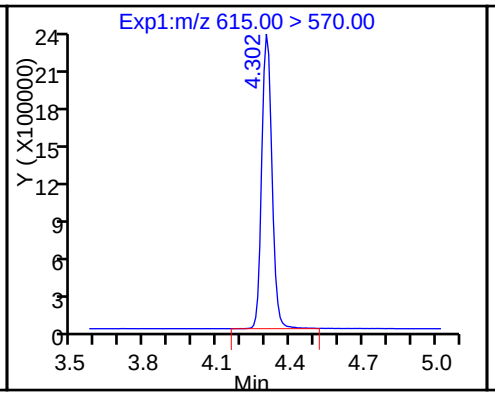
28 Perfluoroundecanoic acid



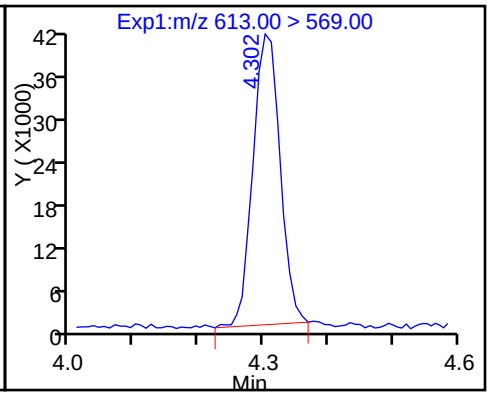
D 27 13C2 PFUnA



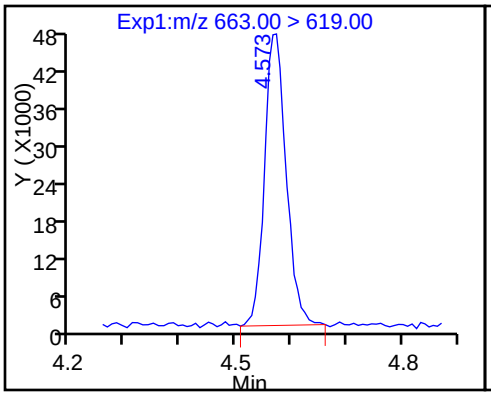
D 30 13C2 PFDoA



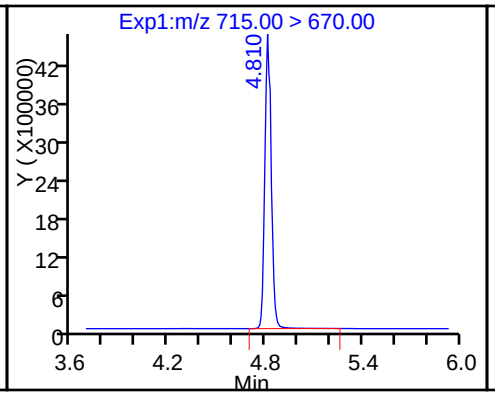
29 Perfluorododecanoic acid



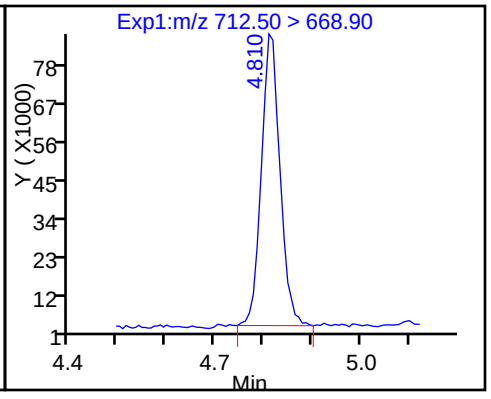
31 Perfluorotridecanoic acid



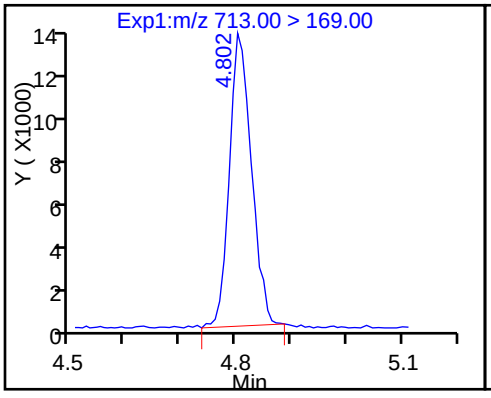
D 32 13C2-PFTeDA



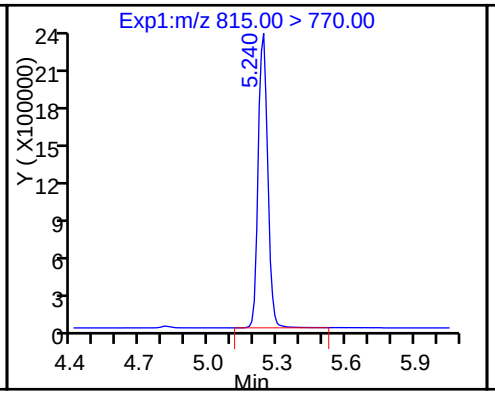
33 Perfluorotetradecanoic acid



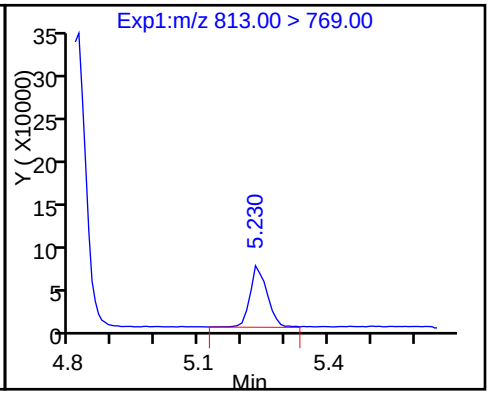
33 Perfluorotetradecanoic acid



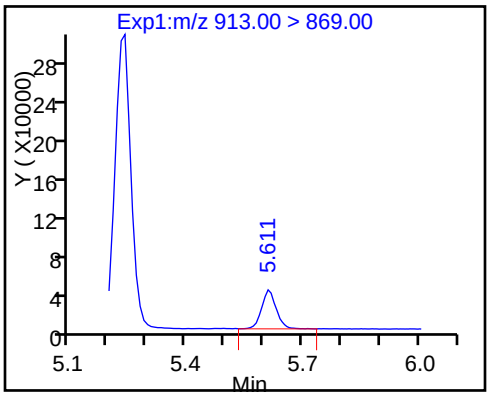
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

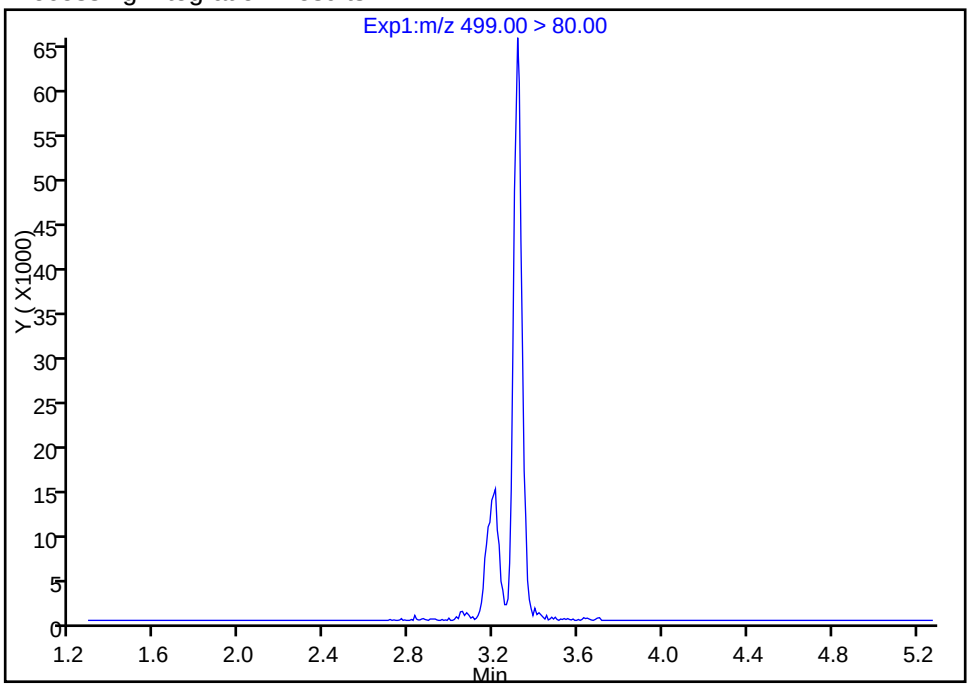
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_005.d
Injection Date: 04-Jan-2017 16:33:05 Instrument ID: A8_N
Lims ID: CCV L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

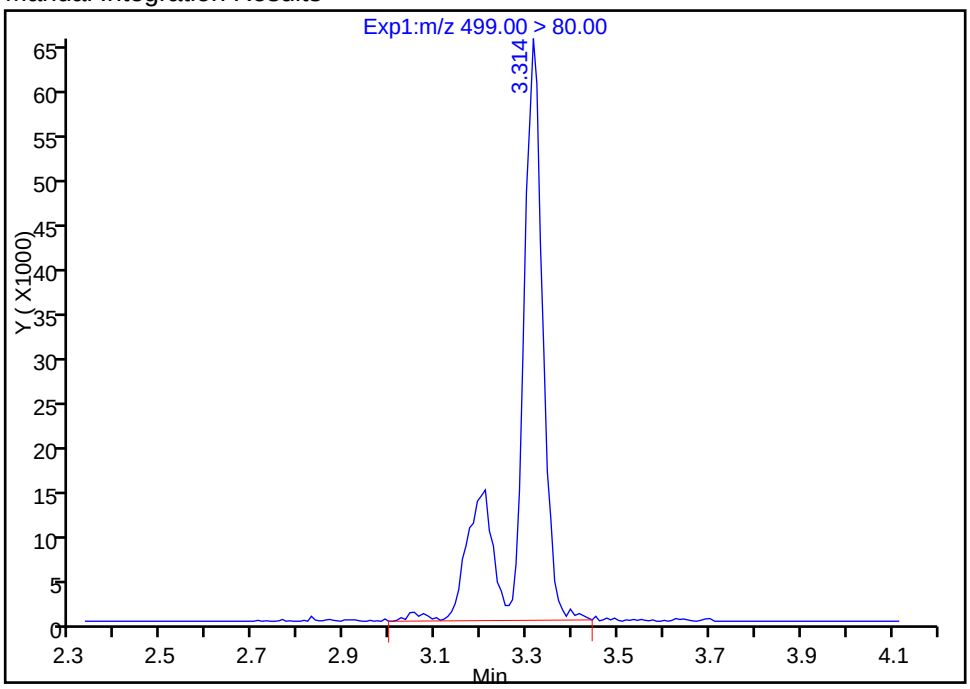
Not Detected
Expected RT: 3.28

Processing Integration Results



Manual Integration Results

RT: 3.31
Area: 243025
Amount: 0.914682
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Jan-2017 09:05:50
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

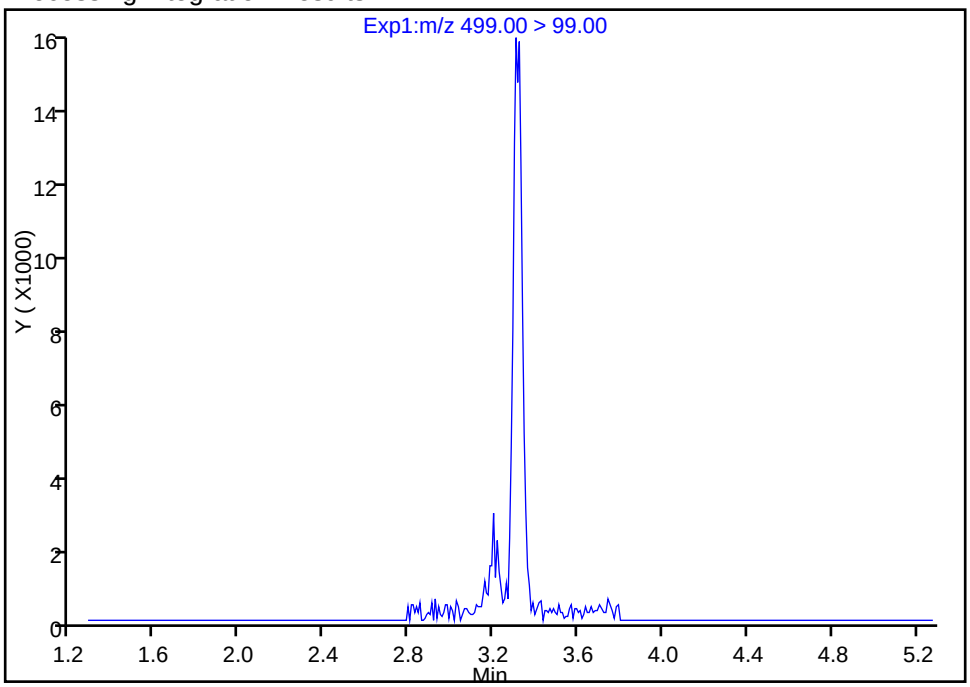
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_005.d
Injection Date: 04-Jan-2017 16:33:05 Instrument ID: A8_N
Lims ID: CCV L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

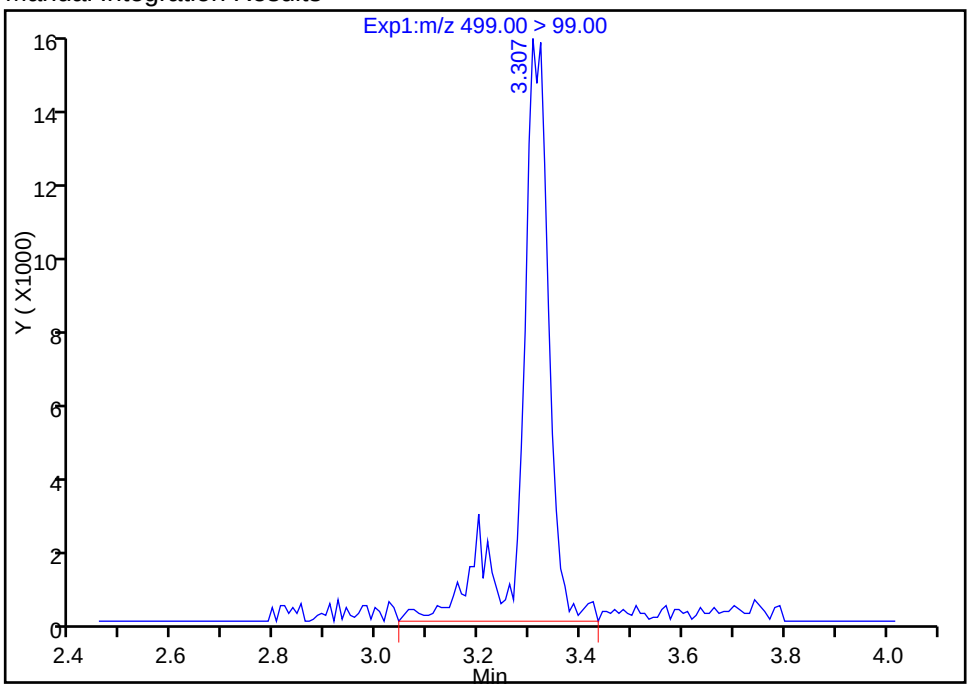
Processing Integration Results

Not Detected
Expected RT: 3.28



Manual Integration Results

RT: 3.31
Area: 58677
Amount: 0.914682
Amount Units: ng/ml



Reviewer: chandrasenas, 05-Jan-2017 09:05:50
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-145022/41 Calibration Date: 01/04/2017 21:03

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 04JAN2017A_041.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9676		22.7	20.0	13.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.064		21.6	20.0	7.9	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.735		21.6	17.7	22.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9742		21.0	20.0	4.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.002		20.5	20.0	2.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.092		19.3	18.2	6.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.220		21.1	19.0	10.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.091		21.7	20.0	8.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.096		20.4	18.6	10.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9690		20.4	20.0	1.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	1.025		22.0	20.0	9.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9511		20.2	20.0	0.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6968		23.0	19.3	19.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.999		20.9	20.0	4.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9541		20.8	20.0	3.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9110		20.1	20.0	0.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.658		20.9	20.0	4.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8552		17.3	20.0	-13.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7199		14.0	20.0	-30.1*	25.0
13C4 PFBA	Ave	347743	388079		55.8	50.0	11.6	50.0
13C5-PFPeA	Ave	266072	298168		56.0	50.0	12.1	50.0
13C2 PFHxA	Ave	245110	269713		55.0	50.0	10.0	50.0
13C4-PFHpA	Ave	226344	234033		51.7	50.0	3.4	50.0
18O2 PFHxS	Ave	326976	355474		51.4	47.3	8.7	50.0
13C4 PFOA	Ave	230362	248295		53.9	50.0	7.8	50.0
13C4 PFOS	Ave	248847	286019		54.9	47.8	14.9	50.0
13C5 PFNA	Ave	177687	199182		56.0	50.0	12.1	50.0
13C8 FOSA	Ave	384141	426463		55.5	50.0	11.0	50.0
13C2 PFDA	Ave	157302	186581		59.3	50.0	18.6	50.0
13C2 PFUnA	Ave	117250	138581		59.1	50.0	18.2	50.0
13C2 PFDoA	Ave	110957	136382		61.5	50.0	22.9	50.0
13C2-PFTeDA	Ave	227387	248685		54.7	50.0	9.4	50.0
13C2-PFHxDA	Ave	124568	128222		51.5	50.0	2.9	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_041.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 04-Jan-2017 21:03:10 ALS Bottle#: 40 Worklist Smp#: 41
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 05-Jan-2017 09:51:27 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK034

First Level Reviewer: chandrasenas Date: 05-Jan-2017 09:50:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.617	1.617	0.0		19403972	55.8		112	996975	
1 Perfluorobutyric acid										
212.90 > 169.00	1.617	1.617	0.0	1.000	7509888	22.7		113	55122	
D 4 13C5-PFPeA										
267.90 > 223.00	1.909	1.909	0.0		14908418	56.0		112	917558	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.909	1.909	0.0	1.000	6347957	21.6		108	89232	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.948	1.948	0.0	1.000	10903916	21.6		122		
298.90 > 99.00	1.948	1.948	0.0	1.000	4606012		2.37(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.209	2.209	0.0	1.000	5255047	21.0		105	188504	
D 6 13C2 PFHxA										
315.00 > 270.00	2.217	2.217	0.0		13485657	55.0		110	962527	
D 11 13C4-PFHpA										
367.00 > 322.00	2.558	2.558	0.0		11701632	51.7		103	1014367	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.558	2.558	0.0	1.000	4688733	20.5		102	61667	
D 10 18O2 PFHxS										
403.00 > 84.00	2.573	2.573	0.0		16813943	51.4		109	5920829	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.573	2.573	0.0	1.000	7062347	19.3		106		
D 14 13C4 PFOA										
417.00 > 372.00	2.927	2.927	0.0		12414738	53.9		108	477130	

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	2.927	2.927	0.0	1.000	5417348	21.7		109	59672	
413.00 > 169.00	2.927	2.927	0.0	1.000	3158677		1.72(0.90-1.10)		161373	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.927	2.927	0.0	1.000	6646280	21.1		111		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.271	3.271	0.0	1.000	5815921	20.4		110	34393	
499.00 > 99.00	3.294	3.271	0.023	1.007	1283797		4.53(0.90-1.10)		76362	
D 17 13C4 PFOS										
503.00 > 80.00	3.294	3.294	0.0		13671710	54.9		115	525402	
D 19 13C5 PFNA										
468.00 > 423.00	3.301	3.301	0.0		9959076	56.0		112	488010	
20 Perfluorononanoic acid										
463.00 > 419.00	3.301	3.301	0.0	1.000	3860216	20.4		102	73111	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.621	3.621	0.0	1.000	8739968	22.0		110	347736	
D 21 13C8 FOSA										
506.00 > 78.00	3.621	3.621	0.0		21323143	55.5		111	1071069	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.665	3.665	0.0	1.000	3549276	20.2		101	92525	
D 23 13C2 PFDA										
515.00 > 470.00	3.665	3.665	0.0		9329059	59.3		119	321795	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.971	3.971	0.0	1.000	3842625	23.0		119		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.990	3.990	0.0	1.000	2768992	20.9		104	90005	
D 27 13C2 PFUnA										
565.00 > 520.00	3.990	3.990	0.0		6929028	59.1		118	1247632	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.284	4.284	0.0	1.000	2602512	20.8		104	17502	
D 30 13C2 PFDoA										
615.00 > 570.00	4.284	4.284	0.0		6819112	61.5		123	221726	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.538	4.538	0.0	1.000	2484796	20.1		100	2280	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.783	4.783	0.0		12434260	54.7		109	752448	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.783	4.783	0.0	1.000	4523003	20.9		105	1575	
713.00 > 169.00	4.775	4.783	-0.008	0.998	717967		6.30(0.00-0.00)		53183	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.191	5.191	0.0		6411097	51.5		103	81203	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.202	5.202	0.0	1.000	2332640	17.3		86.6	1437	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.554	5.554	0.0	1.000	1963724	14.0		69.9	1512	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 05-Jan-2017 09:51:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_041.d

Injection Date: 04-Jan-2017 21:03:10 Instrument ID: A8_N

Lims ID: CCV L4

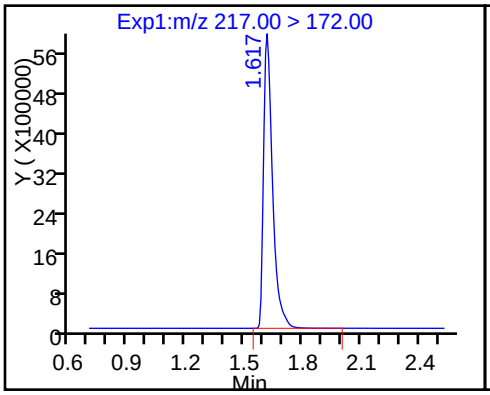
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 41

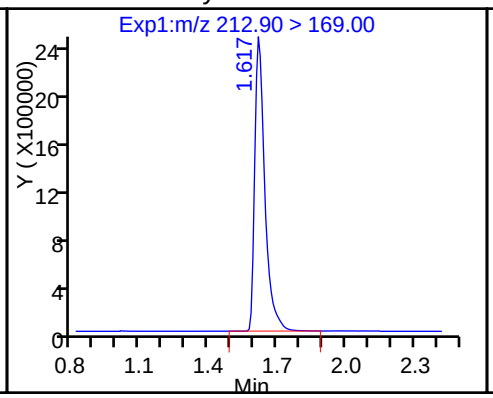
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

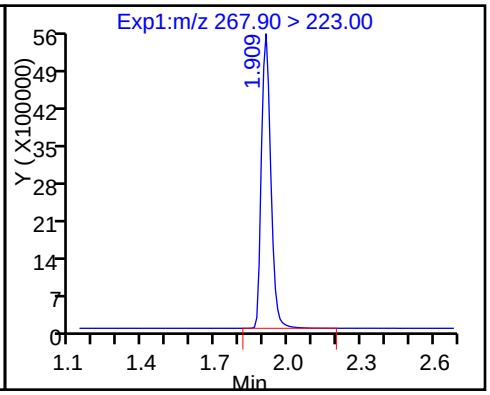
D 2 13C4 PFBA



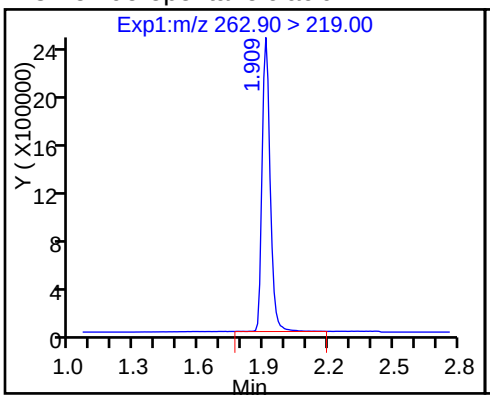
1 Perfluorobutyric acid



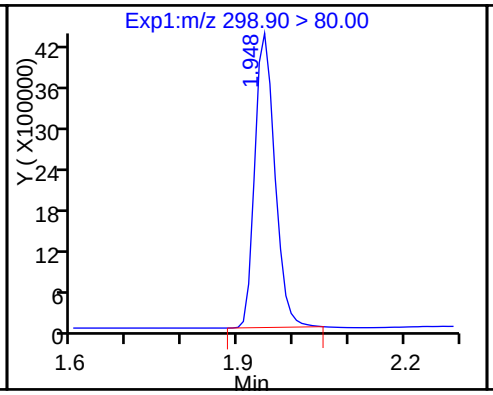
D 4 13C5-PFPeA



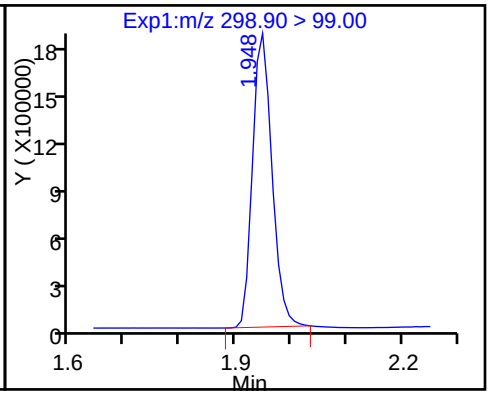
3 Perfluoropentanoic acid



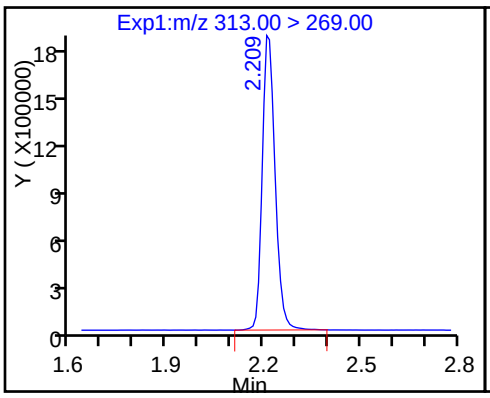
5 Perfluorobutanesulfonic acid



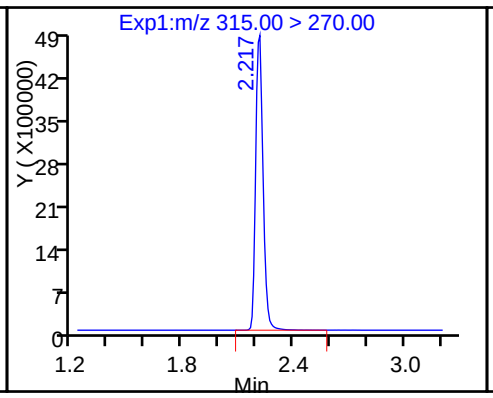
5 Perfluorobutanesulfonic acid



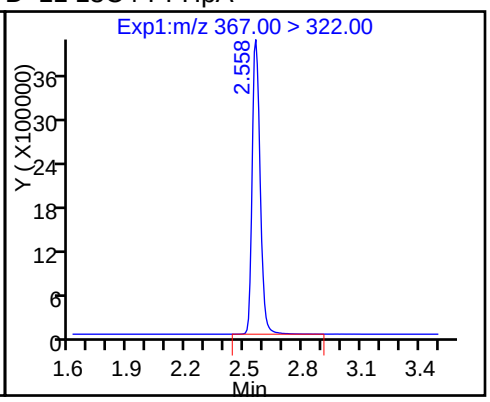
7 Perfluorohexanoic acid



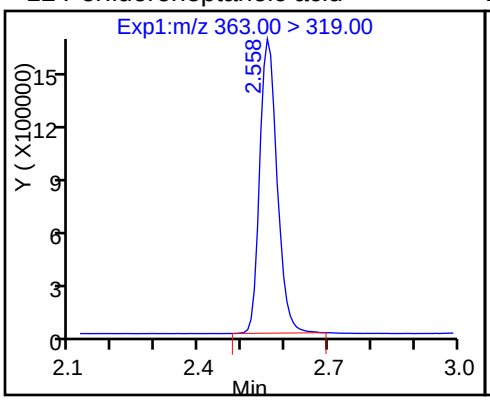
D 6 13C2 PFHxA



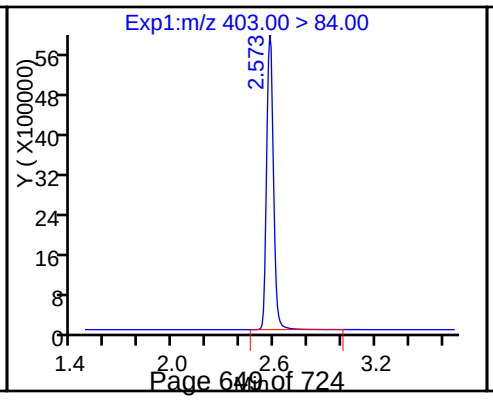
D 11 13C4-PFHpA



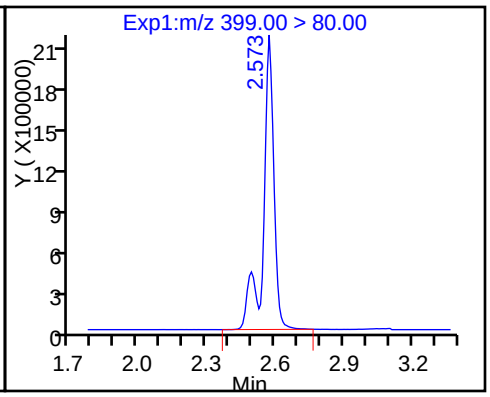
12 Perfluoroheptanoic acid



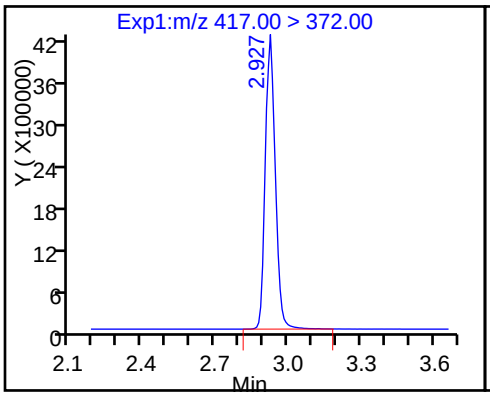
D 10 18O2 PFHxS



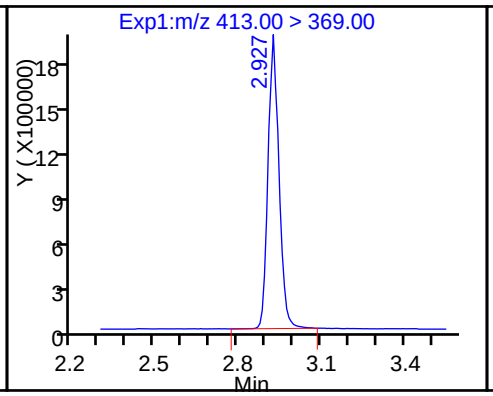
9 Perfluorohexanesulfonic acid



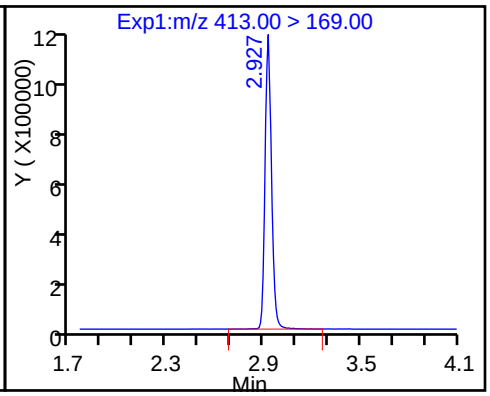
D 14 13C4 PFOA



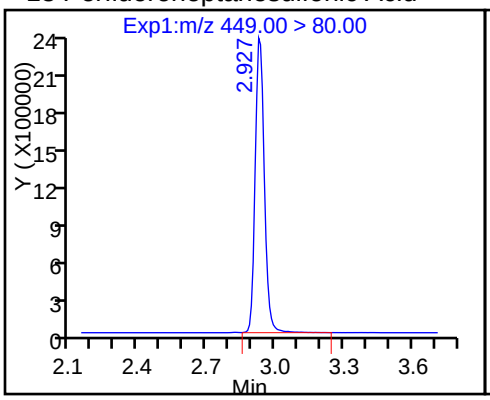
15 Perfluorooctanoic acid



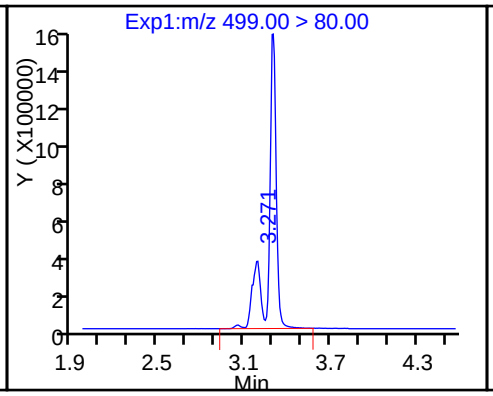
15 Perfluorooctanoic acid



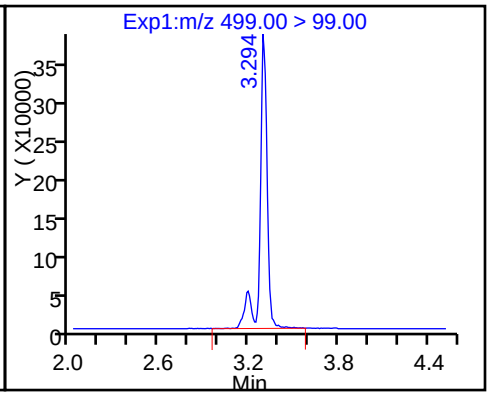
13 Perfluoroheptanesulfonic Acid



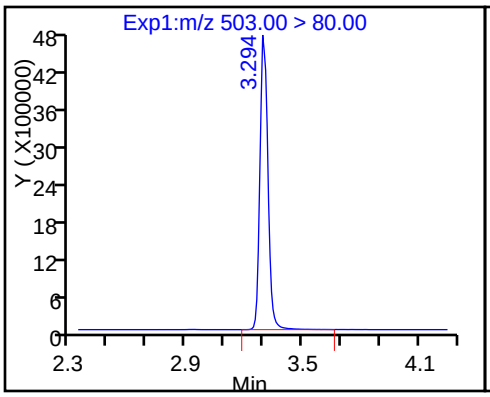
18 Perfluorooctane sulfonic acid



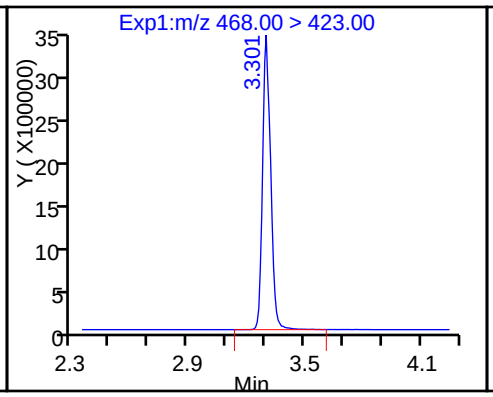
18 Perfluorooctane sulfonic acid



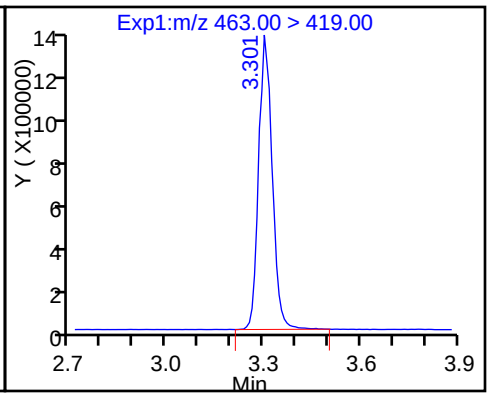
D 17 13C4 PFOS



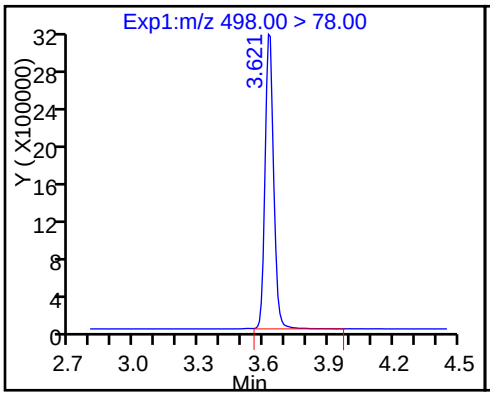
D 19 13C5 PFNA



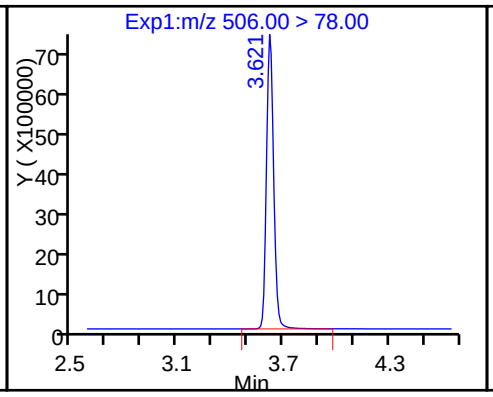
20 Perfluorononanoic acid



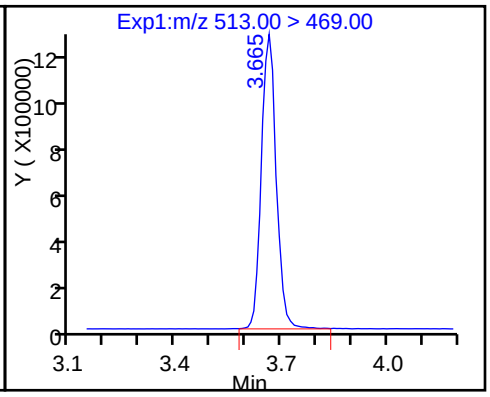
22 Perfluorooctane Sulfonamide



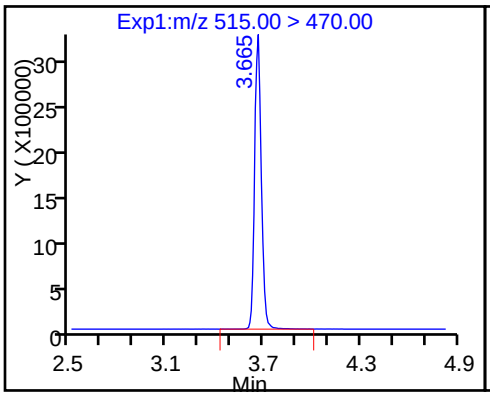
D 21 13C8 FOSA



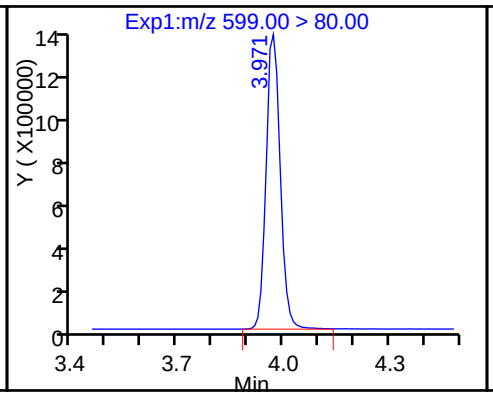
24 Perfluorodecanoic acid



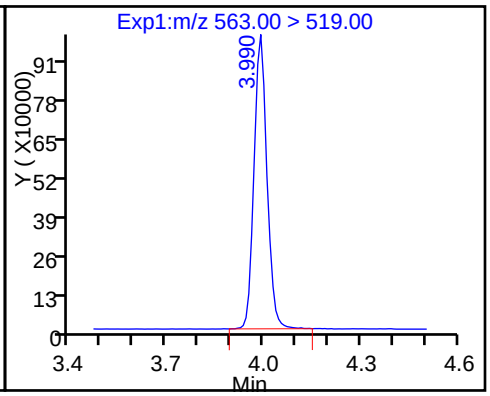
D 23 13C2 PFDA



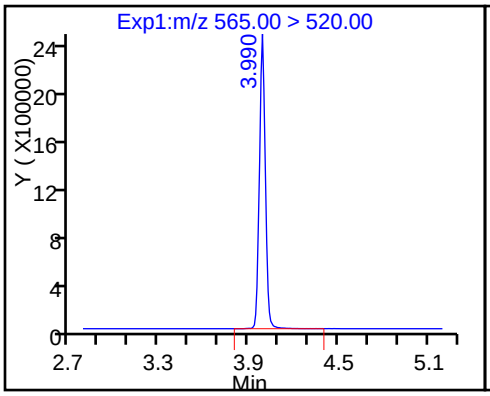
26 Perfluorodecane Sulfonic acid



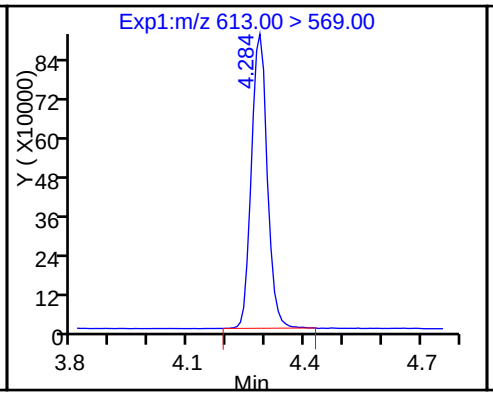
28 Perfluoroundecanoic acid



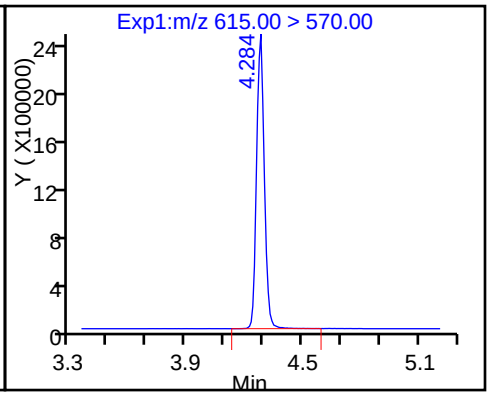
D 27 13C2 PFUnA



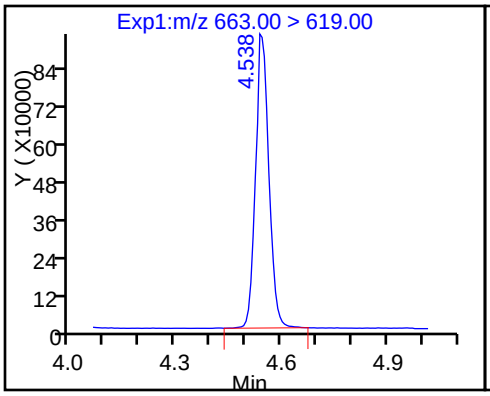
29 Perfluorododecanoic acid



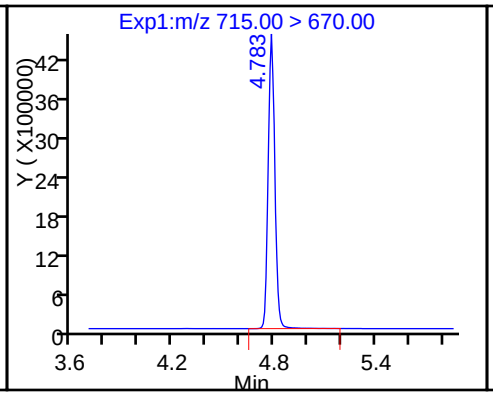
D 30 13C2 PFDoA



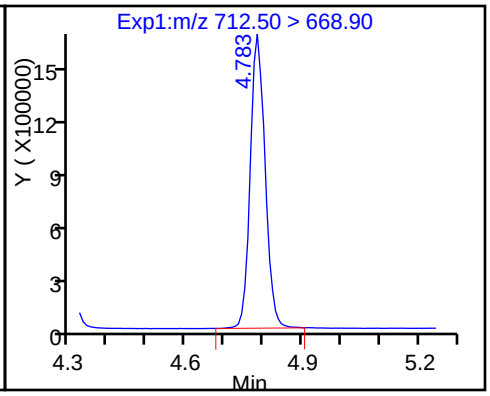
31 Perfluorotridecanoic acid



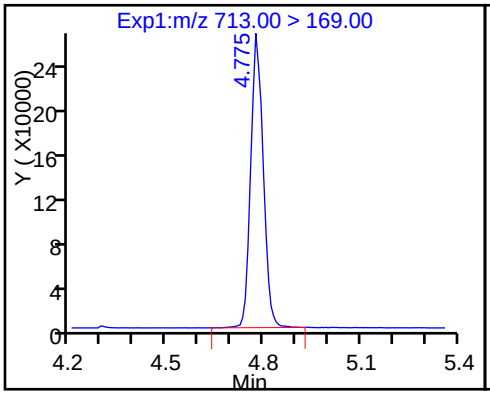
D 32 13C2-PFTeDA



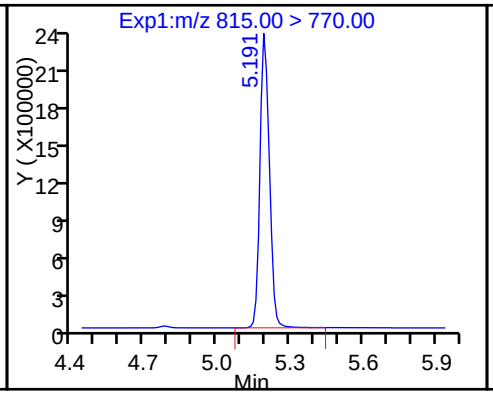
33 Perfluorotetradecanoic acid



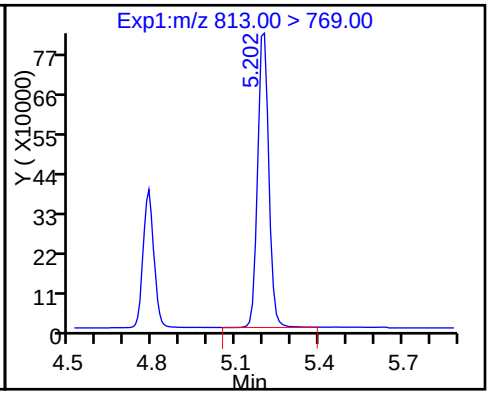
33 Perfluorotetradecanoic acid



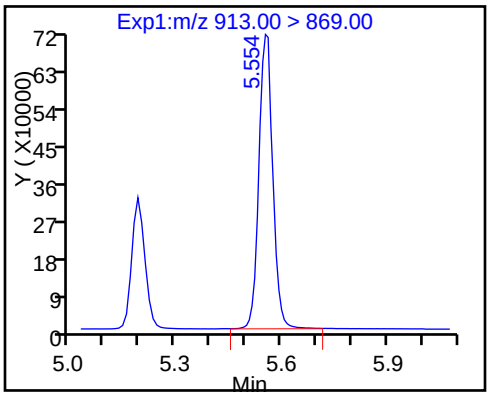
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Lab Sample ID: CCV 320-145022/47 Calibration Date: 01/04/2017 21:48

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 04JAN2017A_047.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9150		53.6	50.0	7.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	0.9931		50.3	50.0	0.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.644		51.3	44.2	16.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9193		49.5	50.0	-1.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9915		50.6	50.0	1.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.060		46.8	45.5	2.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.040		51.8	50.0	3.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.147		49.5	47.6	4.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.059		49.4	46.4	6.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9663		50.8	50.0	1.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9338		50.1	50.0	0.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9708		51.4	50.0	2.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6866		56.7	48.2	17.6	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9440		49.4	50.0	-1.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9619		52.4	50.0	4.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9353		51.6	50.0	3.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.574		49.7	50.0	-0.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8476		43.8	50.0	-12.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.7016		34.0	50.0	-31.9*	25.0
13C4 PFBA	Ave	347743	352162		50.6	50.0	1.3	50.0
13C5-PFPeA	Ave	266072	268991		50.5	50.0	1.1	50.0
13C2 PFHxA	Ave	245110	248725		50.7	50.0	1.5	50.0
13C4-PFHpA	Ave	226344	208761		46.1	50.0	-7.8	50.0
18O2 PFHxS	Ave	326976	313413		45.3	47.3	-4.1	50.0
13C4 PFOA	Ave	230362	215277		46.7	50.0	-6.5	50.0
13C4 PFOS	Ave	248847	252933		48.6	47.8	1.6	50.0
13C5 PFNA	Ave	177687	170900		48.1	50.0	-3.8	50.0
13C8 FOSA	Ave	384141	399782		52.0	50.0	4.1	50.0
13C2 PFDA	Ave	157302	167759		53.3	50.0	6.6	50.0
13C2 PFUnA	Ave	117250	125429		53.5	50.0	7.0	50.0
13C2 PFDoA	Ave	110957	117767		53.1	50.0	6.1	50.0
13C2-PFTeDA	Ave	227387	224797		49.4	50.0	-1.1	50.0
13C2-PFHxDA	Ave	124568	114118		45.8	50.0	-8.4	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_047.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 04-Jan-2017 21:48:07 ALS Bottle#: 41 Worklist Smp#: 47
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jan-2017 12:50:33 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK021

First Level Reviewer: chandrasenas Date: 06-Jan-2017 12:50:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.609	1.609	0.0		17608110	50.6		101	756280	
1 Perfluorobutyric acid										
212.90 > 169.00	1.609	1.609	0.0	1.000	16111211	53.6		107	111070	
D 4 13C5-PFPeA										
267.90 > 223.00	1.899	1.899	0.0		13449541	50.5		101	1230139	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.899	1.899	0.0	1.000	13356659	50.3		101	150572	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.938	1.938	0.0	1.000	22768020	51.3		116		
298.90 > 99.00	1.938	1.938	0.0	1.000	10348324		2.20(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.200	2.200	0.0	1.000	11432599	49.5		99.0	310194	
D 6 13C2 PFHxA										
315.00 > 270.00	2.209	2.209	0.0		12436270	50.7		101	744569	
D 11 13C4-PFHpA										
367.00 > 322.00	2.553	2.553	0.0		10438028	46.1		92.2	706465	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.553	2.553	0.0	1.000	10348940	50.6		101	139328	
D 10 18O2 PFHxS										
403.00 > 84.00	2.560	2.560	0.0		14824443	45.3		95.9	1362100	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.560	2.560	0.0	1.000	15120173	46.8		103		
D 14 13C4 PFOA										
417.00 > 372.00	2.911	2.911	0.0		10763855	46.7		93.5	893940	

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	2.911	2.911	0.0	1.000	11195879	51.8		104	94970	
413.00 > 169.00	2.911	2.911	0.0	1.000	6628457		1.69(0.90-1.10)		324610	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.919	2.919	0.0	1.000	13803677	49.5		104		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.269	3.269	0.0	1.000	12427636	49.4		106	214215	
499.00 > 99.00	3.285	3.269	0.016	1.005	2669926		4.65(0.90-1.10)		166755	
D 17 13C4 PFOS										
503.00 > 80.00	3.285	3.285	0.0		12090178	48.6		102	239816	
D 19 13C5 PFNA										
468.00 > 423.00	3.292	3.292	0.0		8545021	48.1		96.2	555561	
20 Perfluorononanoic acid										
463.00 > 419.00	3.292	3.292	0.0	1.000	8257342	50.8		102	127549	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.610	3.610	0.0	1.000	18665943	50.1		100	383545	
D 21 13C8 FOSA										
506.00 > 78.00	3.610	3.610	0.0		19989096	52.0		104	527554	
D 23 13C2 PFDA										
515.00 > 470.00	3.644	3.644	0.0		8387961	53.3		107	228946	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.644	3.644	0.0	1.000	8142956	51.4		103	170745	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.958	3.958	0.0	1.000	8370907	56.7		118		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.976	3.976	0.0	1.000	5920259	49.4		98.7	130948	
D 27 13C2 PFUnA										
565.00 > 520.00	3.976	3.976	0.0		6271451	53.5		107	310642	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.262	4.262	0.0	1.000	5663986	52.4		105	59693	
D 30 13C2 PFDoA										
615.00 > 570.00	4.270	4.270	0.0		5888362	53.1		106	187137	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.537	4.537	0.0	1.000	5507635	51.6		103	5541	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.768	4.768	0.0		11239869	49.4		98.9	389960	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.777	4.777	0.0	1.000	9270288	49.7		99.3	3274	
713.00 > 169.00	4.759	4.777	-0.018	0.996	1519691		6.10(0.00-0.00)		112603	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.182	5.182	0.0		5705894	45.8		91.6	79527	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.182	5.182	0.0	1.000	4991225	43.8		87.6	3408	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.539	5.539	0.0	1.000	4131486	34.0		68.1	3226	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 06-Jan-2017 12:50:33 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b\04JAN2017A_047.d

Injection Date: 04-Jan-2017 21:48:07 Instrument ID: A8_N

Lims ID: CCV L5

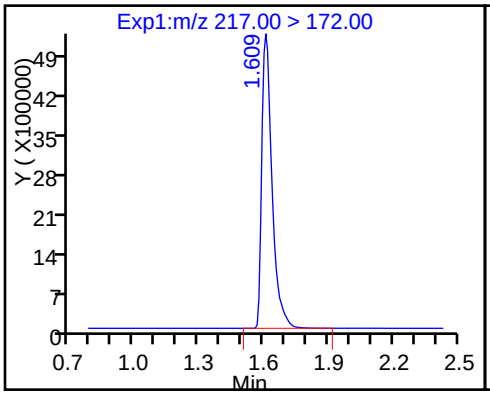
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 47

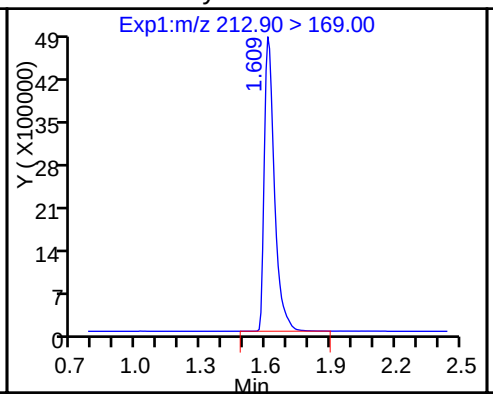
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

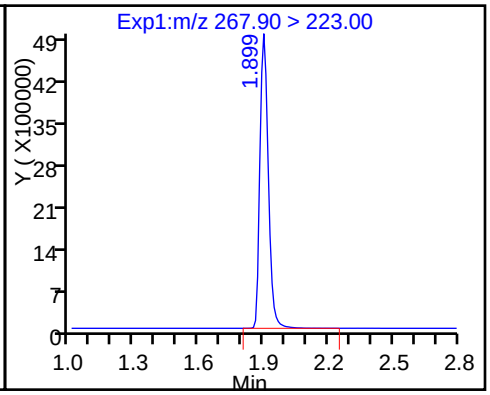
D 2 13C4 PFBA



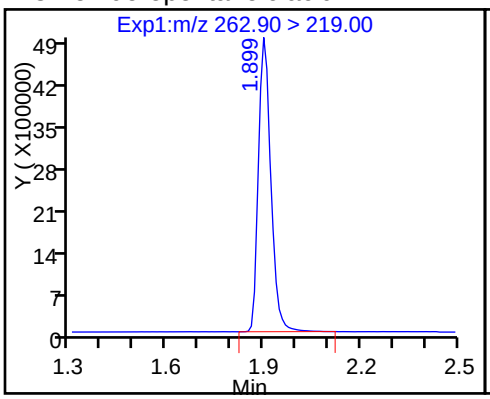
1 Perfluorobutyric acid



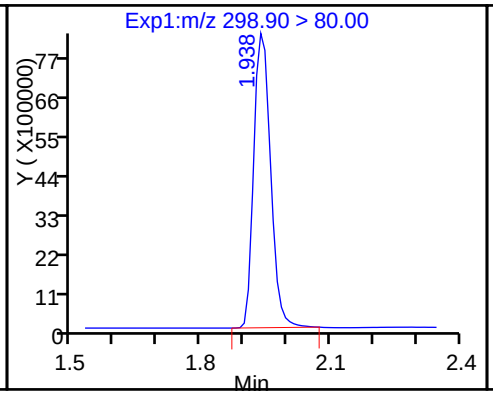
D 4 13C5-PFPeA



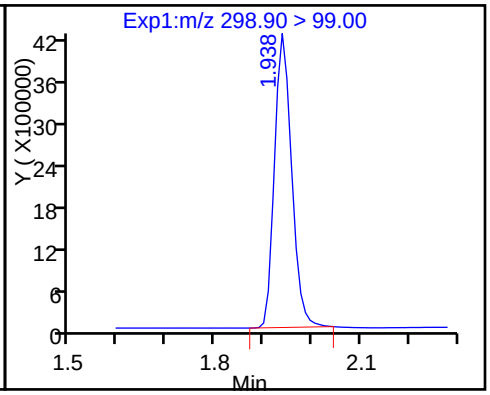
3 Perfluoropentanoic acid



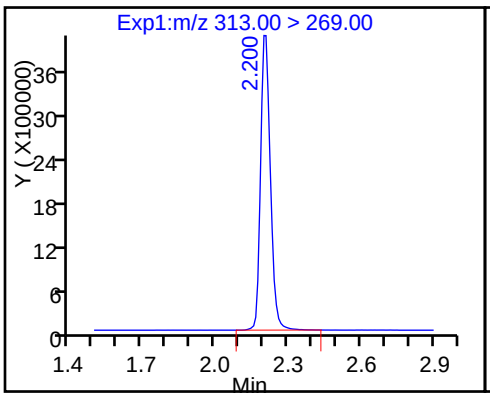
5 Perfluorobutanesulfonic acid



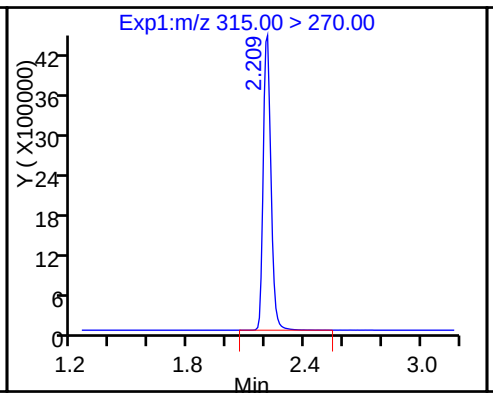
5 Perfluorobutanesulfonic acid



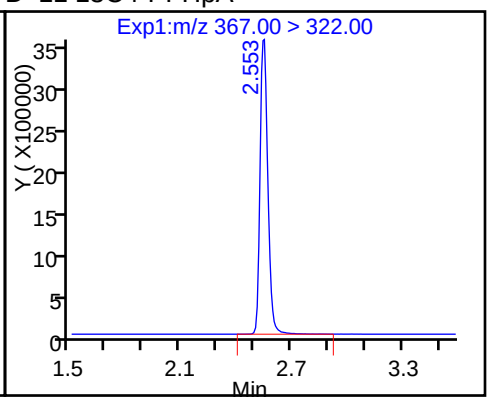
7 Perfluorohexanoic acid



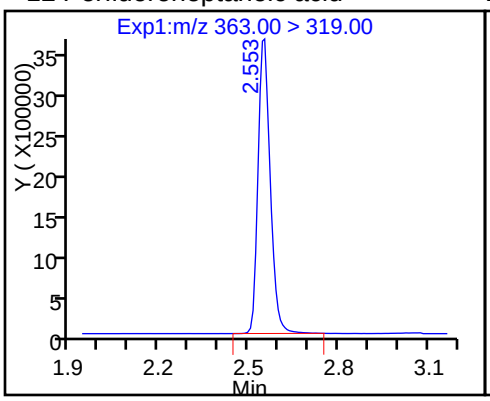
D 6 13C2 PFHxA



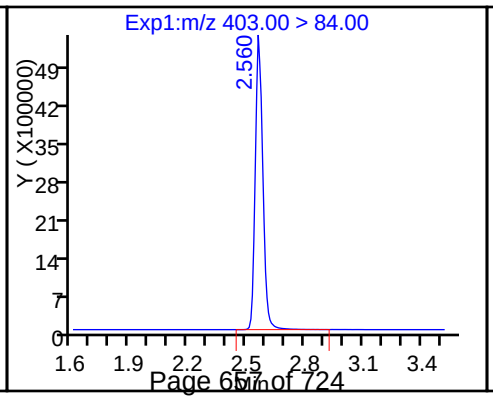
D 11 13C4-PFHpA



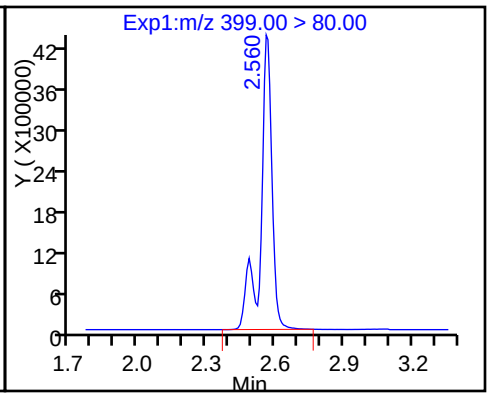
12 Perfluoroheptanoic acid



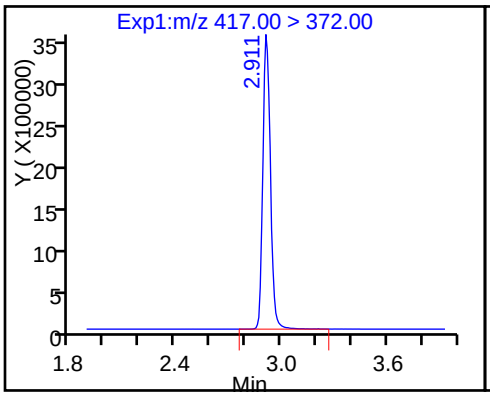
D 10 18O2 PFHxS



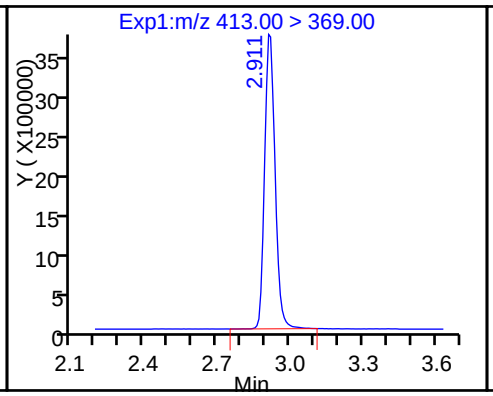
9 Perfluorohexanesulfonic acid



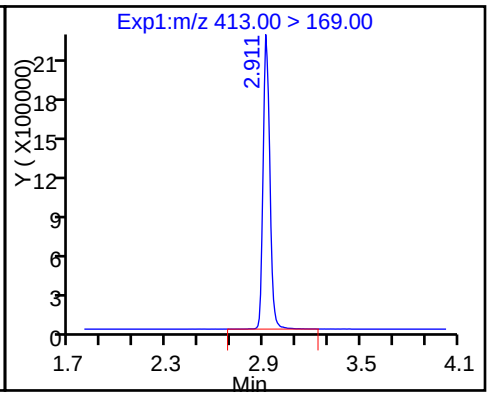
D 14 13C4 PFOA



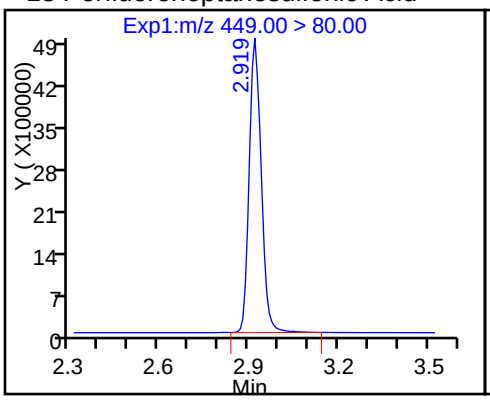
15 Perfluorooctanoic acid



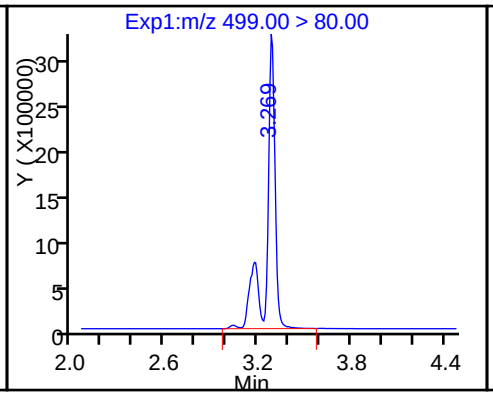
15 Perfluorooctanoic acid



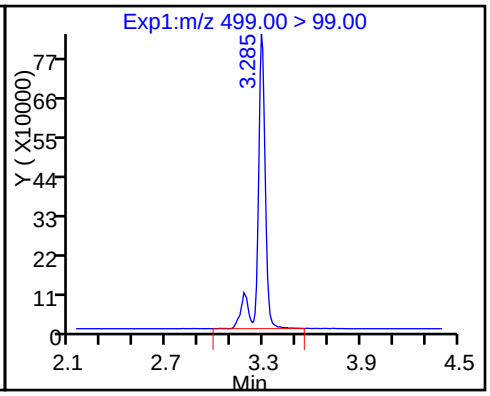
13 Perfluoroheptanesulfonic Acid



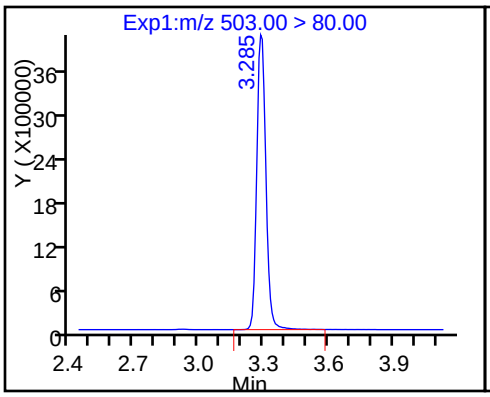
18 Perfluorooctane sulfonic acid



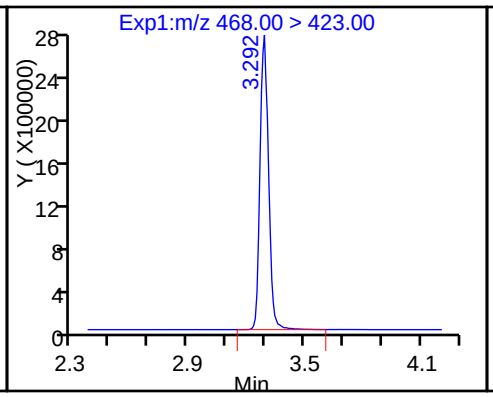
18 Perfluorooctane sulfonic acid



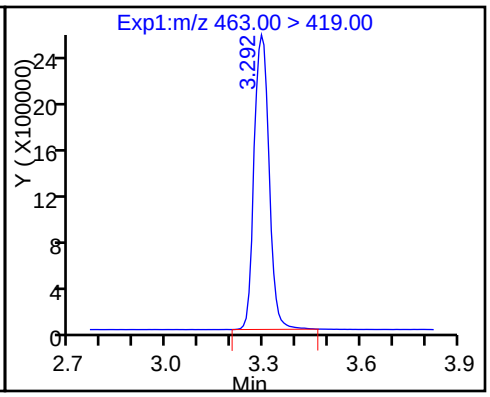
D 17 13C4 PFOS



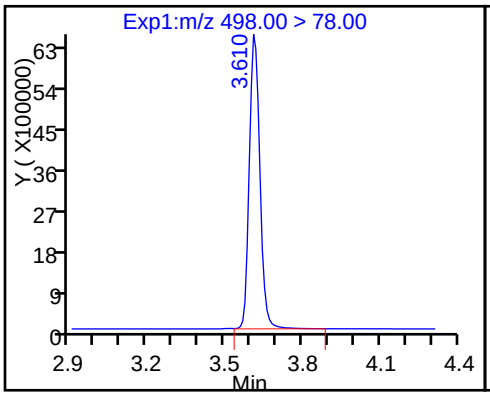
D 19 13C5 PFNA



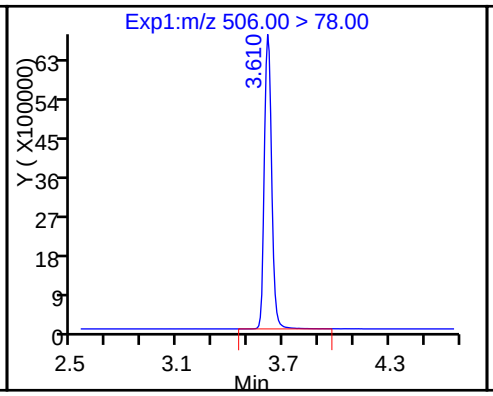
20 Perfluorononanoic acid



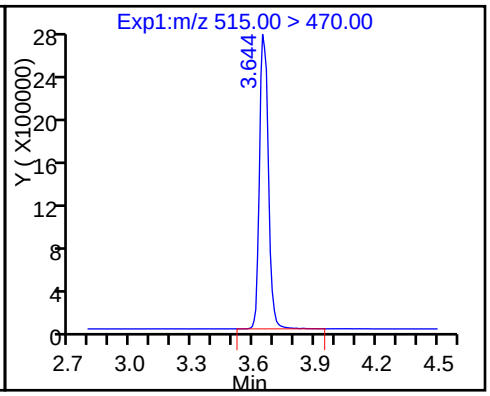
22 Perfluorooctane Sulfonamide



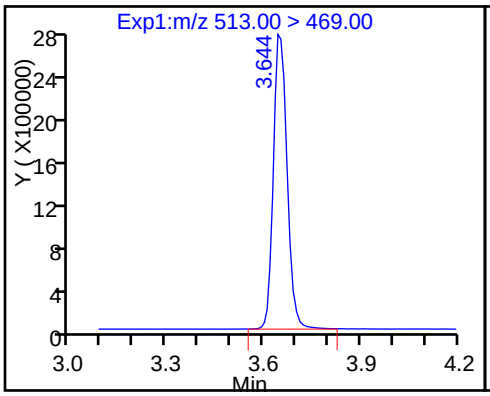
D 21 13C8 FOSA



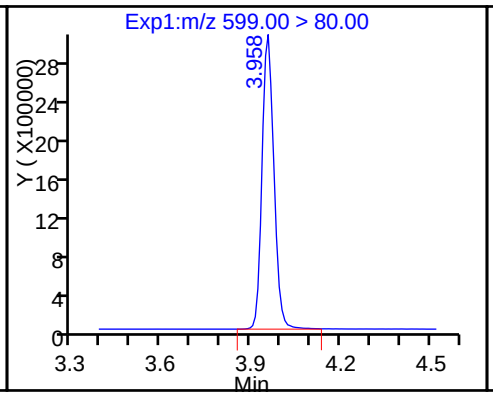
D 23 13C2 PFDA



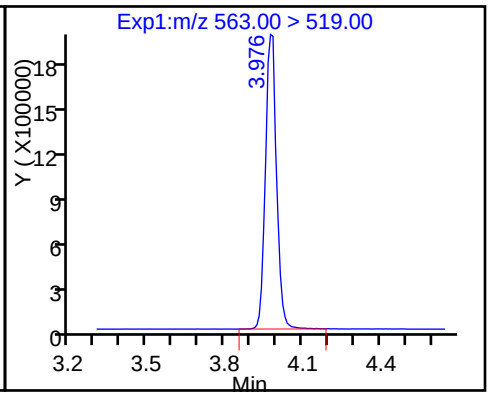
24 Perfluorodecanoic acid



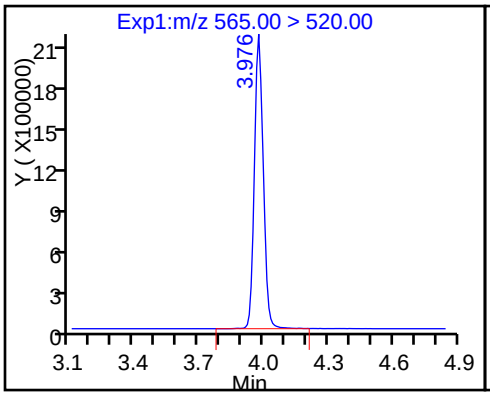
26 Perfluorodecane Sulfonic acid



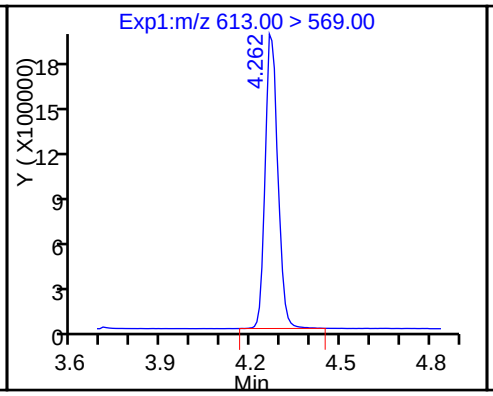
28 Perfluoroundecanoic acid



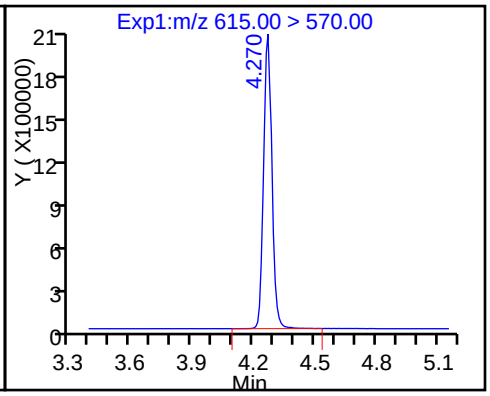
D 27 13C2 PFUnA



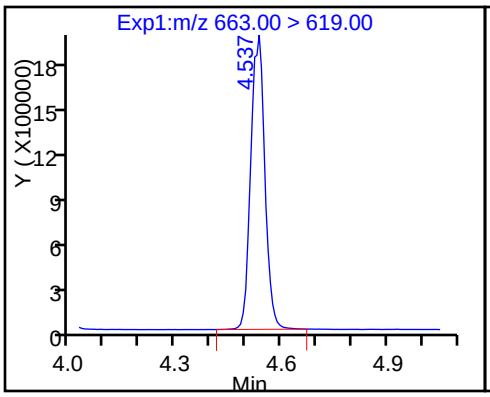
29 Perfluorododecanoic acid



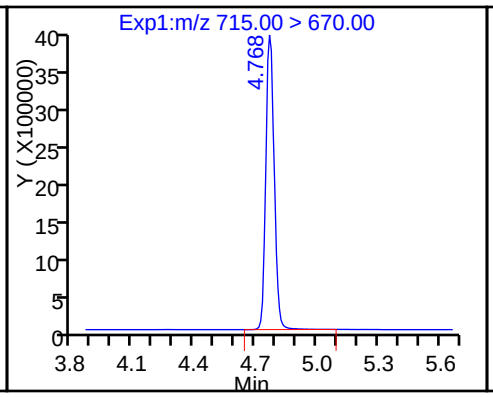
D 30 13C2 PFDoA



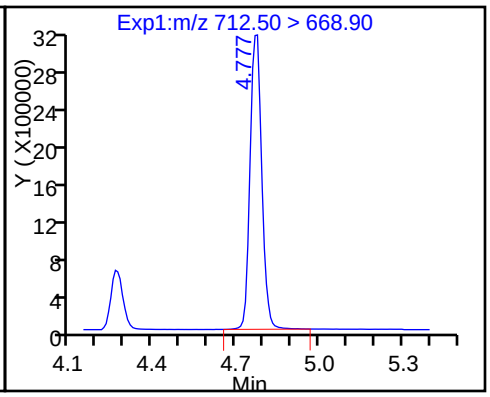
31 Perfluorotridecanoic acid



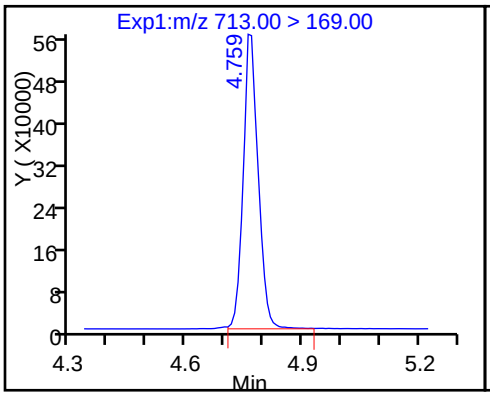
D 32 13C2-PFTeDA



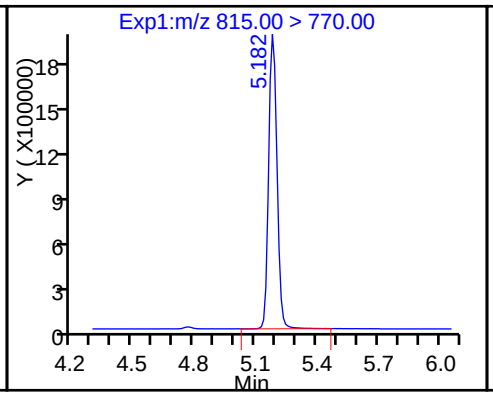
33 Perfluorotetradecanoic acid



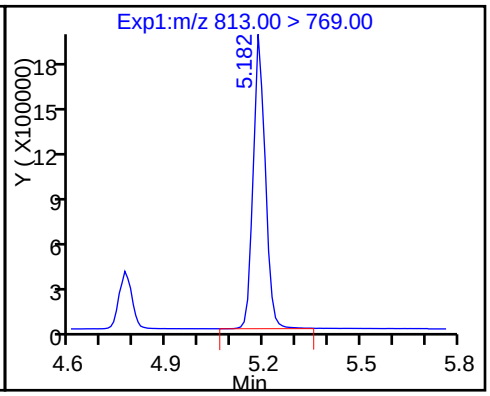
33 Perfluorotetradecanoic acid



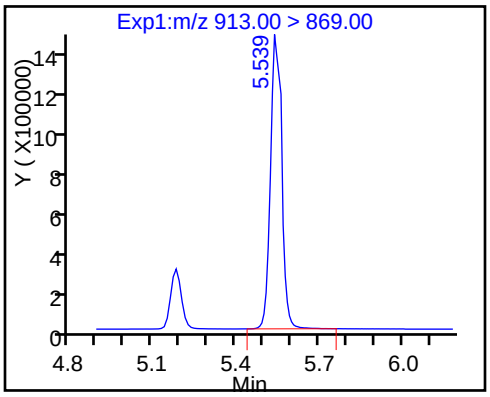
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-142967/1-A

Matrix: Water | Lab File ID: 28DEC2016C_003.d

Analysis Method: 537 (Modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 250(mL) | Date Analyzed: 12/29/2016 00:06

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0010	U	0.0025	0.0010	0.00046
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0020	U	0.0025	0.0020	0.00099
307-24-4	Perfluorohexanoic acid (PFHxA)	0.00147	J	0.0025	0.0020	0.00079
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.00116	J	0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00065
335-76-2	Perfluorodecanoic acid (PFDA)	0.0010	U	0.0025	0.0010	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0020	U	0.0025	0.0020	0.00075
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0020	U	0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0020	U	0.0025	0.0020	0.00055
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0010	U	0.0025	0.0010	0.00040
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.000944	J	0.0025	0.0020	0.00087
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0030	U	0.0040	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0020	U	0.0025	0.0020	0.00064

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-142967/1-A

Matrix: Water | Lab File ID: 28DEC2016C_003.d

Analysis Method: 537 (Modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 250(mL) | Date Analyzed: 12/29/2016 00:06

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	64		25-150
STL00992	13C4 PFBA	131		25-150
STL01893	13C5-PFPeA	137		25-150
STL00993	13C2 PFHxA	131		25-150
STL01892	13C4-PFHpA	132		25-150
STL00990	13C4 PFOA	133		25-150
STL00995	13C5 PFNA	126		25-150
STL00996	13C2 PFDA	130		25-150
STL00997	13C2 PFUnA	127		25-150
STL00998	13C2 PFDoA	112		25-150
STL00994	18O2 PFHxS	130		25-150
STL00991	13C4 PFOS	126		25-150

Report Date: 29-Dec-2016 17:33:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_003.d
Lims ID: MB 320-142967/1-A
Client ID:
Sample Type: MB
Inject. Date: 29-Dec-2016 00:06:57 ALS Bottle#: 1 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-142967/1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Dec-2016 17:32:20 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:26:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.533	1.534	-0.001		22721769	65.3		131	925685	
1 Perfluorobutyric acid										
212.90 > 169.00	1.533	1.534	-0.001	1.000	68891	0.1776			395	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		18203986	68.4		137	1419246	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	129663	0.3609			1124	
D 6 13C2 PFHxA										
315.00 > 270.00	2.095	2.097	-0.002		16019429	65.4		131	855679	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.095	2.097	-0.002	1.000	218047	0.7328			5026	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.440	2.422	0.018	1.000	207215	0.4721				
D 11 13C4-PFHpA										
367.00 > 322.00	2.425	2.429	-0.004		14896126	65.8		132	901870	
D 10 18O2 PFHxS										
403.00 > 84.00	2.440	2.452	-0.012		20159010	61.7		130	1823256	
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.745	2.773	-0.028	1.000	4852	NR				
D 47 M2-6:2FTS										
429.00 > 409.00	2.754	2.781	-0.027		1527	0.0131		0.0		
D 14 13C4 PFOA										
417.00 > 372.00	2.785	2.790	-0.005		15351124	66.6		133	1373543	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.777	2.790	-0.013	1.000	178217	0.5786			1647	
413.00 > 169.00	2.777	2.790	-0.013	1.000	118363		1.51(0.90-1.10)		4542	
D 17 13C4 PFOS										
503.00 > 80.00	3.154	3.158	-0.004		15004280	60.3		126	1809672	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFNA										
468.00 > 423.00	3.146	3.166	-0.020		11219527	63.1		126	468115	
D 21 13C8 FOSA										
506.00 > 78.00	3.477	3.481	-0.004		12344298	32.1		64.3	469588	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.477	3.481	-0.004	1.000	18875	0.0820			1393	
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.664	3.519	0.145	1.000	328	NR				
D 23 13C2 PFDA										
515.00 > 470.00	3.511	3.523	-0.012		10192833	64.8		130	457986	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.503	3.523	-0.020	1.000	4780	0.0248			192	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.664	3.683	-0.019		15222	0.2021		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.813	3.834	-0.021	1.000	231	0.001260				
D 27 13C2 PFUnA										
565.00 > 520.00	3.839	3.851	-0.012		7424245	63.3		127	379052	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.839	3.851	-0.012	1.000	16579	0.1168			479	
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.839	3.855	-0.016		19849	0.2533		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.723	3.864	-0.141	0.970	702	NR				
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.511	3.997	-0.486		851904	8.96		0.0		
D 30 13C2 PFDoA										
615.00 > 570.00	4.136	4.134	0.002		6231043	56.2		112	238714	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.213	4.180	0.033		342	0.003987		0.0		
D 32 13C2-PFTeDA										
715.00 > 670.00	4.647	4.652	-0.005		14245009	62.6		125	1014829	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.647	4.652	-0.005	1.000	33805	0.1712			351	
713.00 > 169.00	4.637	4.652	-0.015	0.998	5978		5.65(0.00-0.00)		2064	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.060	5.069	-0.009		6519433	52.3		105	185875	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.060	5.069	-0.009	1.000	83401	0.1013			163	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.415	5.421	-0.006	1.000	4279	0.0333			3.5	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Report Date: 29-Dec-2016 17:33:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_003.d

Injection Date: 29-Dec-2016 00:06:57 Instrument ID: A8_N

Lims ID: MB 320-142967/1-A

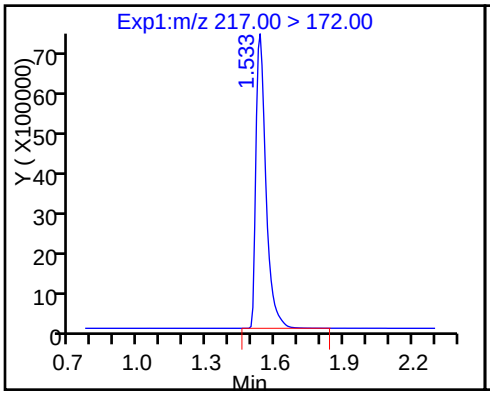
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 3

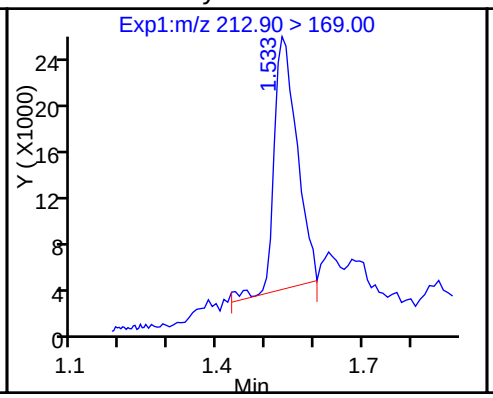
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

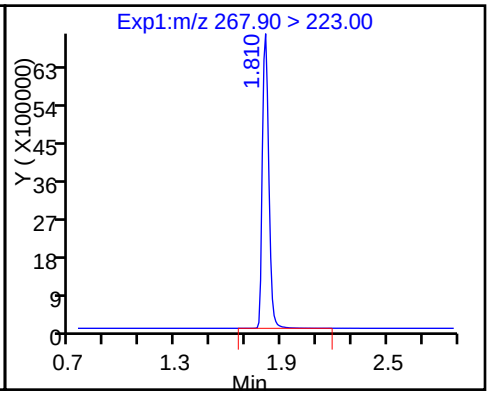
D 2 13C4 PFBA



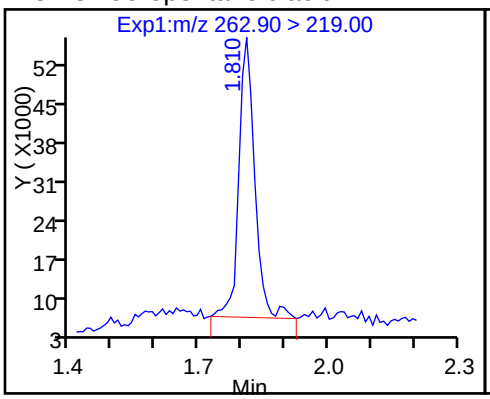
1 Perfluorobutyric acid



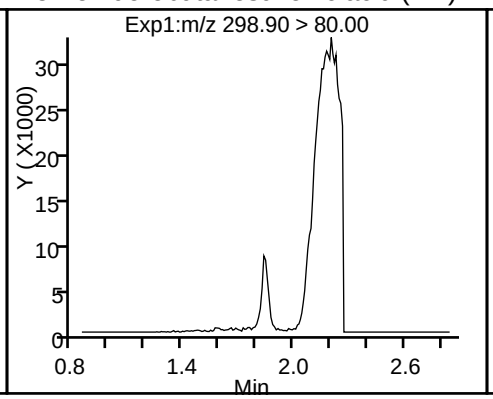
D 4 13C5-PFPeA



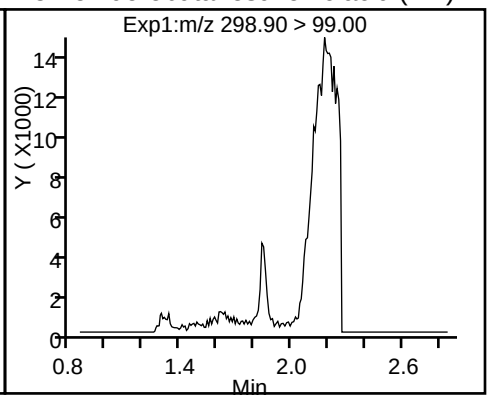
3 Perfluoropentanoic acid



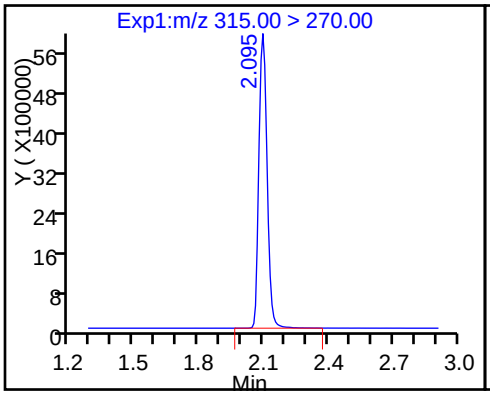
5 Perfluorobutanesulfonic acid (ND)



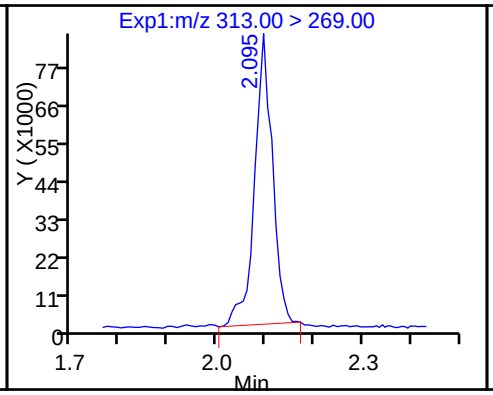
5 Perfluorobutanesulfonic acid (ND)



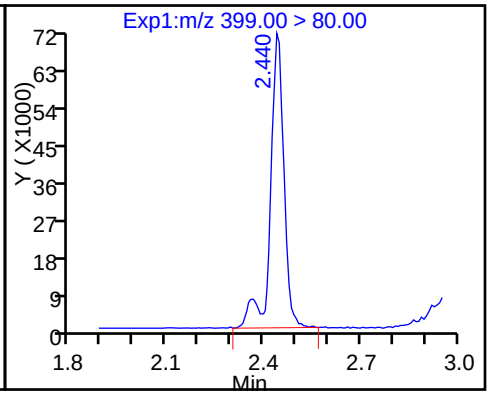
D 6 13C2 PFHxA



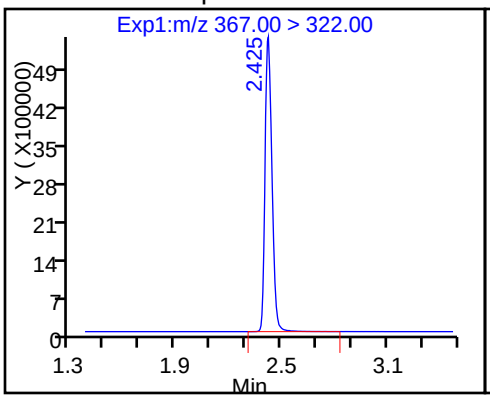
7 Perfluorohexanoic acid



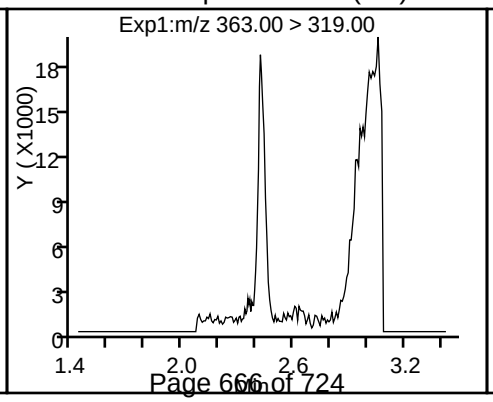
9 Perfluorohexanesulfonic acid



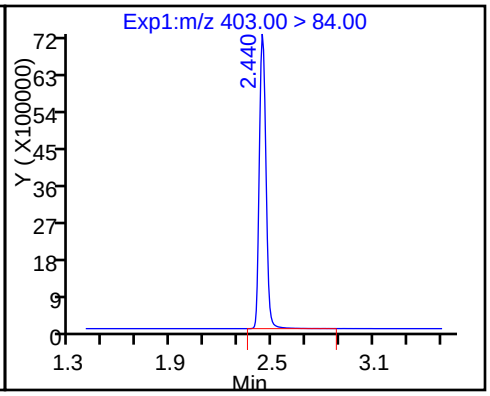
D 11 13C4-PFHpA



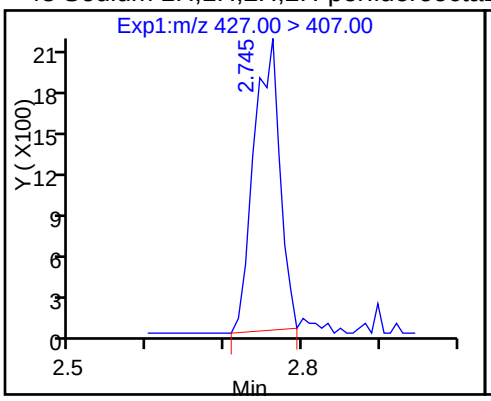
12 Perfluoroheptanoic acid (ND)



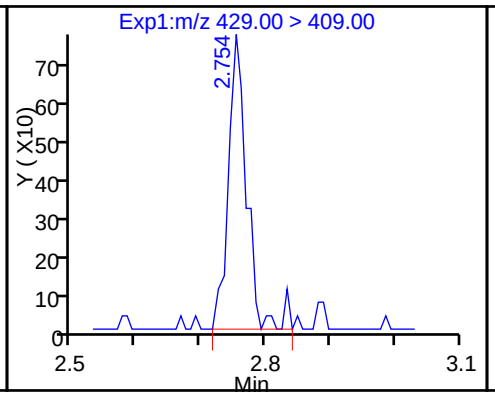
D 10 18O2 PFHxS



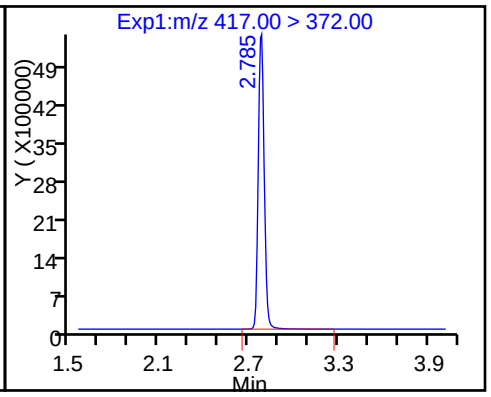
48 Sodium 1H,1H,2H,2H-perfluorooctane



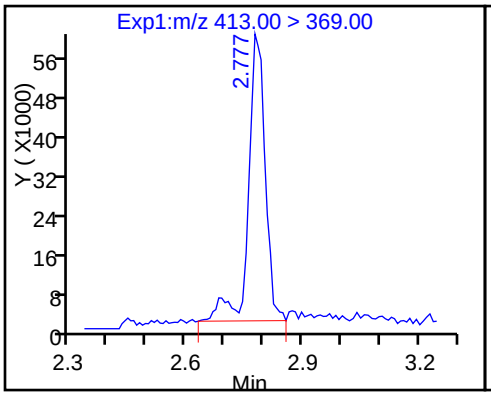
D 47 M2-6:2FTS



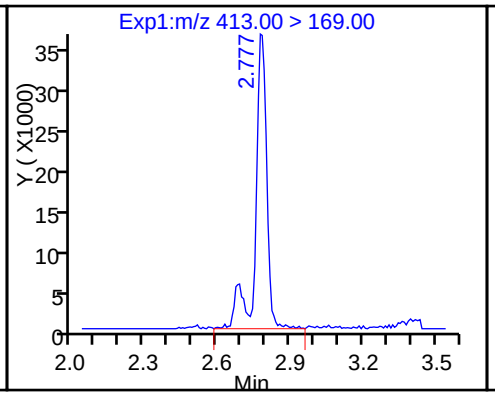
D 14 13C4 PFOA



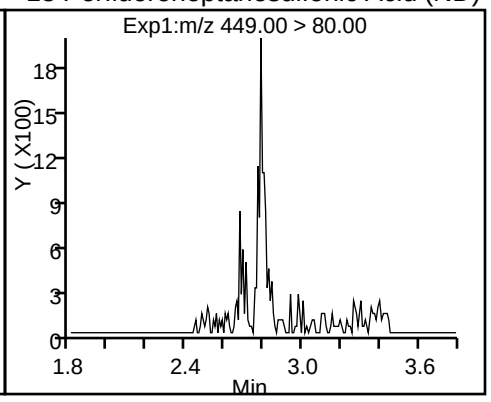
15 Perfluorooctanoic acid



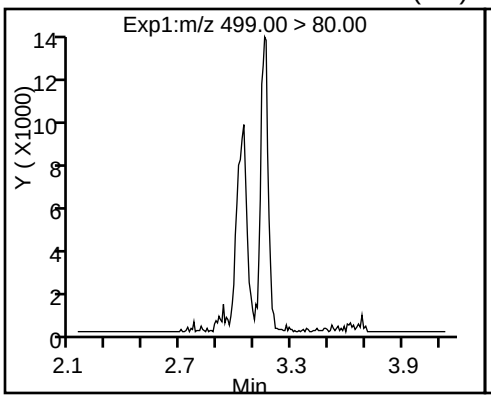
15 Perfluorooctanoic acid



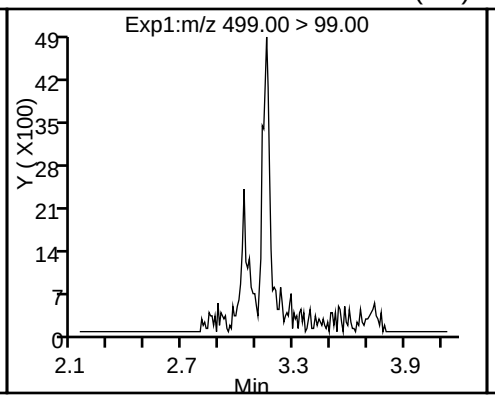
13 Perfluoroheptanesulfonic Acid (ND)



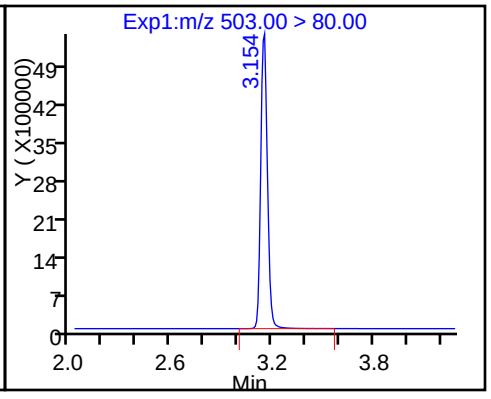
18 Perfluorooctane sulfonic acid (ND)



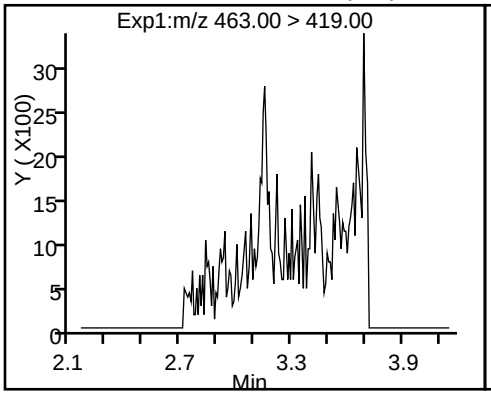
18 Perfluorooctane sulfonic acid (ND)



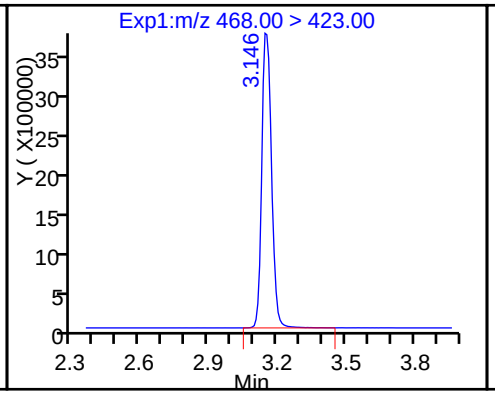
D 17 13C4 PFOS



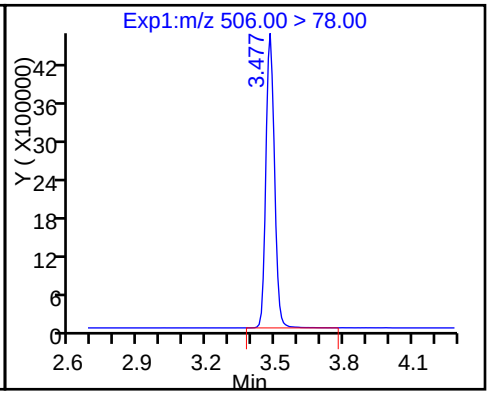
20 Perfluorononanoic acid (ND)



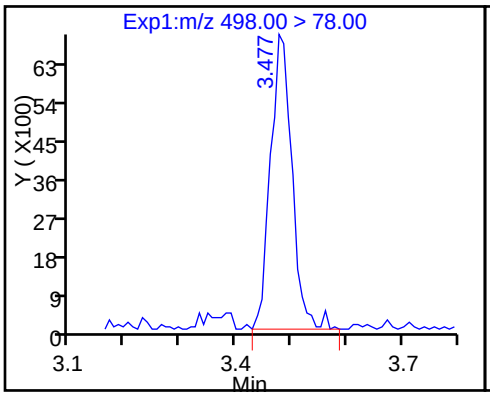
D 19 13C5 PFNA



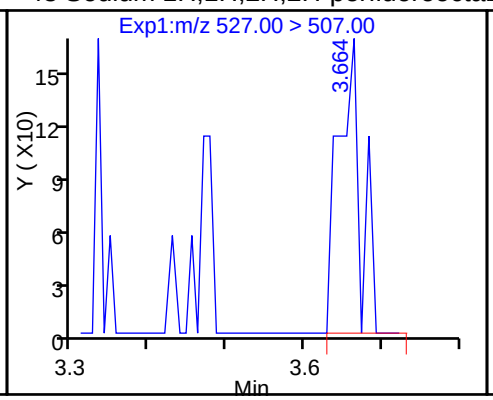
D 21 13C8 FOSA



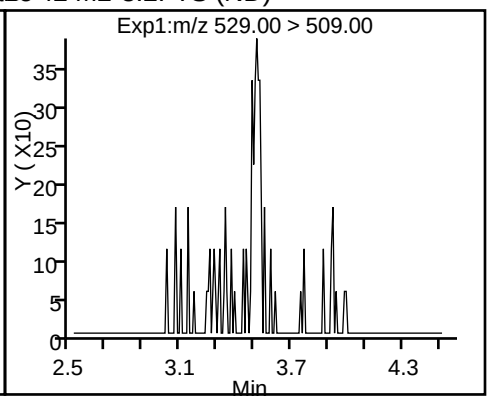
22 Perfluorooctane Sulfonamide



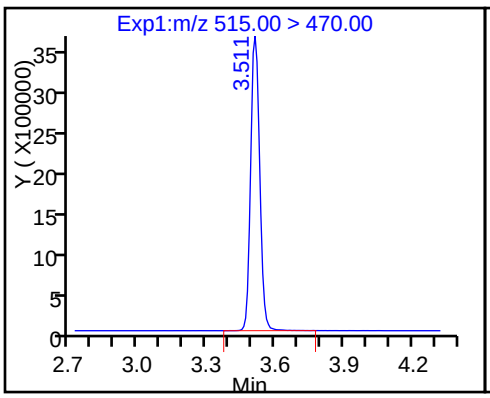
43 Sodium 1H,1H,2H,2H-perfluorooctane



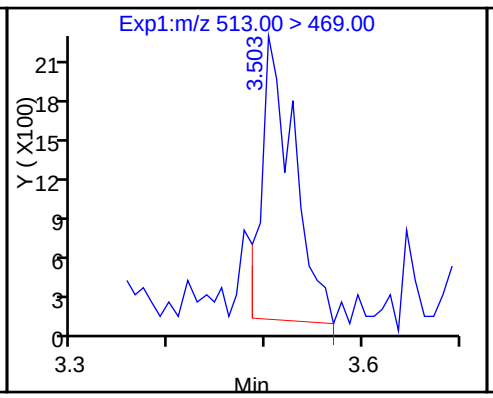
D 42 M2-8:2FTS (ND)



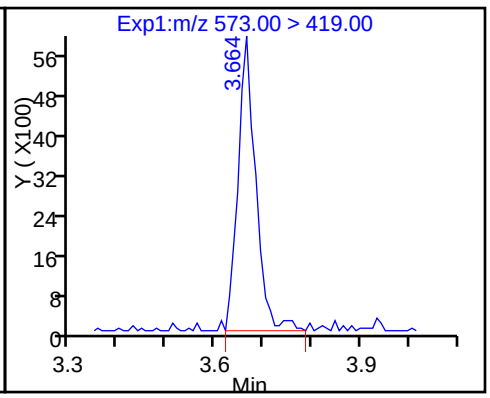
D 23 13C2 PFDA



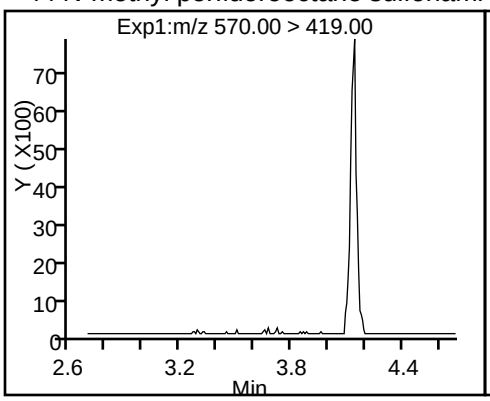
24 Perfluorodecanoic acid



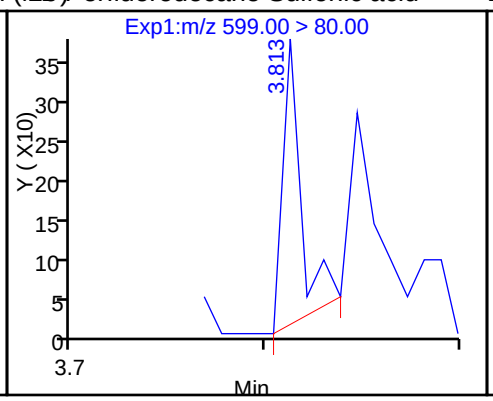
D 45 d3-NMeFOSAA



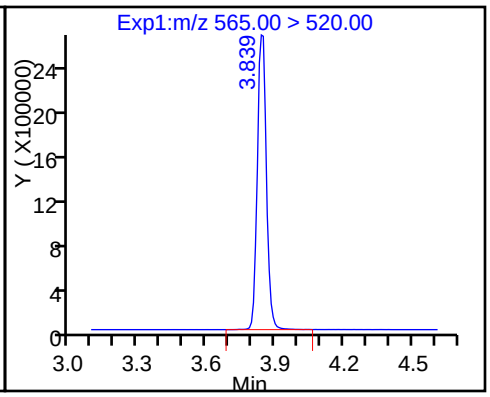
44 N-methyl perfluorooctane sulfonami (ND)



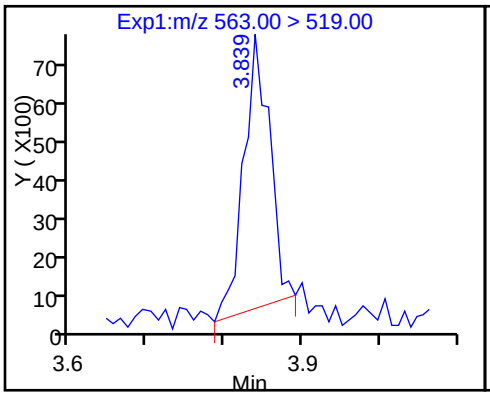
26 Perfluorodecane Sulfonic acid



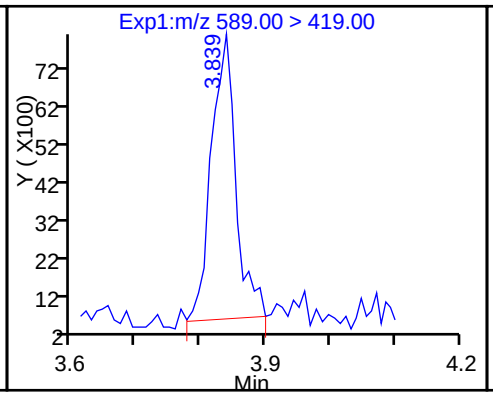
D 27 13C2 PFUnA



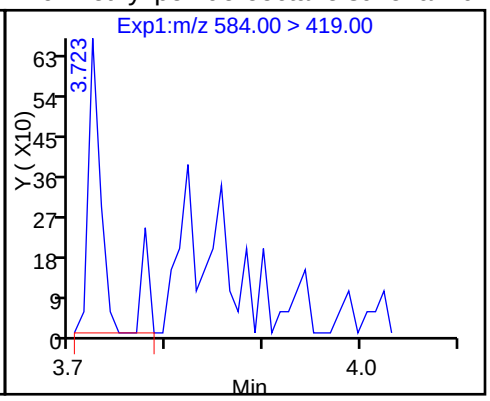
28 Perfluoroundecanoic acid



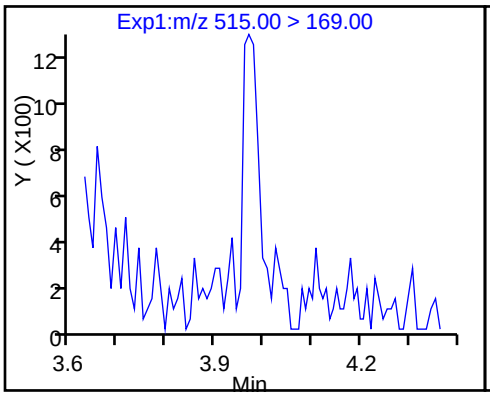
D 46 d5-NEtFOSAA



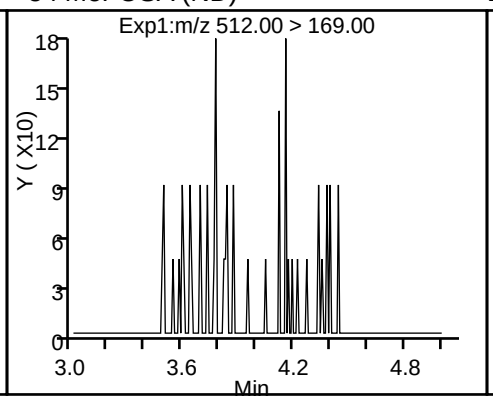
49 N-ethyl perfluorooctane sulfonamid



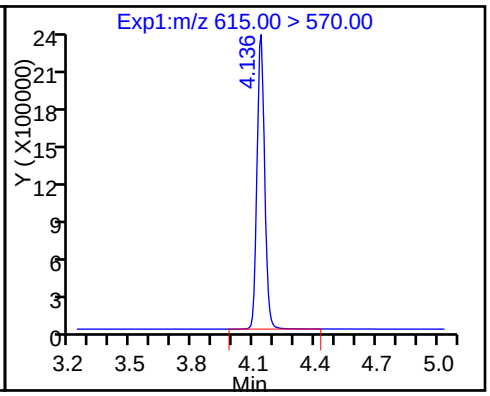
D 52 d-N-MeFOSA-M



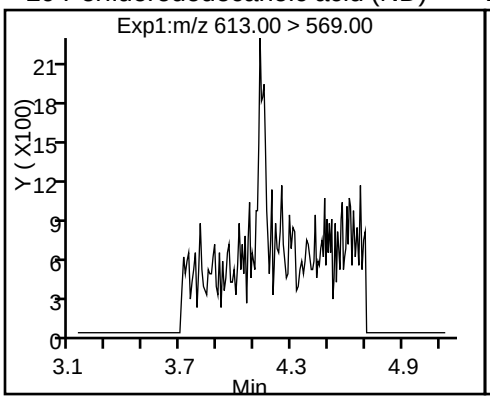
54 MeFOSA (ND)



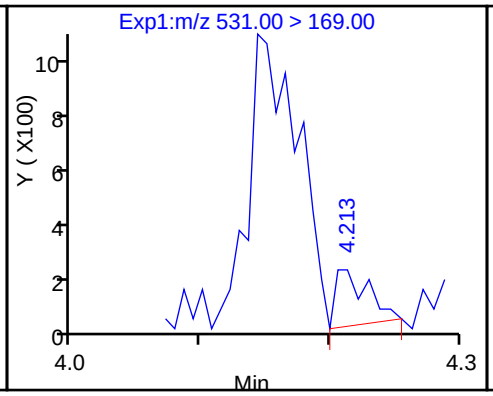
D 30 13C2 PFDoA



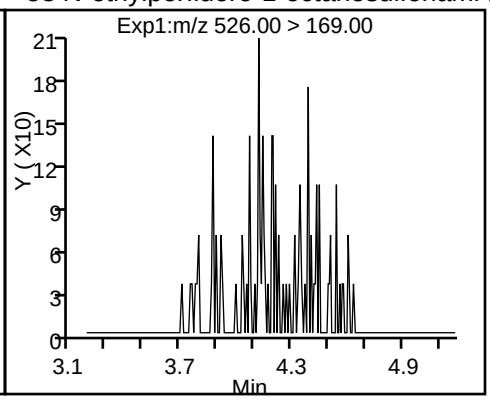
29 Perfluorododecanoic acid (ND)



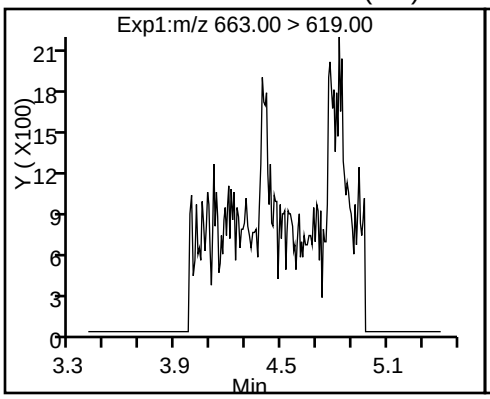
D 51 d-N-EtFOSA-M



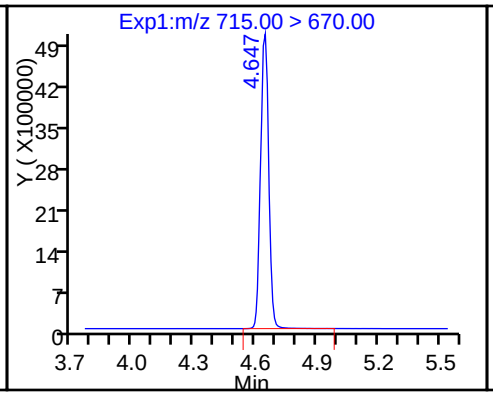
53 N-ethylperfluoro-1-octanesulfonami (ND)



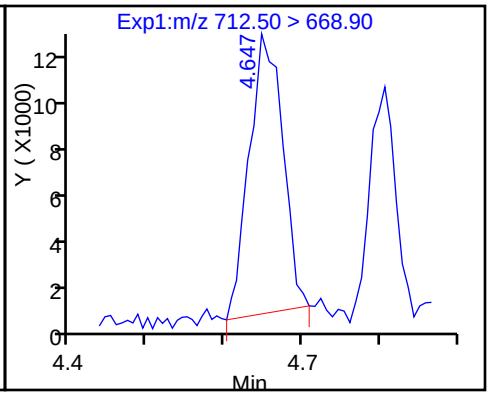
31 Perfluorotridecanoic acid (ND)



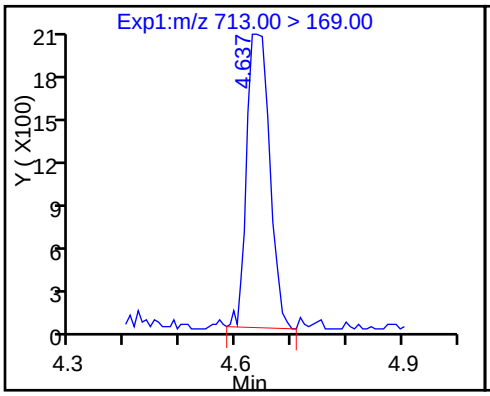
D 32 13C2-PFTeDA



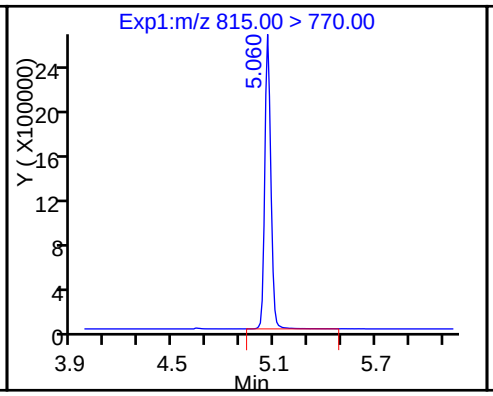
33 Perfluorotetradecanoic acid



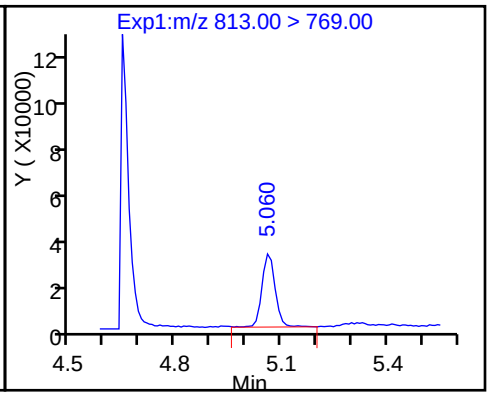
33 Perfluorotetradecanoic acid



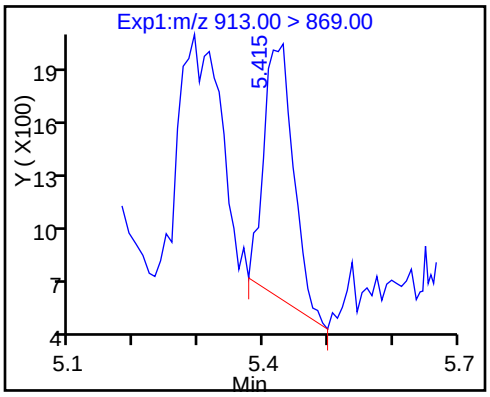
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-142967/1-A RA

Matrix: Water Lab File ID: 30DEC2016B_032.d

Analysis Method: 537 (Modified) Date Collected:

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 250(mL) Date Analyzed: 12/30/2016 16:11

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	113		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_032.d
Lims ID: MB 320-142967/1-A
Client ID:
Sample Type: MB
Inject. Date: 30-Dec-2016 16:11:36 ALS Bottle#: 22 Worklist Smp#: 42
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-142967/1-a
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:47 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 13:27:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		19948771	57.4		115	1129876	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.534	0.0	1.000	76986	0.2260			273	
D 4 13C5-PFPeA										
267.90 > 223.00	1.811	1.810	0.001		15664834	58.9		118	1265682	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.820	1.810	0.010	1.000	100082	0.3237			959	
D 6 13C2 PFHxA										
315.00 > 270.00	2.106	2.093	0.013		12684975	51.8		104	704879	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.106	2.093	0.013	1.000	165186	0.7010			3485	
D 11 13C4-PFHpA										
367.00 > 322.00	2.437	2.424	0.013		12441009	55.0		110	488472	
D 10 18O2 PFHxS										
403.00 > 84.00	2.452	2.447	0.005		17145709	52.4		111	679373	
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.759	2.773	-0.014	1.000	2686	NR				
D 47 M2-6:2FTS										
429.00 > 409.00	2.750	2.781	-0.031		962	0.008223		0.0		
D 14 13C4 PFOA										
417.00 > 372.00	2.798	2.791	0.007		12703011	55.1		110	517684	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.806	2.791	0.015	1.000	150010	0.5886			1732	
413.00 > 169.00	2.798	2.791	0.007	0.997	104355		1.44(0.90-1.10)		4136	
D 17 13C4 PFOS										
503.00 > 80.00	3.167	3.160	0.007		13397237	53.8		113	976866	
D 19 13C5 PFNA										
468.00 > 423.00	3.167	3.160	0.007		9628175	54.2		108	1635815	

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	3.499	3.491	0.008		10446875	27.2		54.4	446128	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.515	3.499	0.016	1.000	16139	0.0828			1012	
D 42 M2-8:2FTS										
529.00 > 509.00	3.524	3.519	0.005		1098	0.0102		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.532	3.524	0.008	1.000	4824	0.0298			248	
D 23 13C2 PFDA										
515.00 > 470.00	3.532	3.524	0.008		8589040	54.6		109	270154	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.688	3.683	0.005		15585	0.2069		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.688	3.692	-0.004	1.000	290	NR				
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.843	3.836	0.007	1.000	682	0.004167				
D 27 13C2 PFUnA										
565.00 > 520.00	3.860	3.853	0.007		6561505	56.0		112	314957	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.852	3.853	-0.001	1.000	17755	0.1415			406	
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.852	3.855	-0.003		25005	0.3191		0.0		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.002	3.997	0.005		2820	0.0297		0.0		
D 30 13C2 PFDoA										
615.00 > 570.00	4.148	4.144	0.004		5549360	50.0		100	210714	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.155	4.180	-0.025		1749	0.0204		0.0		
D 32 13C2-PFTeDA										
715.00 > 670.00	4.663	4.648	0.015		12674070	55.7		111	683445	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.663	4.658	0.005	1.000	28048	0.1595			336	
713.00 > 169.00	4.654	4.658	-0.004	0.998	5491		5.11(0.00-0.00)		2423	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.069	5.072	-0.003		5940740	47.7		95.4	178094	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.080	5.072	0.008	1.000	73762	0.0964			135	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.429	5.415	0.014	1.000	2881	0.0252			3.5	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Report Date: 03-Jan-2017 14:28:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_032.d

Injection Date: 30-Dec-2016 16:11:36 Instrument ID: A8_N

Lims ID: MB 320-142967/1-A

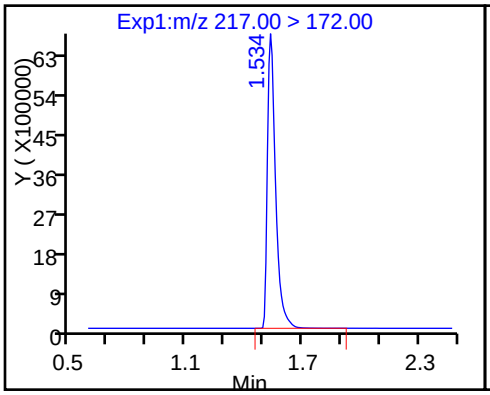
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 42

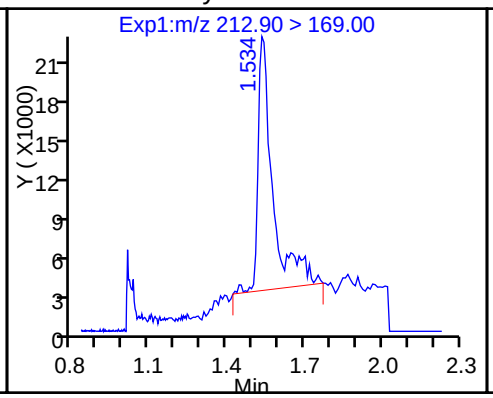
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

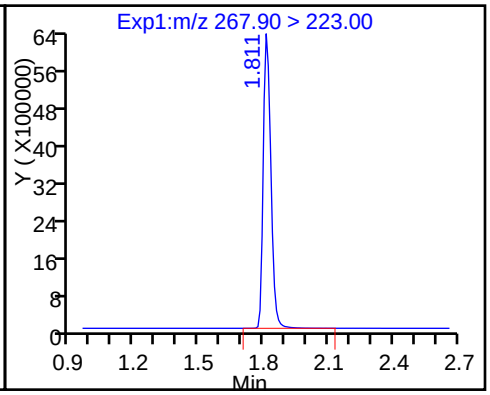
D 2 13C4 PFBA



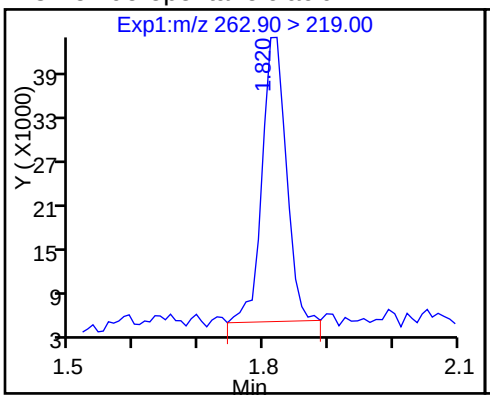
1 Perfluorobutyric acid



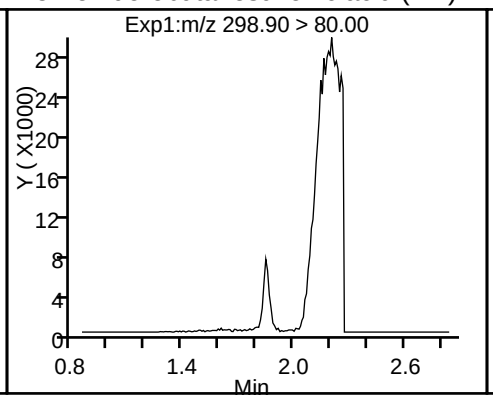
D 4 13C5-PFPeA



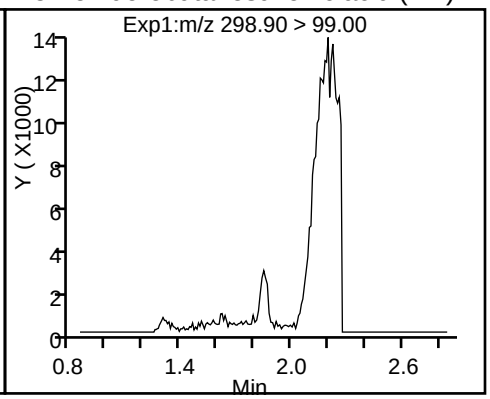
3 Perfluoropentanoic acid



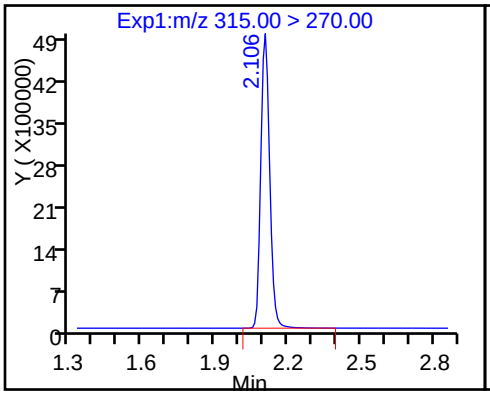
5 Perfluorobutanesulfonic acid (ND)



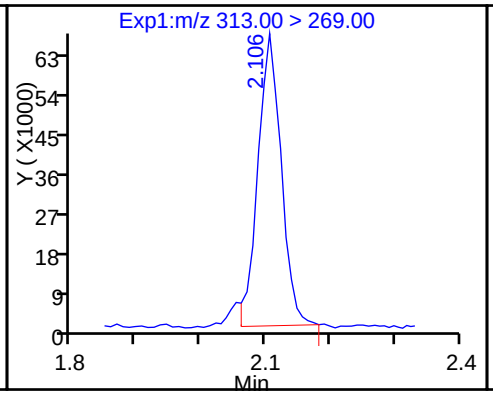
5 Perfluorobutanesulfonic acid (ND)



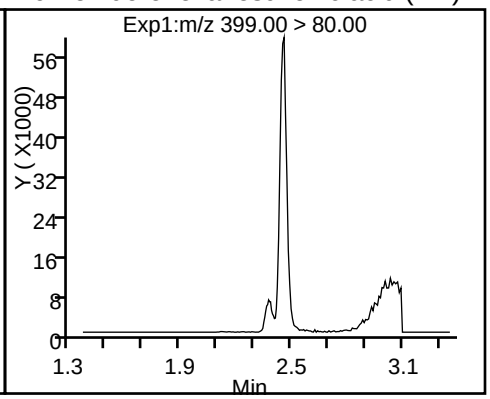
D 6 13C2 PFHxA



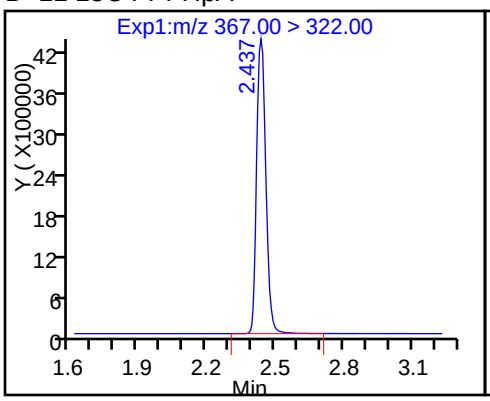
7 Perfluorohexanoic acid



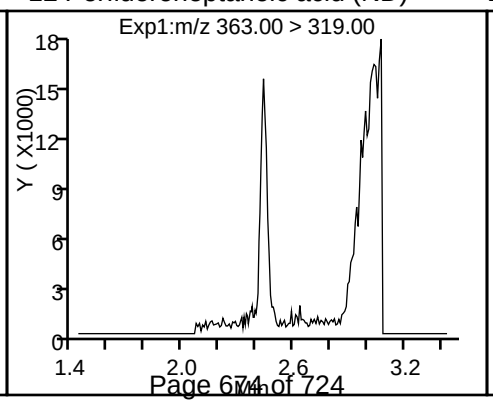
9 Perfluorohexanesulfonic acid (ND)



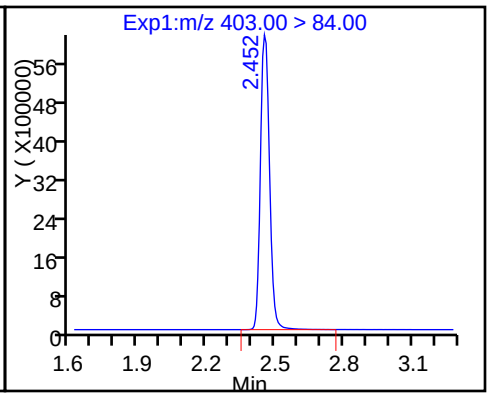
D 11 13C4-PFHpA



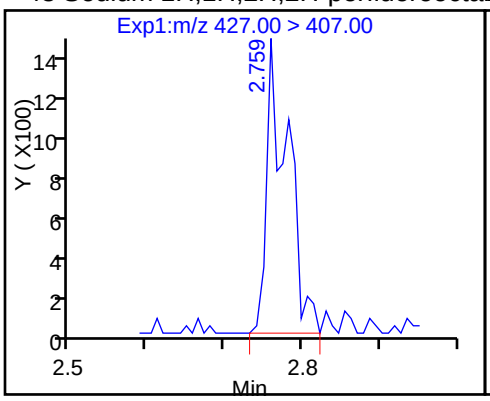
12 Perfluoroheptanoic acid (ND)



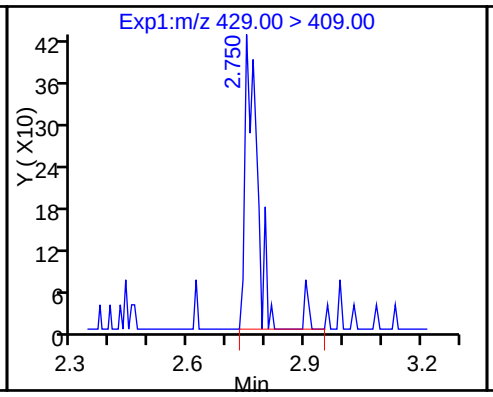
D 10 18O2 PFHxS



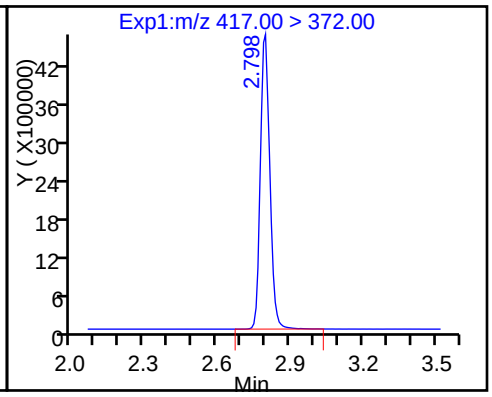
48 Sodium 1H,1H,2H,2H-perfluorooctane



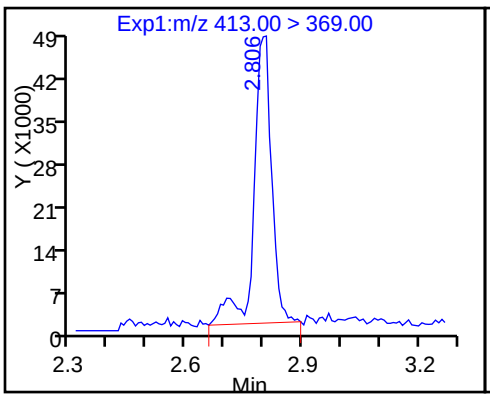
D 47 M2-6:2FTS



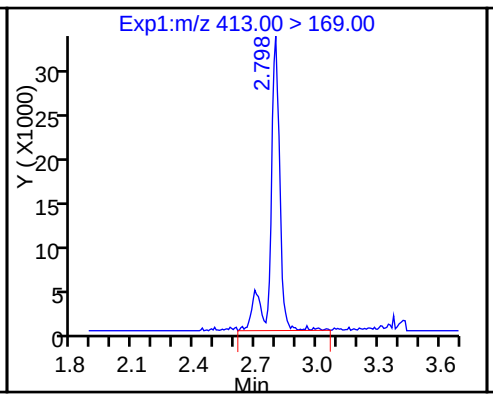
D 14 13C4 PFOA



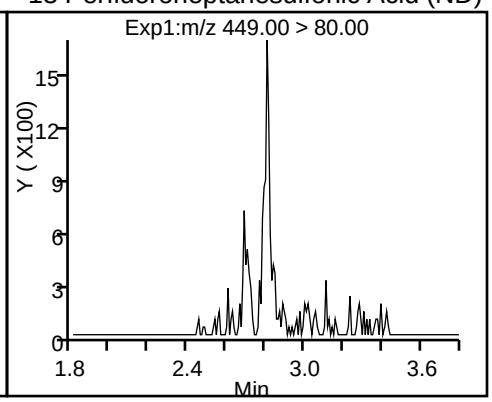
15 Perfluorooctanoic acid



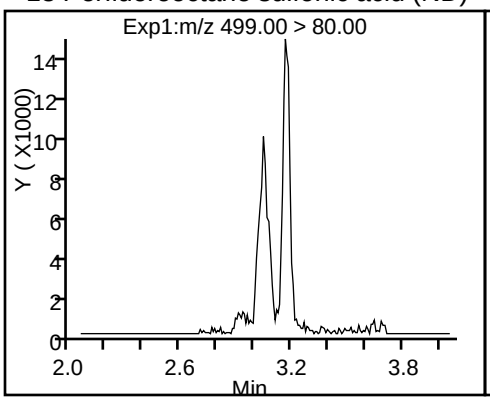
15 Perfluorooctanoic acid



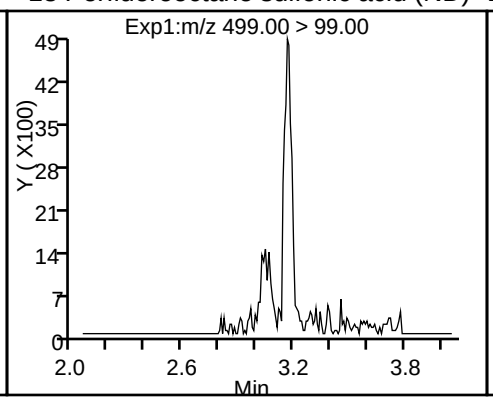
13 Perfluoroheptanesulfonic Acid (ND)



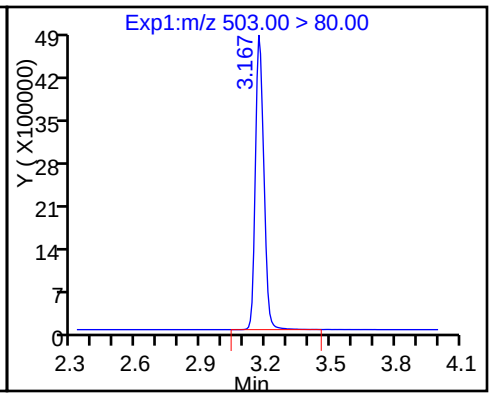
18 Perfluorooctane sulfonic acid (ND)



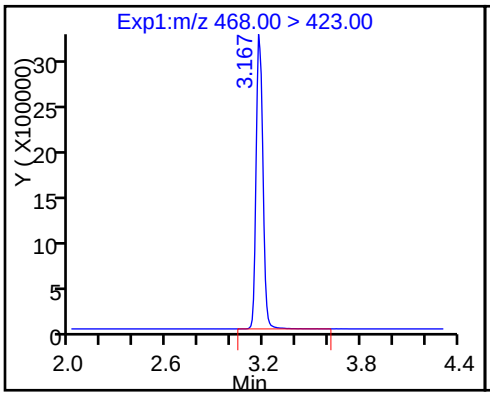
18 Perfluorooctane sulfonic acid (ND)



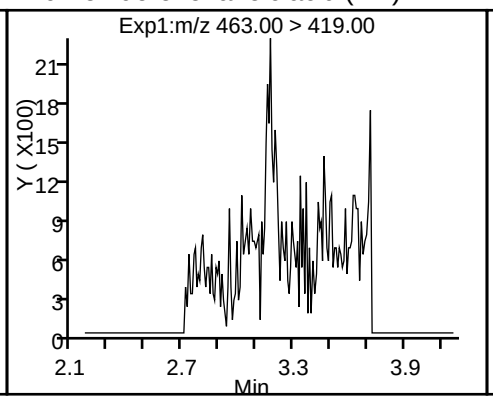
D 17 13C4 PFOS



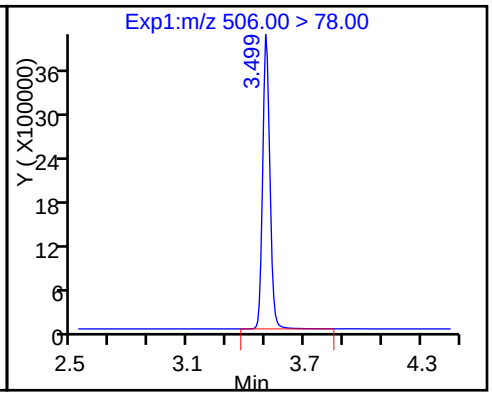
D 19 13C5 PFNA



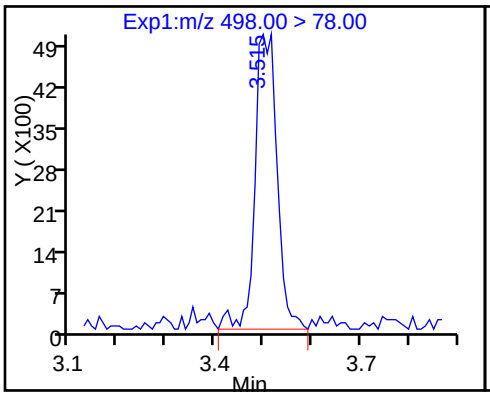
20 Perfluorononanoic acid (ND)



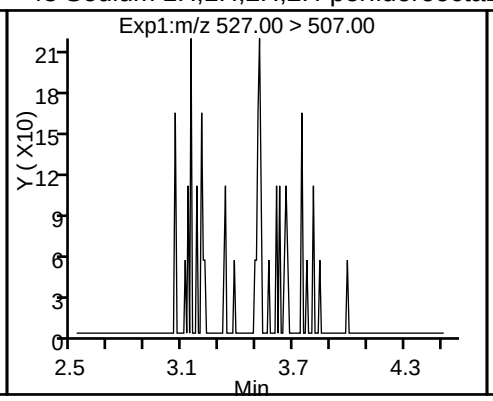
D 21 13C8 FOSA



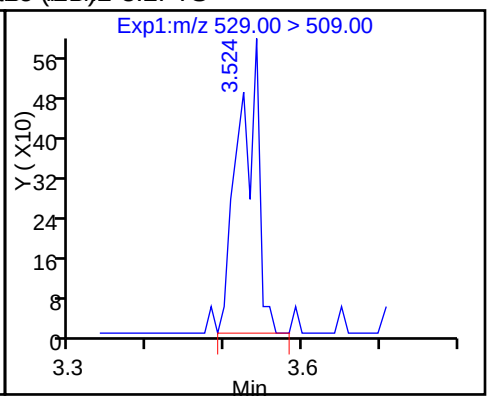
22 Perfluorooctane Sulfonamide



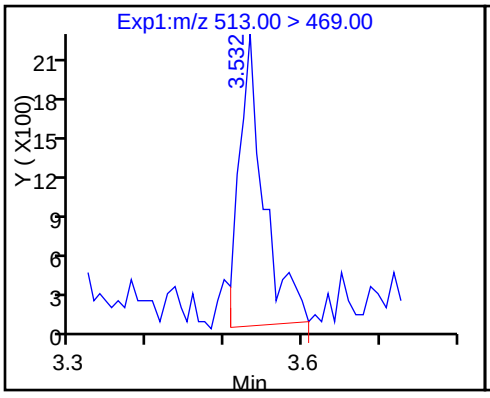
43 Sodium 1H,1H,2H,2H-perfluorooctane (4:2)



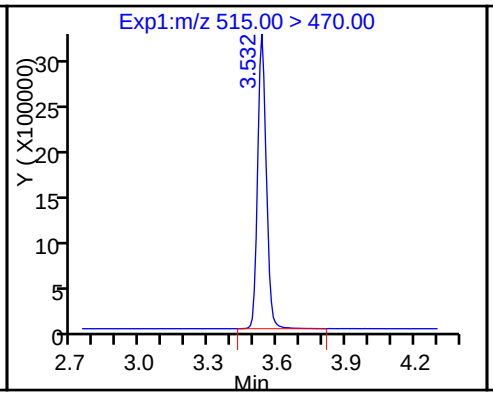
D 42 M2-8:2FTS



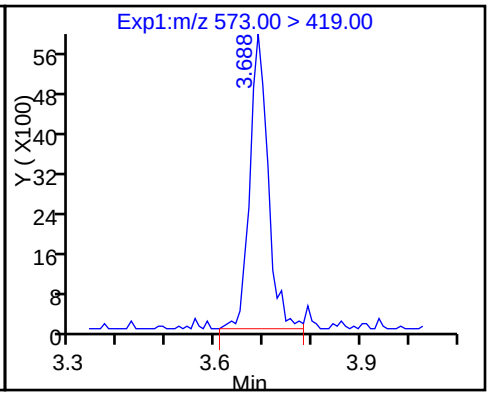
24 Perfluorodecanoic acid



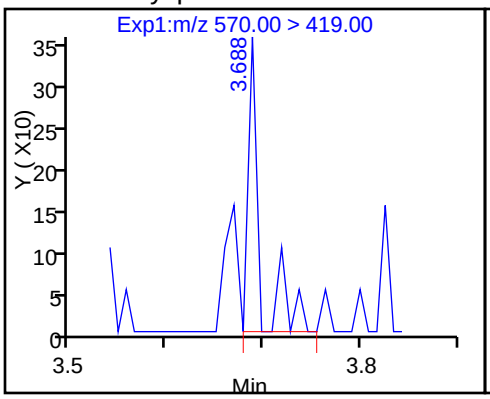
D 23 13C2 PFDA



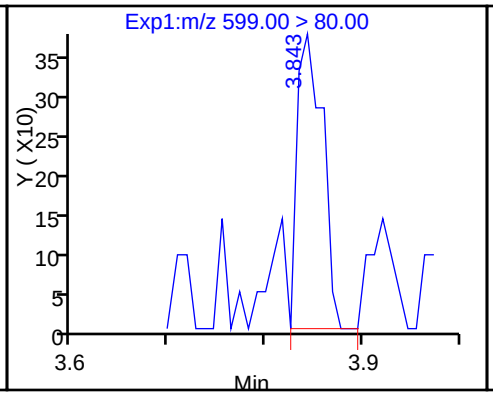
D 45 d3-NMeFOSAA



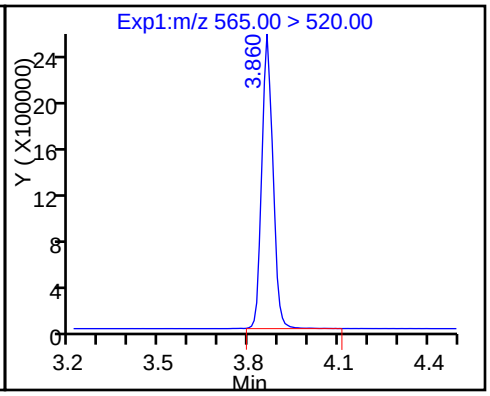
44 N-methyl perfluorooctane sulfonami



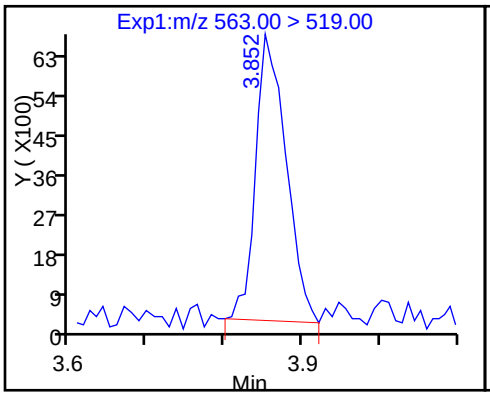
26 Perfluorodecane Sulfonic acid



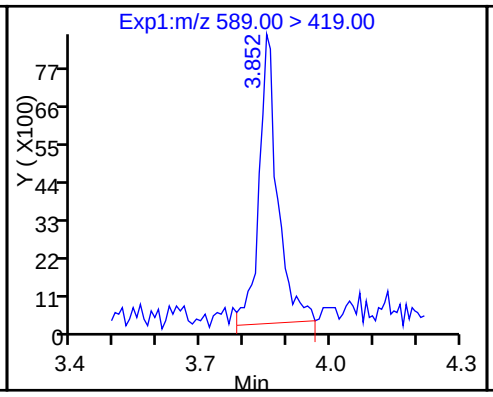
D 27 13C2 PFUnA



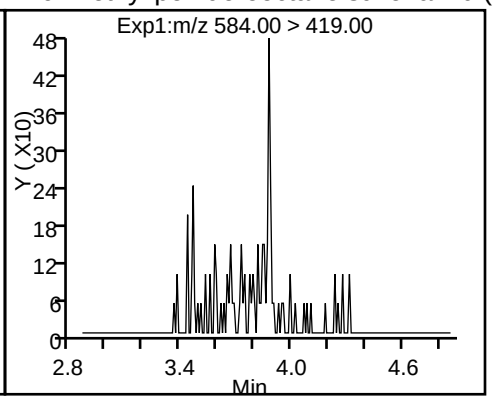
28 Perfluoroundecanoic acid



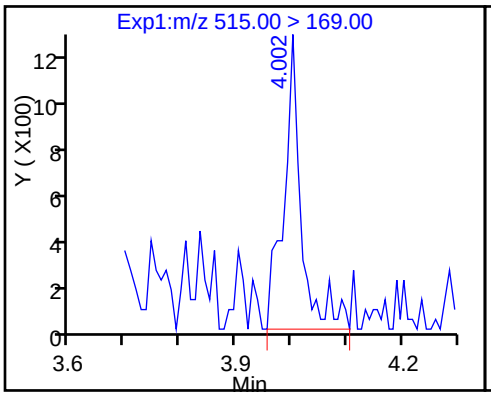
D 46 d5-NEtFOSAA



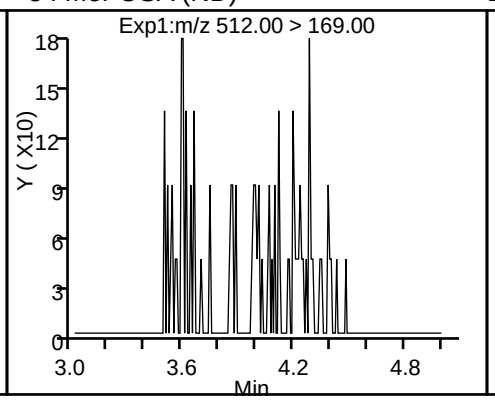
49 N-ethyl perfluorooctane sulfonamid (ND)



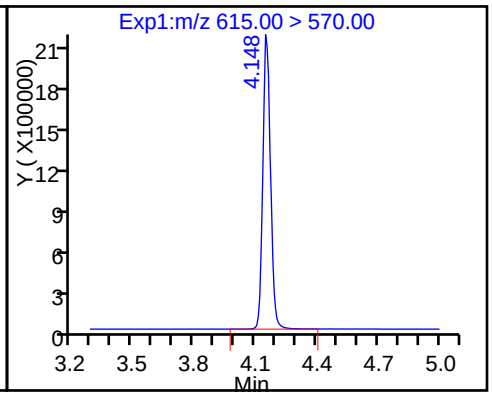
D 52 d-N-MeFOSA-M



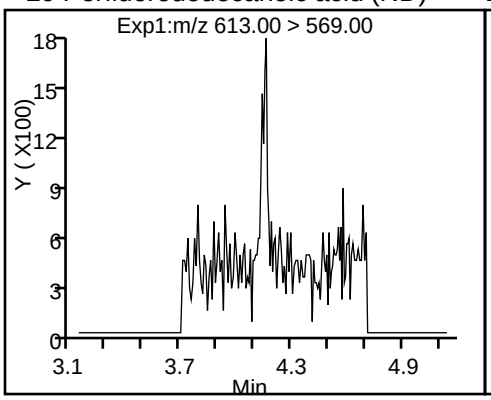
54 MeFOSA (ND)



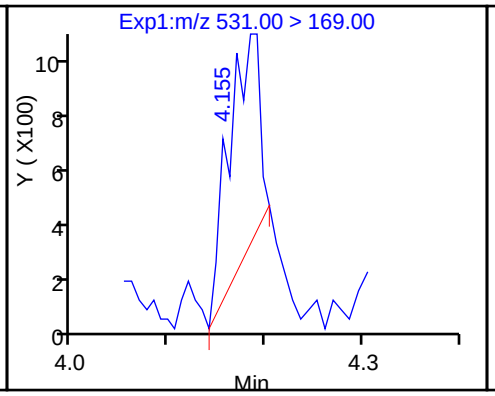
D 30 13C2 PFDoA



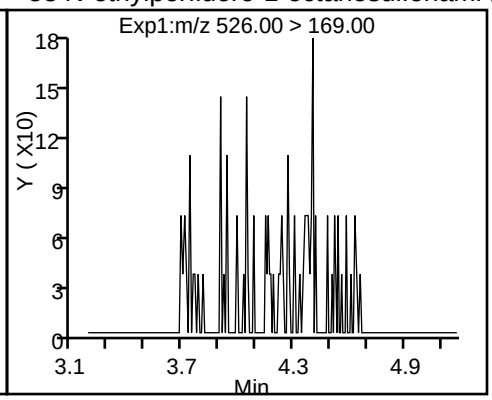
29 Perfluorododecanoic acid (ND)



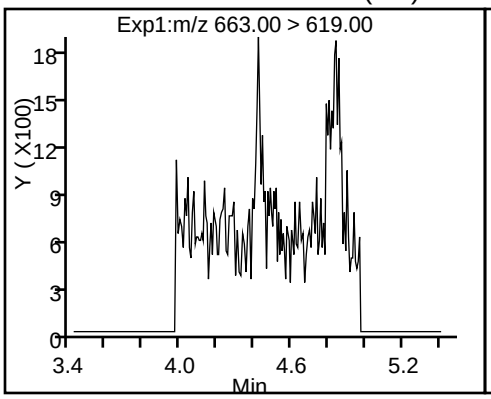
D 51 d-N-EtFOSA-M



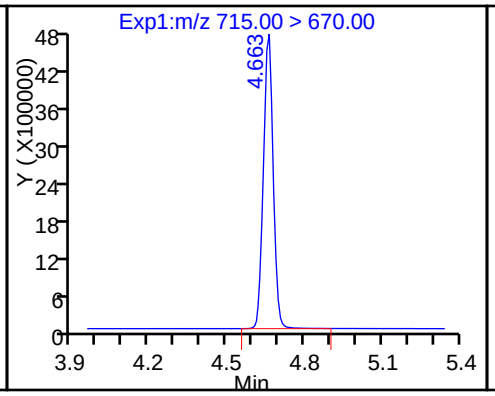
53 N-ethylperfluoro-1-octanesulfonami (ND)



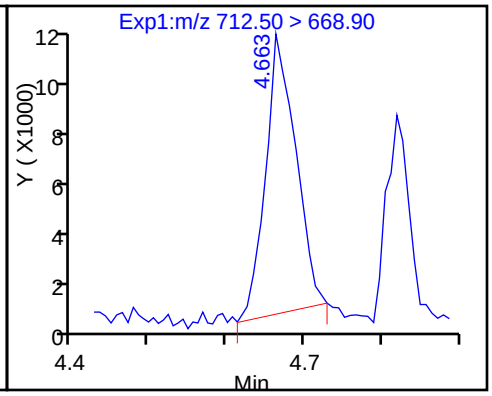
31 Perfluorotridecanoic acid (ND)



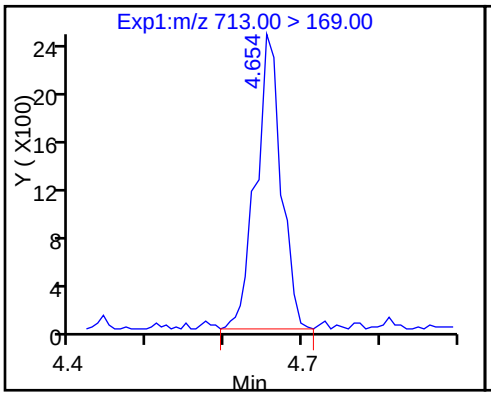
D 32 13C2-PFTeDA



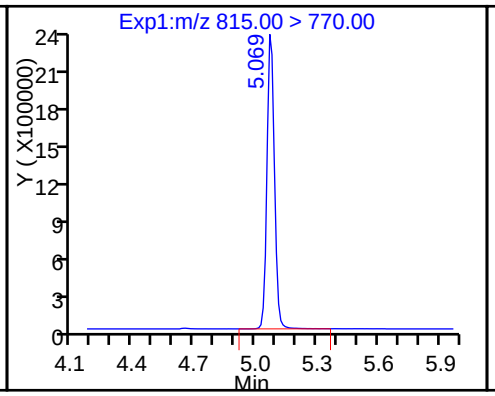
33 Perfluorotetradecanoic acid



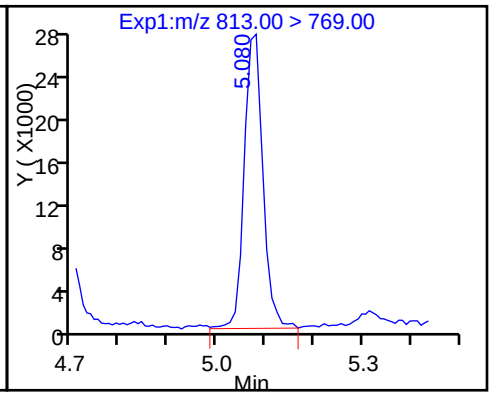
33 Perfluorotetradecanoic acid



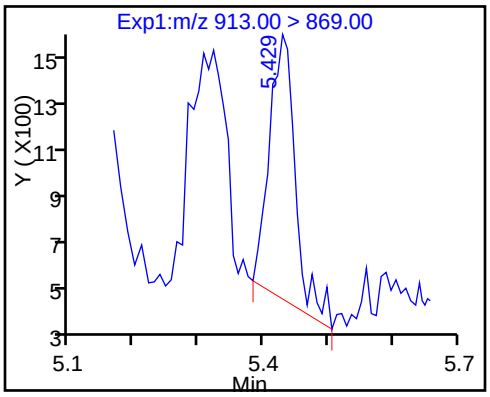
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-142967/2-A

Matrix: Water | Lab File ID: 28DEC2016C_004.d

Analysis Method: 537 (Modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 250(mL) | Date Analyzed: 12/29/2016 00:14

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0441		0.0025	0.0010	0.00046
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0422		0.0025	0.0020	0.00099
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0413		0.0025	0.0020	0.00079
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0418		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0406		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0384		0.0025	0.0020	0.00065
335-76-2	Perfluorodecanoic acid (PFDA)	0.0399		0.0025	0.0010	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0382		0.0025	0.0020	0.00075
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0386		0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0384		0.0025	0.0020	0.00055
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0478		0.0025	0.0010	0.00040
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0432		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0397		0.0025	0.0020	0.00087
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0385		0.0040	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0384		0.0025	0.0020	0.00064

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24149-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-142967/2-A

Matrix: Water | Lab File ID: 28DEC2016C_004.d

Analysis Method: 537 (Modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/19/2016 14:38

Sample wt/vol: 250(mL) | Date Analyzed: 12/29/2016 00:14

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 144253 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	62		25-150
STL00992	13C4 PFBA	131		25-150
STL01893	13C5-PFPeA	132		25-150
STL00993	13C2 PFHxA	126		25-150
STL01892	13C4-PFHpA	128		25-150
STL00990	13C4 PFOA	127		25-150
STL00995	13C5 PFNA	123		25-150
STL00996	13C2 PFDA	127		25-150
STL00997	13C2 PFUnA	119		25-150
STL00998	13C2 PFDoA	114		25-150
STL00994	18O2 PFHxS	128		25-150
STL00991	13C4 PFOS	128		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_004.d
Lims ID: LCS 320-142967/2-A
Client ID:
Sample Type: LCS
Inject. Date: 29-Dec-2016 00:14:27 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-142967/2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 29-Dec-2016 17:32:20 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 29-Dec-2016 17:32:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.533	1.534	-0.001		22745171	65.4		131	907829	
1 Perfluorobutyric acid										
212.90 > 169.00	1.533	1.534	-0.001	1.000	8555666	22.0		110	60595	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		17512342	65.8		132	963502	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	7290750	21.1		105	80268	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.848	1.849	-0.001	1.000	12771474	21.6		122		
298.90 > 99.00	1.848	1.849	-0.001	1.000	5467672		2.34(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.098	2.097	0.001		15456996	63.1		126	807976	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.098	2.097	0.001	1.000	5929814	20.7		103	124616	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.422	2.422	0.0	1.000	8545949	19.9		109		
D 11 13C4-PFHpA										
367.00 > 322.00	2.429	2.429	0.0		14459227	63.9		128	885210	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.429	2.429	0.0	1.000	5914551	20.9		104	54434	
D 10 18O2 PFHxS										
403.00 > 84.00	2.451	2.452	-0.001		19756760	60.4		128	1190700	
D 14 13C4 PFOA										
417.00 > 372.00	2.789	2.790	-0.001		14658582	63.6		127	636565	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.789	2.790	-0.001	1.000	5964939	20.3		101	77218	
413.00 > 169.00	2.789	2.790	-0.001	1.000	3669201		1.63(0.90-1.10)		186769	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.789	2.798	-0.009	1.000	7509937	21.3		112		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.134	3.134	0.0	1.000	8156406	25.7		138	88097	
499.00 > 99.00	3.126	3.134	-0.008	0.997	1805462		4.52(0.90-1.10)		35073	
D 17 13C4 PFOS										
503.00 > 80.00	3.158	3.158	0.0		15283766	61.4		128	411196	
20 Perfluorononanoic acid										
463.00 > 419.00	3.158	3.158	0.0	1.000	4000873	19.2		96.1	61812	
D 19 13C5 PFNA										
468.00 > 423.00	3.158	3.166	-0.008		10934977	61.5		123	912296	
D 21 13C8 FOSA										
506.00 > 78.00	3.481	3.481	0.0		11918495	31.0		62.1	557879	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.481	3.481	0.0	1.000	4273200	19.2		96.1	225795	
D 23 13C2 PFDA										
515.00 > 470.00	3.515	3.523	-0.008		9953645	63.3		127	347732	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.515	3.523	-0.008	1.000	3746468	19.9		99.7	112186	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.825	3.834	-0.009	1.000	3595209	19.3		99.9		
D 27 13C2 PFUnA										
565.00 > 520.00	3.842	3.851	-0.009		6963884	59.4		119	347347	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.851	3.851	0.0	1.000	2541473	19.1		95.4	61115	
D 30 13C2 PFDoA										
615.00 > 570.00	4.133	4.134	-0.001		6345418	57.2		114	229094	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.133	4.141	-0.008	1.000	2247085	19.3		96.4	62721	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.404	4.404	0.0	1.000	2212049	19.2		96.1	48978	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.642	4.652	-0.010		14637408	64.4		129	847727	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.652	4.652	0.0	1.000	4810498	23.9		120	62833	
713.00 > 169.00	4.642	4.652	-0.010	0.998	728141		6.61(0.00-0.00)		95577	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.058	5.069	-0.011		6676700	53.6		107	161695	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.069	-0.011	1.000	2269575	18.1		90.7	3449	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.421	5.421	0.0	1.000	2160389	16.5		82.6	2214	

Report Date: 29-Dec-2016 17:32:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b\28DEC2016C_004.d

Injection Date: 29-Dec-2016 00:14:27 Instrument ID: A8_N

Lims ID: LCS 320-142967/2-A

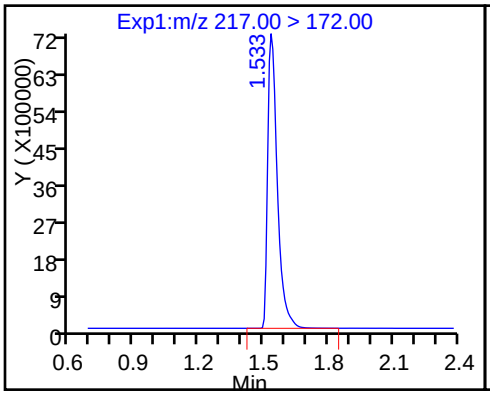
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 4

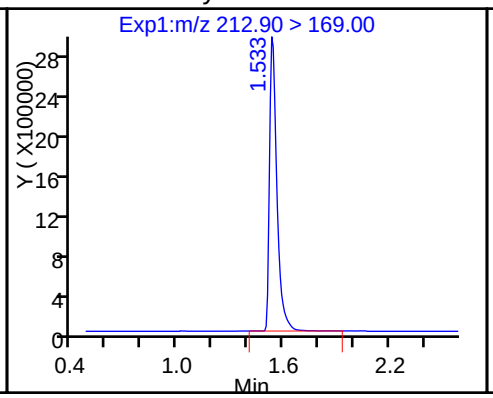
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

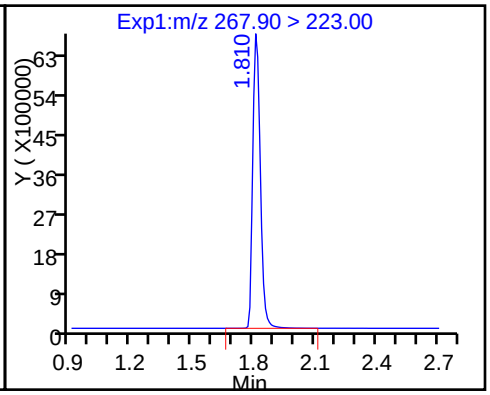
D 2 13C4 PFBA



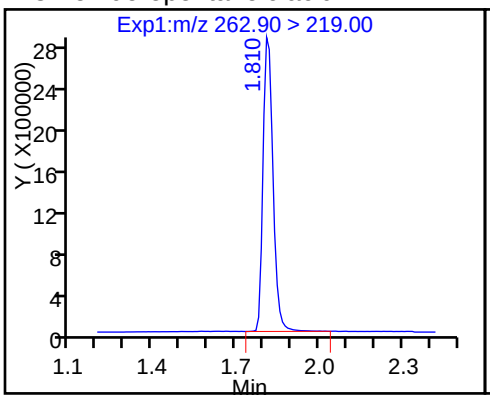
1 Perfluorobutyric acid



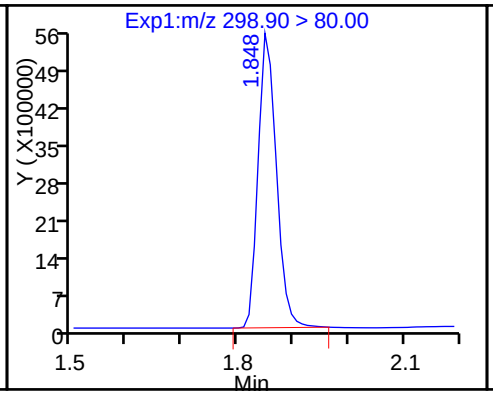
D 4 13C5-PFPeA



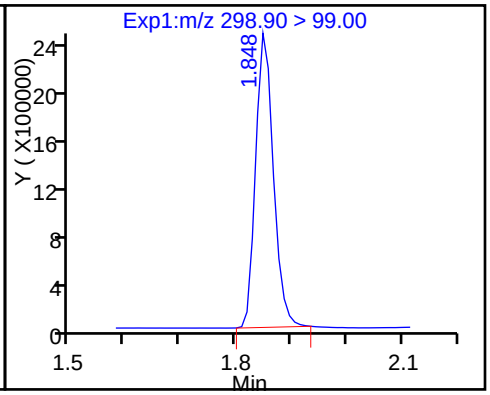
3 Perfluoropentanoic acid



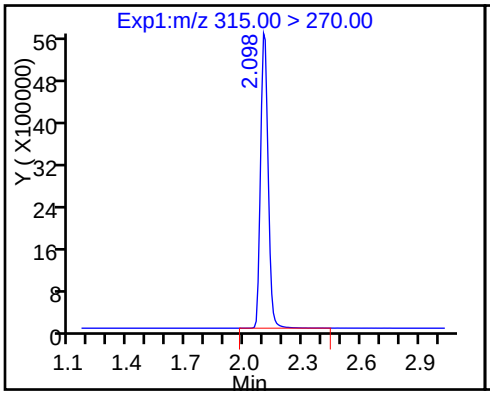
5 Perfluorobutanesulfonic acid



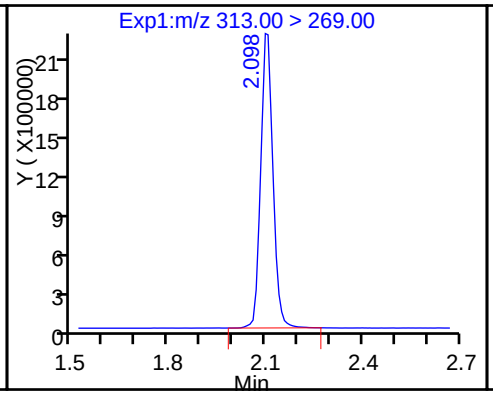
5 Perfluorobutanesulfonic acid



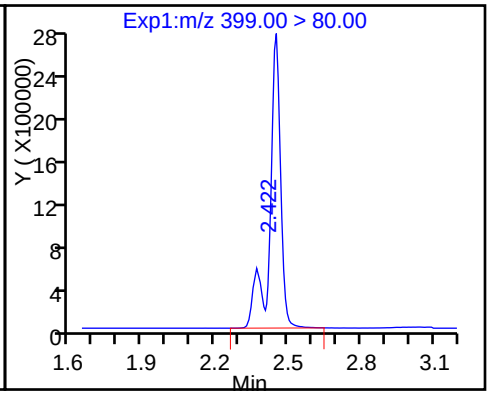
D 6 13C2 PFHxA



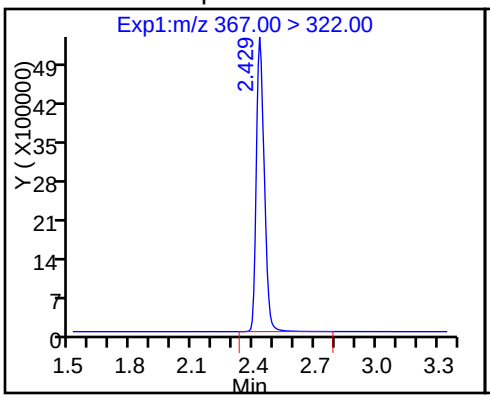
7 Perfluorohexanoic acid



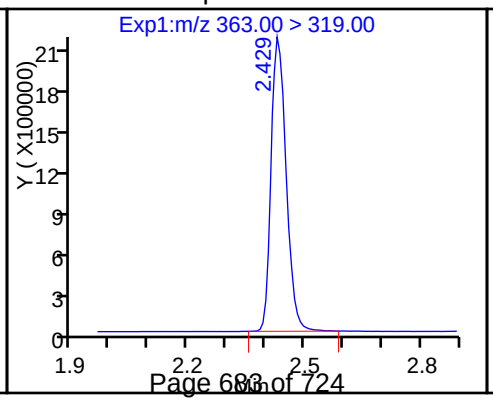
9 Perfluorohexanesulfonic acid



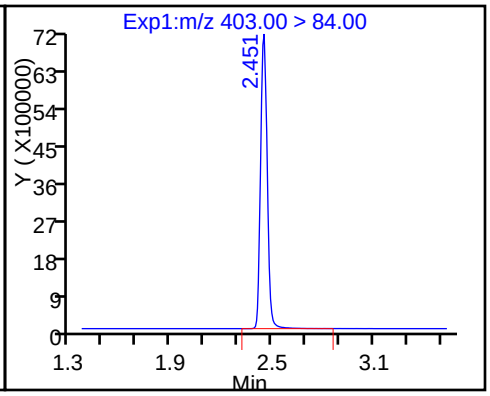
D 11 13C4-PFHpA



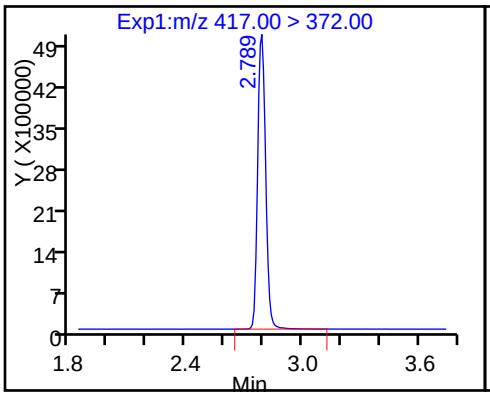
12 Perfluoroheptanoic acid



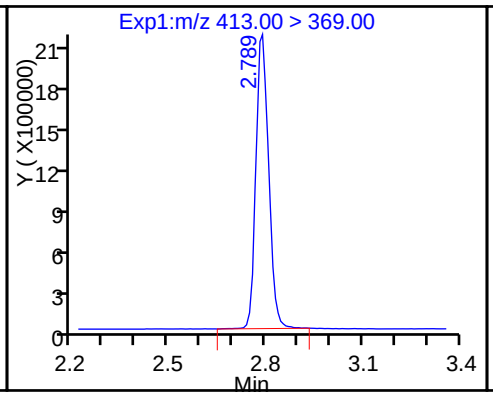
D 10 18O2 PFHxS



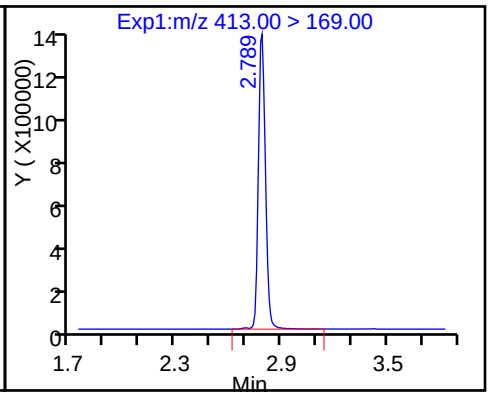
D 14 13C4 PFOA



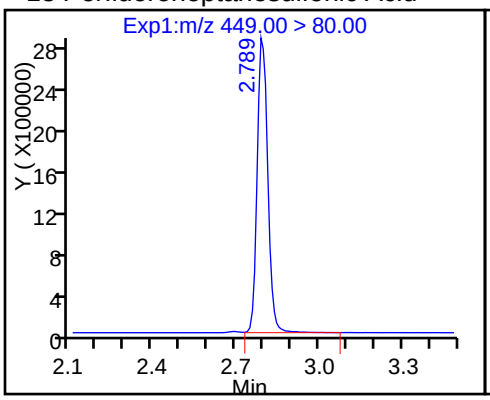
15 Perfluorooctanoic acid



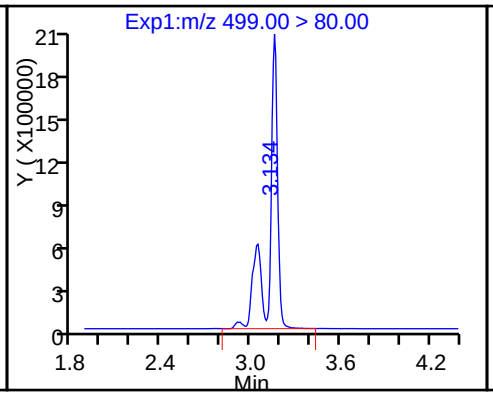
15 Perfluorooctanoic acid



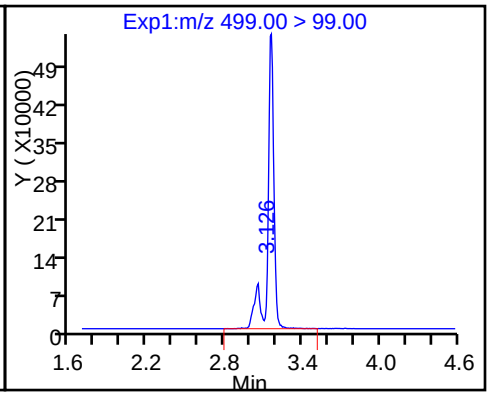
13 Perfluoroheptanesulfonic Acid



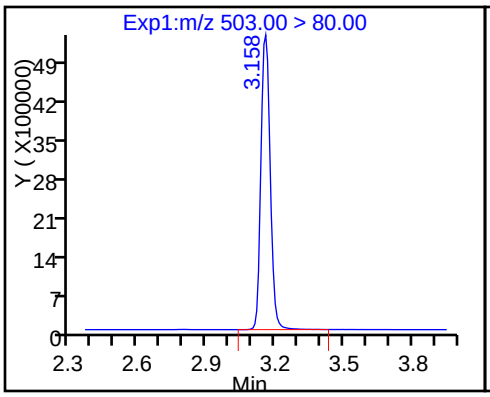
18 Perfluorooctane sulfonic acid



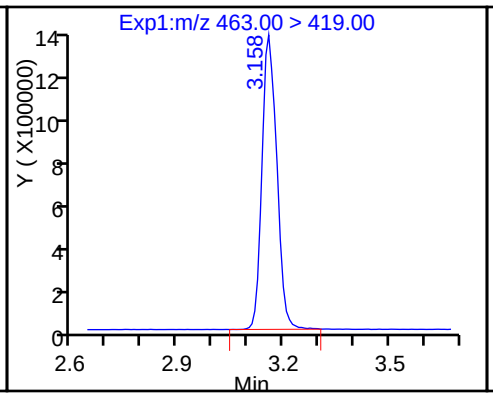
18 Perfluorooctane sulfonic acid



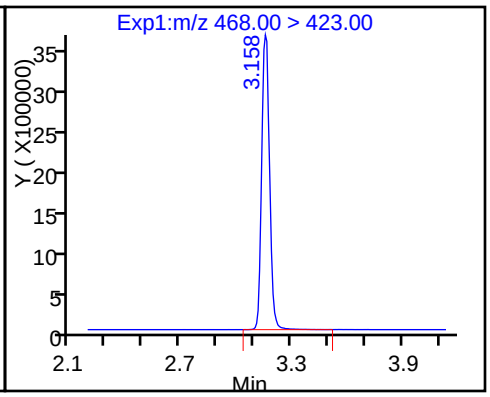
D 17 13C4 PFOS



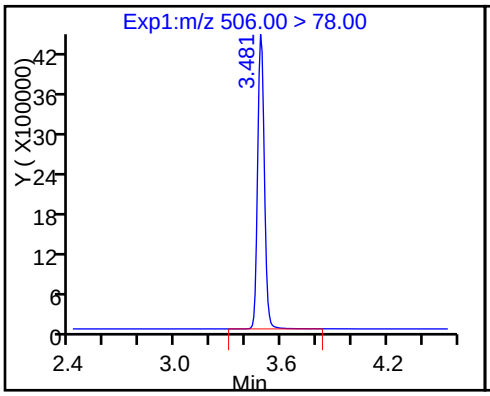
20 Perfluorononanoic acid



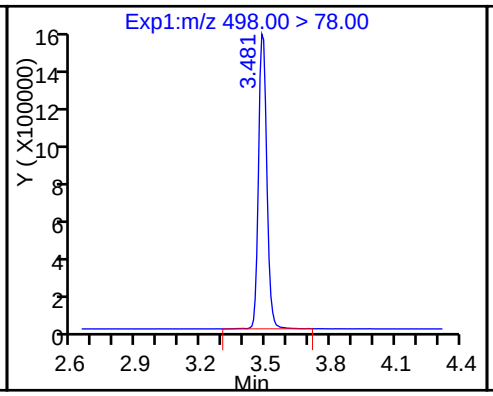
D 19 13C5 PFNA



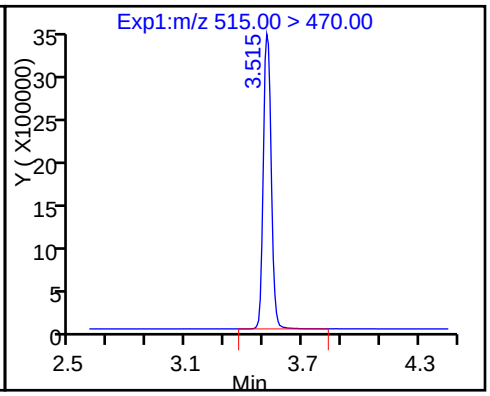
D 21 13C8 FOSA



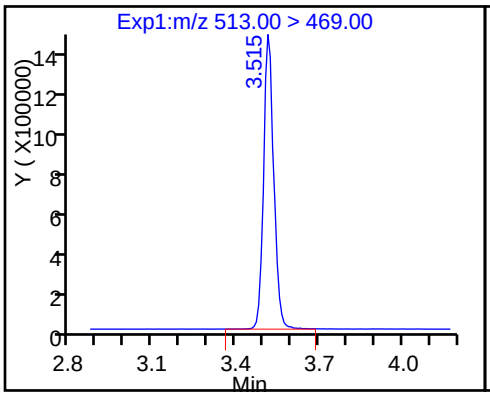
22 Perfluorooctane Sulfonamide



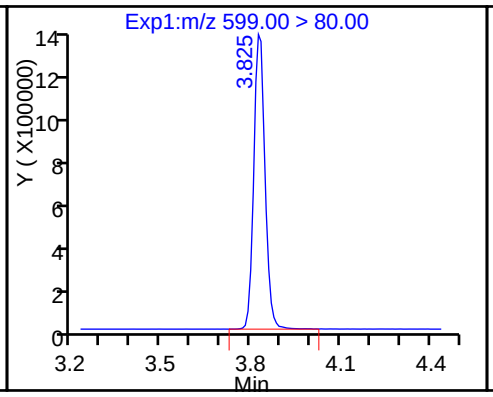
D 23 13C2 PFDA



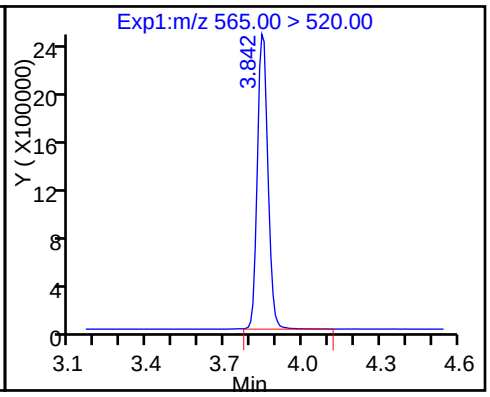
24 Perfluorodecanoic acid



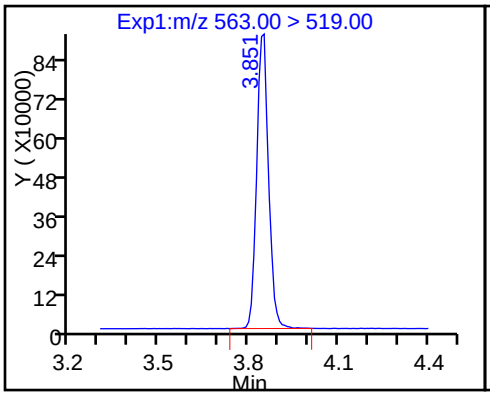
26 Perfluorodecane Sulfonic acid



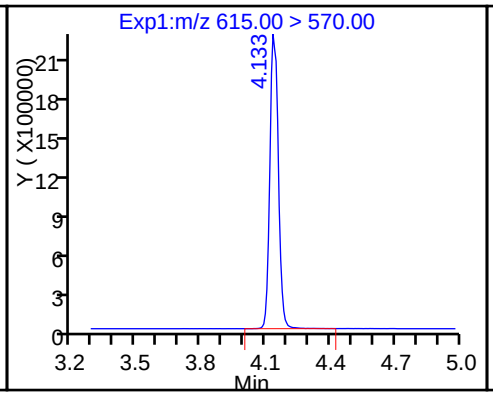
D 27 13C2 PFUnA



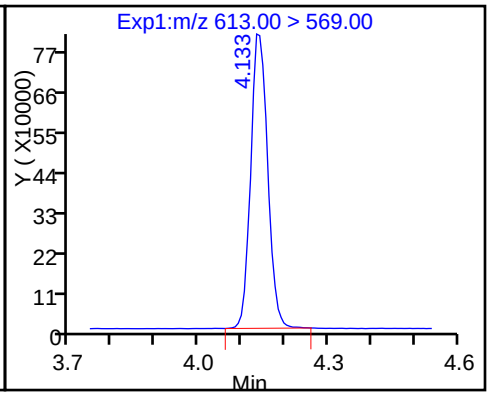
28 Perfluoroundecanoic acid



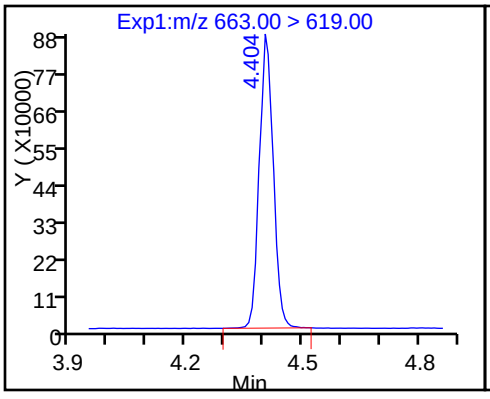
D 30 13C2 PFDoA



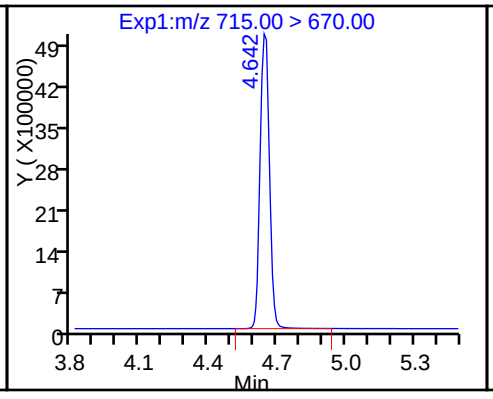
29 Perfluorododecanoic acid



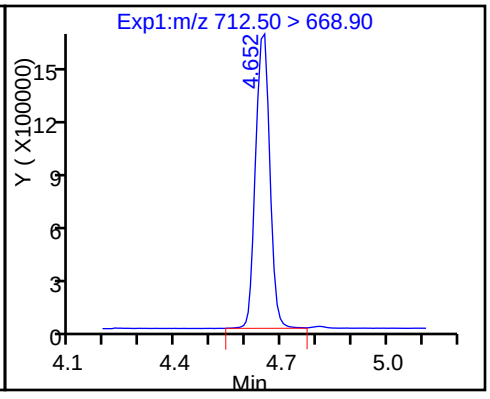
31 Perfluorotridecanoic acid



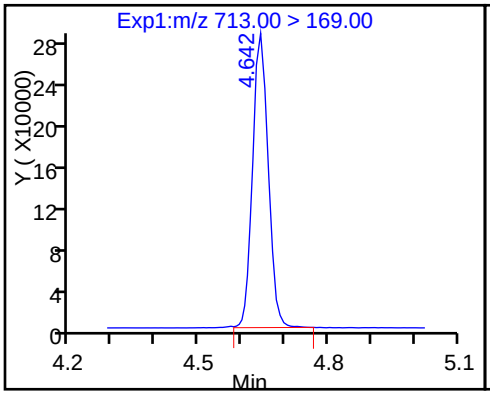
D 32 13C2-PFTeDA



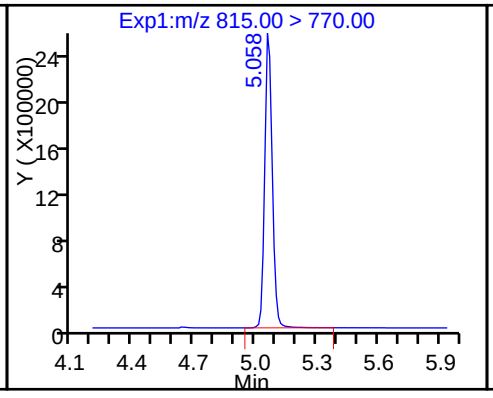
33 Perfluorotetradecanoic acid



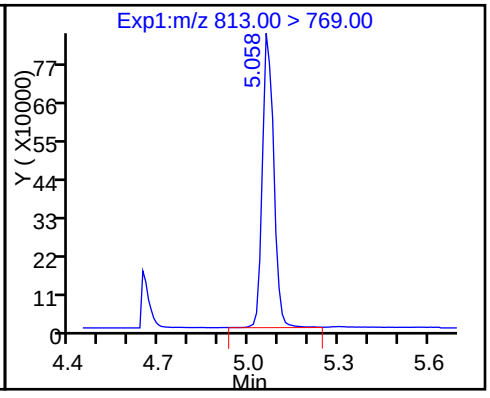
33 Perfluorotetradecanoic acid



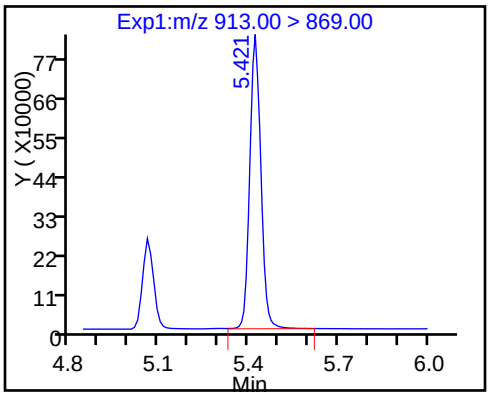
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 320-142967/2-A RA

Matrix: Water Lab File ID: 30DEC2016B_033.d

Analysis Method: 537 (Modified) Date Collected:

Extraction Method: 3535 Date Extracted: 12/19/2016 14:38

Sample wt/vol: 250(mL) Date Analyzed: 12/30/2016 16:19

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 144510 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0511		0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	126		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_033.d
Lims ID: LCS 320-142967/2-A
Client ID:
Sample Type: LCS
Inject. Date: 30-Dec-2016 16:19:09 ALS Bottle#: 23 Worklist Smp#: 43
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-142967/2-a
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 03-Jan-2017 14:28:47 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK026

First Level Reviewer: phomsophat Date: 03-Jan-2017 14:19:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.528	1.534	-0.006		21990959	63.2		126	973508	
1 Perfluorobutyric acid										
212.90 > 169.00	1.536	1.534	0.002	1.000	8240189	21.9		110	40088	
D 4 13C5-PFPeA										
267.90 > 223.00	1.813	1.810	0.003		17147382	64.4		129	1080293	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.813	1.810	0.003	1.000	7164736	21.2		106	92618	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.851	1.849	0.002	1.000	11666172	20.5		116		
298.90 > 99.00	1.841	1.849	-0.008	0.995	5081397		2.30(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.100	2.093	0.007		14303512	58.4		117	491614	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.100	2.093	0.007	1.000	5364684	20.2		101	110148	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.416	2.362	0.054	1.000	8338277	20.2		111		
D 11 13C4-PFHpA										
367.00 > 322.00	2.429	2.424	0.005		13796559	61.0		122	704065	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.429	2.432	-0.003	1.000	5529405	20.5		102	42528	
D 10 18O2 PFHxS										
403.00 > 84.00	2.443	2.447	-0.004		18956697	58.0		123	1628744	
D 14 13C4 PFOA										
417.00 > 372.00	2.781	2.791	-0.010		13574629	58.9		118	585037	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.789	2.791	-0.002	1.000	5557698	20.4		102	80738	
413.00 > 169.00	2.789	2.791	-0.002	1.000	3473579		1.60(0.90-1.10)		112124	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.797	2.799	-0.002	1.000	7097453	20.5		108		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.055	3.058	-0.003	1.000	7981662	25.5		138	70927	
499.00 > 99.00	3.165	3.058	0.107	1.036	1763327		4.53(0.90-1.10)		86795	
D 17 13C4 PFOS										
503.00 > 80.00	3.165	3.160	0.005		15022345	60.4		126	435048	
D 19 13C5 PFNA										
468.00 > 423.00	3.165	3.160	0.005		10289260	57.9		116	593967	
20 Perfluorononanoic acid										
463.00 > 419.00	3.165	3.167	-0.002	1.000	3860899	19.7		98.6	68965	
D 21 13C8 FOSA										
506.00 > 78.00	3.489	3.491	-0.002		11186702	29.1		58.2	532677	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.497	3.499	-0.002	1.000	4060018	19.5		97.3	221852	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.522	3.524	-0.002	1.000	3610274	20.1		100	122598	
D 23 13C2 PFDA										
515.00 > 470.00	3.522	3.524	-0.002		9525414	60.6		121	494928	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.833	3.836	-0.003	1.000	3499950	19.1		98.9		
D 27 13C2 PFUnA										
565.00 > 520.00	3.850	3.853	-0.003		7162965	61.1		122	386832	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.850	3.853	-0.003	1.000	2694267	19.7		98.3	82597	
D 30 13C2 PFDoA										
615.00 > 570.00	4.148	4.144	0.004		6318440	56.9		114	337271	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.148	4.144	0.004	1.000	2254931	19.4		97.2	69019	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.411	4.416	-0.005	1.000	2184499	19.1		95.3	49483	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.652	4.648	0.004		14493754	63.7		127	1339620	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.652	4.658	-0.006	1.000	4574658	22.8		114	65058	
713.00 > 169.00	4.652	4.658	-0.006	1.000	717193		6.38(0.00-0.00)		143757	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.068	5.072	-0.004		6351590	51.0		102	198415	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.068	5.072	-0.004	1.000	2249702	18.0		90.2	3843	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.421	5.415	0.006	1.000	1858495	14.3		71.4	2216	

Report Date: 03-Jan-2017 14:28:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b\30DEC2016B_033.d

Injection Date: 30-Dec-2016 16:19:09 Instrument ID: A8_N

Lims ID: LCS 320-142967/2-A

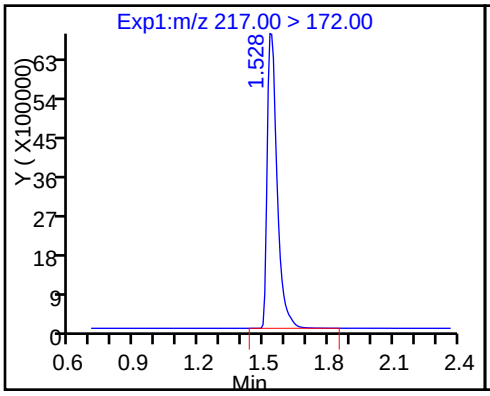
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 43

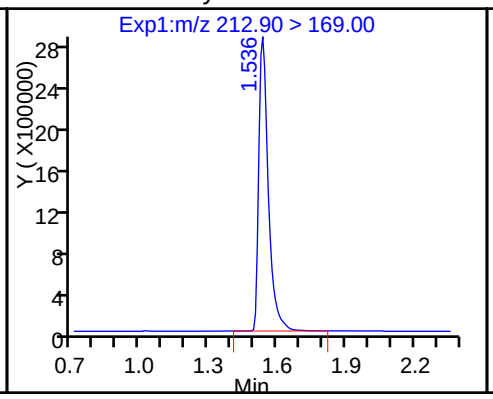
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

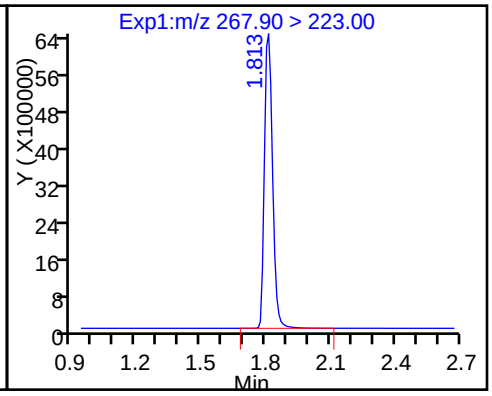
D 2 13C4 PFBA



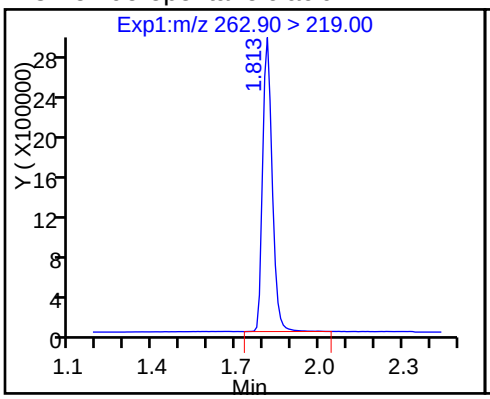
1 Perfluorobutyric acid



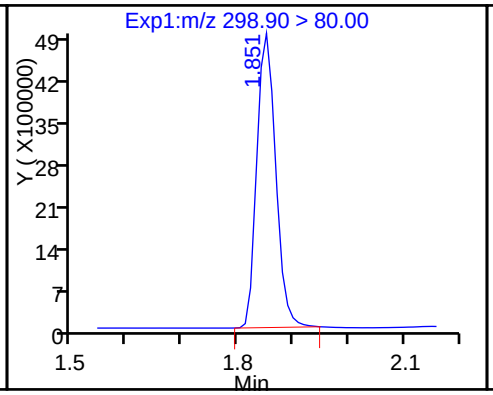
D 4 13C5-PFPeA



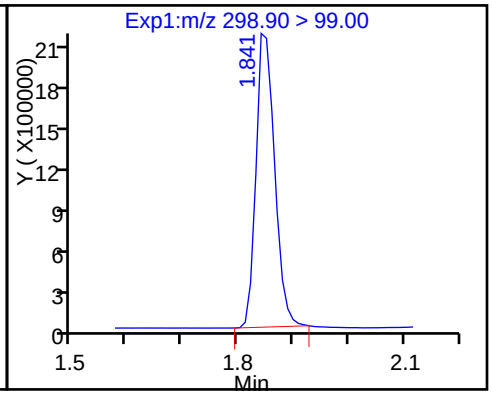
3 Perfluoropentanoic acid



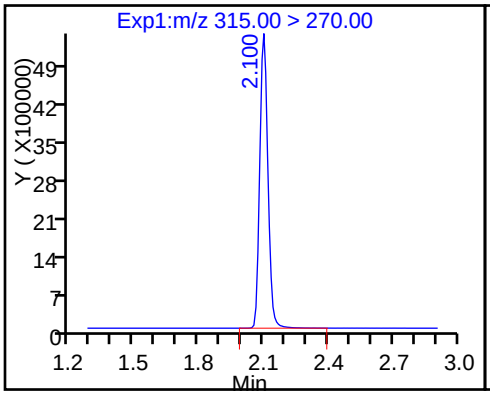
5 Perfluorobutanesulfonic acid



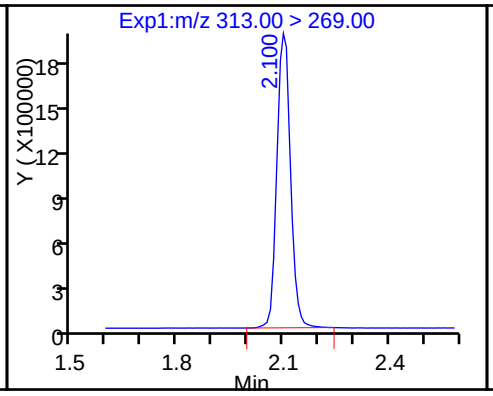
5 Perfluorobutanesulfonic acid



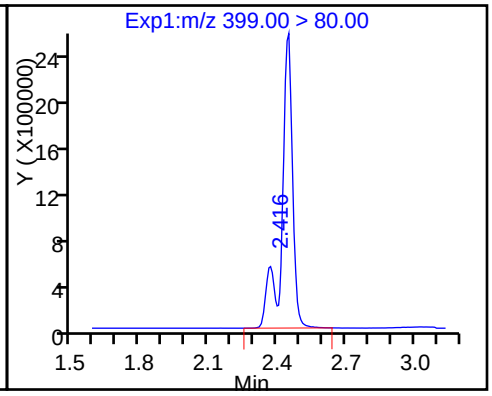
D 6 13C2 PFHxA



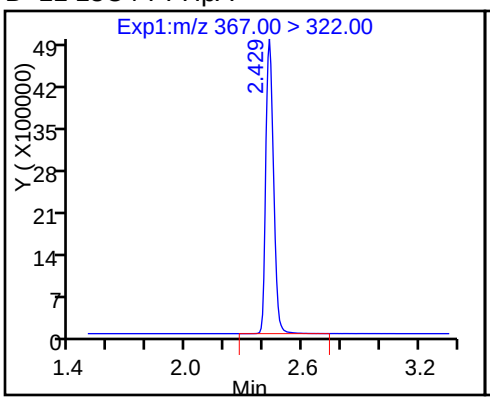
7 Perfluorohexanoic acid



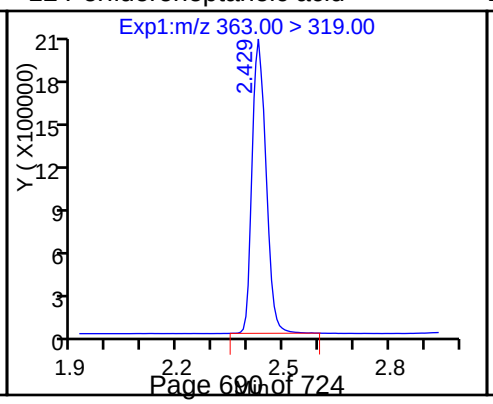
9 Perfluorohexanesulfonic acid



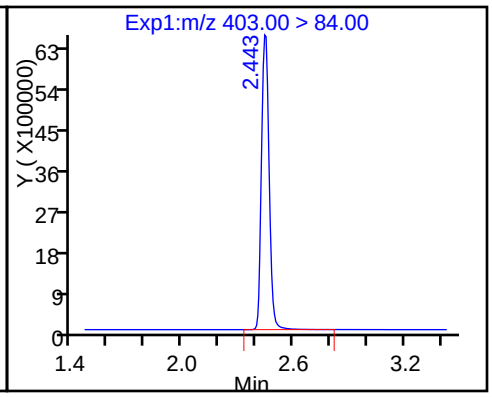
D 11 13C4-PFHpA



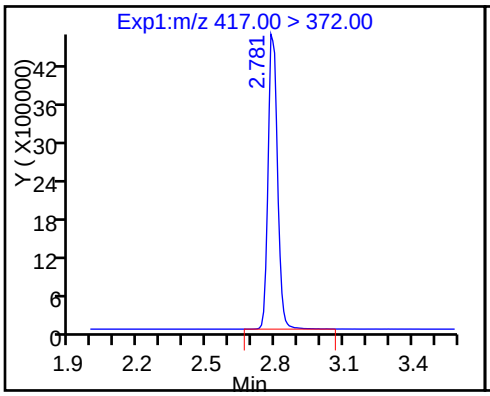
12 Perfluoroheptanoic acid



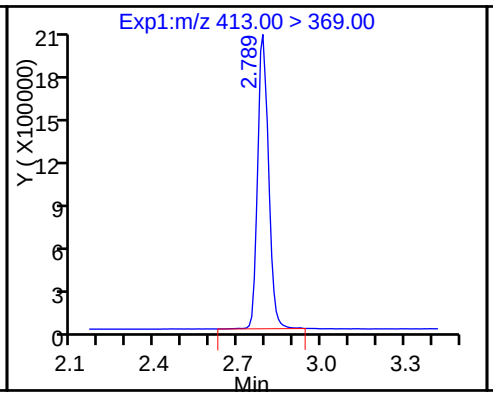
D 10 18O2 PFHxS



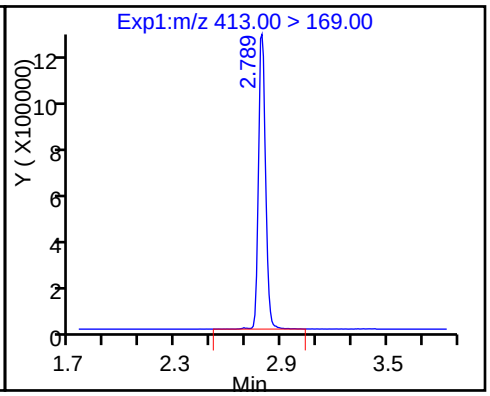
D 14 13C4 PFOA



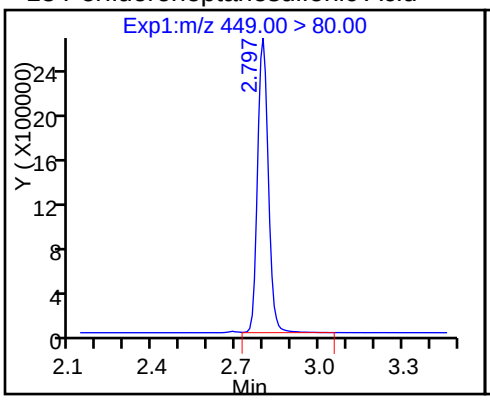
15 Perfluorooctanoic acid



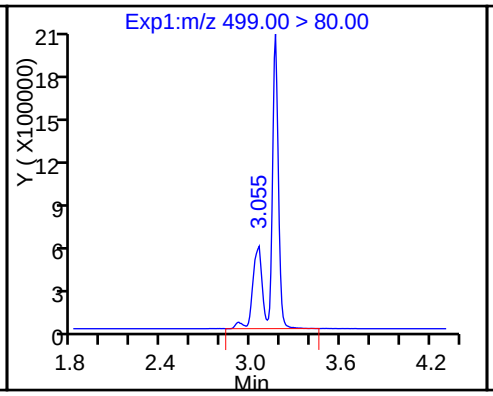
15 Perfluorooctanoic acid



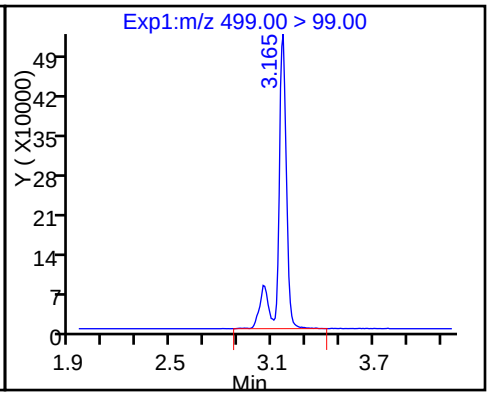
13 Perfluoroheptanesulfonic Acid



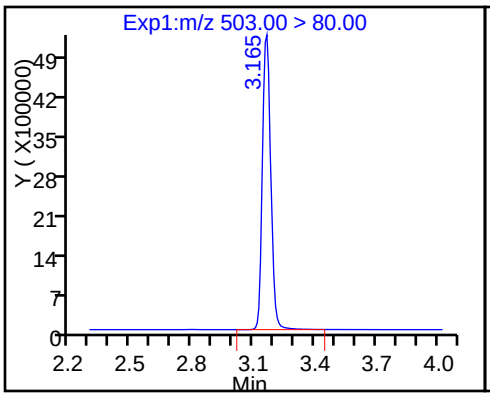
18 Perfluorooctane sulfonic acid



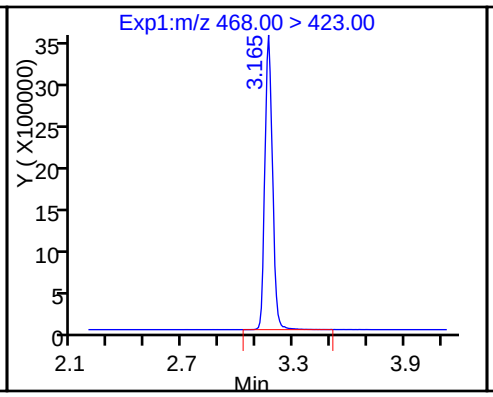
18 Perfluorooctane sulfonic acid



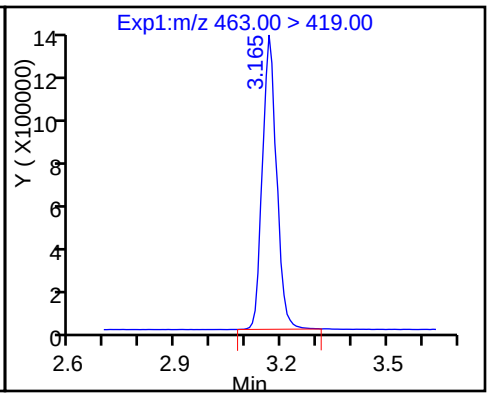
D 17 13C4 PFOS



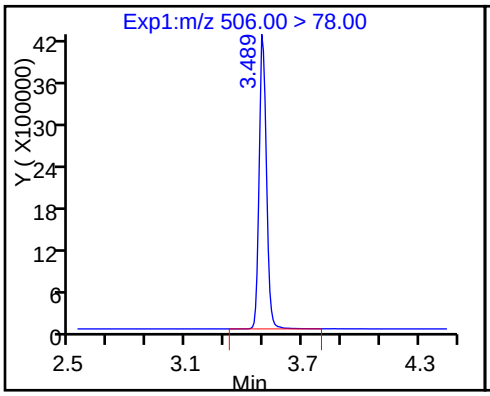
D 19 13C5 PFNA



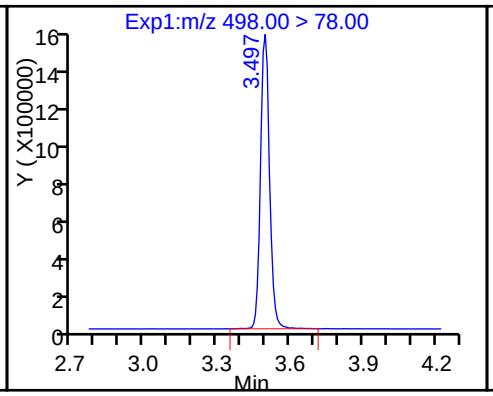
20 Perfluorononanoic acid



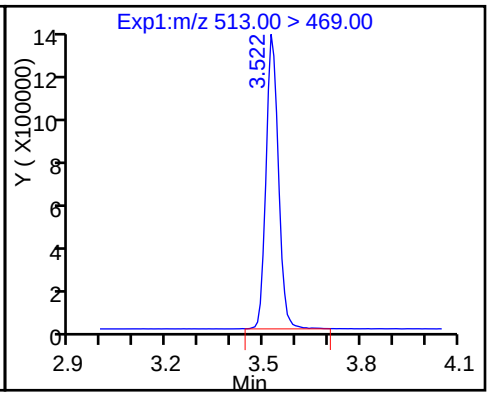
D 21 13C8 FOSA



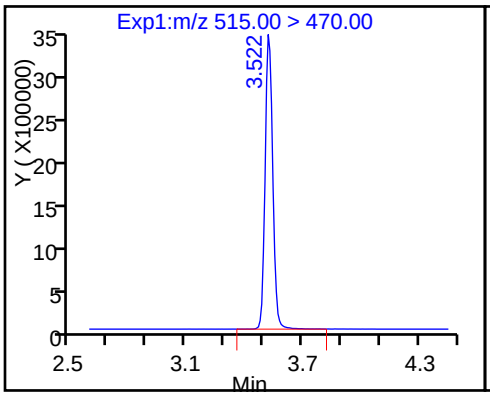
22 Perfluorooctane Sulfonamide



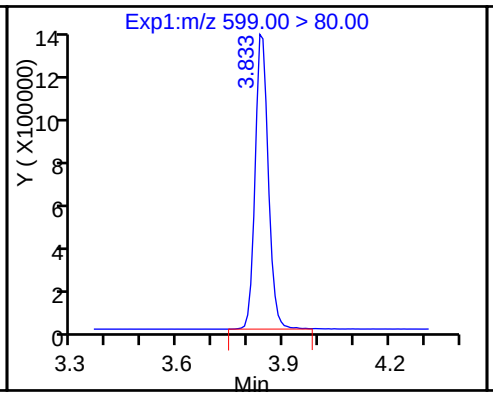
24 Perfluorodecanoic acid



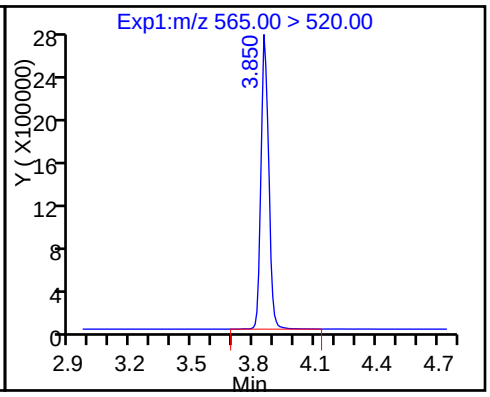
D 23 13C2 PFDA



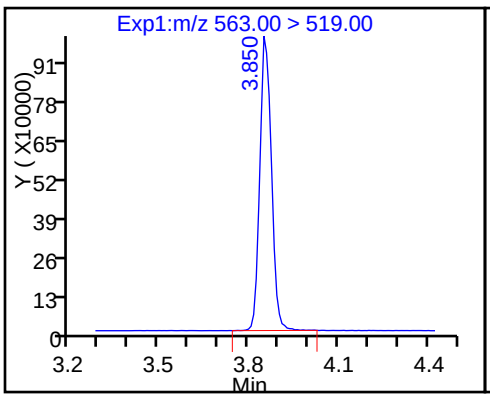
26 Perfluorodecane Sulfonic acid



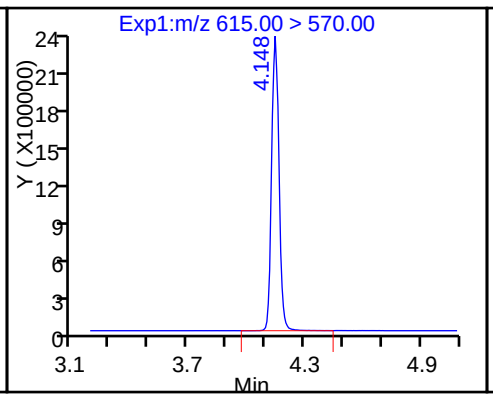
D 27 13C2 PFUnA



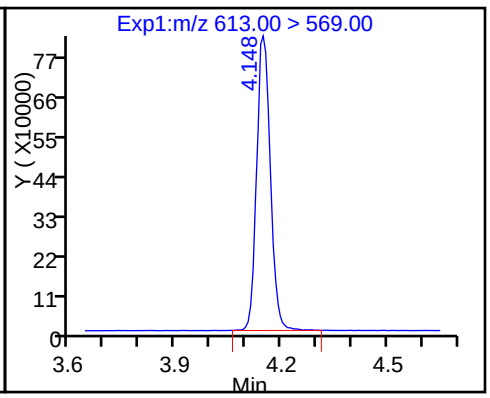
28 Perfluoroundecanoic acid



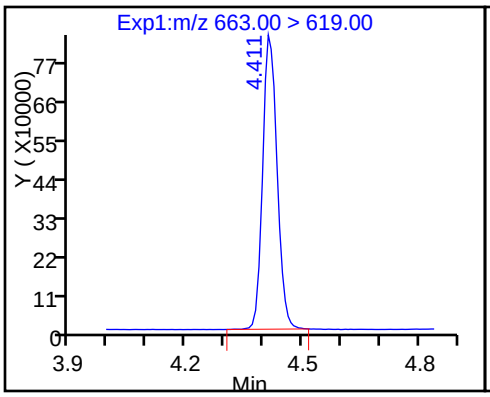
D 30 13C2 PFDoA



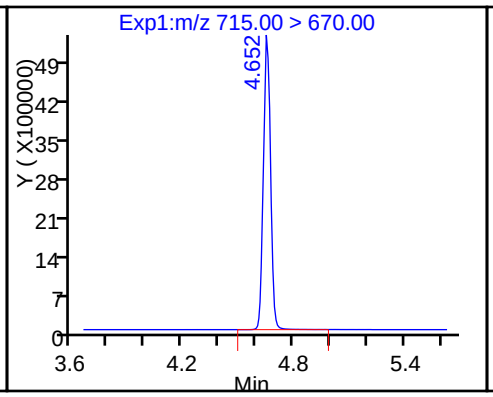
29 Perfluorododecanoic acid



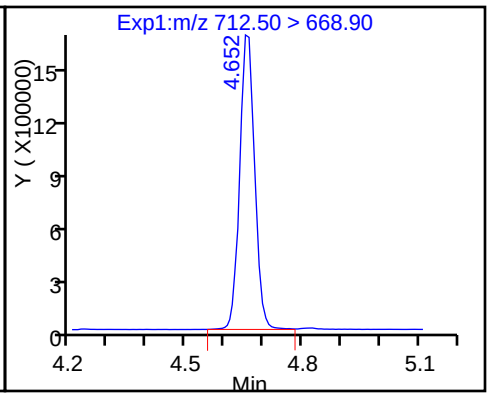
31 Perfluorotridecanoic acid



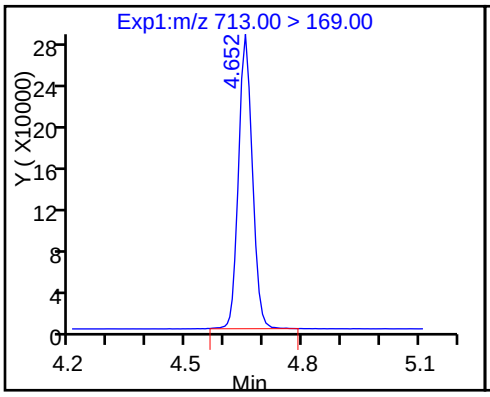
D 32 13C2-PFTeDA



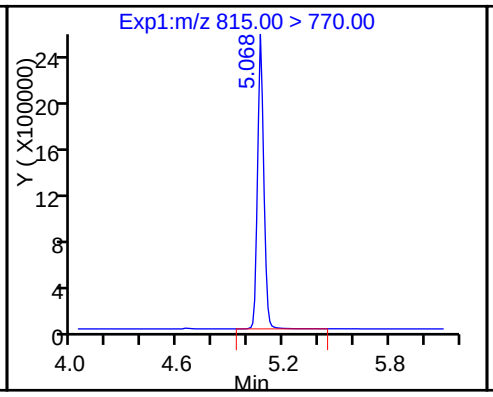
33 Perfluorotetradecanoic acid



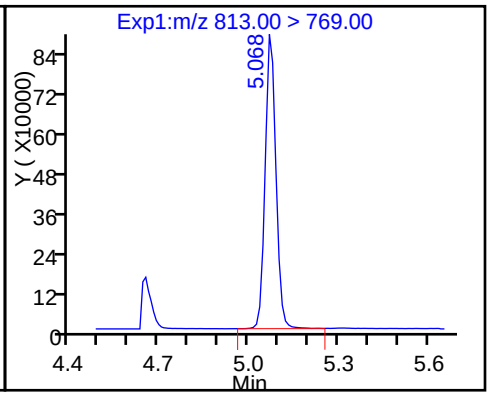
33 Perfluorotetradecanoic acid



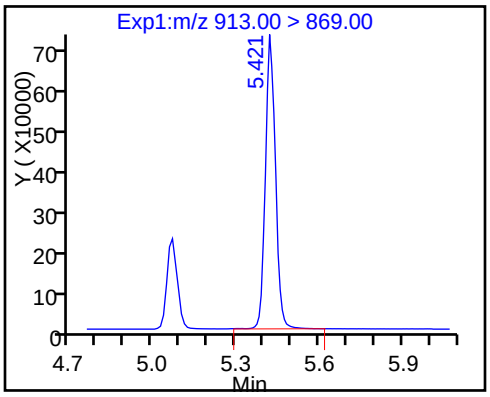
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Start Date: 12/15/2016 12:06

Analysis Batch Number: 142379 End Date: 12/15/2016 19:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-142379/1 CCB		12/15/2016 12:06	1		Acquity 2.1(mm)
RB 320-142379/2 CCB		12/15/2016 12:14	1		Acquity 2.1(mm)
RB 320-142379/3 CCB		12/15/2016 12:21	1		Acquity 2.1(mm)
IC 320-142379/4		12/15/2016 12:29	1	15DEC2016B_004.d	Acquity 2.1(mm)
IC 320-142379/5		12/15/2016 12:36	1	15DEC2016B_005.d	Acquity 2.1(mm)
IC 320-142379/6		12/15/2016 12:44	1	15DEC2016B_006.d	Acquity 2.1(mm)
IC 320-142379/7		12/15/2016 12:51	1	15DEC2016B_007.d	Acquity 2.1(mm)
IC 320-142379/8		12/15/2016 12:59	1	15DEC2016B_008.d	Acquity 2.1(mm)
IC 320-142379/9		12/15/2016 13:06	1	15DEC2016B_009.d	Acquity 2.1(mm)
ICB 320-142379/10		12/15/2016 13:14	1		Acquity 2.1(mm)
ICV 320-142379/11		12/15/2016 13:21	1	15DEC2016B_011.d	Acquity 2.1(mm)
IC 320-142379/13		12/15/2016 13:41	1	15DEC2016BB_013.d	Acquity 2.1(mm)
IC 320-142379/14		12/15/2016 13:48	1	15DEC2016B_014.d	Acquity 2.1(mm)
IC 320-142379/15		12/15/2016 13:56	1	15DEC2016B_015.d	Acquity 2.1(mm)
IC 320-142379/16		12/15/2016 14:03	1	15DEC2016B_016.d	Acquity 2.1(mm)
IC 320-142379/17		12/15/2016 14:11	1	15DEC2016B_017.d	Acquity 2.1(mm)
IC 320-142379/18		12/15/2016 14:18	1	15DEC2016B_018.d	Acquity 2.1(mm)
ICB 320-142379/19		12/15/2016 14:26	1		Acquity 2.1(mm)
ICV 320-142379/20		12/15/2016 14:33	1		Acquity 2.1(mm)
RB 320-142379/21 CCB		12/15/2016 14:41	1		Acquity 2.1(mm)
CCV 320-142379/24		12/15/2016 15:46	1		Acquity 2.1(mm)
RB 320-142379/25 CCB		12/15/2016 15:54	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:01	1		Acquity 2.1(mm)
CCV 320-142379/27		12/15/2016 16:09	1		Acquity 2.1(mm)
RB 320-142379/28 CCB		12/15/2016 16:16	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:24	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:31	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:39	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:46	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:54	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:01	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:09	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:16	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:24	1		Acquity 2.1(mm)
RB 320-142379/44 CCB		12/15/2016 19:47	1		Acquity 2.1(mm)
CCV 320-142379/42		12/15/2016 19:54	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Start Date: 12/28/2016 16:21

Analysis Batch Number: 144213 End Date: 12/28/2016 18:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-144213/1 CCB		12/28/2016 16:21	1		Acquity 2.1(mm)
RB 320-144213/2 CCB		12/28/2016 16:29	1		Acquity 2.1(mm)
RB 320-144213/3 CCB		12/28/2016 16:36	1		Acquity 2.1(mm)
RB 320-144213/4 CCB		12/28/2016 16:44	1		Acquity 2.1(mm)
CCV 320-144213/5 CCVL		12/28/2016 16:51	1	28DEC2016A_005.d	Acquity 2.1(mm)
CCV 320-144213/6 CCVL		12/28/2016 16:59	1		Acquity 2.1(mm)
CCV 320-144213/7		12/28/2016 17:06	1		Acquity 2.1(mm)
RB 320-144213/8 CCB		12/28/2016 17:14	1		Acquity 2.1(mm)
CCV 320-144213/17		12/28/2016 18:21	1		Acquity 2.1(mm)
RB 320-144213/18 CCB		12/28/2016 18:29	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Start Date: 12/28/2016 23:51

Analysis Batch Number: 144253 End Date: 12/29/2016 03:44

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-144253/1		12/28/2016 23:51	1	28DEC2016C_001.d	Acquity 2.1(mm)
ZZZZZ		12/28/2016 23:59	1		Acquity 2.1(mm)
MB 320-142967/1-A		12/29/2016 00:06	1	28DEC2016C_003.d	Acquity 2.1(mm)
LCS 320-142967/2-A		12/29/2016 00:14	1	28DEC2016C_004.d	Acquity 2.1(mm)
320-24149-1		12/29/2016 00:21	1	28DEC2016C_005.d	Acquity 2.1(mm)
320-24149-2		12/29/2016 00:29	1	28DEC2016C_006.d	Acquity 2.1(mm)
ZZZZZ		12/29/2016 00:36	1		Acquity 2.1(mm)
320-24149-4		12/29/2016 00:44	1	28DEC2016C_008.d	Acquity 2.1(mm)
ZZZZZ		12/29/2016 00:52	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 00:59	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 01:07	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 01:14	1		Acquity 2.1(mm)
CCV 320-144253/13		12/29/2016 01:22	1	28DEC2016C_013.d	Acquity 2.1(mm)
ZZZZZ		12/29/2016 01:29	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 01:37	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 01:44	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 01:52	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 01:59	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 02:07	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 02:14	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 02:22	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 02:29	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 02:37	1		Acquity 2.1(mm)
CCV 320-144253/24		12/29/2016 02:44	1	28DEC2016C_024.d	Acquity 2.1(mm)
ZZZZZ		12/29/2016 02:52	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 02:59	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 03:07	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 03:14	1		Acquity 2.1(mm)
CCV 320-144253/29		12/29/2016 03:22	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 03:29	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 03:37	1		Acquity 2.1(mm)
ZZZZZ		12/29/2016 03:44	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Start Date: 12/30/2016 10:56

Analysis Batch Number: 144510 End Date: 12/30/2016 17:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		12/30/2016 10:56	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 11:03	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 11:11	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 11:18	1		Acquity 2.1(mm)
CCV 320-144510/5 CCVL		12/30/2016 11:26	1	30DEC2016A_005.d	Acquity 2.1(mm)
CCV 320-144510/6 CCVL		12/30/2016 11:33	1		Acquity 2.1(mm)
CCV 320-144510/7		12/30/2016 11:41	1		Acquity 2.1(mm)
RB 320-144510/8 CCB		12/30/2016 11:48	1		Acquity 2.1(mm)
CCV 320-144510/9		12/30/2016 12:03	1		Acquity 2.1(mm)
RB 320-144510/10 CCB		12/30/2016 12:11	1		Acquity 2.1(mm)
CCV 320-144510/11		12/30/2016 12:18	1	30DEC2016B_001.d	Acquity 2.1(mm)
ZZZZZ		12/30/2016 12:26	1		Acquity 2.1(mm)
320-24149-1 DL		12/30/2016 12:33	200	30DEC2016B_003.d	Acquity 2.1(mm)
ZZZZZ		12/30/2016 12:41	200		Acquity 2.1(mm)
ZZZZZ		12/30/2016 12:48	200		Acquity 2.1(mm)
ZZZZZ		12/30/2016 12:56	1		Acquity 2.1(mm)
320-24149-2 DL		12/30/2016 13:03	10	30DEC2016B_007.d	Acquity 2.1(mm)
ZZZZZ		12/30/2016 13:11	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 13:18	1		Acquity 2.1(mm)
320-24149-3		12/30/2016 13:26	1	30DEC2016B_010.d	Acquity 2.1(mm)
ZZZZZ		12/30/2016 13:33	50		Acquity 2.1(mm)
ZZZZZ		12/30/2016 13:41	1		Acquity 2.1(mm)
CCV 320-144510/23		12/30/2016 13:48	1	30DEC2016B_013.d	Acquity 2.1(mm)
ZZZZZ		12/30/2016 13:56	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 14:03	10		Acquity 2.1(mm)
ZZZZZ		12/30/2016 14:11	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 14:18	50		Acquity 2.1(mm)
ZZZZZ		12/30/2016 14:26	20		Acquity 2.1(mm)
ZZZZZ		12/30/2016 14:34	20		Acquity 2.1(mm)
ZZZZZ		12/30/2016 14:41	20		Acquity 2.1(mm)
ZZZZZ		12/30/2016 14:49	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 14:56	50		Acquity 2.1(mm)
ZZZZZ		12/30/2016 15:04	50		Acquity 2.1(mm)
CCV 320-144510/34		12/30/2016 15:11	1	30DEC2016B_024.d	Acquity 2.1(mm)
ZZZZZ		12/30/2016 15:19	1		Acquity 2.1(mm)
CCV 320-144510/40		12/30/2016 15:56	1	30DEC2016B_030.d	Acquity 2.1(mm)
ZZZZZ		12/30/2016 16:04	1		Acquity 2.1(mm)
MB 320-142967/1-A RA		12/30/2016 16:11	1	30DEC2016B_032.d	Acquity 2.1(mm)
LCS 320-142967/2-A RA		12/30/2016 16:19	1	30DEC2016B_033.d	Acquity 2.1(mm)
320-24149-4 RA		12/30/2016 16:26	1	30DEC2016B_034.d	Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Start Date: 12/30/2016 10:56

Analysis Batch Number: 144510 End Date: 12/30/2016 17:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		12/30/2016 16:34	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 16:41	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 16:49	1		Acquity 2.1(mm)
ZZZZZ		12/30/2016 16:56	1		Acquity 2.1(mm)
CCV 320-144510/49		12/30/2016 17:04	1	30DEC2016B_039.d	Acquity 2.1(mm)
ZZZZZ		12/30/2016 17:11	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Instrument ID: A8_N Start Date: 01/04/2017 16:33

Analysis Batch Number: 145022 End Date: 01/04/2017 22:03

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-145022/5 CCVL		01/04/2017 16:33	1	04JAN2017A_005.d	Acquity 2.1(mm)
CCV 320-145022/6 CCVL		01/04/2017 16:40	1		Acquity 2.1(mm)
CCV 320-145022/7		01/04/2017 16:48	1		Acquity 2.1(mm)
CCV 320-145022/8		01/04/2017 16:55	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 17:03	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 17:18	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 17:25	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 17:33	1		Acquity 2.1(mm)
CCV 320-145022/18		01/04/2017 18:10	1		Acquity 2.1(mm)
CCV 320-145022/19		01/04/2017 18:18	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 18:25	1		Acquity 2.1(mm)
CCV 320-145022/31		01/04/2017 19:48	1		Acquity 2.1(mm)
CCV 320-145022/32		01/04/2017 19:55	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 20:03	1		Acquity 2.1(mm)
CCV 320-145022/41		01/04/2017 21:03	1	04JAN2017A_041.d	Acquity 2.1(mm)
CCV 320-145022/42		01/04/2017 21:10	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 21:18	1		Acquity 2.1(mm)
320-24149-1 DL2		01/04/2017 21:25	1	04JAN2017A_044.d	Acquity 2.1(mm)
ZZZZZ		01/04/2017 21:33	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 21:40	1		Acquity 2.1(mm)
CCV 320-145022/47		01/04/2017 21:48	1	04JAN2017A_047.d	Acquity 2.1(mm)
CCV 320-145022/48		01/04/2017 21:55	1		Acquity 2.1(mm)
ZZZZZ		01/04/2017 22:03	1		Acquity 2.1(mm)

537 (Modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Batch Number: 142967 Batch Start Date: 12/19/16 14:38 Batch Analyst: Marchenko, Veronika P

Batch Method: 3535 Batch End Date: 12/20/16 18:14

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00073
MB 320-142967/1		3535, 537 (Modified)				250 mL	0.5 mL	25 uL	
LCS 320-142967/2		3535, 537 (Modified)				250 mL	0.5 mL	25 uL	20 uL
320-24149-A-1	FSS4TMW-1216	3535, 537 (Modified)	T	308.46 g	27.04 g	281.4 mL	0.5 mL	25 uL	
320-24149-A-2	FSS5TMW-1216	3535, 537 (Modified)	T	313.10 g	27.07 g	286 mL	0.5 mL	25 uL	
320-24149-A-3	EBGW120616	3535, 537 (Modified)	T	301.18 g	27.02 g	274.2 mL	0.5 mL	25 uL	
320-24149-A-4	EBWC120616	3535, 537 (Modified)	T	291.97 g	27.13 g	264.8 mL	0.5 mL	25 uL	

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N NaOH/H2O: 794893
H2O ID	12/15/16
Hexane ID	0000135581
Manifold ID	5,6
Methanol ID	798085
Pipette ID	MD05306
Analyst ID - Reagent Drop	VPM
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	OM
Solvent Lot #	800649
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 150mg
Solid Phase Extraction Disk ID	002836112A

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.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Batch Number: 142967 Batch Start Date: 12/19/16 14:38 Batch Analyst: Marchenko, Veronika P

Batch Method: 3535 Batch End Date: 12/20/16 18:14

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	
320-24149-A-1	FSS4TMW-1216	3535, Dilution, 537 (Modified)	T	308.46 g	27.04 g	281.4 mL	0.5 mL	25 uL	

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N NaOH/H2O: 794893
H2O ID	12/15/16
Hexane ID	0000135581
Manifold ID	5,6
Methanol ID	798085
Pipette ID	MD05306
Analyst ID - Reagent Drop	VPM
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	OM
Solvent Lot #	800649
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 150mg
Solid Phase Extraction Disk ID	002836112A

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.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24149-1

SDG No.:

Batch Number: 145739 Batch Start Date: 12/19/16 14:38 Batch Analyst: Phomsopha, Thep

Batch Method: Dilution Batch End Date: 12/20/16 18:14

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialVolume1	FinalVolume1	InitialVolume2	FinalVolume2	InitialVolume3	FinalVolume3
320-24149-A-1-A	FSS4TMW-1216	Dilution, 537 (Modified)	T	30 uL	300 uL	15 uL	300 uL	15 uL	300 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	DilutionFactor	CalcMsg	LCMPFCSU 00046			
320-24149-A-1-A	FSS4TMW-1216	Dilution, 537 (Modified)	T	4000 No Unit	OK	15 uL			

Batch Notes	
Batch Comment	0.1N NaOH/H2O: 794893

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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 24149; 24184; 24236 Work List ID(s): 38288; 38358; 38437

Extraction Batch: 142967 Analysis Batch(es): 144253; 144510; 144867

Delivery Rank 4 Due Date: 12/23/16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 142379	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?	✓	✓	
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation			
1. Are all non-conformances documented/attached? NCM#	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?		✓	
5. Was QC Checker run for this job?	✓	✓	

**Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.*

1st Level (Analyst): [signature] Date: 1/5/17

2nd Level Reviewer: [signature] Date: 1/6/2017

NCMs: 74501; 74503; 74504; 74505; 74506; 73213; 74508; 74533; 74534; 74535

TestAmerica Laboratories
Worklist QC Batch Report

TBL BATCH : 144253

Worklist Name: 28DEC2016C_PFC Worklist Number: 38288
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161229-38288.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 144253	LC PFC ICAL Raw Batch: 144254	LC PFAS ICAL Raw Batch: 144255
#1 CCV L5	#1 CCV L5	#1 CCV L5	#1 CCV L5
#2 RB	#2 RB	#2 RB	#2 RB
#3 MB 320-142967/1-A	#3 MB 320-142967/1-A		
#4 LCS 320-142967/2-A	#4 LCS 320-142967/2-A		
#5 320-24149-A-1-A	#5 320-24149-A-1-A		
#6 320-24149-A-2-A	#6 320-24149-A-2-A		
#7 320-24149-A-3-A	#7 320-24149-A-3-A		
#8 320-24149-A-4-A	#8 320-24149-A-4-A		
#9 320-24184-A-1-A	#9 320-24184-A-1-A		
#10 320-24184-A-2-A - Reprep	#10 320-24184-A-2-A		
#11 320-24184-A-3-A	#11 320-24184-A-3-A		
#12 320-24184-A-4-A - Reprep	#12 320-24184-A-4-A		
#13 CCV L4 - PFOS Failed	#13 CCV L4	#13 CCV L4	#13 CCV L4
#14 RB	#14 RB	#14 RB	#14 RB
#15 320-24236-A-1-A	#15 320-24236-A-1-A		
#16 320-24236-A-2-A	#16 320-24236-A-2-A		
#17 320-24236-A-3-A	#17 320-24236-A-3-A		
#18 320-24236-A-3-B MS	#18 320-24236-A-3-B MS		
#19 320-24236-A-3-C MSD	#19 320-24236-A-3-C MSD		
#20 320-24236-A-4-A	#20 320-24236-A-4-A		
#21 320-24236-A-5-A	#21 320-24236-A-5-A		
#22 320-24236-A-6-A	#22 320-24236-A-6-A		
#23 320-24236-A-7-A	#23 320-24236-A-7-A		
#24 CCV L5	#24 CCV L5	#24 CCV L5	#24 CCV L5
#25 RB	#25 RB	#25 RB	#25 RB
#26 320-24236-A-8-A	#26 320-24236-A-8-A		
#27 320-24236-A-9-A	#27 320-24236-A-9-A		
#28 320-24236-A-10-A	#28 320-24236-A-10-A		
#29 CCV L4	#29 CCV L4	#29 CCV L4	#29 CCV L4
#30 RB	#30 RB	#30 RB	#30 RB
#31 RB	#31 RB	#31 RB	#31 RB
#32 RB	#32 RB	#32 RB	#32 RB

PBS RPT

MB contamination NCM 74501

MS/MSD high targets NCM 74503
MS/MSD LCS good NCM 74504
IDA low NCM 74505
Eflag NCM 74506

CCV L2 144213
ICV 142379

Tune NCM 73213

TestAmerica Laboratories
Worklist QC Batch Report

TAL PFC_IC – 144511
TAL DOD – 144510

Worklist Name: 30DEC2016A_PFC Worklist Number: 38358
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161230-38358.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 144510	LC PFC ICAL Raw Batch: 144511	LC PFAS ICAL Raw Batch: 144512
#1 RB	#1 RB	#1 RB	#1 RB
#2 RB	#2 RB	#2 RB	#2 RB
#3 RB	#3 RB	#3 RB	#3 RB
#4 RB	#4 RB	#4 RB	#4 RB
#5 CCV L2	#5 CCV L2	#5 CCV L2	#5 CCV L2
#6 CCV L2 ADD ON	#6 CCV L2 ADD ON	#6 CCV L2 ADD ON	#6 CCV L2 ADD ON
#7 CCV L5	#7 CCV L5	#7 CCV L5	#7 CCV L5
#8 RB	#8 RB	#8 RB	#8 RB
#9 CCV L4	#9 CCV L4	#9 CCV L4	#9 CCV L4
#10 RB	#10 RB	#10 RB	#10 RB
#11 CCV L5	#11 CCV L5	#11 CCV L5	#11 CCV L5
#12 RB	#12 RB	#12 RB	#12 RB
#13 320-24149-A-1-A	#13 320-24149-A-1-A	} needs complex DL	
#14 320-24184-A-3-A	#14 320-24184-A-3-A		
#15 320-24236-A-2-A	#15 320-24236-A-2-A		
#16 RB	#16 RB	#16 RB	#16 RB
#17 320-24149-A-2-A	#17 320-24149-A-2-A		
#18 320-24149-A-2-A	#18 320-24149-A-2-A		
#19 RB	#19 RB	#19 RB	#19 RB
#20 320-24149-A-3-A	#20 320-24149-A-3-A	NCM 74501	
#21 320-24184-A-1-A	#21 320-24184-A-1-A		
#22 320-24184-A-2-A	#22 320-24184-A-2-A		
#23 CCV L4	#23 CCV L4	#23 CCV L4	#23 CCV L4
#24 RB	#24 RB	#24 RB	#24 RB
#25 320-24184-A-4-A	#25 320-24184-A-4-A		
#26 320-24184-A-4-A	#26 320-24184-A-4-A		
#27 320-24236-A-1-A	#27 320-24236-A-1-A	RL Dil	
#28 320-24236-A-3-A	#28 320-24236-A-3-A	NCM 74508	
#29 320-24236-A-3-B MS	#29 320-24236-A-3-B MS		
#30 320-24236-A-3-C MSD	#30 320-24236-A-3-C MSD		
#31 320-24236-A-4-A	#31 320-24236-A-4-A		
#32 320-24236-A-9-A	#32 320-24236-A-9-A		
#33 320-24236-A-10-A	#33 320-24236-A-10-A		
#34 CCV L5	#34 CCV L5	#34 CCV L5	#34 CCV L5
#35 RB	#35 RB	#35 RB	#35 RB
#36 320-24282-A-1-A		#36 320-24282-A-1-A	#36 320-24282-A-1-A
#37 320-24282-A-2-A		#37 320-24282-A-2-A	#37 320-24282-A-2-A
#38 320-24282-A-2-B MS		#38 320-24282-A-2-B MS	#38 320-24282-A-2-B MS
#39 320-24282-A-2-C MSD		#39 320-24282-A-2-C MSD	#39 320-24282-A-2-C MSD
#40 CCV L4	#40 CCV L4	#40 CCV L4	#40 CCV L4
#41 RB	#41 RB	#41 RB	#41 RB
#42 MB 320-142967/1-A	#42 MB 320-142967/1-A		
#43 LCS 320-142967/2-A	#43 LCS 320-142967/2-A		
#44 320-24149-A-4-A	#44 320-24149-A-4-A		
#45 320-24236-A-5-A	#45 320-24236-A-5-A		
#46 320-24236-A-6-A	#46 320-24236-A-6-A		
#47 320-24236-A-7-A	#47 320-24236-A-7-A		
#48 320-24236-A-8-A	#48 320-24236-A-8-A		
#49 CCV L5	#49 CCV L5	#49 CCV L5	#49 CCV L5
#50 RB	#50 RB	#50 RB	#50 RB

ICV 142379

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 03JAN2017C_PFC Worklist Number: 38437
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170104-38437.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 144867	LC PFC ICAL Raw Batch: 144868	LC PFAS ICAL Raw Batch: 144869
# 1 RB	# 1 RB	# 1 RB	# 1 RB
# 2 CCV L5	# 2 CCV L5	# 2 CCV L5	# 2 CCV L5
# 3 CCV L5 ADD ON	# 3 CCV L5 ADD ON	# 3 CCV L5 ADD ON	# 3 CCV L5 ADD ON
# 4 RB	# 4 RB	# 4 RB	# 4 RB
# 5 320-24209-A-4-B		# 5 320-24209-A-4-B	# 5 320-24209-A-4-B
# 6 RB	# 6 RB FOSA low → NCM 74451	# 6 RB	# 6 RB
# 7 MB 320-143624/1-A		# 7 MB 320-143624/1-A	# 7 MB 320-143624/1-A
# 8 320-23317-A-88-A MDLV		# 8 320-23317-A-88-A MDLV	# 8 320-23317-A-88-A MDLV
# 9 320-23317-A-89-A MDLV		# 9 320-23317-A-89-A MDLV	# 9 320-23317-A-89-A MDLV
#10 320-23317-A-90-A MDLV	IDA high NCM 74453	#10 320-23317-A-90-A MDLV	#10 320-23317-A-90-A MDLV
#11 320-23317-A-91-A LOQV		#11 320-23317-A-91-A LOQV	#11 320-23317-A-91-A LOQV
#12 320-23317-A-92-A LOQV		#12 320-23317-A-92-A LOQV	#12 320-23317-A-92-A LOQV
#13 RB	#13 RB	#13 RB	#13 RB
#14 CCV L4	#14 CCV L4	#14 CCV L4	#14 CCV L4
#15 CCV L4 ADD ON	#15 CCV L4 ADD ON	#15 CCV L4 ADD ON	#15 CCV L4 ADD ON
#16 RB	#16 RB	#16 RB	#16 RB
#17 MB 320-143618/1-A		#17 MB 320-143618/1-A	#17 MB 320-143618/1-A
#18 320-23317-A-82-A MDLV		#18 320-23317-A-82-A MDLV	#18 320-23317-A-82-A MDLV
#19 320-23317-A-83-A MDLV		#19 320-23317-A-83-A MDLV	#19 320-23317-A-83-A MDLV
#20 320-23317-A-84-A LOQV		#20 320-23317-A-84-A LOQV	#20 320-23317-A-84-A LOQV
#21 QC MB 01683632913		#21 QC MB 01683632913	#21 QC MB 01683632913
#22 QC LCS 01683632913		#22 QC LCS 01683632913	#22 QC LCS 01683632913
#23 320-24236-A-1-A	#23 320-24236-A-1-A		
#24 320-24236-A-9-A	#24 320-24236-A-9-A		
#25 320-24236-A-10-A	#25 320-24236-A-10-A		
#26 CCV L5	#26 CCV L5	#26 CCV L5	#26 CCV L5
#27 CCV L5 ADD ON	#27 CCV L5 ADD ON	#27 CCV L5 ADD ON	#27 CCV L5 ADD ON
#28 RB	#28 RB	#28 RB	#28 RB

ICV ~~142380~~ 142379 SBC 1/4/17

ICV 142380

CCV L2 144784

IDA FOSA low NCM 74533

IDA high NCM 74534

Dilution NCM 74535

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

AB 12/28/16

Batch Number: 320-142967

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320

Batch End: 12/20/16 18:14

Solid-Phase Extraction (SPE)

Dil 1

Due 12/29

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-142967/1 N/A	N/A		250 mL				N/A	N/A	N/A	RI	MB 320-142967/1-A
				0.5 mL								
2	LCS~320-142967/2 N/A	N/A		250 mL				N/A	N/A	N/A	RI	LCS 320-142967/2-A
				0.5 mL								
3	320-24149-A-1 (PFC_IDA_DOD5)	N/A (320-24149-1)	308.46 g	281.4 mL				12/23/16	12_Days	4	200X 100X	320-24149-A-1-A
			27.04 g	0.5 mL								
4	320-24149-A-2 (PFC_IDA_DOD5)	N/A (320-24149-1)	313.10 g	286 mL				12/23/16	12_Days	4	10X 1X	320-24149-A-2-A
			27.07 g	0.5 mL								
5	320-24149-A-3 (PFC_IDA_DOD5)	N/A (320-24149-1)	301.18 g	274.2 mL				12/23/16	12_Days	4	1X	320-24149-A-3-A
			27.02 g	0.5 mL								
6	320-24149-A-4 (PFC_IDA_DOD5)	N/A (320-24149-1)	291.97 g	264.8 mL				12/23/16	12_Days	4	~~50X~~ 12/22/2016	320-24149-A-4-A
			27.13 g	0.5 mL								
7	320-24184-A-1 (PFC_IDA_DOD5)	N/A (320-24184-1)	298.32 g	271 mL				12/27/16	12_Days	4	50X	320-24184-A-1-A
			27.31 g	0.5 mL								
8	320-24184-A-2 (PFC_IDA_DOD5)	N/A (320-24184-1)	280.69 g	253.5 mL				12/27/16	12_Days	4	1X	320-24184-A-2-A
			27.19 g	0.5 mL								
9	320-24184-A-3 (PFC_IDA_DOD5)	N/A (320-24184-1)	307.26 g	280.7 mL				12/27/16	12_Days	4	200X 100X	320-24184-A-3-A
			26.57 g	0.5 mL								
10	320-24184-A-4 (PFC_IDA_DOD5)	N/A (320-24184-1)	306.47 g	279.8 mL				12/27/16	12_Days	4	10X 1X	320-24184-A-4-A
			26.67 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142967 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320 Batch End:

11	320-24236-A-1 (PFC_IDA_DOD5)	N/A (320-24236-1)	271.48 g / 26.16 g	245.3 mL / 0.5 mL				12/28/16	12_Days	4	50X (100X)
12	320-24236-A-2 (PFC_IDA_DOD5)	N/A (320-24236-1)	280.04 g / 27.00 g	253 mL / 0.5 mL				12/28/16	12_Days	4	300X 200X 100X
13	320-24236-A-3 (PFC_IDA_DOD5)	N/A (320-24236-1)	268.47 g / 26.98 g	241.5 mL / 0.5 mL				12/28/16	12_Days	4	20X
14	320-24236-A-3~MS (PFC_IDA_DOD5)	N/A (320-24236-1)	264.35 g / 30.69 g	233.7 mL / 0.5 mL				12/28/16	12_Days	4	20X
15	320-24236-A-3~MSD (PFC_IDA_DOD5)	N/A (320-24236-1)	263.98 g / 28.01 g	236 mL / 0.5 mL				12/28/16	12_Days	4	20X
16	320-24236-A-4 (PFC_IDA_DOD5)	N/A (320-24236-1)	306.35 g / 27.17 g	279.2 mL / 0.5 mL				12/28/16	12_Days	4	1X
17	320-24236-A-5 (PFC_IDA_DOD5)	N/A (320-24236-1)	286.26 g / 27.08 g	259.2 mL / 0.5 mL				12/28/16	12_Days	4	RI
18	320-24236-A-6 (PFC_IDA_DOD5)	N/A (320-24236-1)	269.41 g / 27.94 g	241.5 mL / 0.5 mL				12/28/16	12_Days	4	RI
19	320-24236-A-7 (PFC_IDA_DOD5)	N/A (320-24236-1)	292.74 g / 26.64 g	266.1 mL / 0.5 mL				12/28/16	12_Days	4	RI
20	320-24236-A-8 (PFC_IDA_DOD5)	N/A (320-24236-1)	299.51 g / 26.49 g	273 mL / 0.5 mL				12/28/16	12_Days	4	RI
21	320-24236-A-9 (PFC_IDA_DOD5)	N/A (320-24236-1)	288.85 g / 27.77 g	261.1 mL / 0.5 mL				12/28/16	12_Days	4	50X (100X)
22	320-24236-A-10 (PFC_IDA_DOD5)	N/A (320-24236-1)	289.02 g / 28.33 g	260.7 mL / 0.5 mL				12/28/16	12_Days	4	50X (100X)

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142967 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320 Batch End:

Batch Notes

Manifold ID	5,6
Methanol ID	798085
Hexane ID	0000135581
Sodium Hydroxide ID	NA
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 150mg
Solid Phase Extraction Disk ID	002836112A
Balance ID	QA-070
H2O ID	12/15/16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	800649
Analyst ID - Reagent Drop	VPM
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	VM
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
SOP Number	WS-LC-0025

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142967 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320 Batch End:

Batch Comment 0.1N NaOH/H2O: 794893

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142967 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-142967/1	LCMPFCSU_00046	25 uL	~~250 mL~~ 0.5mL	VPM 12/19/16	DM 12/19/16
LCS 320-142967/2	LCMPFCSU_00046	25 uL	~~250 mL~~		
LCS 320-142967/2	LCPFCSP_00073	20 uL	~~250 mL~~		
320-24149-A-1	LCMPFCSU_00046	25 uL			
320-24149-A-2	LCMPFCSU_00046	25 uL			
320-24149-A-3	LCMPFCSU_00046	25 uL			
320-24149-A-4	LCMPFCSU_00046	25 uL			
320-24184-A-1	LCMPFCSU_00046	25 uL			
320-24184-A-2	LCMPFCSU_00046	25 uL			
320-24184-A-3	LCMPFCSU_00046	25 uL			
320-24184-A-4	LCMPFCSU_00046	25 uL			
320-24236-A-1	LCMPFCSU_00046	25 uL			
320-24236-A-2	LCMPFCSU_00046	25 uL			
320-24236-A-3	LCMPFCSU_00046	25 uL			
320-24236-A-3 MS	LCMPFCSU_00046	25 uL			
320-24236-A-3 MS	LCPFCSP_00073	20 uL			
320-24236-A-3 MSD	LCMPFCSU_00046	25 uL			
320-24236-A-3 MSD	LCPFCSP_00073	20 uL			

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142967 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320 Batch End:

320-24236-A-4	LCMPFCSU_00046	25 uL	0.5mL	VPM 12/19/16	DM 12/19/16
320-24236-A-5	LCMPFCSU_00046	25 uL			
320-24236-A-6	LCMPFCSU_00046	25 uL			
320-24236-A-7	LCMPFCSU_00046	25 uL			
320-24236-A-8	LCMPFCSU_00046	25 uL			
320-24236-A-9	LCMPFCSU_00046	25 uL			
320-24236-A-10	LCMPFCSU_00046	25 uL			

Other Reagents:

Reagent	Amount/Units	Lot#:

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142967 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-142967/1	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-142967/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-142967/2	LCPFCSP_00073	20 uL	0.5 mL		
320-24149-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-24149-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-24149-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-24149-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-24184-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-24184-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-24184-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-24184-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-3 MS	LCPFCSP_00073	20 uL	0.5 mL		
320-24236-A-3 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-3 MSD	LCPFCSP_00073	20 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142967 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-3535_PFC-320 Batch End:

320-24236-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-7	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-8	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-9	LCMPFCSU_00046	25 uL	0.5 mL		
320-24236-A-10	LCMPFCSU_00046	25 uL	0.5 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 142907 Test: PFC_IDA_DOD5(L)
Earliest Holding Time: 12/20/16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: VPM Date: 12/20/16
2nd Level Reviewer: NSH Date: 12-20-16
Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC - IDA

Job # 320-24149, 320-24184, ~~320~~ TD 12/30/16
320-24236

Analyst (Print Name) Thep Phomsopha

Analyst Initials TP

Date 12/30/16

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
320-24149-1	500	30	300	10X
320-24149-1(10X)	300	15	300	200X
320-24149-2	500	30	300	10X
320-24184-1	500	30	1500	50X
320-24184-3	500	30	300	10X
320-24184-3(10X)	300	15	300	200X
320-24184-4	500	30	300	10X
320-24236-1	500	30	1500	50X
320-24236-2	500	30	300	10X
320-24236-2 (10X)	300	15	300	200X
320-24236-3	500	15	300	20X
320-24236-3MS	500	15	300	20X
320-24236-3MSD	500	15	300	20X
320-24236-9	500	30	1500	50X
320-24236-10	500	30	1500	50X
				TP 12/30/16

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC_1DA **Job #** 320-24236

Analyst (Print Name) Thep Phomsopha **Analyst Initials** TP

Date 1/3/17

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
24236-1	500	15	1500	100X
↓ -9	500	15	1500	100X
-10	500	15	1500	100X

TP 1/4/17

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 24149; 24184; 24236 Work List ID(s): 38480

Extraction Batch: ~~145299~~ 145739 TP 1/10/17 Analysis Batch(es): 145022

Delivery Rank 4 Due Date: 12/23/16; 12/27/16; 12/28/16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 142379	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?	✓	✓	
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation			
1. Are all non-conformances documented/attached? NCM# 74664	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?		✓	
5. Was QC Checker run for this job?	✓	✓	

**Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.*

1st Level (Analyst): SEC/TP Date: 1/6/17

2nd Level Reviewer: MkWolf Date: 1/11/2017

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 04JAN2017_PFC Worklist Number: 38480
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170105-38480.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 145022	LC PFC ICAL Raw Batch: 145023	LC PFAS ICAL Raw Batch: 145024
# 1 RB	# 1 RB	# 1 RB	# 1 RB
# 2 RB	# 2 RB	# 2 RB	# 2 RB
# 3 RB	# 3 RB	# 3 RB	# 3 RB
# 4 RB	# 4 RB	# 4 RB	# 4 RB
# 5 CCV L2	# 5 CCV L2	# 5 CCV L2	# 5 CCV L2
# 6 CCV L2 ADD ON	# 6 CCV L2 ADD ON	# 6 CCV L2 ADD ON	# 6 CCV L2 ADD ON
# 7 CCV L5	# 7 CCV L5	# 7 CCV L5	# 7 CCV L5
# 8 CCV L5 ADD ON	# 8 CCV L5 ADD ON	# 8 CCV L5 ADD ON	# 8 CCV L5 ADD ON
# 9 RB	# 9 RB	# 9 RB	# 9 RB
#10 320-23763-A-20-A		#10 320-23763-A-20-A	#10 320-23763-A-20-A
#11 RB	#11 RB	#11 RB	#11 RB
#12 RB	#12 RB	#12 RB	#12 RB
#13 RB	#13 RB	#13 RB	#13 RB
#14 MB 320-144781/1-A		#14 MB 320-144781/1-A	#14 MB 320-144781/1-A
#15 LCS 320-144781/2-A		#15 LCS 320-144781/2-A	#15 LCS 320-144781/2-A
#16 LCSD 320-144781/3-A		#16 LCSD 320-144781/3-A	#16 LCSD 320-144781/3-A
#17 320-24608-B-6-A		#17 320-24608-B-6-A	#17 320-24608-B-6-A
#18 CCV L4	#18 CCV L4	#18 CCV L4	#18 CCV L4
#19 CCV L4 ADD ON	#19 CCV L4 ADD ON	#19 CCV L4 ADD ON	#19 CCV L4 ADD ON
#20 RB	#20 RB	#20 RB	#20 RB
#21 MB 320-144783/1-A		#21 MB 320-144783/1-A	#21 MB 320-144783/1-A
#22 LCS 320-144783/2-A		#22 LCS 320-144783/2-A	#22 LCS 320-144783/2-A
#23 320-24645-A-1-A		#23 320-24645-A-1-A	#23 320-24645-A-1-A
#24 320-24645-A-2-A		#24 320-24645-A-2-A	#24 320-24645-A-2-A
#25 320-24645-A-3-A		#25 320-24645-A-3-A	#25 320-24645-A-3-A
#26 320-24645-A-4-A		#26 320-24645-A-4-A	#26 320-24645-A-4-A
#27 320-24645-A-5-A		#27 320-24645-A-5-A	#27 320-24645-A-5-A
#28 320-24645-A-6-A		#28 320-24645-A-6-A	#28 320-24645-A-6-A
#29 320-24645-A-6-B MS		#29 320-24645-A-6-B MS	#29 320-24645-A-6-B MS
#30 320-24645-A-6-C MSD		#30 320-24645-A-6-C MSD	#30 320-24645-A-6-C MSD
#31 CCV L5	#31 CCV L5	#31 CCV L5	#31 CCV L5
#32 CCV L5 ADD ON	#32 CCV L5 ADD ON	#32 CCV L5 ADD ON	#32 CCV L5 ADD ON
#33 RB	#33 RB	#33 RB	#33 RB
#34 320-24645-A-7-A		#34 320-24645-A-7-A	#34 320-24645-A-7-A
#35 320-24645-A-8-A		#35 320-24645-A-8-A	#35 320-24645-A-8-A
#36 320-24645-A-9-A		#36 320-24645-A-9-A	#36 320-24645-A-9-A
#37 320-24645-A-10-A		#37 320-24645-A-10-A	#37 320-24645-A-10-A
#38 320-24645-A-11-A	complex DL	#38 320-24645-A-11-A	#38 320-24645-A-11-A
#39 320-24645-A-12-A	NCM 74664	#39 320-24645-A-12-A	#39 320-24645-A-12-A
#40 320-24645-A-13-A		#40 320-24645-A-13-A	#40 320-24645-A-13-A
#41 CCV L4	#41 CCV L4	#41 CCV L4	#41 CCV L4
#42 CCV L4 ADD ON	#42 CCV L4 ADD ON	#42 CCV L4 ADD ON	#42 CCV L4 ADD ON
#43 RB	#43 RB	#43 RB	#43 RB
#44 320-24149-A-1-F	#44 320-24149-A-1-F		
#46 320-24184-A-3-F	#46 320-24184-A-3-F		
#45 320-24236-A-2-F	#45 320-24236-A-2-F		
#47 CCV L5	#47 CCV L5	#47 CCV L5	#47 CCV L5
#48 CCV L5 ADD ON	#48 CCV L5 ADD ON	#48 CCV L5 ADD ON	#48 CCV L5 ADD ON
#49 RB	#49 RB	#49 RB	#49 RB

ICV 142379

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-145739 Analyst: Phomsopha, Thep Batch Open: 12/19/2016 2:38:00PM

Method Code: 320-PFC_Dil-320 Batch End: 12/20/2016 6:14:00PM

Dilution and Re-foritfication of Standards

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	320-24149-A-1-A (PFC_IDA_DOD5)	N/A (320-24149-1)		300 uL				12/23/16	12_Days	4		320-24149-A-1-G
2	320-24184-A-3-A (PFC_IDA_DOD5)	N/A (320-24184-1)		300 uL				12/27/16	12_Days	4		320-24184-A-3-G
3	320-24236-A-2-A (PFC_IDA_DOD5)	N/A (320-24236-1)		300 uL				12/28/16	12_Days	4		320-24236-A-2-G

Batch Notes

Batch Comment 0.1N NaOH/H2O: 794893

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-145739
Method Code: 320-PFC_Dil-320

Analyst: Phomsopha, Thep

Batch Open: 12/19/2016 2:38:00PM
Batch End: 12/20/2016 6:14:00PM

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
320-24149-A-1-A	LCMPFCSU_00046	15 uL	300 uL		
320-24184-A-3-A	LCMPFCSU_00046	15 uL	300 uL		
320-24236-A-2-A	LCMPFCSU_00046	15 uL	300 uL		

Other Reagents:

Reagent	Amount/Units	Lot#:

Shipping and Receiving Documents

RESOLUTION CONSULTANTS

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

COC No. EJBizo614 | Page 1 of 1

Project Name: PFAS Groundwater Investigation | PO No. 21529 | Project No. 12796 | Phase EIFS

Site Location: NAS Dallas

CTO No. JM76 | RC Project Manager: Tom Weberg

Sampler/Site Phone#

Lab Name: TestAmerica Sacramento | Turnaround Time(specify): 21-Day

Sample Analysis Requested (*Enter number of containers for each test*)

Lab ID	Sample ID (sys_samp_code)	Location ID (sys_loc_code)	Date (mm/dd/yy)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	Field Filtered (Y/N)	(3)→ Total No. of Containers	PFAS (USEPA Method 537)	Extra Volume for MS/MSD	HOLD
	FSS4TMW-1216	FSS4TMW	12/06/16	1220	WG	N	N	2	X		
	FSS5TMW-1216	FSS5TMW	12/06/16	1100	WG	N	N	2	X		
	EBGW120616	—	12/06/16	1245	WQ	EB	N	2	X		
	EBWC120616	—	12/06/16	1310	WQ	EB	N	2	X		

320-24149 Chain of Custody

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***Field* Comments:** TRRP Reporting — no preservative

***Lab* Comments:** Modified 7-Day Hold 16 PFAS's

Sample Shipment and Delivery Details

Number of coolers in shipment: 1

Samples Iced?(check) Yes ✓ No

Method of Shipment: Fed Ex

Airbill No:

Date Shipped: 12/6/2016

Relinquished by (signature)	Date	Time
1 TRRP Reporting		
2	12/06/2016	1445
3		

Received by (signature)	Date	Time
1		
2 Troy Catterson TAS	12/7/16	1070 1.2°C
3		

(1) AA=Ambient air, **AQ**=Air quality control, **ASB**=Asbestos, **CK**=Caulk, **DS**=Storm drain sediment, **GS**=Soil gas, **IC**=IDW Concrete, **IDD**=IDW Solid, **IDS**=IDW soil, **IDW**=IDW Water, **LF**=Free Product, **MA**=Mastic, **PC**=Paint Chips, **SC**=Cement/Concrete, **SE**=Sediment, **SL**=Sludge, **SO**=Soil, **SQ**=Soil/Solid quality control, **SSD**=Subsurface sediment, **SU**=Surface soil (<6 in), **SW**=Swab or wipe, **TA**=Animal tissue, **TP**=Plant tissue, **TQ**=Tissue quality control, **WG**=Ground water, **WL**=Leachate, **WO**=Ocean water, **WP**=Drinking water, **WQ**=Water quality control, **WR**=Ground water effluent, **WS**=Surface water, **WU**=Storm water, **WW**=Waste water

(2) Sample Type: AB=Ambient Blk, **EB**=Equipment Blk, **FB**=Field Blk, **FD**=Field Duplicate Sample, **IDW**=Investigative-Derived Waste, **MIS**=Incremental Sampling Methodology, **N**=Normal Environmental Sample, **TB**=Trip Blk

(3) Preservative added: **HA**=Hydrochloric Acid, **NI**=Nitric Acid, **SH**=Sodium Hydroxide, **SA**=Sulfuric Acid, **ME**=Methanol, **SB**=sodium bisulfate, **ST**=Sodium Thiosulfate, If **NO preservative** added leave blank

Rev 5/12

Login Sample Receipt Checklist

Client: EnSafe, Inc.

Job Number: 320-24149-1

Login Number: 24149
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
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.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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	RES_META_ID
SOUTHEAST	DALLAS_NAS	320-24149-1	SWMU 00004	SWMU 00004	FSS4TMW	Temporary well point	2440585.814	6957048.881	N6247011D8013	JM37	RESOLUTION CONSULTANTS	FSS4TMW-1216	Ground water	Normal (Regular)	6-Dec-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST	DALLAS_NAS	320-24149-1	SWMU 00004	SWMU 00004	FSS5TMW	Temporary well point	2440583.949	6957305.059	N6247011D8013	JM37	RESOLUTION CONSULTANTS	FSS5TMW-1216	Ground water	Normal (Regular)	6-Dec-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST	DALLAS_NAS	320-24149-1							N6247011D8013	JM37	RESOLUTION CONSULTANTS	EBGW120616	Water for QC samples	QC Sample	6-Dec-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST	DALLAS_NAS	320-24149-1							N6247011D8013	JM37	RESOLUTION CONSULTANTS	EBWC120616	Water for QC samples	QC Sample	6-Dec-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00